# Easy Data Transform v2.9.0 for Windows

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# Getting started

Easy Data Transform introduction.

# 1 Getting started

## 1.1 Introduction

Easy Data Transform allows you to quickly transform table and list data into new and more useful forms, without coding. The step-by-step visual transformation is quicker, more interactive, more repeatable and less error prone than other approaches.

Please take a couple of minutes to read the Quick Start Guide.

## 1.2 System requirements

The suggested requirements for running this software are:

- Operating system: Windows 11, 10, 8 or 7 (64 bit versions only).
- Screen resolution: 1280x720 pixels or better.

If your operating system is more recent than the above, check our website to find a compatible version of Easy Data Transform.

You may be able to run the software satisfactorily on lower specification systems or more recent operating systems, but we can't guarantee it. If in doubt, try running an unlicensed trial version before you buy a license.

## 1.3 Quick start guide

This is a quick tour of some of Easy Data Transform's features. It should only take a few minutes to complete.

Start Easy Data Transform. If the **Free Trial** window appears, click **Continue free trial**. If the Getting Started window appears, click **I got this!** (or you will just end up back on this page). You should now see the main window.


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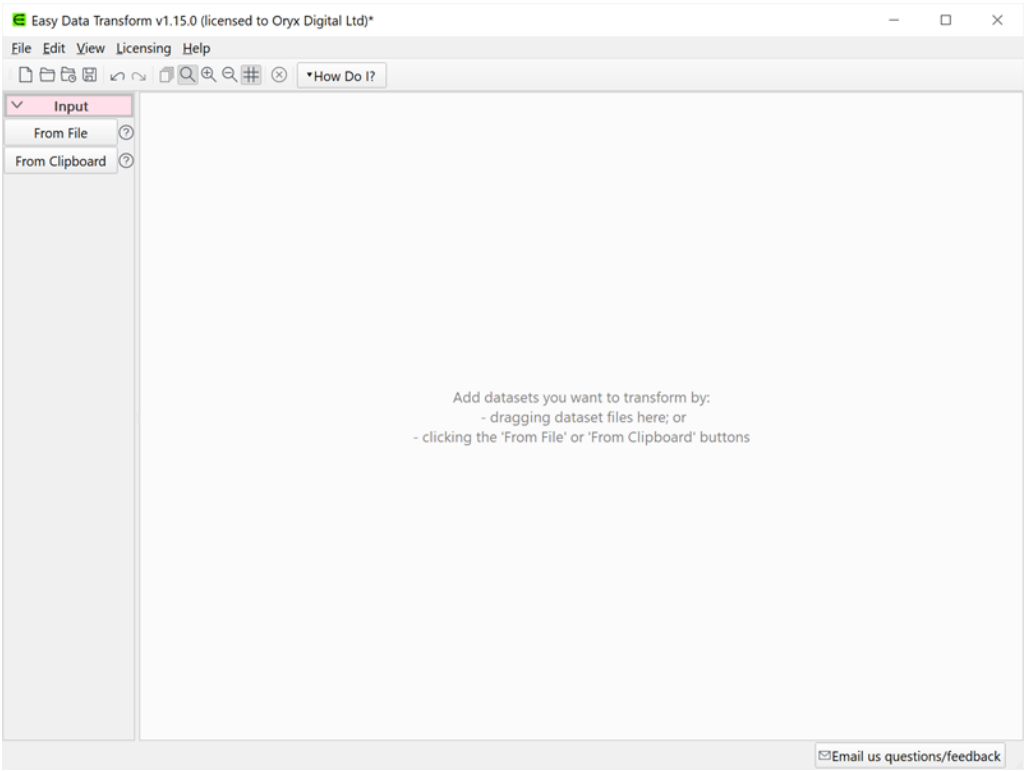
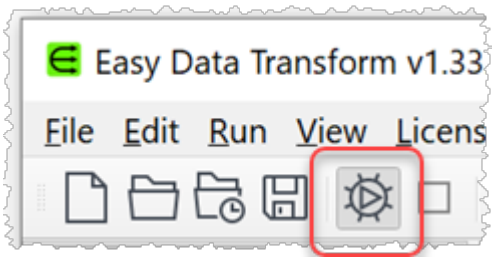



Make sure that **Auto Run** tool bar button is checked (pressed in), so that any changes you make are processed automatically after a short delay.




Drag a data file you want to transform onto Easy Data Transform. For example a CSV file or an Excel .xlsx/.xls file. XML, JSON, fixed width, plain text and vCard formats are also supported.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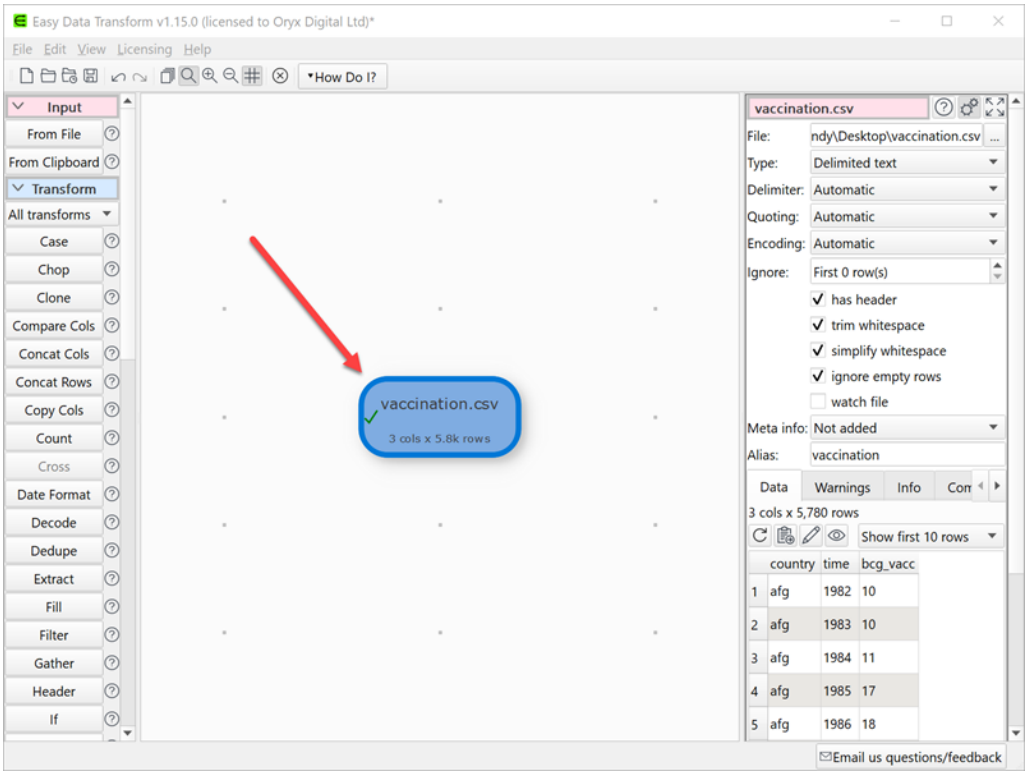


Notice that the available transforms are shown in the **Left** pane and the selected dataset is shown in the **Right** pane.

In the **Right** pane, you can check **has header**, depending on whether you want to treat the first row of the dataset as a header. For some input formats, such as JSON and XML, the header is added automatically.


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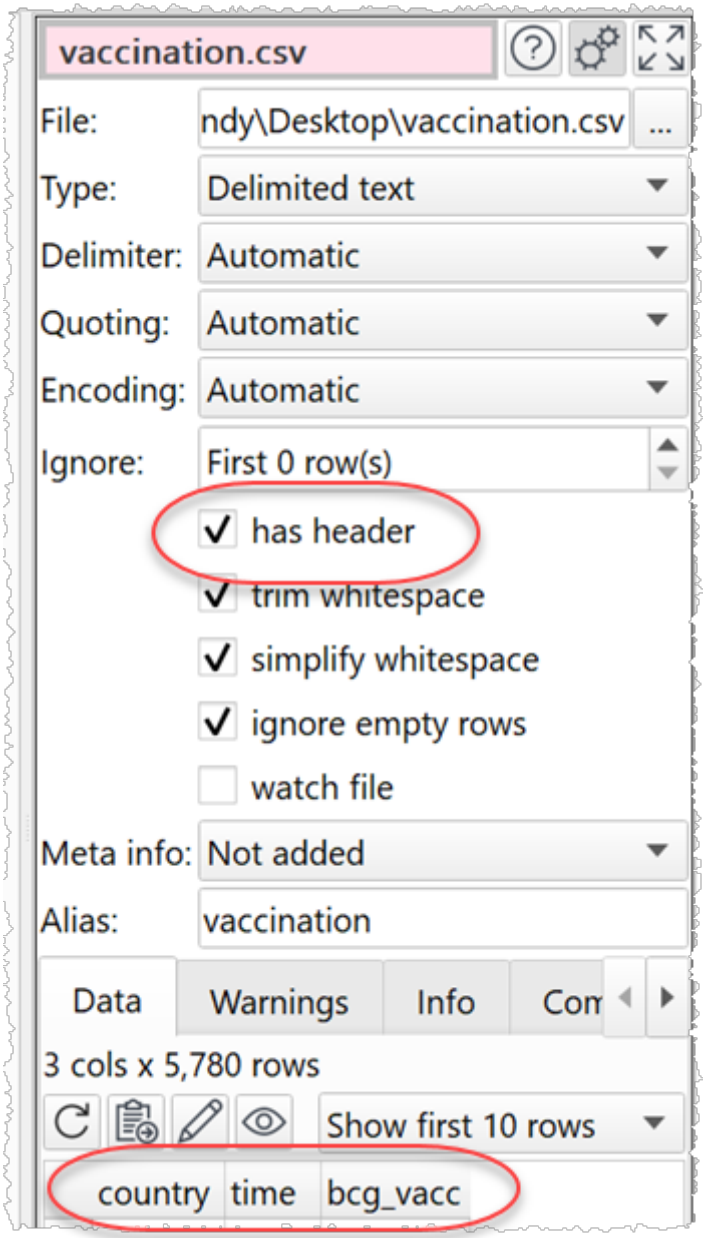


Transforms are shown in the **Left** pane. Hover over the transforms to see tooltips explaining what they do. Click on the **?** next to a transform button for more details.

Ensure the input item is selected and click on the **Case** transform button to change the case of your data.


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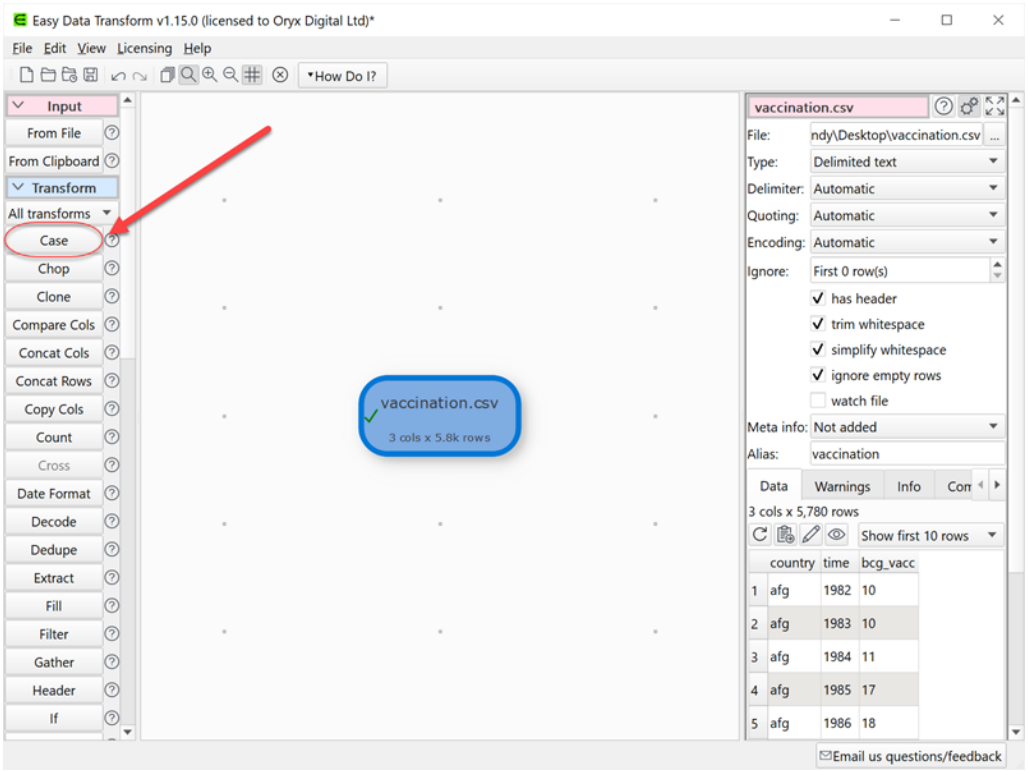
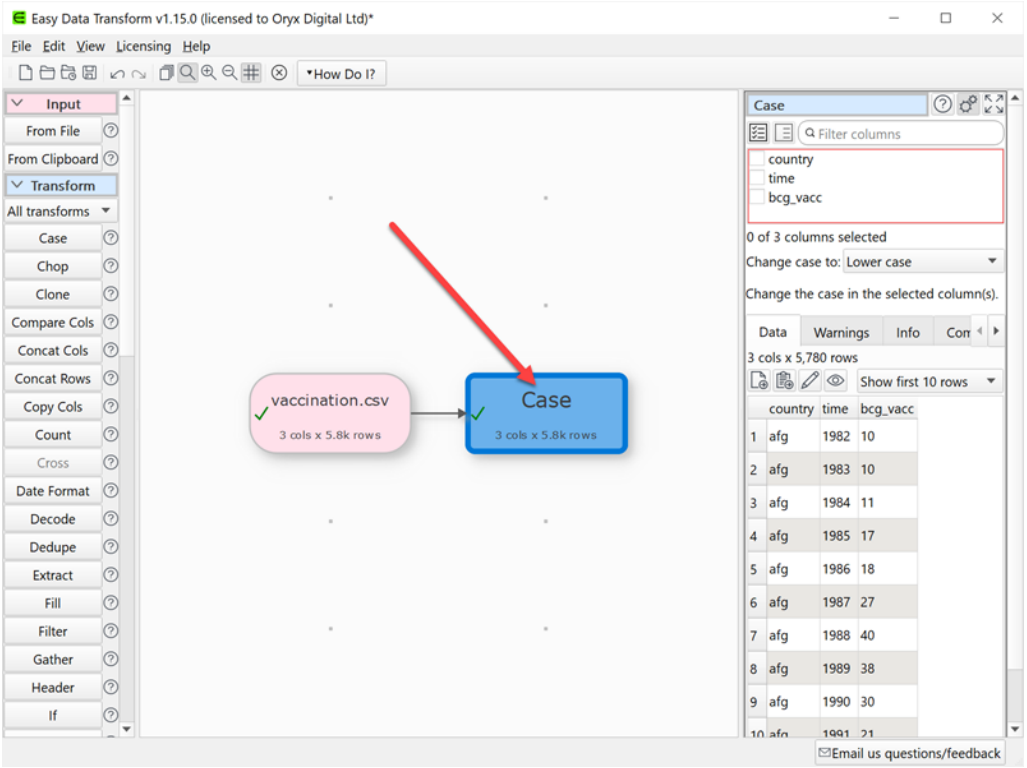



A **Case** transform item will now be added.




In the **Right** pane, check one of the columns and set **Change case to** to **Upper case**. All the text in that column will now be converted to upper case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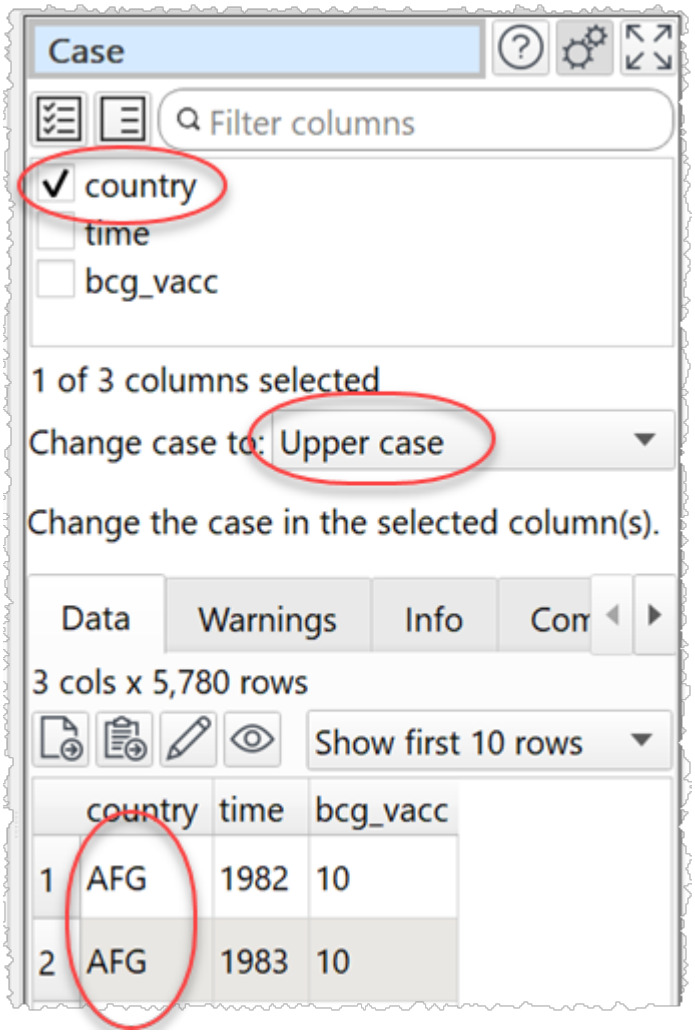
once you have stopped making changes in the **Right** pane. You don't have to click a 'run' button.




You can create a sequence of transforms to easily perform complex manipulations.

Some transforms require more than one input dataset. For example, to stack two datasets, one on top of the other:

- Select **File>New** to start again. Don't save the changes.
- Drag two data files onto the **Center** pane.
- Select both input items (by dragging a box around them or using `Ctrl`+click).
- Click the **Stack** transform button (you may need to scroll the **Left** pane to see the button).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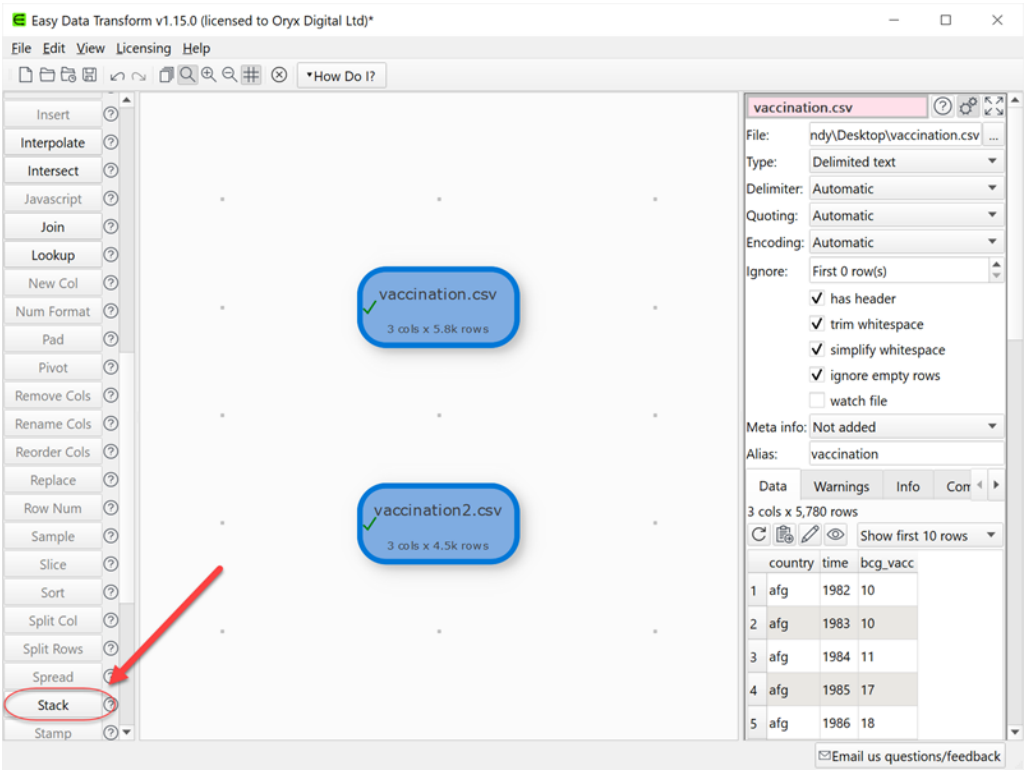
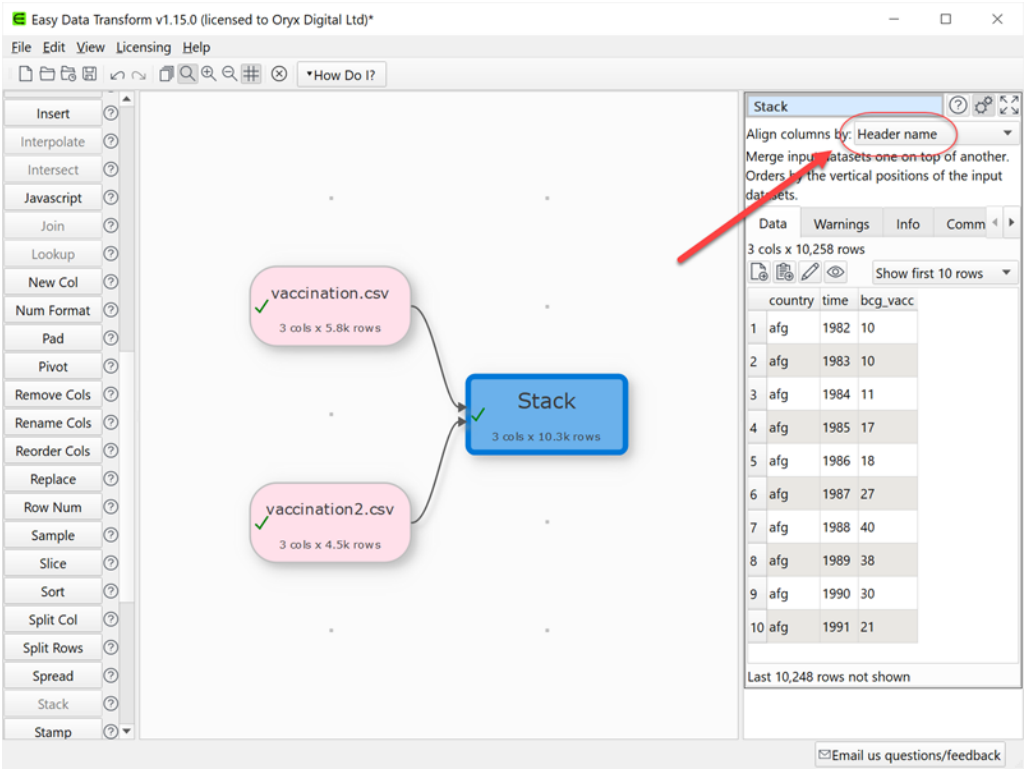



The tables are now stacked one on top of the other in a new dataset item. You can choose to match the columns by **Header name** or **Column number**.





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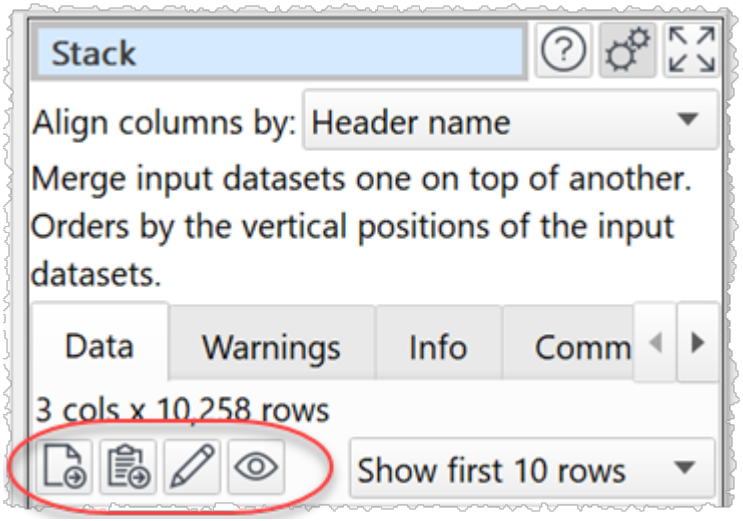
Note that the vertical (Y) position of the inputs affects the order the datasets are stacked. Try swapping the two inputs around and re-select **Stack** to see the effect.

Any changes to input options will cause the input file to be automatically re-read. Any changes to input datasets or transform options will be automatically propagated 'downstream'.

To export your transformed dataset to a file or the clipboard, view it in a local editor or see it with whitespace displayed, click on the appropriate button in the **Right** pane.




You can also add an output item to automatically write a dataset to file whenever it changes. With the **Stack** item selected, click **To File** at the bottom of the **Left** pane. You may need to scroll to see it.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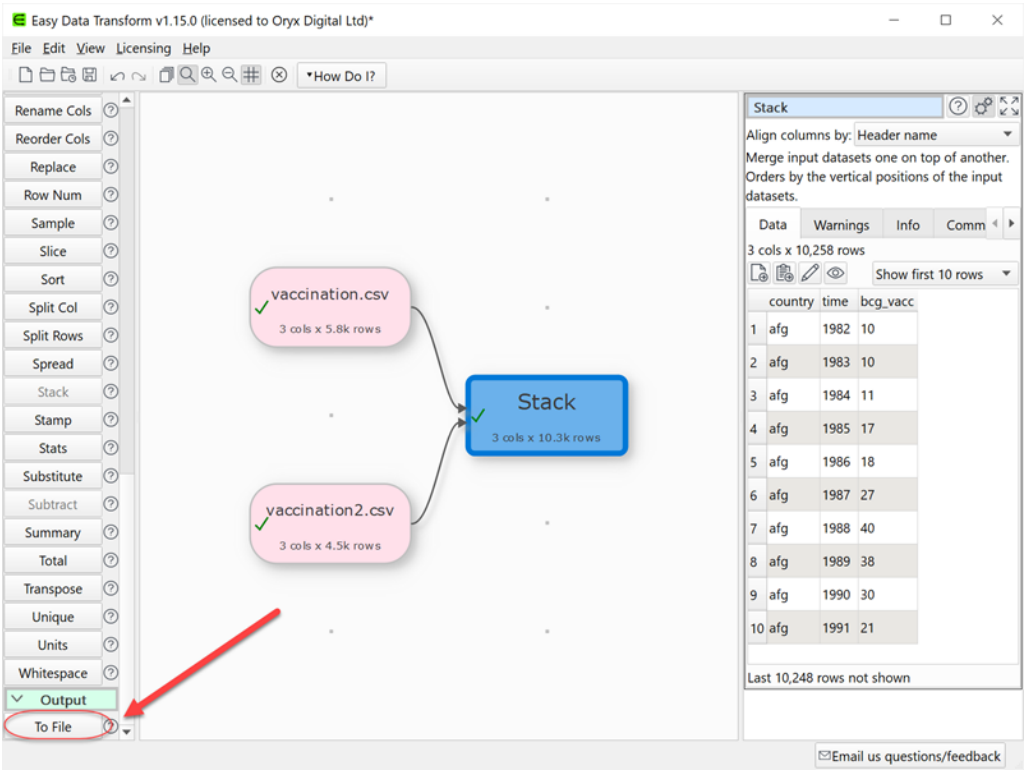
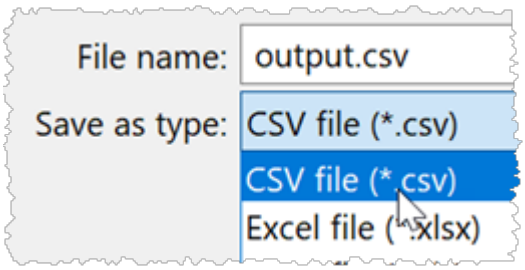



You will be asked for a file to write to. You can choose amongst CSV, Excel, HTML, JSON, Markdown, Plain text, TSV, vCard, XML and YAML file formats. Select **CSV file**.




Your dataset will then be written to this file every time it changes.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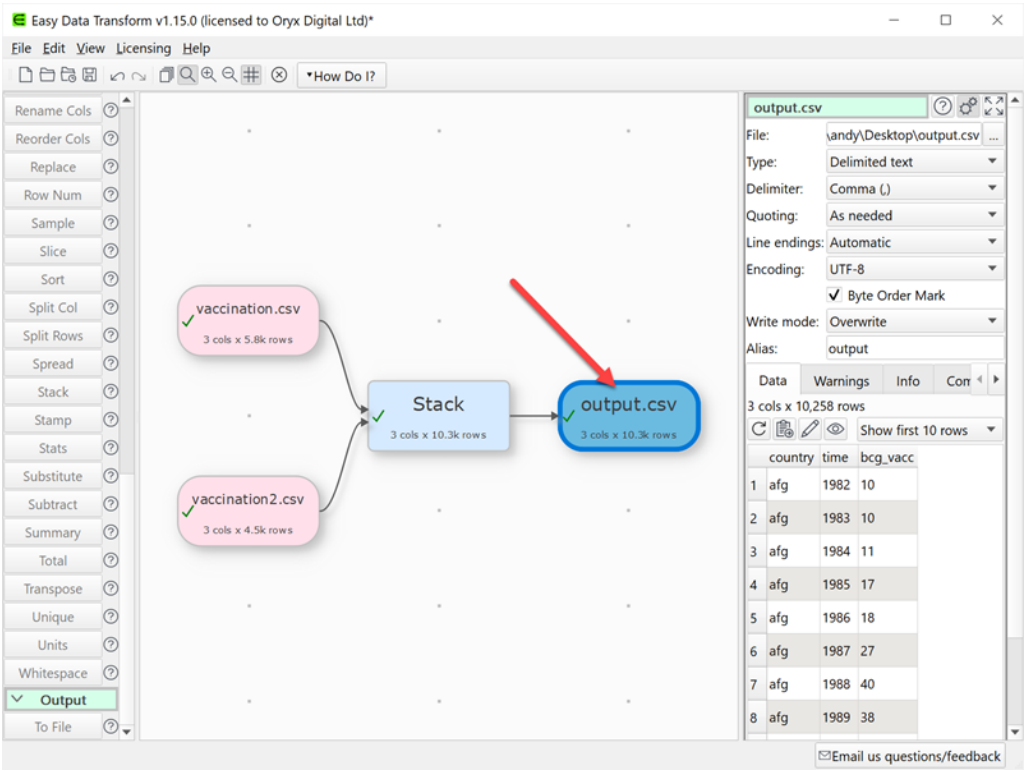
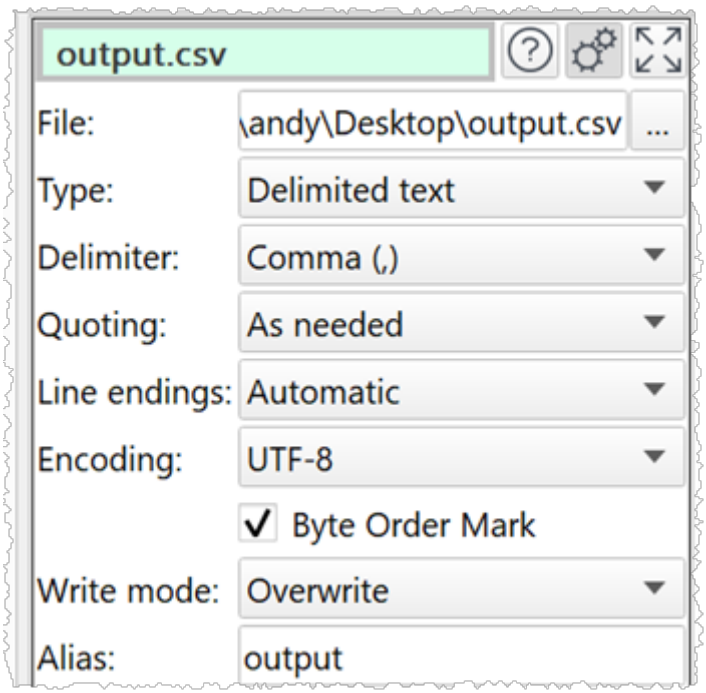



You can also specify the **Delimiter**, **Quoting**, **Encoding, Line endings** etc for your CSV files in the **Right** pane.




You can save your transforms to a .transform document to use again with **File>Save**.

Have a play!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Tips:

- You can also watch a short introductory video.
- Check the **show advanced** check box in the **Left** pane to see all the available transforms.
- You can paste in data from the clipboard (for example, a table from a web page or Word document) using the **From Clipboard** button in the **Left** pane.
- Transforms such as **Compare Cols**, **Filter**, **If** and **Sort** take account of dates, numbers and text. You can define what date formats to recognize in the Preferences window.
- New columns are always added to the right of a dataset.
- Comparisons of text are sensitive to case, unless stated otherwise. E.g. "CASE", "case" and "Case" are treated differently.
- Comparisons of text are sensitive to whitespace (e.g. spaces and tabs), unless stated otherwise. You can use the Whitespace transform to remove unnecessary whitespace.
- The contents of input and output data files are not saved in an Easy Data Transform .transform file, only their locations.
- As well as stacking two datasets, you can also Join them, side-by-side, if they have a common ('key') column.
- You can insert a new transform between existing items by selecting the connection between the items and then clicking the transform button in the **Left** pane.
- To be more productive with Easy Data Transform see the expert tips.

We are interested in your feedback, so please contact us to ask a question, report a bug or request an enhancement.


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# Reference

Easy Data Transform Main window help.

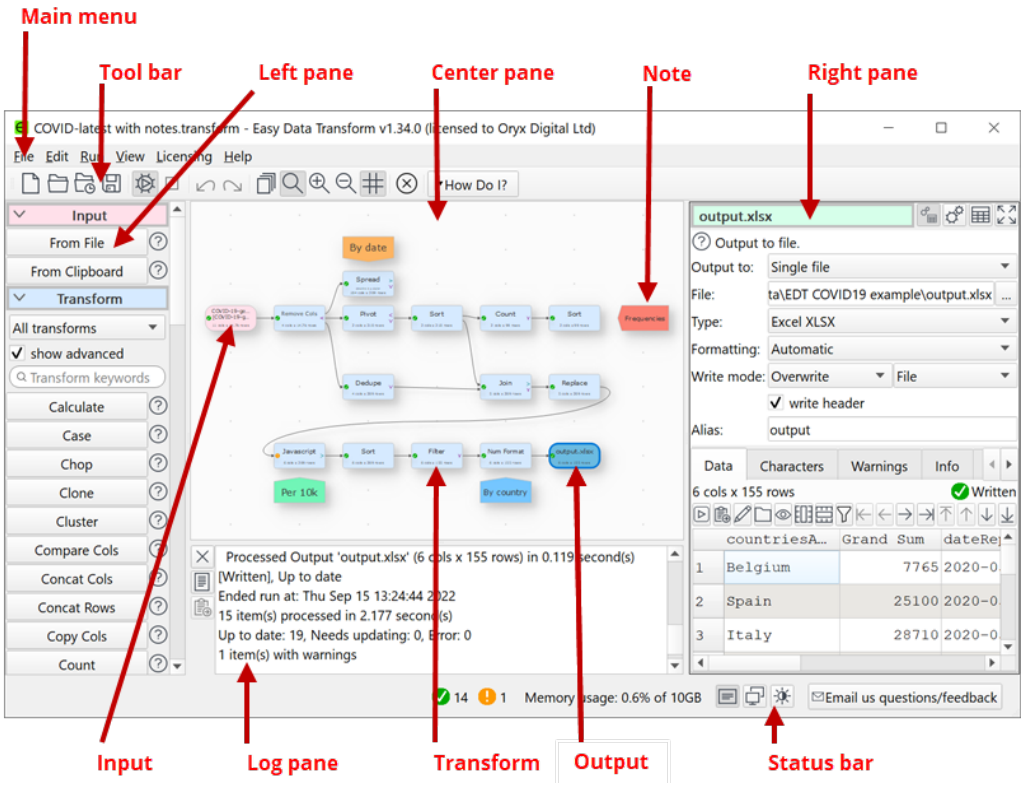
# 2 Reference

## 2.1 User Interface

### 2.1.1 Main window

The Main window comprises:

- **Main** menu
- **Tool** bar
- Left pane
- Center pane
- Right pane
- Log pane
- **Status** bar




You can split the **Right** pane onto a separate monitor (if available) by selecting **View>Two Screen Mode**.

### 2.1.2 Left pane

The **Left** pane shows all the available actions you can perform.

### 2.1.3 Center pane

The **Center** pane show the inputs, transforms and outputs you are using to transform your data. You can also add Note items.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### 2.1.4 Right pane

The **Right** pane shows details of an input, transform or output item you have selected in the Center pane.

### 2.1.5 Log pane

The **Log** pane shows a text representation of processing on the current .transform file. It shows a maximum of 5000 rows.

- Click the ✕ button to clear all text in the pane.
- Click the button to select all text in the pane.
- Click the button to copy selected text in the pane to the clipboard.
- Select **View>Log** (or the corresponding status bar button) to hide/show the pane.

### 2.1.6 Preferences window

#### General tab

Check **gray Left pane buttons when not available** if you want to gray buttons in the **Left** pane that cannot be used, because the appropriate **Center** pane items have not been selected.

Check **move Note items with associated items** if you want Note items to be automatically moved when you drag other items that the notes are adjacent to and pointing at.

Check **use native file windows** to use the native Windows file open/save windows.

Check **make a sound when processing completed** if you want to make a system sound every time processing is completed.

Check **warn on locale change** if you want be warned when you **File>Open** a .transform file with a different locale to the current locale.

Set **At start-up** depending on what you want to happen when Easy Data Transform starts.

Set **Opening a transform with auto run** according to what you want to do when you open a .transform file with auto-run enabled:

- **Leave auto run enabled** to leave auto run enabled. This could be risky if you are opening .transform files of unknown provenance.
- **Prompt to disable auto run** to prompt you whether to disable auto run (you can re-enable it).
- **Disable auto run** to disable auto run (you can re-enable it).


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- **Prompt to disable outputs** to prompt you whether to disable any output items that are not already disabled (you can re-enable them).
- **Disable outputs** to disable any output items that are not already disabled (you can re-enable them).

Note that this setting is ignored when using the -cli command line argument.

Set **User interface theme** to **Automatic** to follow the theme of the operating system or override it by setting **Light** or **Dark**. This is only available if your operating system supports a dark theme. Changing **User interface theme** does not update the Center pane colors. You can also toggle between themes using a keyboard shortcut.

Set **Tool bar icon size** to the size of the icons you wish to display in the tool bar.

Set **Copy data to clipboard text/plain as** according to how you want data to be formatted, when it is copied to the clipboard with MIME type text/plain.

- **Comma Separated Value** uses Comma as a column delimiter and quotes Carriage Returns, Commas and quotes within data.
- **Tab Separated Value** uses Tab as a column delimiter and converts Carriage Returns and Tabs to Spaces within data.
- **Plain text** outputs without any column delimiter.

Data is also copied to the clipboard with MIME type text/csv in Comma Separated Value format and to MIME type text/html as an HTML fragment.

Set **Optimize processing for** to:

- **Minimum memory use** to use memory compression to reduce the memory used. This is usually recommended. It works best when columns contain repeated values.
- **Maximum speed** to turn off memory compression. This might be faster, but uses a lot more memory. It might also be slower if the memory required is more than your RAM. It might also cause **Maximum memory usage** to be exceeded.

Set **Maximum memory usage** to the maximum amount of memory that you want Easy Data Transform to be allowed to use. If this limit is exceeded the program will give you the option to allocate more memory or exit.

Set **Right pane processing delay** depending on how long you want to wait after changes in the **Right** pane before starting processing, when **Run>Auto Run** is checked. Setting the value to 0 is generally not recommended, as this means that every single click in the **Right** pane will cause processing.


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Set **Zoom wheel behavior** according to how you want the mouse wheel to work in the **Center** pane. Hold down the `Ctrl` key while moving the mouse wheel to switch between zoom and scroll. Hold down the `Alt` key while moving the mouse wheel to switch between up/down and left/right scroll.

Set **Store these preferences in** according to where you want preferences store. **portable .ini file** is useful if you want to run Easy Data Transform as a portable application.

**User interface font** shows the font used for the application user interface, apart from data tables (see below). Click **Choose...** to choose a new font. Click **Default** to set it back to the operating system default.

**Data table font** shows the font used in the data tables in the **Right** pane. Click **Choose...** to choose a new font. You might prefer a monospaced (fixed width) font such as Consolas, Lucida Console or Courier New. Click **Default** to set it back to the operating system default.

The **Locale** language and country setting affects how some numbers and dates are displayed. Consequently it may have an effect on some transforms. It does not change the language of the user interface, which is English only.

## Dates tab

Set **Supported date formats** to the date formats you wish to recognize. List the date formats in order of preference, with the most likely to be used first.

Click **Default (US)** to replace the current supported date formats with US defaults.

Click **Default (non-US)** to replace the current supported date formats with non-US defaults.

## Input Extensions tab

Set the default file types corresponding to input file extensions. The order in which file extensions are shown is not significant.

Click in the **Extension** column and type to change an input file extension. The text will be trimmed of whitespace, converted to lower case and any '.' characters removed.

Click in the **Default type** column and change the drop-down list to change the file type to associate with an input file extension.


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Click **Add** to add a new input file extension.

Click **Remove** to remove the selected input file extension(s).

Click **Default** to set the input file extensions back to the default setting.

Set **Block input from files with extensions** to a Comma separated list of file extensions that you want to block Easy Data Transform from reading from for data security. The case and the order in which file extensions are shown is not significant.

## Output Extensions tab

Set the default file types corresponding to output file extensions. The order in which file extensions are shown is not significant.

Click in the **Extension** column and type to change an output extension. The text will be trimmed of whitespace, converted to lower case and any '.' characters removed.

Click in the **Default type** column and change the drop-down list to change the file type to associate with an output file extension.

Click **Add** to add a new output file extension.

Click **Remove** to remove the selected output file extension(s).

Click **Default** to set the output file extensions back to the default setting.

Set **Block output to files with extensions** to a Comma separated list of file extensions that you want to block Easy Data Transform from writing to for data security. The case and the order in which file extensions are shown is not significant.

## Colors tab

Select a **Color scheme** for the **Center** pane. A **Preview** is shown in the **Preferences** window. Choose **Custom** to choose your own color scheme.


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## 2.2 Input

### 2.2.1 Input data

You need to input data before you can transform it. Data can be input by:

- dragging a file onto the Center pane; or
- clicking the **From File** or **From Clipboard** button in the Left pane

Enter the file location in **File** or click the browse button. For Excel spreadsheets you also need to add a sheet name, e.g. 'MySpreadsheet.xlsx[Sheet1]'.

Easy Data Transform can input data from files in the following formats:

- delimited text file (e.g. CSV or TSV) with various delimiters
- Excel .xlsx or .xls
- Fixed width
- Plain text
- JSON
- vCard
- XML

You can select the input item in the **Center** pane and change any related options in the Right pane.


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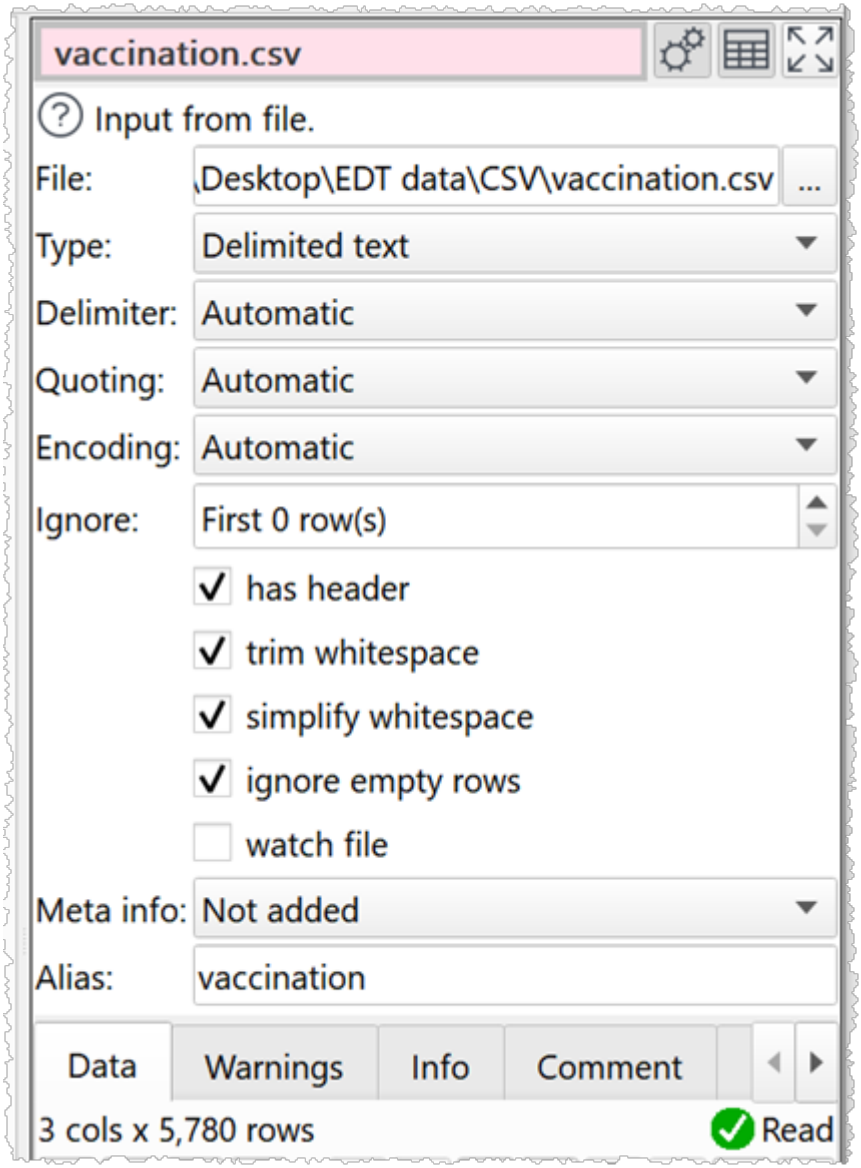


Set **Type** to the file type. The default type will be set according to the file extension and the settings in the **Input Extensions** tab of the Preferences window.

For text files Easy Data Transform will treat `CRLF`, `LF` or `CR` control characters as line endings.

Easy Data Transform will make an intelligent guess at the:
- column delimiter and quoting for delimited text files (e.g. Comma)
- column widths for fixed width text files
- text encoding for text files (e.g. UTF-8)
- presence of a header row in the data

But you can also do this manually by selecting the input item and changing the **Delimiter, Columns**, **Encoding** and **has header** fields in the Right pane.


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Set **Ignore** to the number of rows you want to skip before you start inputting. Note that this takes place before any empty rows are removed by **Ignore empty rows**.

For delimited text you can:
- Set **Delimiter** to the delimiter character.
- Check **ignore repeated delimiters** if you want to treat 2 or more consecutive delimiters as a single delimiter.
- Set **Quoting** according to whether " quoting is used so that the delimiter can appear within values.

See delimited text for more details.

For fixed width set **Columns** to **Manual** to set column widths. See fixed width for more details.

For JSON or XML set **Format** to **Long (more rows)** or **Wide (more columns)** depending on how you want to treat arrays/repeat values. See JSON or XML for more details.

Check **has header** if your dataset has a header row, with column names.

Set **Uses schema** to **Yes** if want to use a schema to manage changes to columns in the input.

Check **trim whitespace** to trim any whitespace (e.g. tabs or spaces) off the start or end of header and data values.

Check **simplify whitespace** to perform the following in header and data values:
- Replace any Tabs or Line Feeds with a Space.
- Replace non-standard spaces (such as non-breaking Space, Thin Space etc) with spaces.
- Remove Carriage Returns.

Check **ignore empty rows** to remove any rows that have only empty values (whitespace is not considered empty).

Check **ignore empty columns** to remove any columns that have only empty values (whitespace is not considered empty). This is carried out after any schema has been applied. Header values are ignored when deciding if a column is empty.

Check **ignore hidden rows** to remove any hidden rows (Excel files only).


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Check **watch file** if you set the input to 'Needs update' whenever the input file changes (which will trigger processing if **Run>Auto Run** checked). Easy Data Transform will wait until the file hasn't been updated for 5 seconds before doing anything.

Use **Meta info** if you wish to add some meta information about the input dataset, e.g. the name of an input file or the date it was created.

Use **Alias** to identify the input for batch processing or command line processing.

To change the file being used by an input, select the input item and change the file location in the **Right** pane (e,g, by clicking the '...' browse file button), rather the disconnecting the input and connecting a new one.

## 2.3 Transforms

### 2.3.1 Transform data

Transforms operate on datasets from input data or other transforms. Some transforms only have a single input (e.g. Case), some transforms have two inputs (e.g. Join) and some transforms have two or more inputs (e.g. Stack).

To create a transform, select one or more input and/or transform items in the Center pane and then click the appropriate button in the Left pane.

Select from the drop-down list in the **Left** pane to choose which types of transform are displayed, e.g. select **Merge Transforms** to show only transforms related to blending data.

Check the **show advanced** checkbox in the **Left** pane to see all available transforms.

You can select the transform item in the **Center** pane and change any options related to the transform (e.g. which columns it acts on) in the Right pane.

The transform will be updated automatically if **Run>Auto Run** is selected and any input or transform 'upstream' of it changes.

### 2.3.2 Calculate

#### Description

Performs a calculation on 1 or 2 columns and creates a new column.


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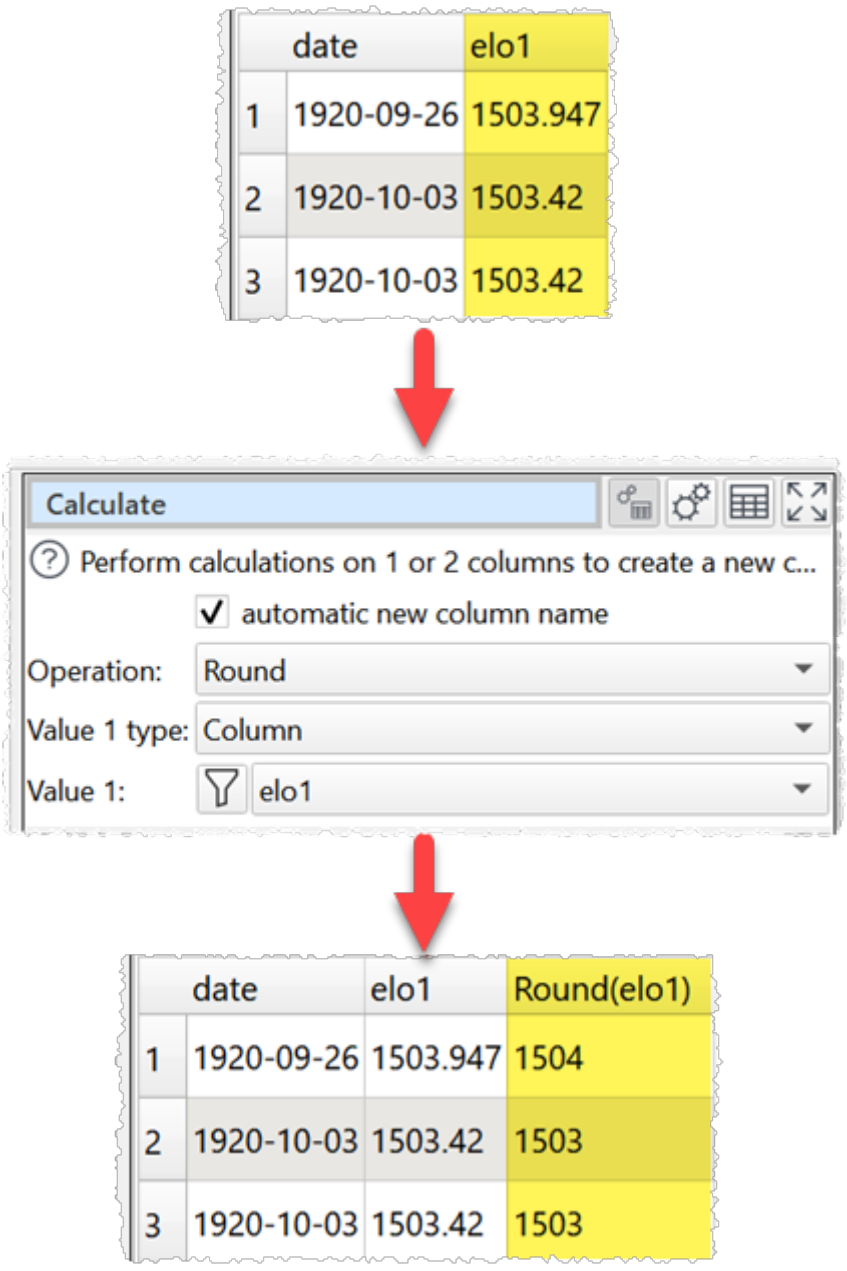
## Examples

Round a column of numbers to the nearest integer:




Divide a column of numbers by 100: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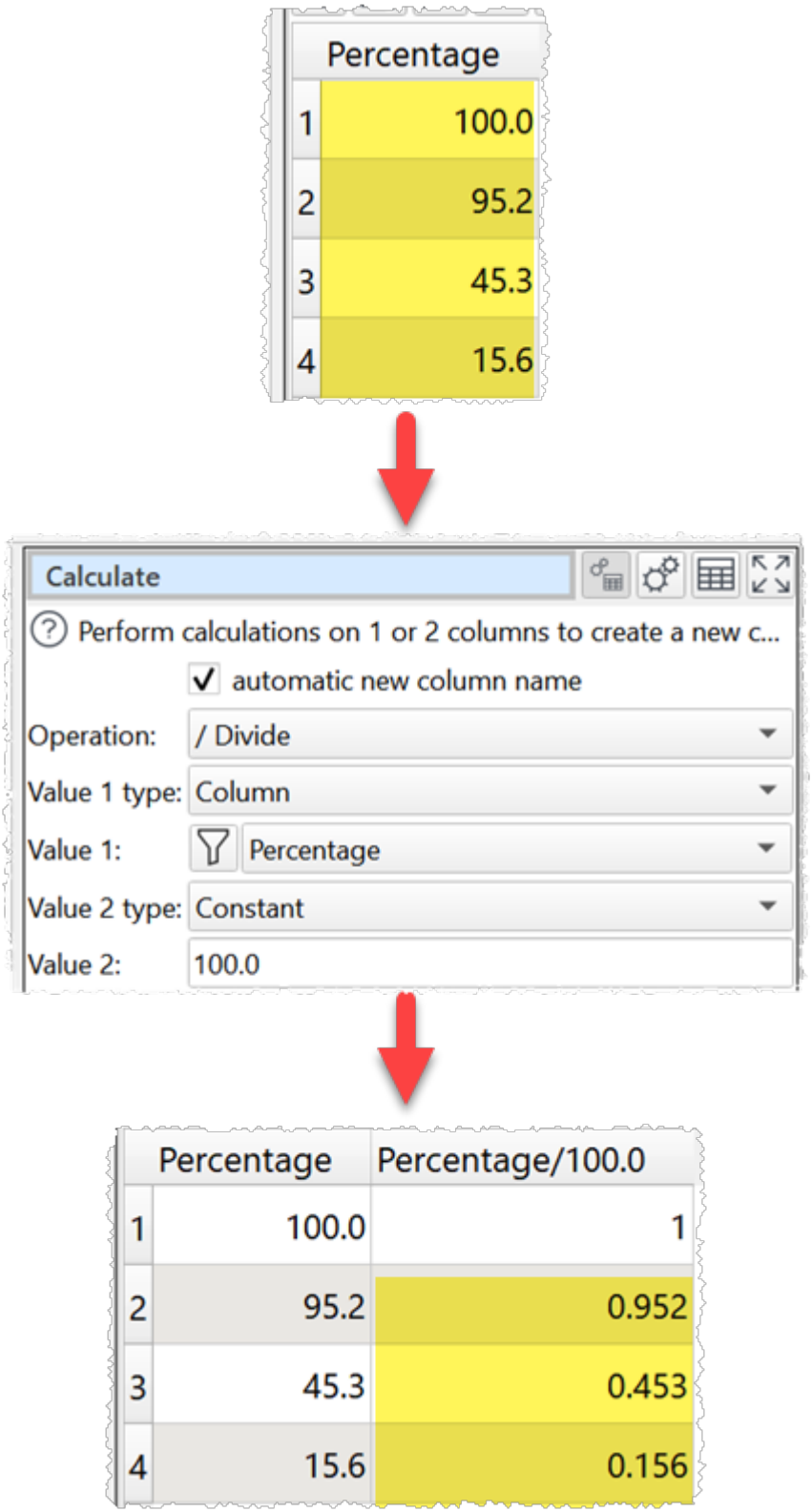


Multiply 2 columns of numeric values:


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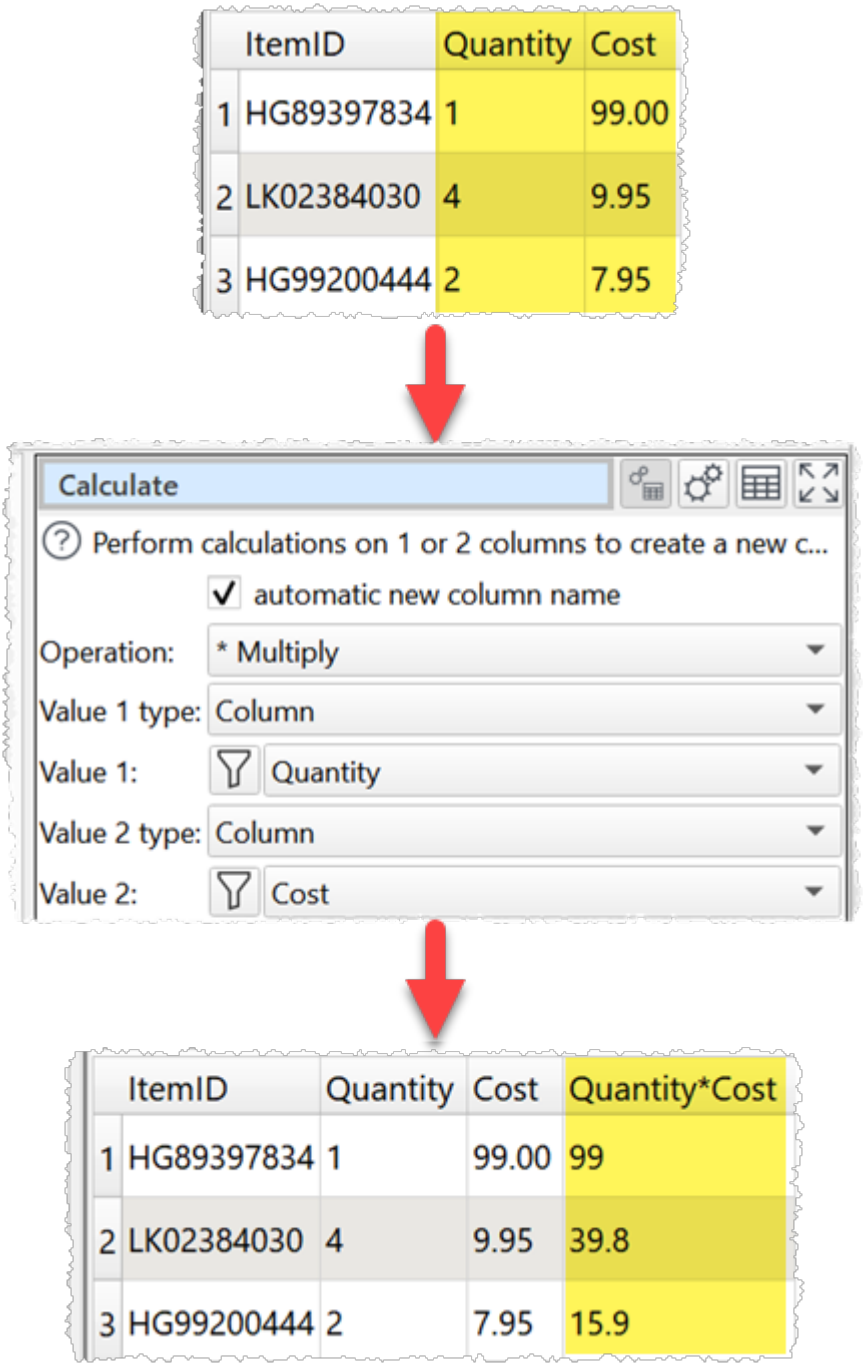


Add a days column to a date column:


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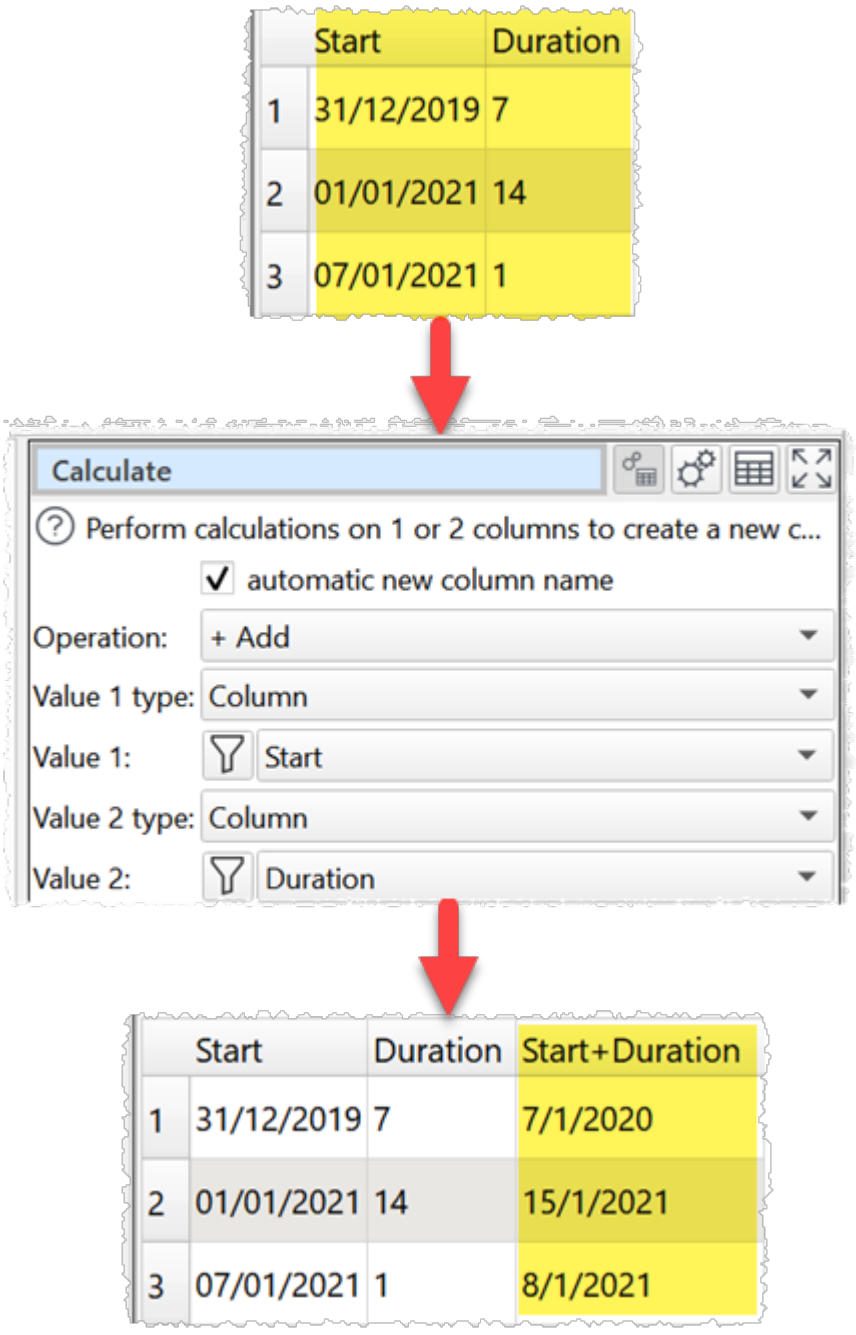


Calculate the difference in days between 2 date columns:


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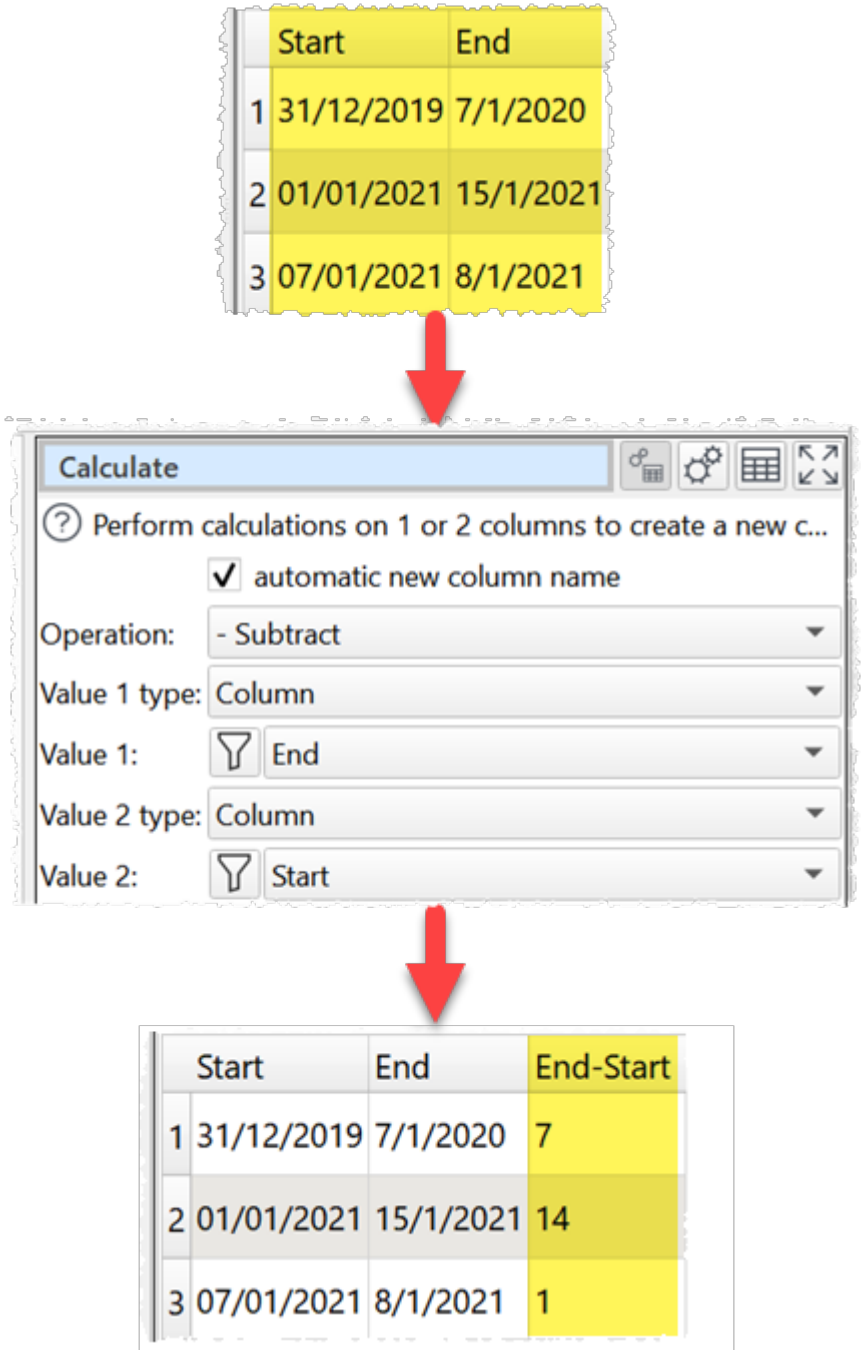


## Inputs

One.

## Options

- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Set **Operation** to the operation you wish to perform.
- Set **Value 1 type** depending on whether you wish to use a single value or a column of values for the first value.


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- Set **Value 1** to the first column of values or constant value you wish to operate on.
- Set **Value 2 type** depending on whether you wish to use a single value or a column of values for the second value (binary operations only).
- Set **Value 2** to the second column of values or constant value you wish to operate on (binary operations only).

## Notes

- The following operations are supported.

| Operation | Value 1 | Value 2 | Notes | Examples |
|---|---|---|---|---|
| **+ Add** | Number | Number | Numerical addition. | `1.2 + 3 = 4.2` |
| | Date | Integer number | Adds days to the date. | `31/01/2021 + 7 = 07/02/2021` |
| **- Subtract** | Number | Number | Numerical subtraction. | `1.2 - 3 = -1.8` |
| | Date | Integer number | Subtracts days from the date. | `31/01/2021 - 7 = 24/01/2021` |
| | Date | Date | Days the date in **Value 1** is after the date in **Value 2** (negative if before). | `31/01/2021 - 24/01/2021 = 7`<br>`24/01/2021 - 31/01/2021 = -7` |
| *** Multiply** | Number | Number | Numerical multiplication. | `1.2 * 3 = 3.6` |
| **/ Divide** | Number | Number | Numerical division. | `1.2 / 3 = 0.4`<br>`1 / 0 = Error` |
| **^ Power** | Number | Number | **Value 1** to the power **Value 2** (**Value 1**$^{\text{Value 2}}$). | `1.2 ^ 3 = 1.728`<br>`2 ^ -3 = 0.125` |
| **% Modulus** | Integer number | Integer number | Remainder after **Value 1** is divided by **Value 2.** | `7 % 2 = 1`<br>`7 % 0 = Error` |


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| Operation | Value 1 | Value 2 | Notes | Examples |
|---|---|---|---|---|
| **Abs** | Number | N/A | The absolute value. | `Abs( 1.2 ) = 1.2`<br>`Abs( -1.2 ) = 1.2` |
| **And** | Boolean | Boolean | Logical AND. | `And( true, false ) = false`<br>`And( 1, 1 ) = true`<br>`And( 0, FALSE ) = false` |
| **AndBitwise** | Integer number | Integer number | Bitwise AND. | `AndBitwise( 7, 1 ) = 1`<br>`AndBitwise( 5, 10 ) = 0` |
| **Ceiling** | Number | N/A | The smallest integer that is not less than the value. | `Ceiling( 1 ) = 1`<br>`Ceiling( 1.2 ) = 2`<br>`Ceiling( -1.2 ) = -1` |
| **DateTimeToMSecs** | ISO datetime | N/A | Convert an ISO datetime to the number of milliseconds since 1970-01-01:00:00:00.000 UTC . | `DateTimeToMSecs( 1970-01-01 ) = 0`<br>`DateTimeToMSecs( 2022-09-15T21:06:10 ) = 1663272370000`<br>`DateTimeToMSecs( 1969-12-30T13:42:23.211Z ) = -123456789`<br>`DateTimeToMSecs( 2022-09-16T13:00:02+01:00 ) = 1663329602000` |
| **DateToJulianDay** | Date | N/A | Convert a date to days since the beginning of the Julian period (1st January 4713 BC). | `DateToJulianDay( 31/01/2021 ) = 2459246`<br>`DateToJulianDay( 01/02/2021 ) = 2459247`<br>`DateToJulianDay( 01/01/0001 ) = 1721426` |
| **DayOfWeek** | Date | N/A | Day of the week, from 1 = Monday to 7 = Sunday. | `DayOfWeek( 31/01/2021 ) = 7`<br>`DayOfWeek( 01/02/2021 ) = 1` |
| **DayOfMonth** | Date | N/A | Day of the month, from 1 to 31. | `DayOfMonth( 31/01/2021 ) = 31` |


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| Operation | Value 1 | Value 2 | Notes | Examples |
|---|---|---|---|---|
| | | | | `DayOfMonth( 01/02/2021 ) = 1` |
| **DayOfYear** | Date | N/A | Day of the year, from 1 to 366. | `DayOfYear( 01/02/2021 ) = 32`<br>`DayOfYear( 31/12/2021 ) = 365` |
| **DaysInMonth** | Date | N/A | The number of days in the date month, from 28 to 31. | `DaysInMonth( 01/02/2023 ) = 28`<br>`DaysInMonth( 01/02/2024 ) = 29` |
| **DaysInYear** | Date | N/A | The number of days in the date year, from 365 to 366. | `DaysInYear( 01/02/2023 ) = 365`<br>`DaysInYear( 01/02/2024 ) = 366` |
| **Decrement** | Number | N/A | Subtract 1. | `Decrement( 1 ) = 0`<br>`Decrement( -1 ) = -2`<br>`Decrement( 1.2 ) = 0.2` |
| | Date | N/A | Subtract 1 day. | `Decrement( 31/01/2021 ) = 30/01/2021` |
| **Floor** | Number | N/A | The largest integer that is not greater than the value. | `Floor( 1 ) = 1`<br>`Floor( 1.2 ) = 1`<br>`Floor( -1.2 ) = -2` |
| **Increment** | Number | N/A | Add 1. | `Increment( 1 ) = 2`<br>`Increment( -1 ) = 0`<br>`Increment( 1.2 ) = 2.2` |
| | Date | N/A | Add 1 day. | `Increment( 31/01/2021 ) = 01/02/2021` |
| **IndexOf** | Any | Any | The 1-based position of the first occurrence of value 1 in value 2. Empty | `IndexOf( a, EasyData ) = 2`<br>`IndexOf( DATA, EasyData ) =`<br>`IndexOf( , EasyData ) = 1`<br>`IndexOf( EasyData, ) =`<br>`IndexOf( , ) = 1` |


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| Operation | Value 1 | Value 2 | Notes | Examples |
|---|---|---|---|---|
| | | | if not found. Case sensitive. | |
| **JulianDayToDate** | Integer number | N/A | Convert days since the beginning of the Julian period (1st January 4713 BC) to an ISO date. | `JulianDayToDate( 2459246 ) = 2021-01-31`<br>`JulianDayToDate( 2459247 ) = 2021-02-01`<br>`JulianDayToDate( 1721426 ) = 0001-01-01`<br>`JulianDayToDate( 1721425 ) = Error` |
| **LastIndexOf** | Any | Any | The 1-based position of the last occurrence of value 1 in value 2. Empty if not found. Case sensitive. | `LastIndexOf( a, EasyData ) = 8`<br>`LastIndexOf( DATA, EasyData ) =`<br>`LastIndexOf( , EasyData ) = 9`<br>`LastIndexOf( EasyData, ) =`<br>`LastIndexOf( , ) = 1` |
| **Length** | Any | N/A | Then number of characters in the value (include any whitespace). | `Length( 1.2 ) = 3`<br>`Length( 31/01/2021 ) = 10`<br>`Length( abcd ) = 4` |
| **LevDistance** | Any | Any | Calculates the Levenshtein distance between 2 text values. Case sensitive. | `LevDistance( EasyData, easydata ) = 3` |
| **Log10** | Number | N/A | The common (base 10) logarithm of the value. | `Log10( 10 ) = 1`<br>`Log10( 0 ) = Error` |
| **Log2** | Number | N/A | The base 2 logarithm of the value. | `Log2( 10 ) = 3.3219280949`<br>`Log2( 0 ) = Error` |


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| Operation | Value 1 | Value 2 | Notes | Examples |
|---|---|---|---|---|
| **Ln** | Number | N/A | The natural (base e) logarithm of the value. | `Ln( 10 ) = 2.302`<br>`Ln( 0 ) = Error` |
| **Maximum** | Number | Number | Returns the larger number. | `Maximum( 10, 11 ) = 11`<br>`Maximum( 10, -11 ) = 10` |
| | Date | Date | Returns the later date. | `Maximum( 31/01/2021, 01/01/2022 ) = 01/01/2022` |
| **Minimum** | Number | Number | Returns the smaller number. | `Minimum( 10, 11 ) = 10`<br>`Minimum( 10, -11 ) = -11` |
| | Date | Date | Returns the earlier date. | `Minimum( 31/01/2021, 01/01/2021 ) = 31/01/2021` |
| **MSecsToDateTime** | Integer number | N/A | Convert the number of milliseconds since 1970-01-01:00:00:00.000 UTC to an ISO datetime. May be affected by locale (e.g. Summertime). | `MSecsToDateTime( 0 ) = 1970-01-01T00:00:00.000`<br>`MSecsToDateTime( -123456789 ) = 1969-12-30T13:42:23.211`<br>`MSecsToDateTime( 123456789 ) = 1970-01-02T10:17:36.789` |
| **MSecsToTime** | Integer number | N/A | Convert the number of milliseconds since midnight to hh:mm:ss.zzz. | `MSecsToTime( 0 ) = 00:00`<br>`MSecsToTime( 8130000 ) = 02:15:30`<br>`MSecsToTime( 86399999 ) = 23:59:59.999`<br>`MSecsToTime( 86400001 ) = 24:00:00.001` |
| **Month** | Date | N/A | 1 = January. | `Month( 31/12/2021 ) = 12` |
| **Occurrences** | Any | Any | The number of times value | `Occurrences( is, This is a string ) = 2` |


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| Operation | Value 1 | Value 2 | Notes | Examples |
|---|---|---|---|---|
| | | | 1 occurs in value 2. Occurrences can overlap. Empty if value 1 is empty. Case sensitive. | `Occurrences( xx, xxxx ) = 3`<br>`Occurrences( xxxx, xx ) = 0`<br>`Occurrences( , xxxx ) =` |
| **Or** | Boolean | Boolean | Logical OR. | `Or( true, false ) = true`<br>`Or( 1, 1 ) = true`<br>`Or( 0, FALSE ) = false` |
| **OrBitwise** | Integer number | Integer number | Bitwise OR. | `OrBitwise( 7, 1 ) = 7`<br>`OrBitwise( 5, 10 ) = 15` |
| **Quarter** | Date | N/A | 1 = Q1 | `Quarter( 1/1/2023 ) = 1`<br>`Quarter( 31/3/2023 ) = 1`<br>`Quarter( 1/4/2023 ) = 2`<br>`Quarter( 31/12/2023 ) = 4` |
| **Round** | Number | N/A | Round to the nearest integer. | `Round( 1 ) = 1`<br>`Round( -1.2 ) = -1`<br>`Round( 1.5 ) = 2` |
| **Sign** | Number | N/A | 1 if value > 0, 0 if value = 0, -1 if value < 0. | `Sign( 1.2 ) = 1`<br>`Sign( 0 ) = 0`<br>`Sign( -1.2 ) = -1` |
| **TimeToMSecs** | Time | N/A | Convert an h:m:s(.zzz) time to the number of milliseconds since midnight. | `TimeToMSecs( 0:0:0 ) = 0`<br>`TimeToMSecs( 02:15:30 ) = 8130000`<br>`TimeToMSecs( 23:59:59.999 ) = 86399999`<br>`TimeToMSecs( 24:00:00.001 ) = 86400001` |
| **WeekOfYear** | Date | N/A | The year and the week of the year, from 01 to 53, | `WeekOfYear( 31/12/2020 ) = 2020,53`<br>`WeekOfYear( 06/01/2021 ) = 2021,01` |


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| Operation | Value 1 | Value 2 | Notes | Examples |
|---|---|---|---|---|
| | | | separated with a Comma. In accordance with ISO 8601, each week falls in the year to which most of its days belong, in the Gregorian calendar. As ISO 8601's week starts on Monday, this is the year in which the week's Thursday falls. | `WeekOfYear( 31/12/2021 ) = 2021,52` |
| **WordCount** | Any | N/A | Count the number of words separated by whitespace and/or punctuation. | `WordLength( Hello world! ) = 2`<br>`WordLength( Hello,world! ) = 2`<br>`WordLength( Hello, world! ) = 2` |
| **Xor** | Boolean | Boolean | Logical XOR (exclusive OR). | `Xor( true, false ) = true`<br>`Xor( 1, 1 ) = false`<br>`Xor( 0, FALSE ) = false` |
| **XorBitwise** | Integer number | Integer number | Bitwise XOR (exclusive OR). | `XorBitwise( 7, 1 ) = 6`<br>`XorBitwise( 5, 10 ) = 15` |
| **Year** | Date | N/A | The 4 digit year. | `Year( 31/01/2021 ) = 2021` |

- Each row is calculated separately.
- Whether values are interpreted as number, dates or text depends on **Supported date formats** and locale.


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- Bitwise operations interpret negative numbers using Two's complement.
- To concatenate text in different columns use the Concat Cols transform.
- To compare 2 columns use the Compare Cols transform.
- For logical operations use the If transform.
- For operations on whole rows or columns use the Stats transform.
- For more complex calculations, including number/date, use the Javascript transform.
- To modify the numerical precision of the results use the Num Format transform.
- To add a new column of values use the New Col transform.

### See also

- Video: How to convert a Unix timestamp

## 2.3.3 Case

### Description

Changes the case of text in one or more columns.

### Example

Set names to title case:


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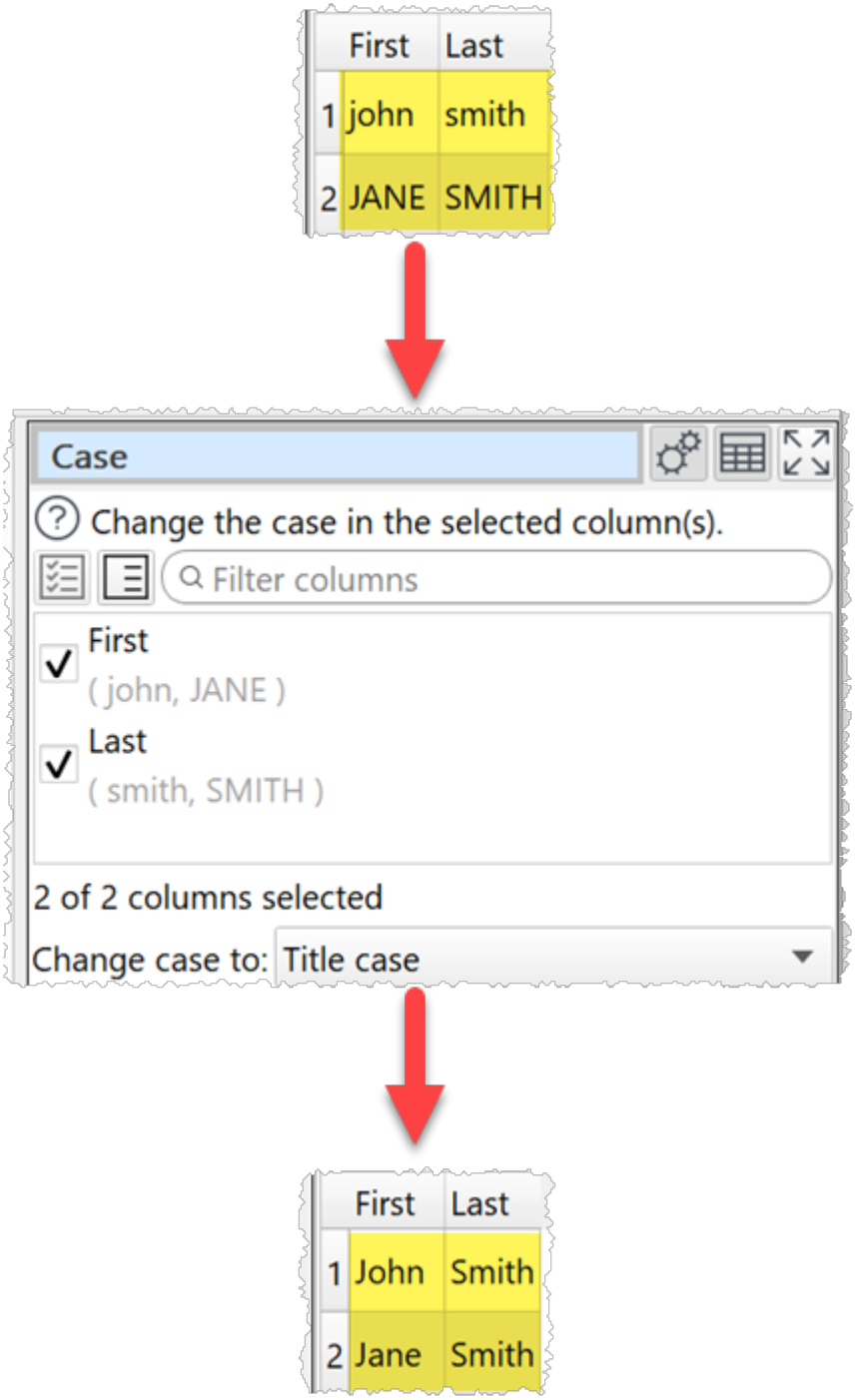


## Inputs

One.

## Options

- Check the column(s) you wish to transform.
- Set **Change case to** according to the case you want:


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| Case | Description | Example output for ' WORD word Word !' |
|---|---|---|
| Lower case | Converts all letters to lower case. | ' word word word ! |
| Upper case | Converts all letters to upper case. | ' WORD WORD WORD ! |
| Title case | Converts the first letter of each word to upper case and all other letters to lower case. | ' Word Word Word ! |
| Sentence case | Converts the first letter to upper case and all other letters to lower case. | ' Word word word ! |
| Lower camel case | Converts the first letter for the second and subsequent words to upper case and all other letters to lower case. Removes whitespace. | wordWordWord! |
| Upper camel case | Converts the first letter of each word to upper case and all other letters to lower case. Removes whitespace. | WordWordWord! |
| Kebab case | Replaces multiple consecutive whitespace characters with a single - (Hyphen) character. | -WORD-word-Word-! |
| Snake case | Replaces multiple consecutive whitespace characters with a single _ (Underscore) character. | _WORD_word_Word_! |
| Inverted case | Convert lower case letters to upper case and upper case letters to lower case. | ' word WORD wORD ! |


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- If **keep upper case** is checked, then any existing upper case letters are left unchanged. This option is only available for **Title case** and **Sentence case**. E.g. you can use **Title case** with **keep upper case** checked to convert 'john McKenzie PhD' to 'John McKenzie PhD'.

### See also

- Whitespace

## 2.3.4 Chop

### Description

Remove characters from the start or end in one or more columns.

### Example

Remove leading zeros:


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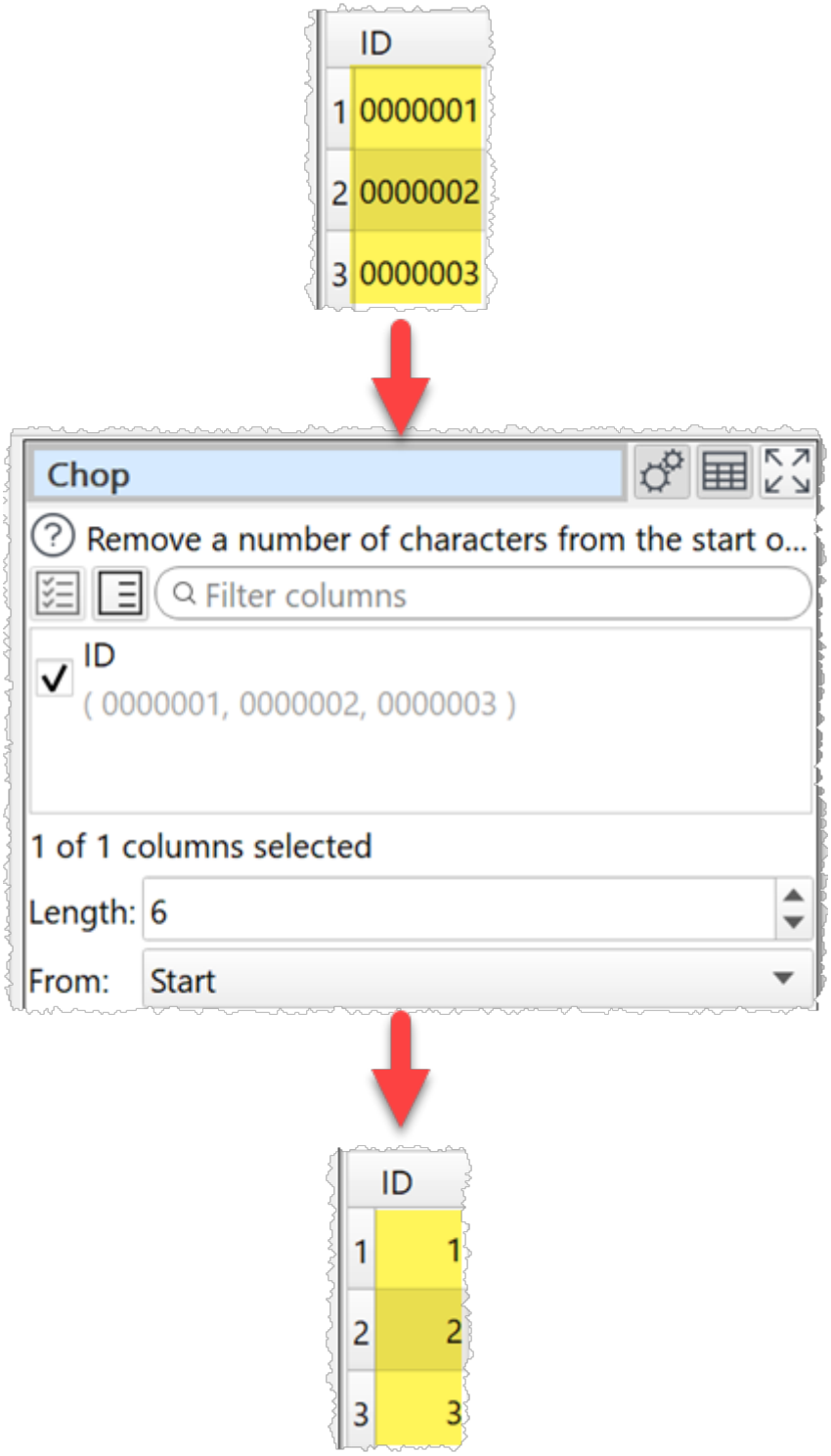


## Inputs

One.

## Options

- Check the column(s) you wish to transform.
- Set **Length** to the number of characters you want to remove.


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- Set **From** to **Start** or **End** depending on whether you want to remove characters from the start or end.

### Notes

- If you can to keep the original column use Copy Cols to copy the column first.
- Whitespace is counted when calculating length. You can use Whitespace to remove whitespace before chopping.
- If you want to set a column to a fixed length use Pad and Chop together.

### See also

- Extract

## 2.3.5 Clone

### Description

Makes an exact copy of the input dataset.

### Inputs

One.

### Options

- None.

### Notes

- Clone can be useful to simplify complicated layouts.

## 2.3.6 Cluster

### Description

Classify rows with similar text into clusters

### Examples

Clustering products by type:


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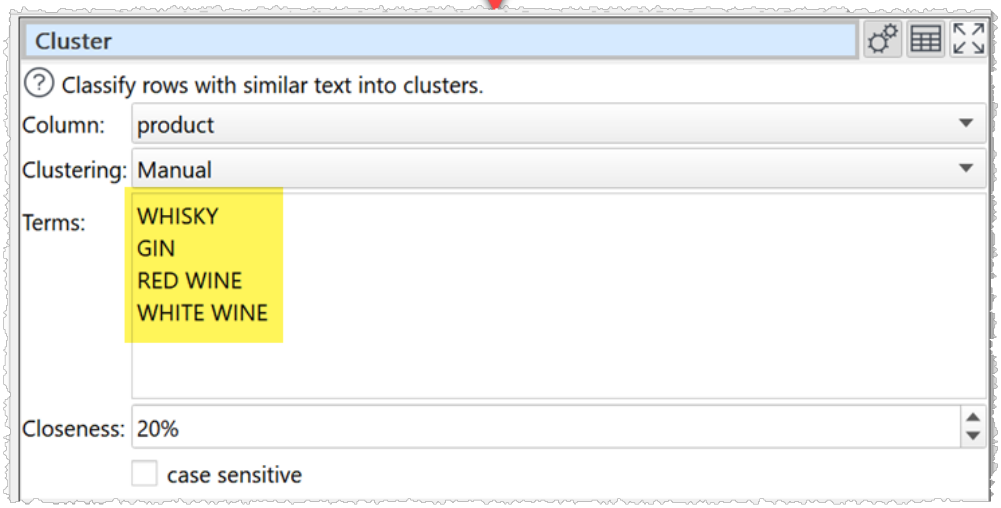
| | product | unit cost | stock |
|---|---|---|---|
| 1 | French red wine | 23.95 | 9 |
| 2 | BULGARIAN RED WN | 11.95 | 13 |
| 3 | Red Label Whisky | 38.45 | 1 |
| 4 | Gordon's Gin | 25 | 7 |
| 5 | German White Wine | 14.95 | 6 |
| 6 | Larios Gin | 19.90 | 50 |
| 7 | Black Label Whisky | 45.50 | 8 |
| 8 | Wine, White, Dessert | 30.00 | 1 |
| 9 | Cocoa Cola | 1.95 | 200 |




| | product | unit cost | stock | Cluster | Closeness |
|---|---|---|---|---|---|
| 1 | French red wine | 23.95 | 9 | RED WINE | 53 |
| 2 | BULGARIAN RED WN | 11.95 | 13 | RED WINE | 25 |
| 3 | Red Label Whisky | 38.45 | 1 | WHISKY | 37 |
| 4 | Gordon's Gin | 25 | 7 | GIN | 25 |
| 5 | German White Wine | 14.95 | 6 | WHITE WINE | 58 |
| 6 | Larios Gin | 19.90 | 50 | GIN | 30 |
| 7 | Black Label Whisky | 45.50 | 8 | WHISKY | 33 |
| 8 | Wine, White, Dessert | 30.00 | 1 | WHITE WINE | 35 |
| 9 | Cocoa Cola | 1.95 | 200 | <none> | |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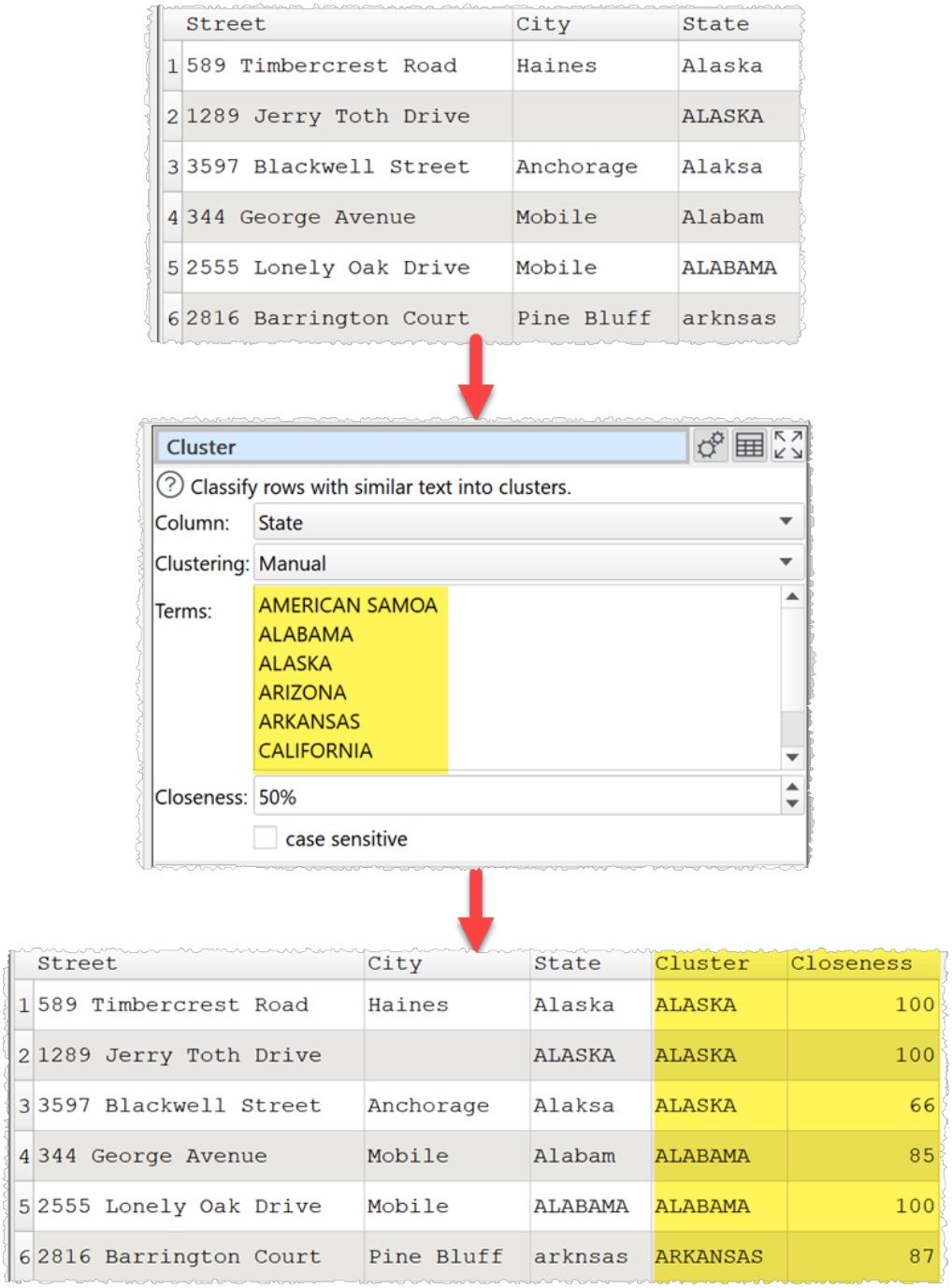
Correcting the state in an address:




| | Street | City | State | Cluster | Closeness |
|---|---|---|---|---|---|
| 1 | 589 Timbercrest Road | Haines | Alaska | ALASKA | 100 |
| 2 | 1289 Jerry Toth Drive | | ALASKA | ALASKA | 100 |
| 3 | 3597 Blackwell Street | Anchorage | Alaksa | ALASKA | 66 |
| 4 | 344 George Avenue | Mobile | Alabam | ALABAMA | 85 |
| 5 | 2555 Lonely Oak Drive | Mobile | ALABAMA | ALABAMA | 100 |
| 6 | 2816 Barrington Court | Pine Bluff | arknsas | ARKANSAS | 87 |

## Inputs

One.

## Options

- Select the **Column** whose values you wish to use for clustering.
- Select **Clustering** as:
  - **Manual** to cluster by **Terms** you provide (one per line).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  - **Guided** to find clustering terms automatically, starting with the **Terms** you provide (one per line).
  - **Automatic** to find clustering terms automatically.
- Set the minimum **Closeness** percentage for a value to a term to be clustered with a term.
- Set **Max clusters** to the maximum number of clustering terms (**Guided** and **Automatic** only).
- Set **Max time** to the maximum amount of time allowed for trying to improve the terms (**Guided** and **Automatic** only).
- Uncheck **case sensitive** to ignore case.

### Notes

- Fuzzy matching is used to classify each row value according to which of the user supplied **Terms** it is closest to.
- Additional **Cluster** and **Closeness** columns are added. The **Cluster** column shows the closest matching of the **Terms** (or the one highest one in the **Terms** list if 2 or more match equally). The **Closeness** column shows the fuzzy match score between 0 (no match) and 100 (exact match).
- Row values that do not meet the minimum **Closeness** score for any term are set to `<None>`.
- Set the minimum **Closeness** score to 0% to force all values to be assigned.
- You can use a Filter to list all the rows with `<None>` in the **Cluster** column to guide you on any additional **Terms** you might want to add in **Manual** mode.

### See also

- Ngram
- Video: How to cluster text

## 2.3.7 Compare Cols

### Description

Creates a new column with a comparison of two other columns.

### Examples

Compare 2 numerical columns:


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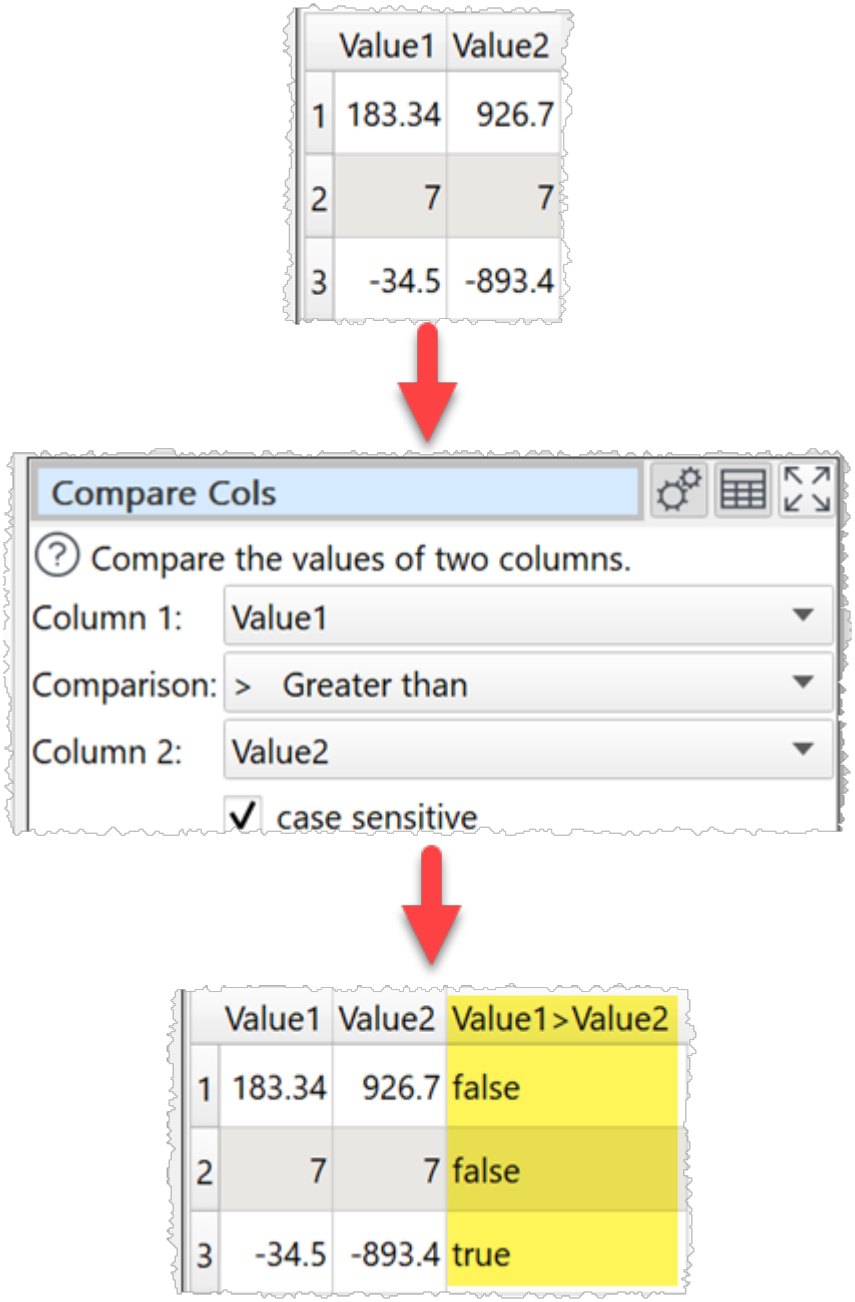


Compare 2 date columns:


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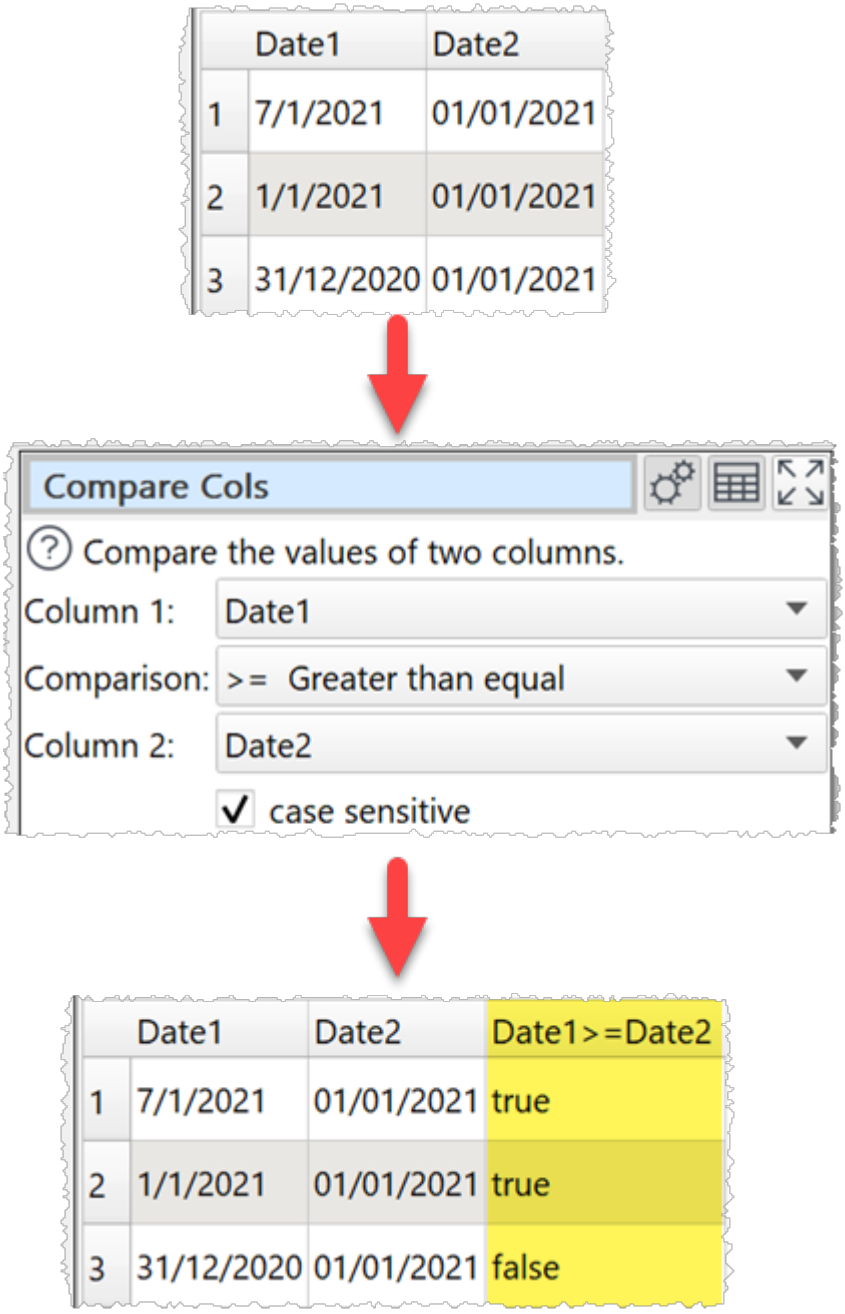


## Inputs

One.

## Options

- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Select the two columns you wish to compare as **Column 1** and **Column 2** and the **Comparison** operator.
- Check **case sensitive** to use case sensitive matching for text.


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### Notes

- Number, date and text values are treated differently for **Equal to**, **Greater than**, **Less than**, **Greater than equal, Less than equal** and **Not equal to** operations.
  - If both values are numeric, a numeric comparison will be carried out. This is accurate to approximately 16 digits of precision.
  - If both values match a supported date formats in Preferences, a date comparison will be carried out.
  - Otherwise the values will be treated as text.
  - For example, an empty value is considered less than 0, because they will be compared as text. So you might want to replace empty values with 0 or remove those rows with Filter, before comparing them.
- Comparisons of text are whitespace sensitive. You can use Whitespace to remove whitespace before filtering and Replace to get of other unwanted characters (e.g. whitespace inside the text).
- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.
- See here for more details on Regular expressions (regex).

### See also

- Split Cols
- Compare datasets

## 2.3.8 Concat Cols

### Description

Creates a new column by concatenating text from existing columns.

### Example

Concatenate 'First' and 'Last' columns with a Comma between:


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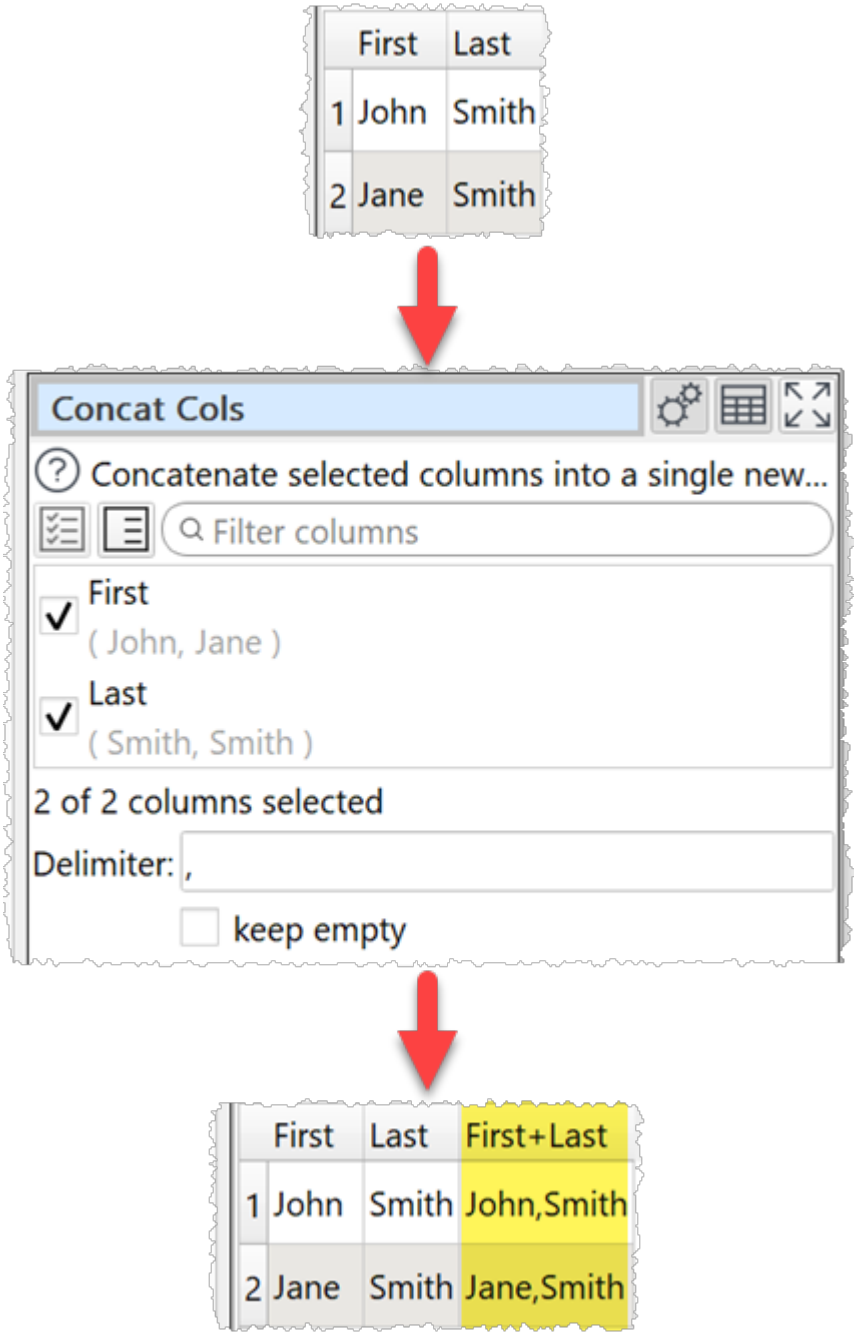


## Inputs

One.

## Options

- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Check the columns you wish to concatenate.
- Supply the **Delimiter** you wish to place between concatenated text (optional). For example ",".
- Check **keep empty** if you wish to keep the delimiter for empty columns.


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### Notes

- If there is a header, the header of the new column is formed from the header of the concatenated columns. You can use Rename Cols to change the new column name.
- Concatenating a single column makes a copy of the column.
- The values in the column are in the order of the original columns. You can change the column order before concatenation with Reorder Cols.
- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.
- Use the right click menu on the **Delimiter** field to add Carriage Return, Line Feed, Tab or Null characters.
- The opposite of **Concat Cols** is Split Col.

### See also

- Concat Rows
- Substitute

## 2.3.9 Concat Rows

### Description

Concatenate multiple consecutive rows into a single row.

### Examples

Concatenate every 2 rows to 1:


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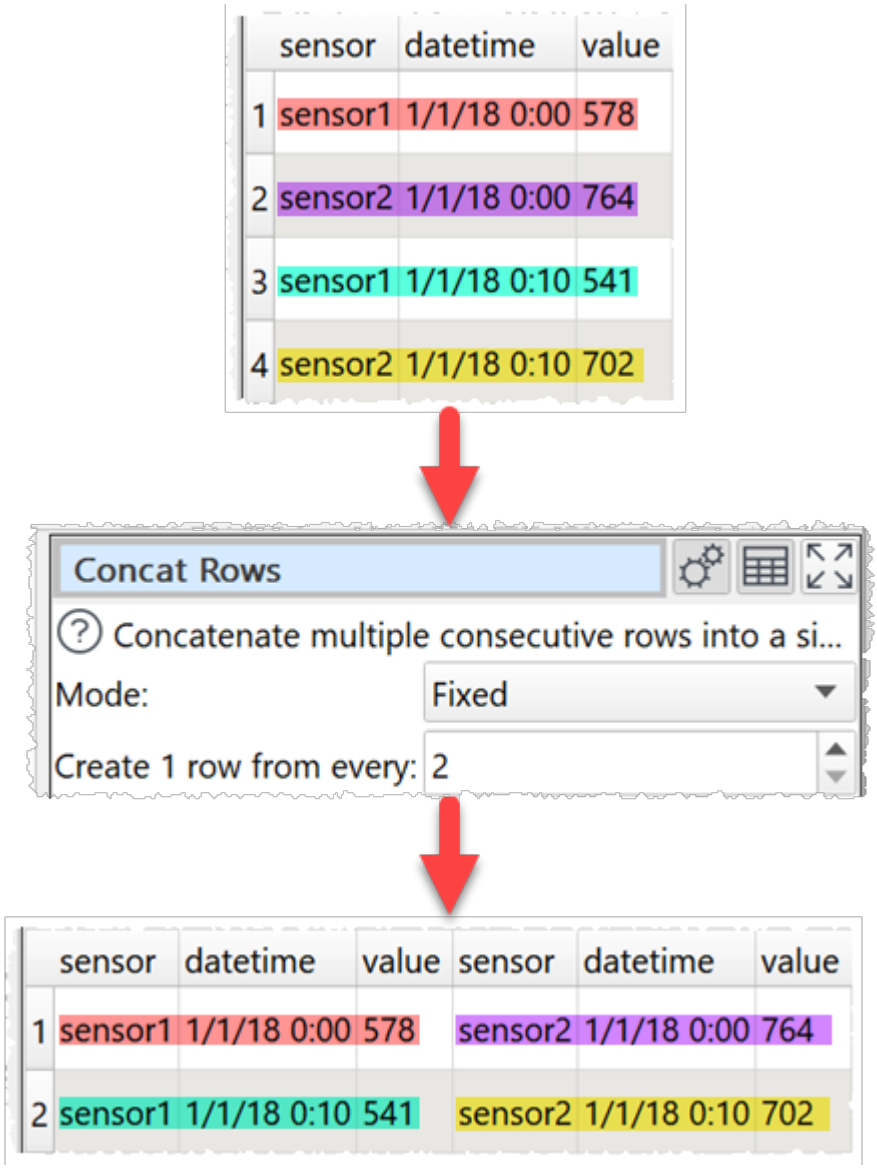


Concatenate values until empty:


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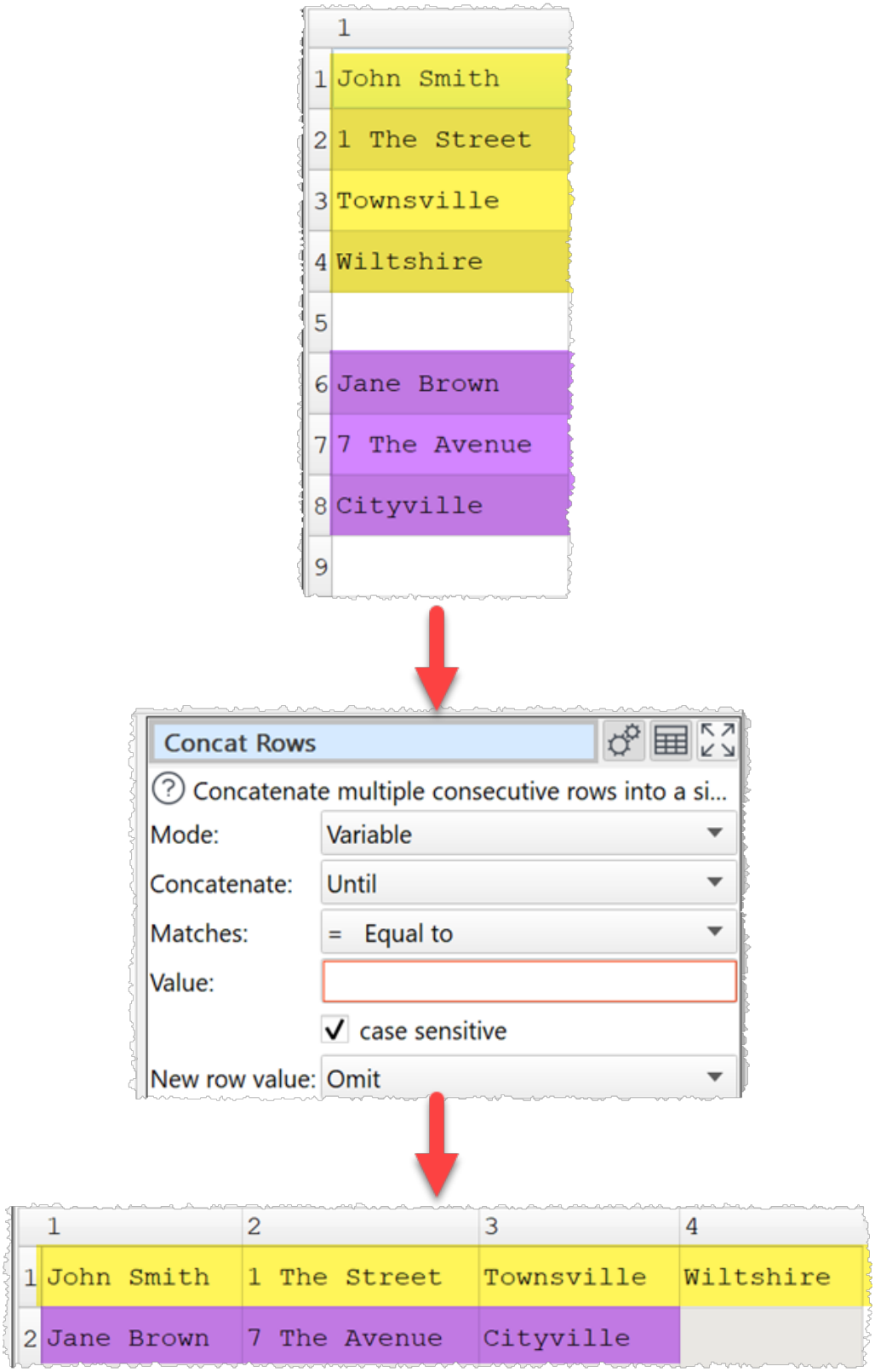


Concatenate values while not starting with 'ID':


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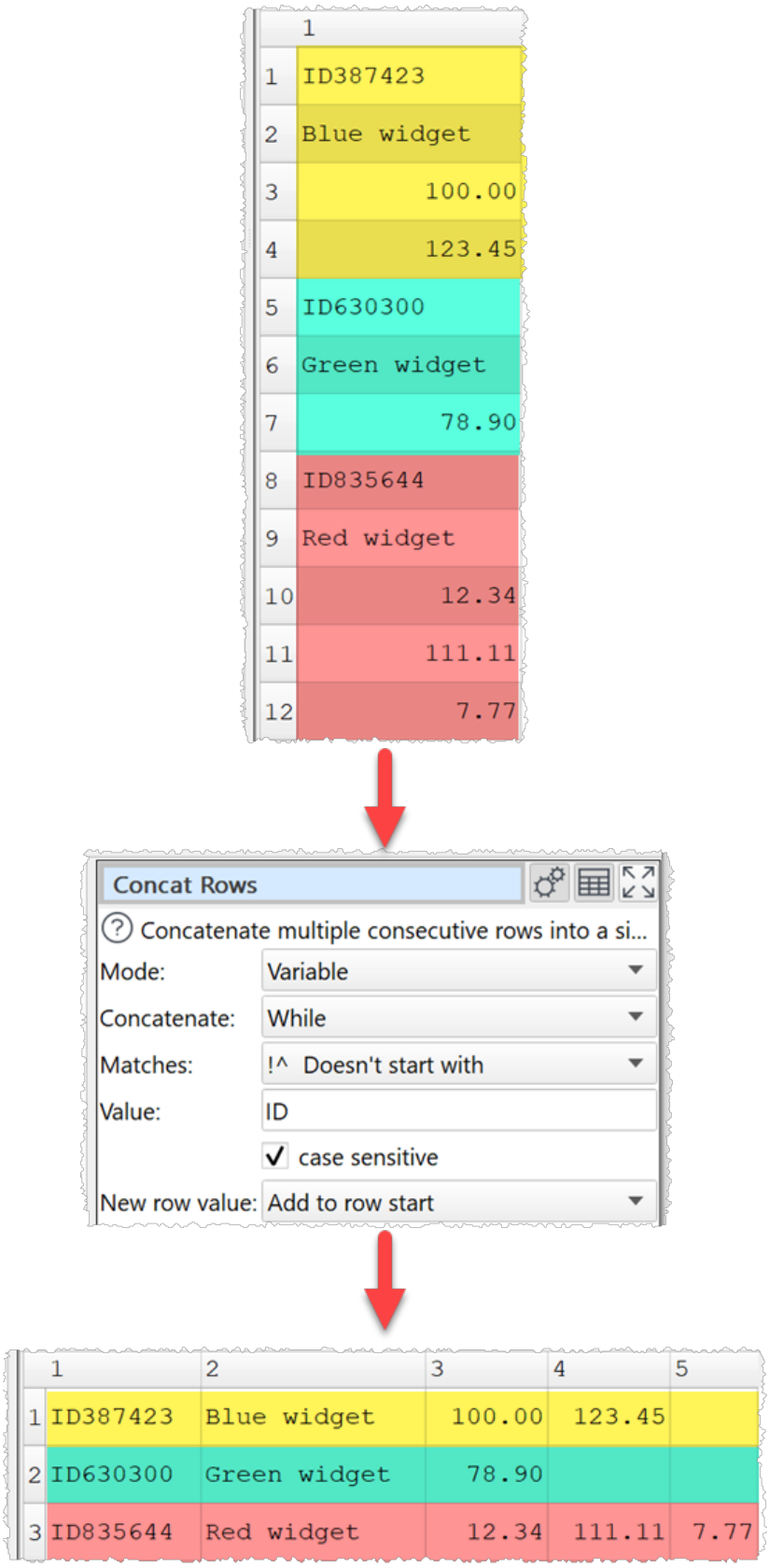


Concatenate consecutive rows with the same OrderId:


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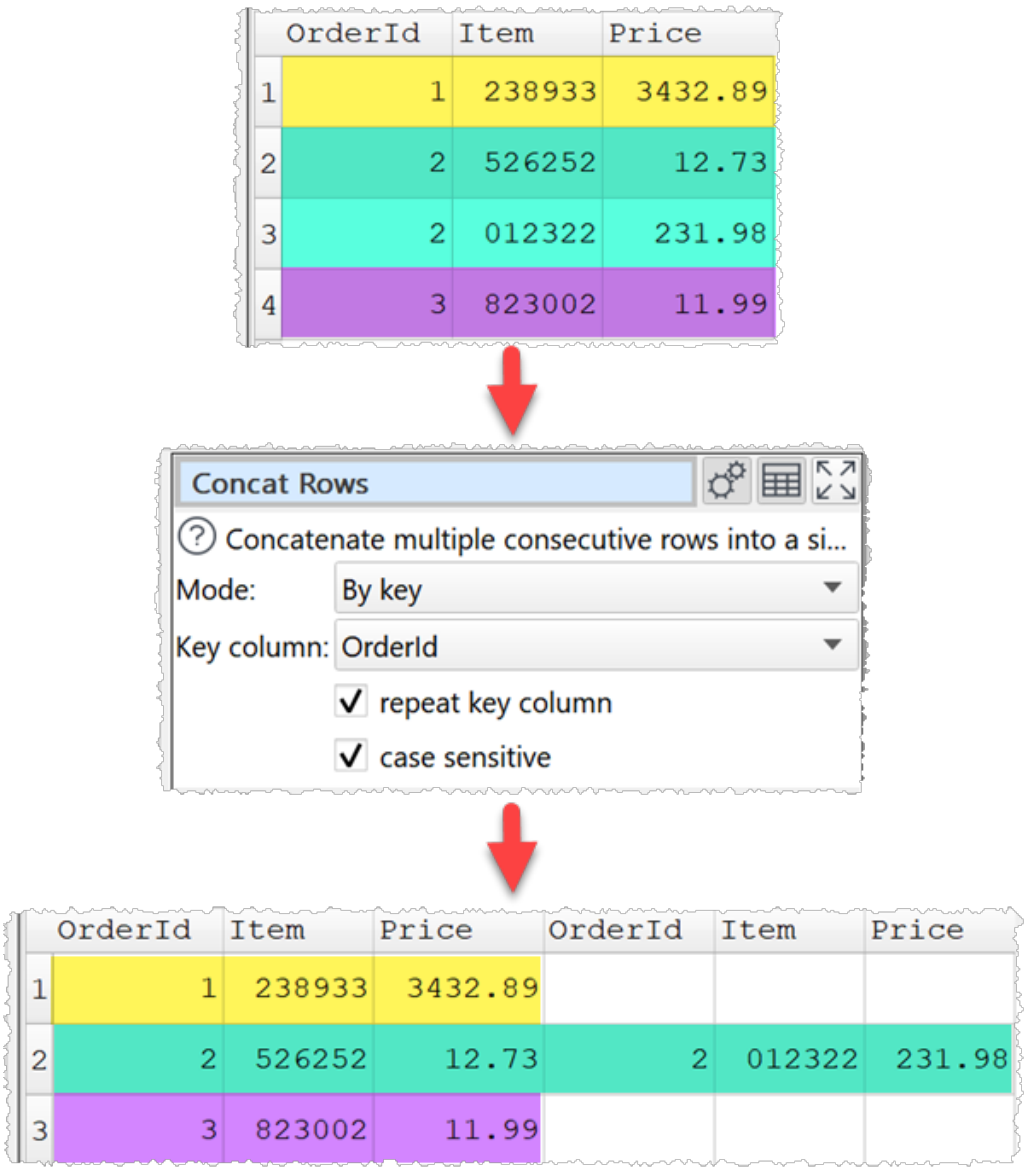


## Inputs

One.

## Options

- Set **Mode** to:
  - **Fixed** to concatenate a fixed number of rows from the current dataset to make each new row.
  - **Variable** to concatenate values while or until a match to make each new row.
  - **By key** to concatenate consecutive rows with the same value in a key column to make each new row.
- Set **Create 1 row from every** to N, to concatenate every N rows into 1 row (**Mode**=**Fixed** only).


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- Set **Concatenate** to **Until** or **While** to keep concatenating until/while a match is found for **Matches** and **Value** (**Mode**=**Variable** only).
- Check **case sensitive** to use case sensitive matching for text (**Mode**=**Variable** or **By Key** only).
- Set **New row value** depending on what you want to do with the value that denotes a new row (**Mode**=**Variable** only).
- Uncheck **repeat key column** to keep only the first key column (**Mode**=**By Key** only).

### Notes

- Use Sort before this transform if you need to change the row order.
- Use New Col if you need to add additional columns before concatenating rows.
- Use Filter if you need to remove rows before concatenating row.
- Use Rename Cols if you need to change column names after concatenating rows.
- The opposite of **Concat Rows** is Split Rows.

### See also

- Reshape
- Spread
- Unique
- Concat Cols

## 2.3.10 Copy Cols

### Description

Creates one or more copies of the selected column(s).

### Example

Copy 2 columns, once each:


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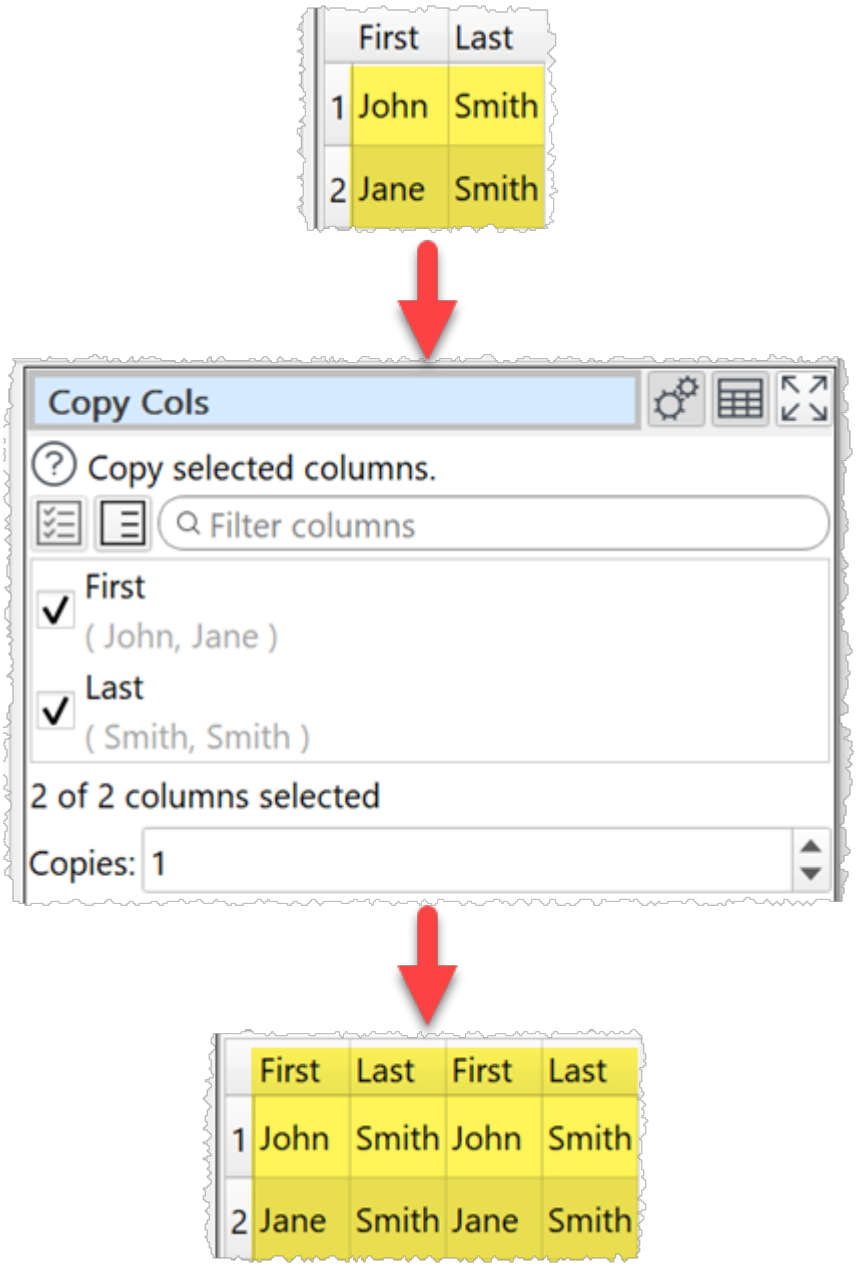


## Inputs

One.

## Options

- Check the columns you wish to copy.
- Set **Copies** to the number of copies you want to make of each checked column.

## Notes

- If there is a header, the header of each new column is the original column name. You can rename columns with Rename Cols.


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- The new columns are added at the right end. You can change the column order with Reorder Cols.

### See also

- New Col

## 2.3.11 Correlate

### Description

Calculates the Pearson correlation coefficient of values in 2 or more pairs of columns.

### Example

Calculate the correlation between specimen weight and length:


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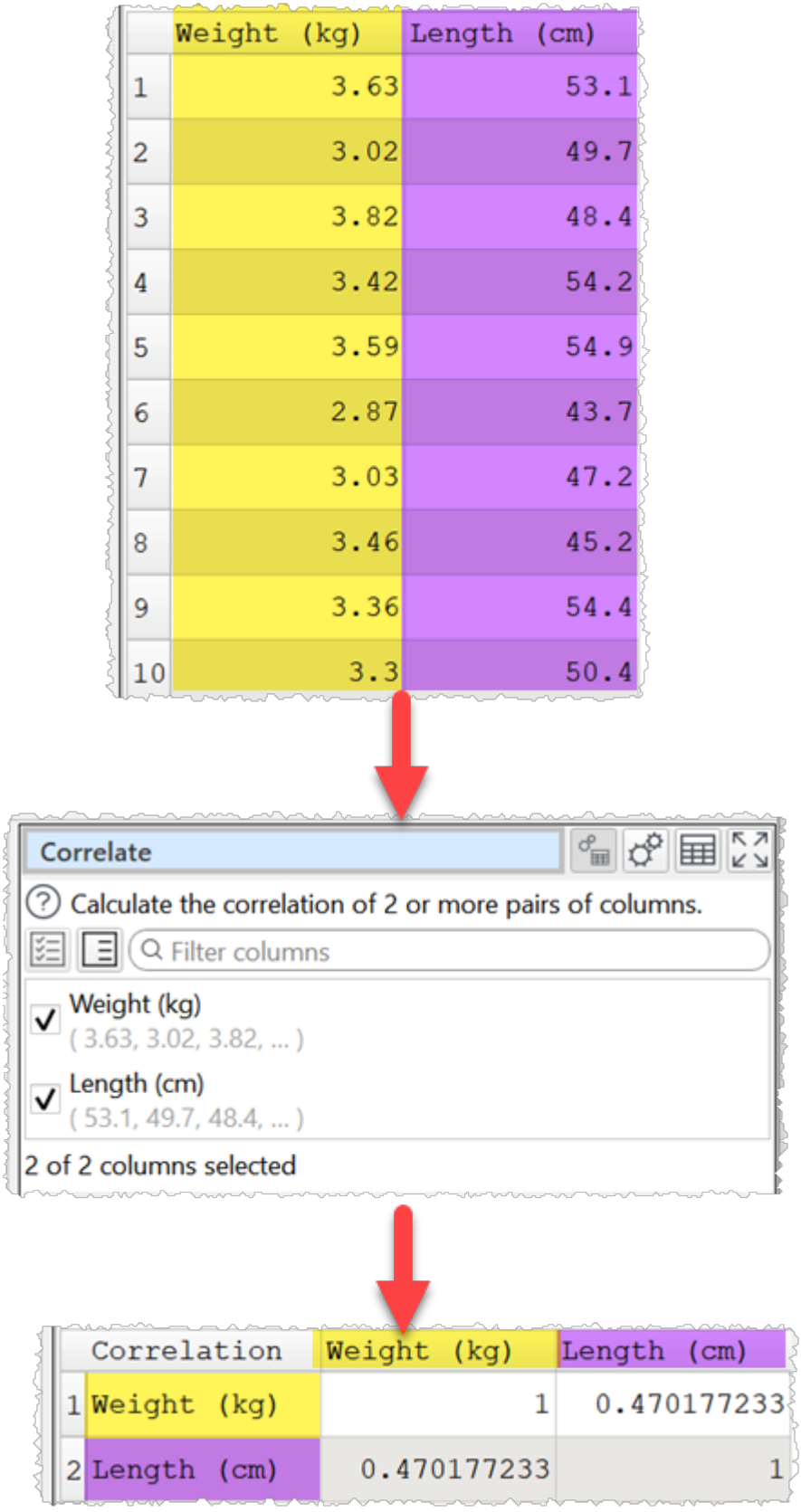


## Inputs

One.


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### Options

- Select 2 or more **Columns** whose values you wish to calculate the correlation for. All possible pairs of selected columns will be calculated.

### Notes

- The Pearson correlation coefficient is calculated in the range +1.0 to -1.0 where:
  - +1.0 means a perfect correlation
  - 0.0 means no correlation
  - -1.0 means a perfect inverse correlation
- A column is assumed to always perfectly correlate with itself. Even if it has no numeric values.
- Pairs of values are ignored if they are not both valid numeric values.
- `N/A` is returned if two columns have no valid numeric pairs.
- `N/A` is returned if all the numeric values in a column are identical (as this gives a standard deviation of 0, which causes a divide by 0 error).
- Use the Num Format transform to change the number of decimal places .

### See also

- Video: How to calculate Pearson correlation
- Stats
- Summary

## 2.3.12 Count

### Description

Counts the number of occurrences of each item of text in the selected column.

### Example

Count unique values in the 'Response' column:


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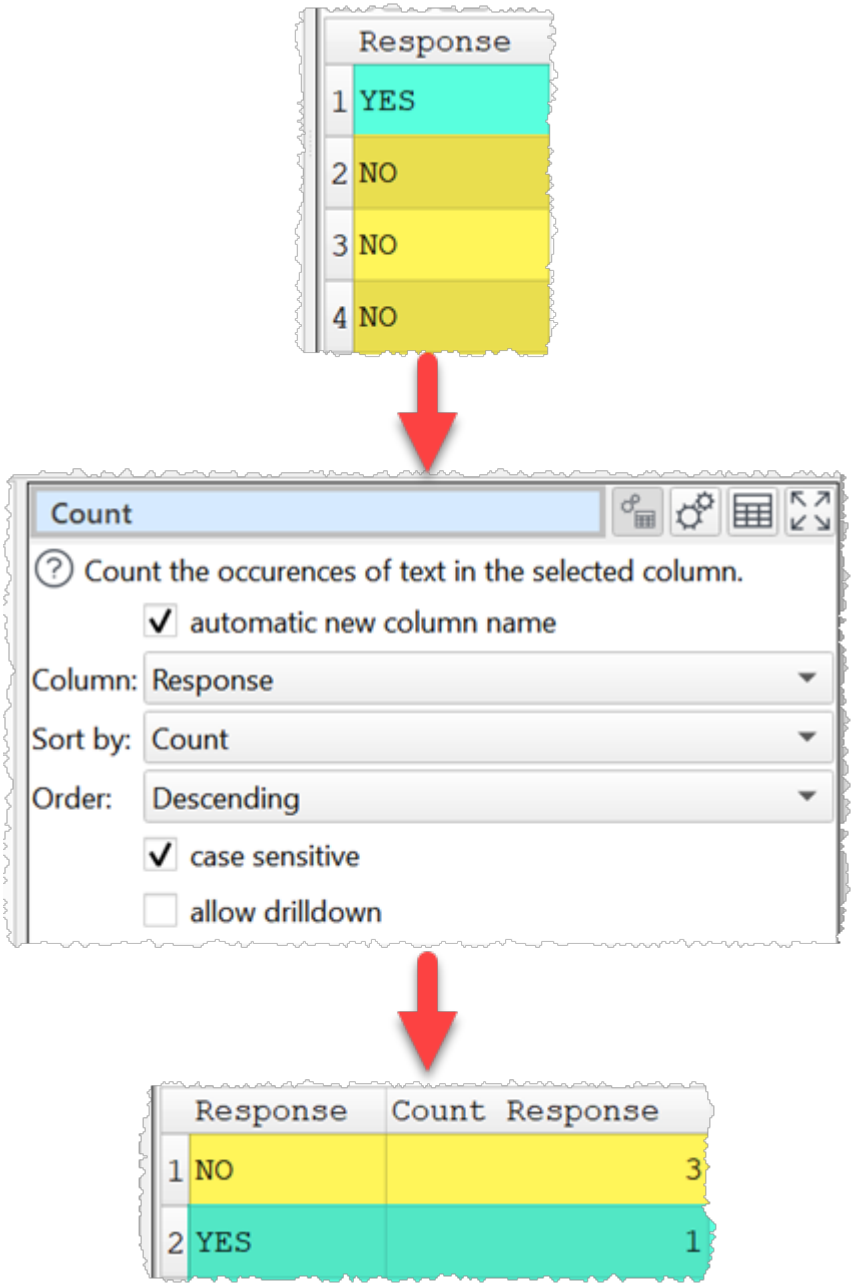


## Inputs

One.

## Options

- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Select the **Column** whose values you wish to count.
- Set **Sort by** depending on whether you wish to sort alphabetically by the **Text** in the left column or numerically by the **Count** in the right column.
- Set **Order** depending on whether you wish to sort **Ascending** or **Descending**.


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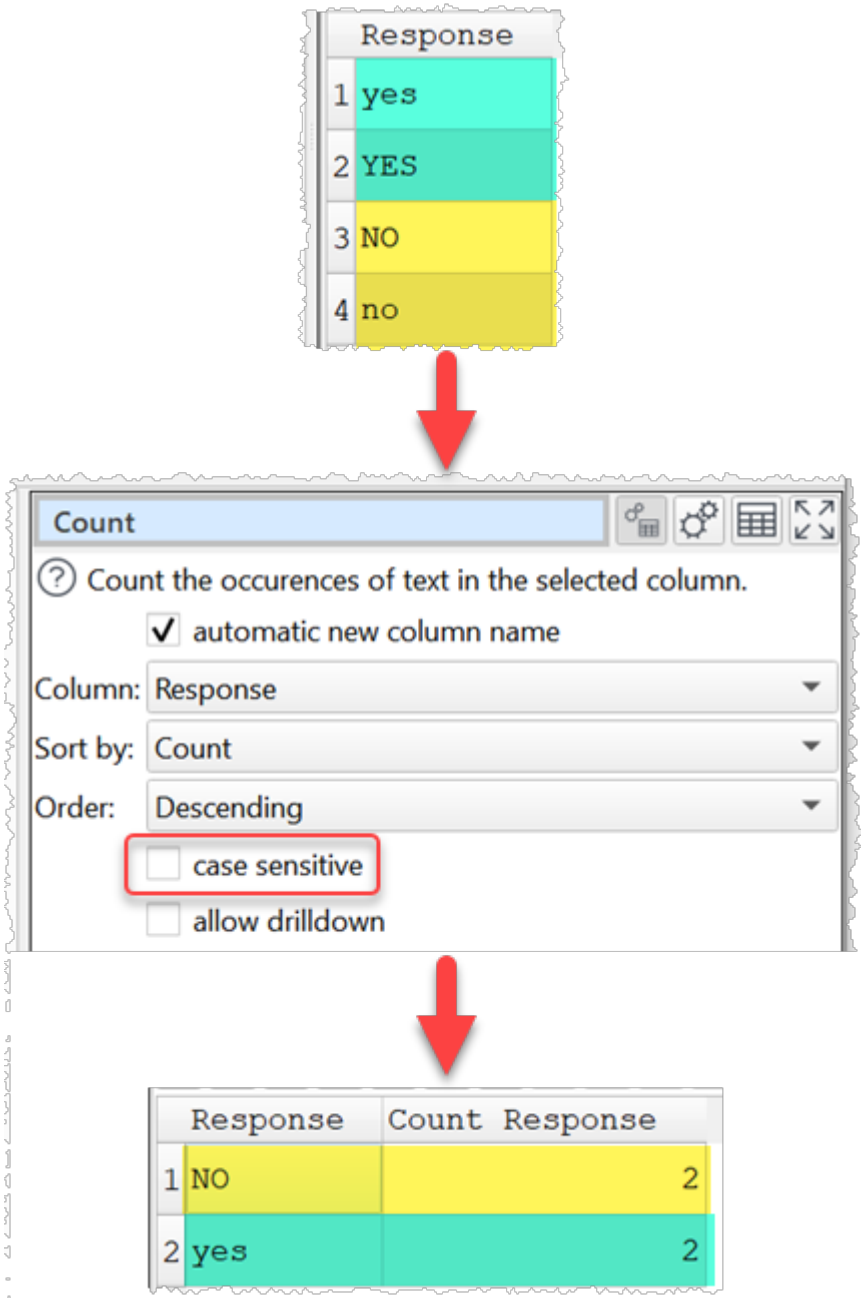
- Uncheck **case sensitive** to convert everything to lower case before counting.
- Check **drilldown** to allow double clicking a row in the data table to drilldown to the rows that contributed to this value in the upstream data.

## Notes

- Date and number values are treated as text.
- Use Rename Cols to change the new column name.
- Use Scale to convert the results to percentages.
- If **case sensitive** is unchecked, the case of the first value encountered is used. You can use a Sort or Case transform before **Count** if you want to control the case shown.





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### See also

- Ngram
- Unique
- Total
- Moving
- Pivot
- Stats
- Summary

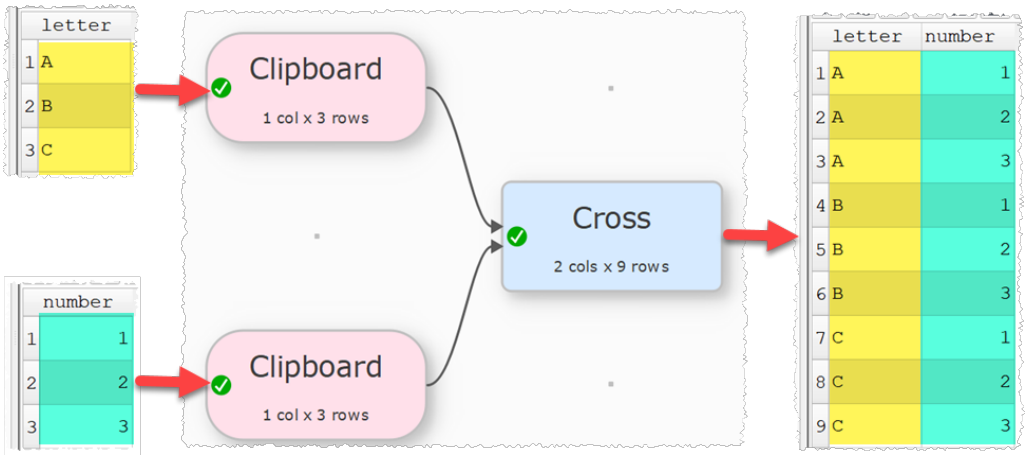
## 2.3.13 Cross

### Description

Creates an output from combining every possible row combination of each input. E.g. if the first input has N1 rows and the second input has N2 rows, then the result will have N1 X N2 rows. Also known as a 'Cartesian product' or 'cross join'.

### Example

Cross 2 small datasets:




### Inputs

Two or more.

### Options

- The output depends on the vertical (Y-axis) position of the inputs.

### Notes

- It can create a very large number of rows!
- Use Clone to cross a dataset with itsself.

### See also

- Join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- Stack

### 2.3.14 DateTime Format

#### Description

Changes the date and/or time format in one or more columns.

#### Examples

Change day/month/year to month-day-year:


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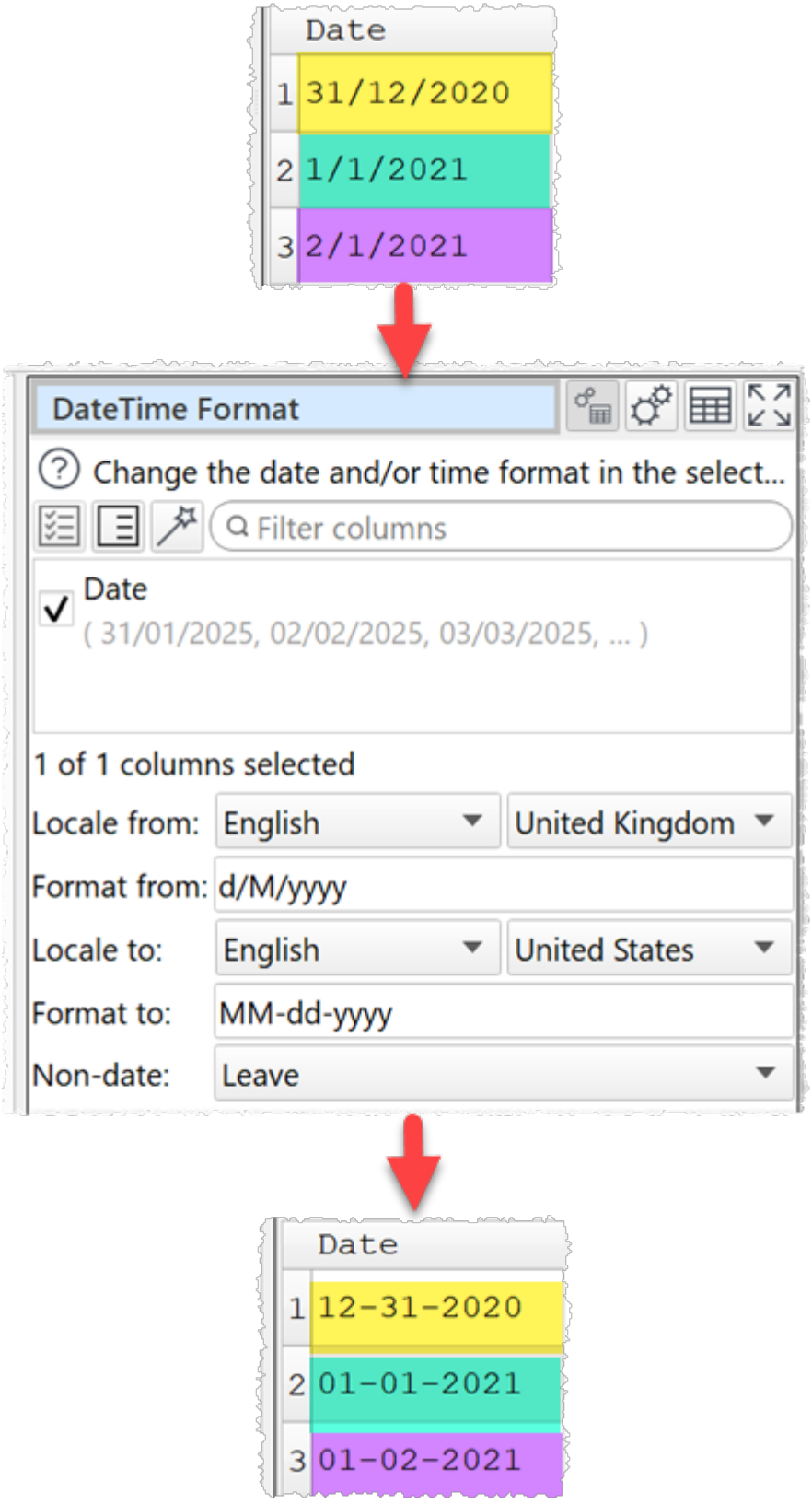


Change 24 hour time to AM/PM time:


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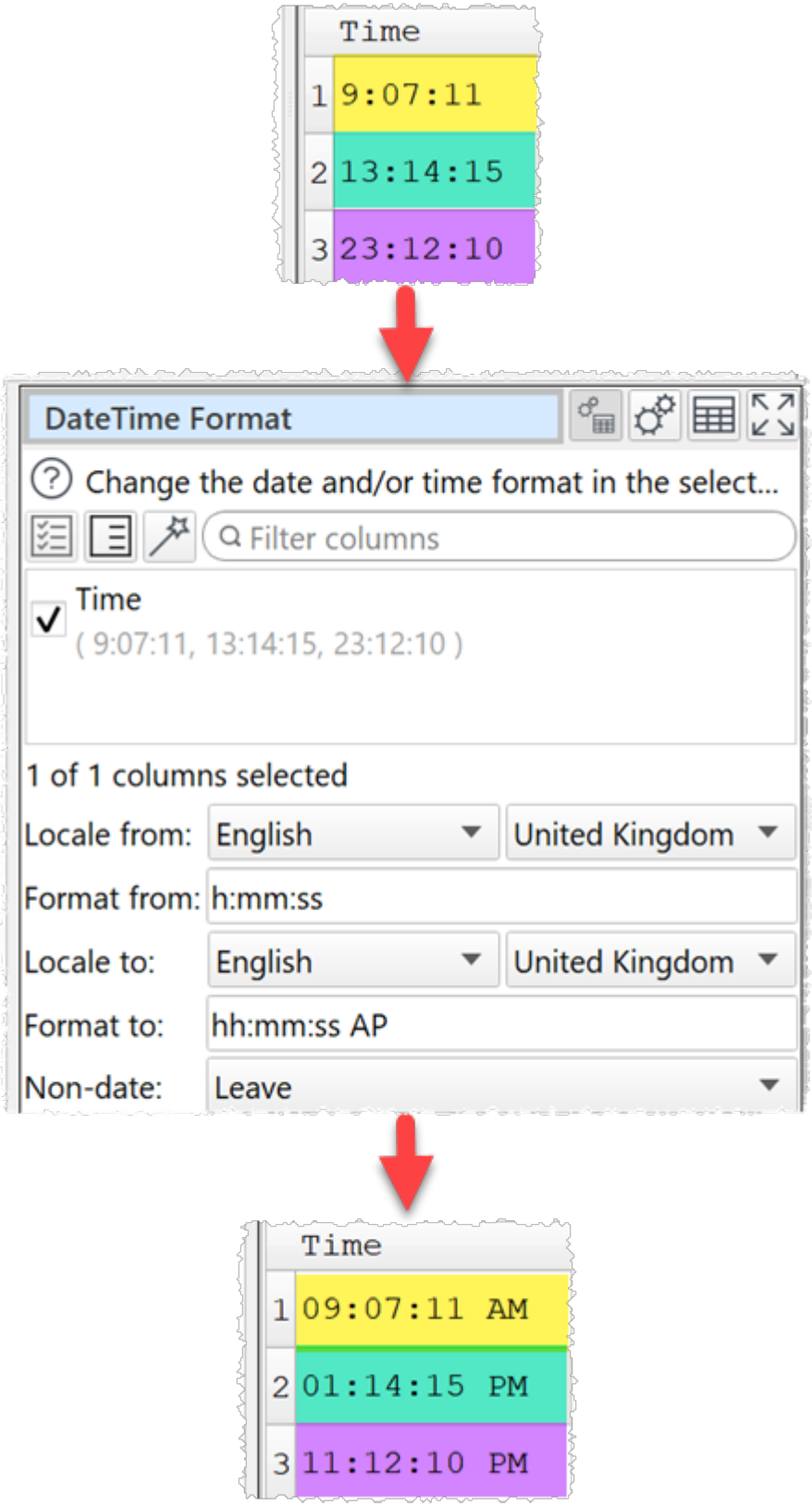


Change datetime to ISO format:


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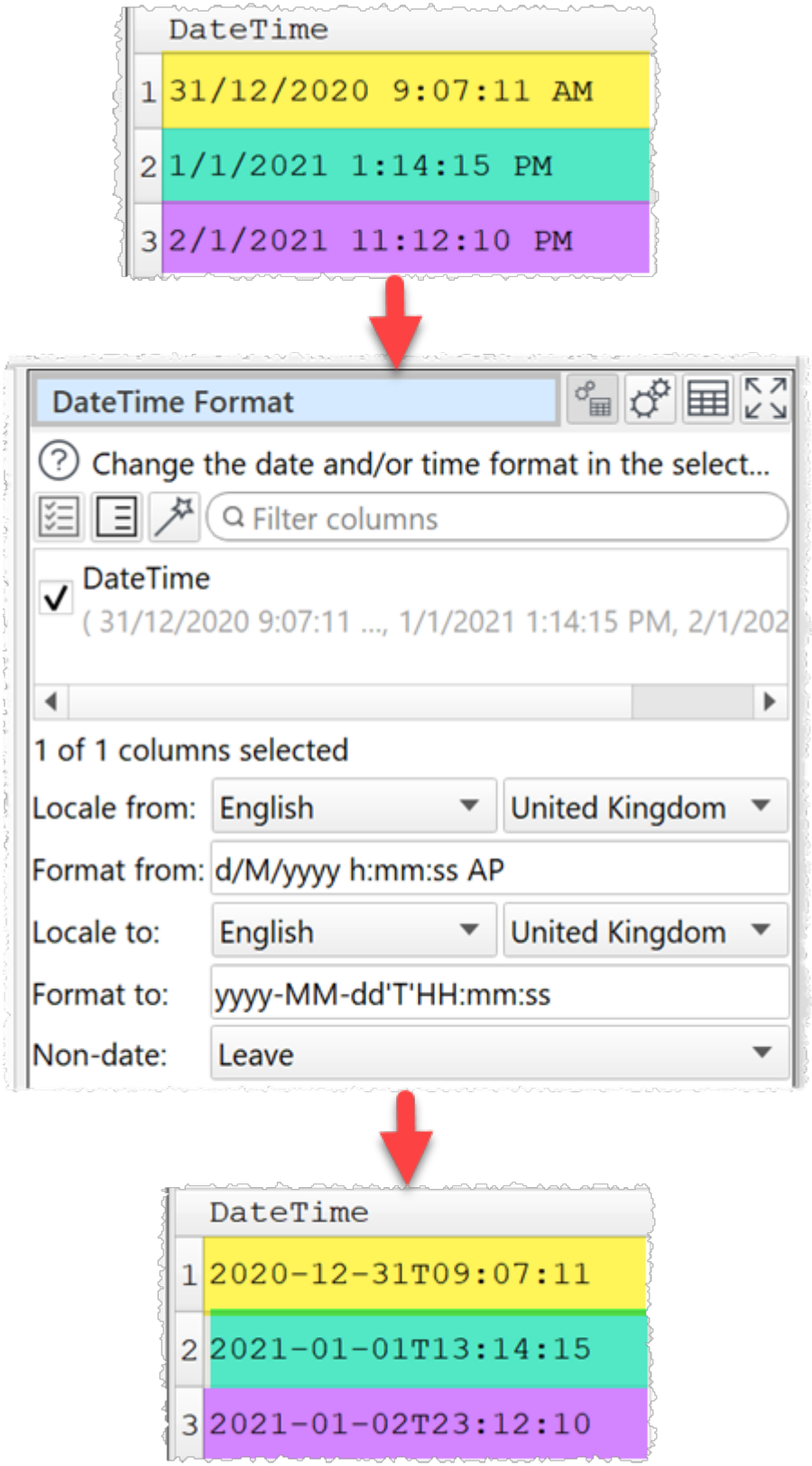


Convert month names from short English to short German:


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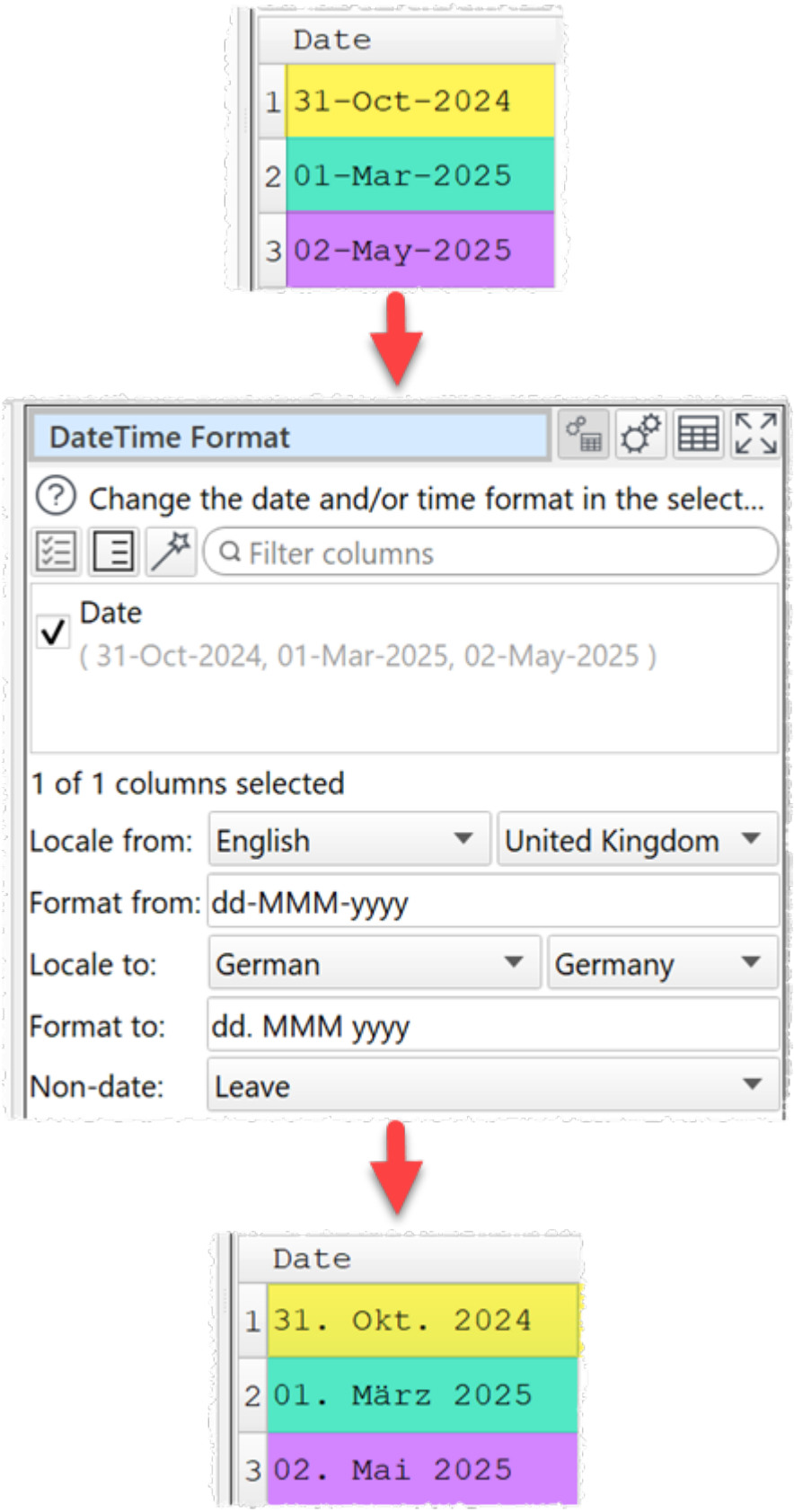


Example formats for 21 May 2001 14:13:09.120 with locale set to English/United States:


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| Format to | Output |
|---|---|
| dd.MM.yyyy | 21.05.2001 |
| yyyy-d-M | 2001-21-5 |
| ddd MMMM d yy | Mon May 21 01 |
| hh:mm:ss.zzz | 14:13:09.120 |
| hh:mm:ss.z | 14:13:09.12 |
| hhmmss | 141309 |
| h:m:s ap | 2:13:9 pm |
| yyyy-MM-dd'T'HH:mm:ss.zzz | 2001-05-21T14:13:09.120 |
| HH:mm:ss 'in yyyy-MM-dd HH:mm:ss format' | 14:13:09 in HH:mm:ss format |

## Inputs

One.

## Options

- Check the columns you wish to transform.
- Set **Locale from** to the locale you wish to use to interpret input dates.
- Supply the existing date and/or time format in **Format from** (see below).
- Set **Locale to** to the locale you wish to use to interpret output dates.
- Supply the new date and/or time format in **Format to** (see below).
- Use **Non-date** to set what to do for values that don't match **Format from**.
- Use **With value** for values that don't match **Format from** when **Non-date** is set to **Change to user defined**.
- The following date and/or time formats are supported for input and output:

| Relates to | | Format | Meaning |
|---|---|---|---|
| Date | Years | yy | The year as a two digit number (00 to 99). |
| | | yyyy | The year as a four digit number. If the year is negative, a minus sign is prepended in addition. |


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| Relates to | | Format | Meaning |
|---|---|---|---|
| | Months | `M` | The month as number without a leading zero (1 to 12). |
| | | `MM` | The month as number with a leading zero (01 to 12) |
| | | `MMM` | The abbreviated localized month name (e.g. 'Jan' to 'Dec'). |
| | | `MMMM` | The long localized month name (e.g. 'January' to 'December'). |
| | Days | `d` | The day as number without a leading zero (1 to 31). |
| | | `dd` | The day as number with a leading zero (01 to 31). |
| | | `ddd` | The abbreviated localized day name (e.g. 'Mon' to 'Sun'). |
| | | `dddd` | The long localized day name (e.g. 'Monday' to 'Sunday'). |
| Time | Hours | `h` | The hour without a leading zero (0 to 23 or 1 to 12 if AM/PM display). |


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| Relates to | | Format | Meaning |
|---|---|---|---|
| | | hh | The hour with a leading zero (00 to 23 or 01 to 12 if AM/PM display). |
| | | H | The hour without a leading zero (0 to 23, even with AM/PM display). |
| | | HH | The hour with a leading zero (00 to 23, even with AM/PM display). |
| | Minutes | m | The minute without a leading zero (0 to 59). |
| | | mm | The minute with a leading zero (00 to 59). |
| | Seconds | s | The whole second, without any leading zero (0 to 59). |
| | | ss | The whole second, with a leading zero where applicable (00 to 59). |
| | Milliseconds | z | The fractional part of the second, to go after a decimal point, without trailing zeroes (0 to 999). Thus "s.z" reports the seconds to full available |


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| Relates to | | Format | Meaning |
|---|---|---|---|
| | | | (millisecond) precision without trailing zeroes, |
| | | `zzz` | The fractional part of the second, to millisecond precision, including trailing zeroes where applicable (000 to 999). |
| | AM/PM | `AP` or `A` | Use AM/PM display. A/AP will be replaced by an upper-case version of locale AM or PM text. |
| | | `ap` or `a` | Use AM/PM display. A/AP will be replaced by an lower-case version of locale AM or PM text. |
| | Timezone | `t` | The timezone (for example "CEST"). |

If not set, the default values are:


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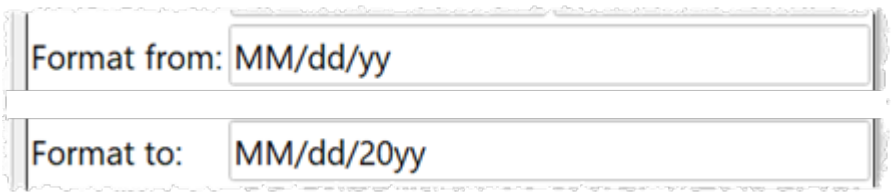
| Value | Default |
|---|---|
| Year | 1900 |
| Month | 1 |
| Day | 1 |
| Hour | 0 |
| Minute | 0 |
| Second | 0 |
| Milliseconds | 0 |

## Notes

- An exact match is expected for the input date. E.g. **Format from** is `yyyy-MM-dd` then `2020-12-17` will be converted, but `2020-12-17T14:58` won't. You can extract just the date or time part here using Split Col with `T` as the delimiter.
- Use the correct case for the format text (e.g. `yyyy-MM-dd`, not `YYYY-mm-DD`).
- Any non-empty sequence of characters enclosed in single quotes will be included verbatim in the output (stripped of the quotes), even if it contains formatting characters. Two consecutive single quotes (`''`) are replaced by a single quote in the output. All other characters in the format text are included verbatim in the output.
- Formats without separators (e.g. `ddMM`) are supported but must be used with care, as the resulting output isn't always reliably readable (e.g. if `dM` produces `212` it could mean either the 2nd of December or the 21st of February).
- You can also use Split Col to split a date into its component parts. For example to split "31/1/2019" into day, month and year components using the "/" delimiter.
- If the date to be converted has only two year digits, it is treated as a date between 1900 and 1999. E.g. "31/1/19" is interpreted in d-M-yy format as 31st January 1919. You can avoid that issue by explicitly setting the century, e.g.:





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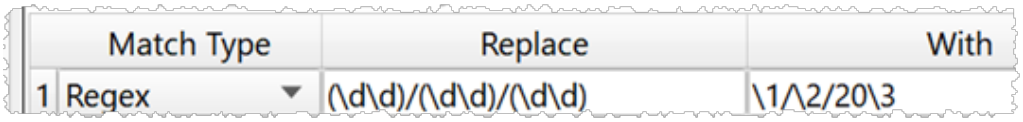
Or you can use Replace. For example to replace `01/15/18` with `01/15/2018`:



| | Match Type | Replace | With |
|---|---|---|---|
| 1 | Regex | (\d\d)/(\d\d)/(\d\d) | \1/\2/20\3 |

- Some dates do not exist, so cannot be converted. For example, 29-02-2023 matches the format `dd-MM-yyyy`. However the date does not exist, so won't be converted.
- Some datetimes do not exist, so cannot be converted. For example, if your **Locale** is **Spanish** / **Chile** then `03-09-2023 0:00:00` may not be converted with **Format from** `dd-MM-yyyy H:mm:ss`, as in Chile the clock is changed at `24:00` first Saturday of September, so `0:00` of next Sunday doesn't exist. This can also depend on the time zone set in your operating system.
- Warnings are shown in the **Warnings** tab for values that don't match **Format from** or don't correspond to a real date or datetime.
- You can also do date and time format conversion using the Javascript transform.

### See also

- Num Format

## 2.3.15 Decode

### Description

Convert to/from Base64 encoding, URL encoding, escaped HTML or escaped XML.

### Example

Convert `<'Hello World!'>` to base64 encoding: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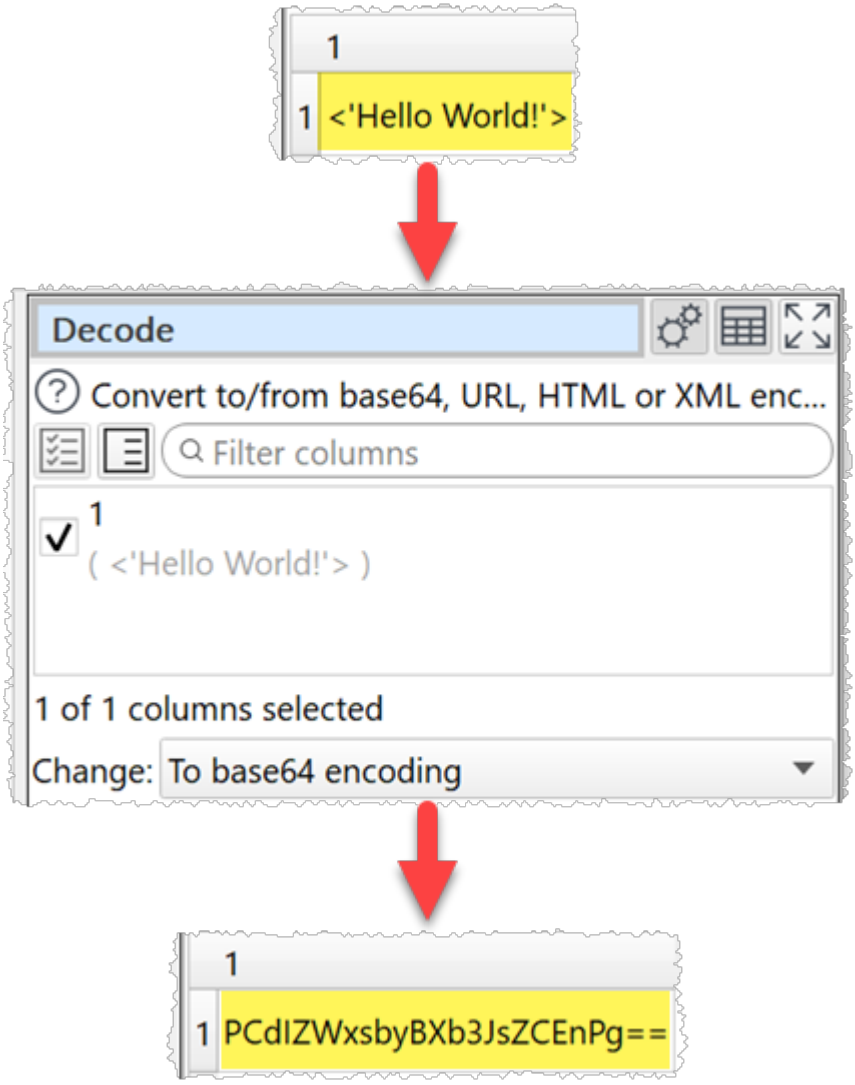


| Type | Plaintext | Encoded |
|---|---|---|
| Based64 encoding | `<'Hello World!'>` | `PCdIZWxsbyBXb3JsZCEnPg==` |
| URL encoding | `<'Hello World!'>` | `%3C%27Hello%20World%21%27%3E` |
| HTML escaping | `<'Hello World!'>` | `<'Hello World!'>` |
| XML escaping | `<'Hello World!'>` | `<'Hello World!'>` |

## Inputs

One.

## Options

- Check the column(s) you wish to transform.


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- Set **Change** according to how you want to decode/encode the selected columns.

### Notes

- This is distinct from text encoding (e.g. UTF-8 vs UTF-16) which is handled on input and output.
- Use Copy Cols to copy columns before you transform them.
- Data input from XML files and output to HTML and XML files is unescaped/escaped automatically.

## 2.3.16 Dedupe

### Description

Remove duplicate rows.

### Example

Keep the first row for each unique 'Customer Id':


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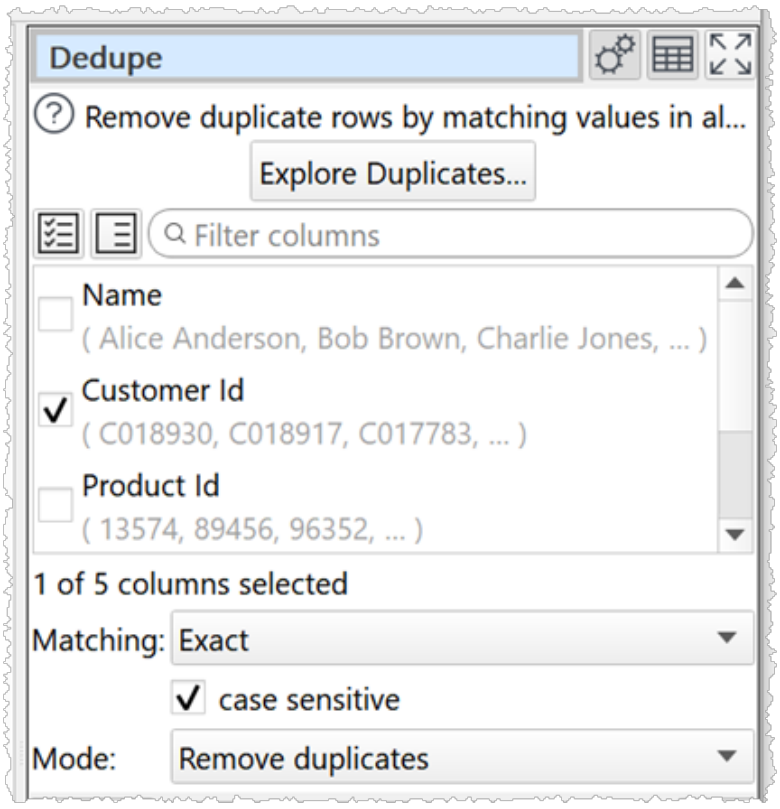
| | Name | Customer Id | Product Id | Cost | Date |
|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 |
| 2 | Bob Brown | C018917 | 89456 | 10.55 | 01/10/2020 |
| 3 | Charlie Jones | C017783 | 96352 | 19.95 | 02/10/2020 |
| 4 | Robert Brown | C018917 | 98526 | 10.00 | 02/10/2020 |
| 5 | Charles Jones | C017783 | 38746 | 25.00 | 03/10/2020 |



| | Name | Customer Id | Product Id | Cost | Date |
|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 |
| 2 | Bob Brown | C018917 | 89456 | 10.55 | 01/10/2020 |
| 3 | Charlie Jones | C017783 | 96352 | 19.95 | 02/10/2020 |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## Inputs

One.

## Options

- Click **Explore Duplicates...** to explore which rows are duplicates.
- Check the column(s) you wish to look for duplicate values in.
- Set **Matching** to **Exact** to use exact matching to find duplicates and **Fuzzy** to match with some differences. Fuzzy matching is much slower.
- Set **Closeness** to how close a fuzzy match has to be to be considered a match. E.g. set it to 80% to make 2 values that are 80% the same a match. For **Fuzzy** matching only.
- Check **case sensitive** to use case sensitive matching.
- Check **ignore whitespace** to ignore whitespace characters when matching.
- Check **ignore punctuation** to ignore punctuation characters when matching.
- Set **Mode** according to what you want to do with duplicates.
  - **Remove duplicates** removes all duplicate rows.
  - **Keep only duplicates** keeps only the duplicate rows (the inverse of **Remove duplicates**).
  - **Add duplicate information** adds extra columns with information about duplicate rows at the end. Reorders rows, but does not remove them. The additional columns are:
    - **Group**: Each row and its duplicates are given a unique group number, starting at 1.
    - **Row**: The number of the row in the input dataset.
    - **Closeness**: How close a match the duplicate is as a percentage. 100% = exact match.
    - **Duplicate**: Set to `true` if the row is a duplicate and `false` if not.
    - **Duplicates**: Set to the number of duplicates a non-duplicate has.
- Check **drilldown** to allow double clicking a row in the data table to drilldown to this row and it's duplicates in the upstream data. This is only available when **Matching** is set to **Exact** and **Mode** is set to **Remove duplicates**.

## Notes

- Rows are considered duplicates if they match in all the checked columns.
- Comparisons are whitespace sensitive. You can use Whitespace to remove whitespace before deduping and Replace to get of other unwanted characters (e.g. whitespace inside the text).
- When several rows are duplicates, only the top one is retained. So you may want to Sort your dataset first.
- The Unique transform is a more powerful (but more complex and slower) alternative to Dedupe.


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### See also

- Dedupe a dataset
- Video: How to clean, merge and scrub email lists

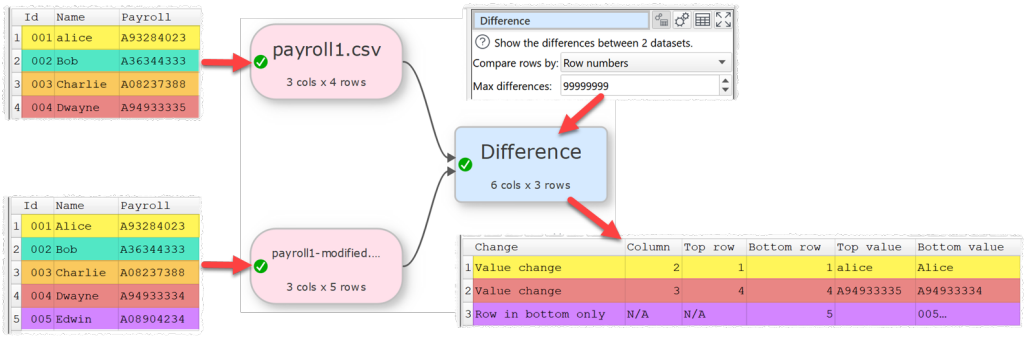
## 2.3.17 Difference

### Description

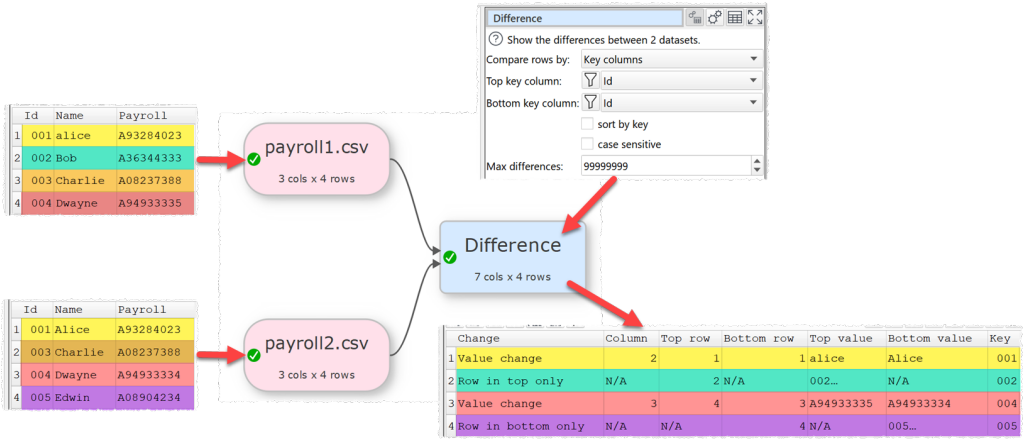
Show the differences between 2 datasets.

### Examples

Compare 2 datasets by row number:




Compare 2 datasets using key columns:




### Inputs

Two.

### Options

- Set **Compare rows by** to:
  - **Row numbers** to compare by row numbers. E.g. row 1 in the top dataset to row 1 in the bottom dataset.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    - **Key columns** to compare by matching values in common key columns in both datasets. E.g. rows with key value 001 in the top dataset to row with key value 001 in the bottom dataset.
- Set **Top key column** to the key column in the top dataset. For **Key columns** matching only.
- Set **Bottom key column** to the key column in the bottom dataset. For **Key columns** matching only.
- Set **Sort by key** to sort key values in ascending order. For **Key columns** matching only.
- Check **case sensitive** for case sensitive matching of keys. For **Key columns** matching only.
- Set **Max differences** to the maximum number of differences you want to report.

### Notes

- Columns are compared by column number (index), not by column name. E.g. column 1 in the top dataset is compared to column 1 in the bottom dataset. You can reorder columns using Recorder Cols.
- All dataset values are treated as text
- Dataset value comparisons are sensitive to case and whitespace.

### See also

- Compare datasets
- Intersect
- Subtract
- Use multiple keys for Join/Lookup/Intersect/Subtract

## 2.3.18 Extract

### Description

Extract text in one or more columns.

### Examples

Extract the first 2 digits from the 'Product Id' column:


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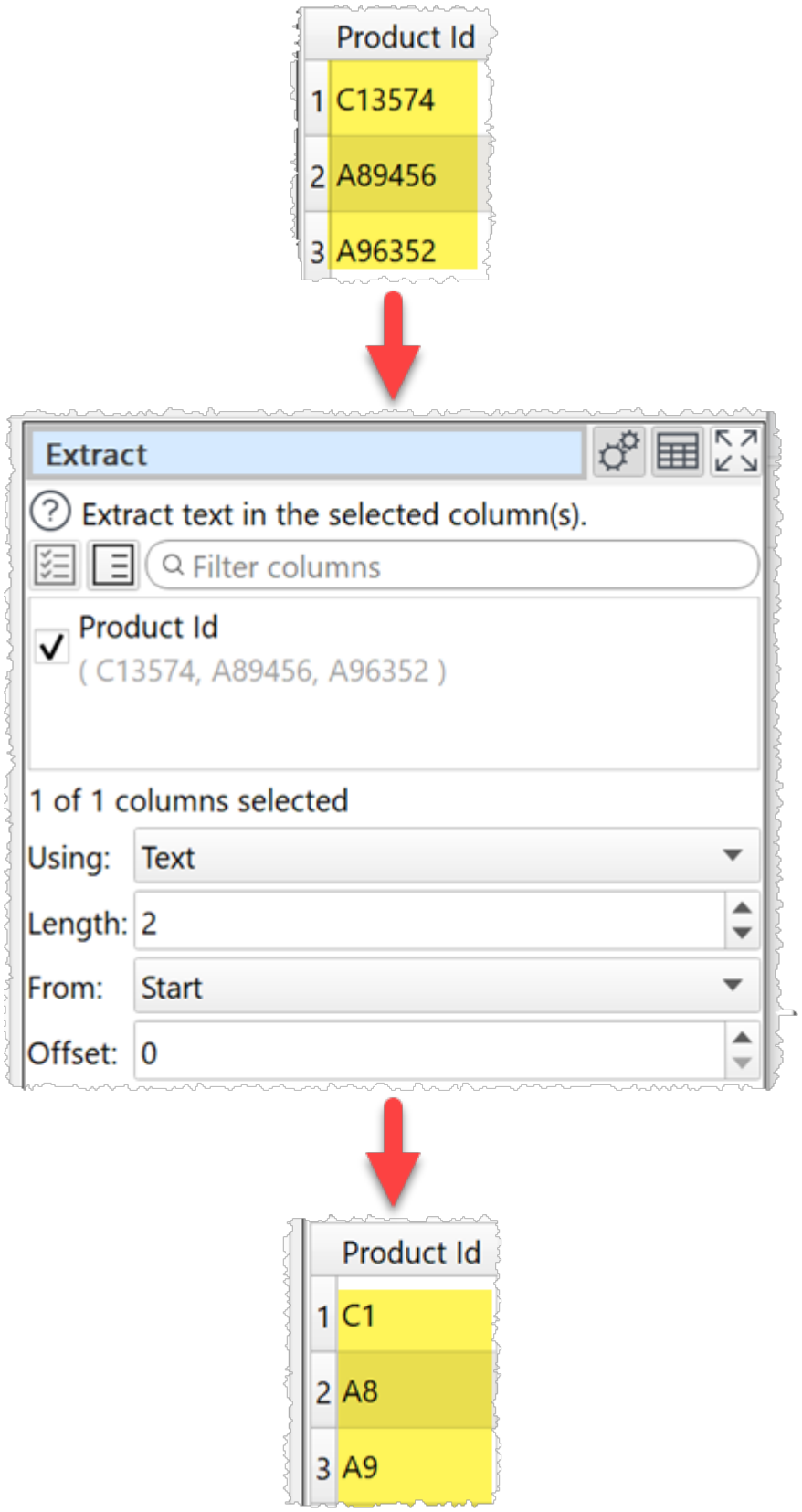


Extract the last group of digits from an IP address:


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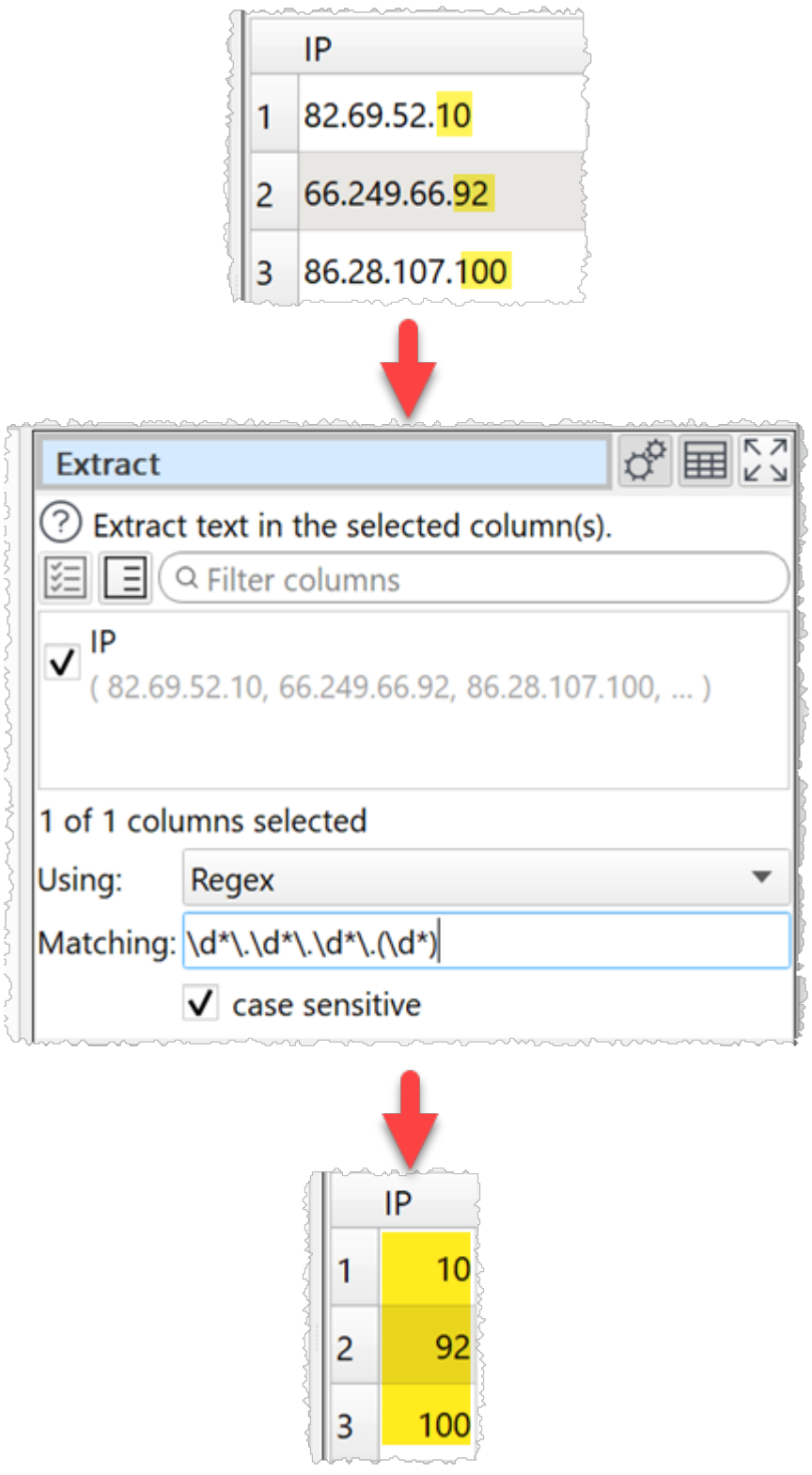


Extract titles from a name:


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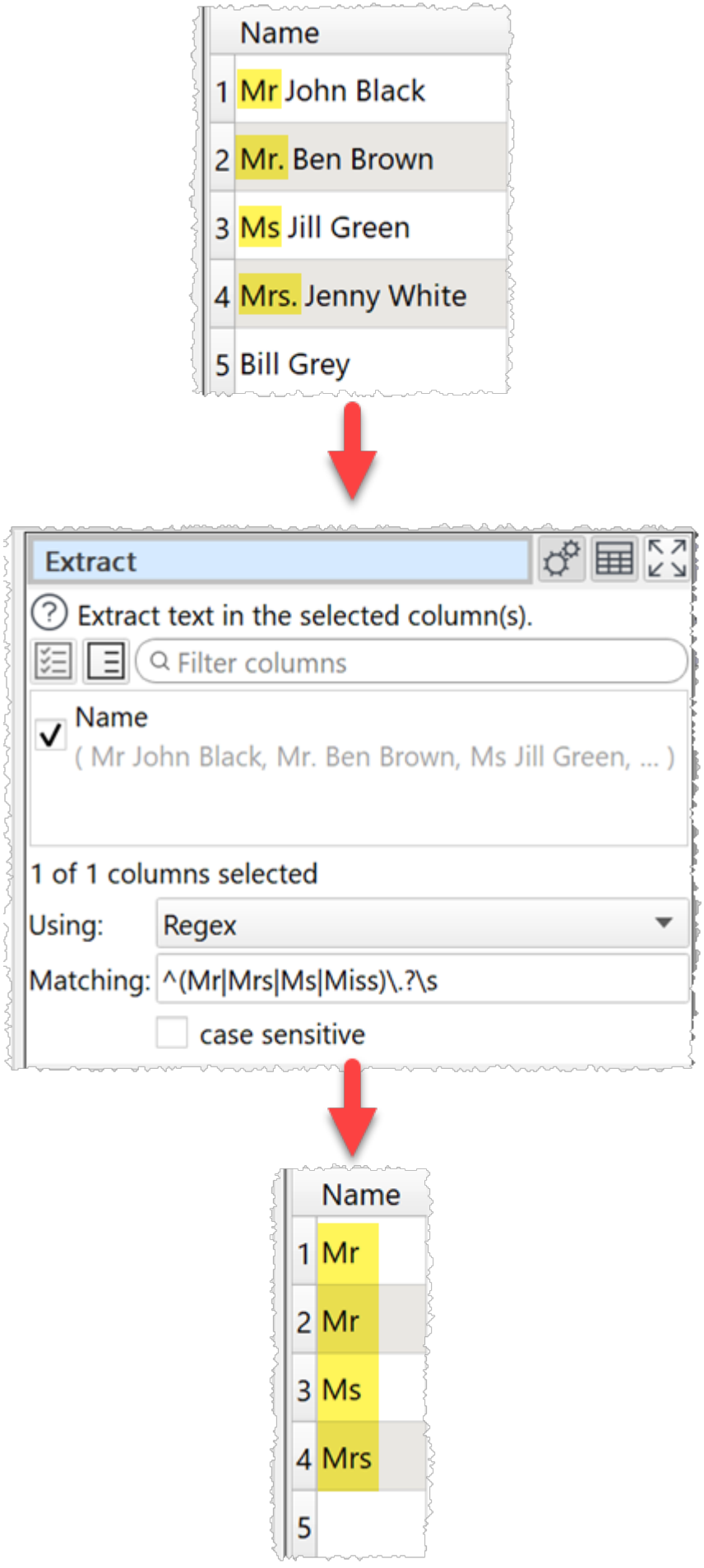



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## Inputs

One.

## Options

- Check the column(s) you wish to transform.
- Set **Using** depending on whether you want to extract a fixed length of text or with a regular expression.
- Set **Length** to the length you want values in selected columns shortened to. **Text** match only.
- Set **From** to **Start** or **End** depending on whether you want to take from the start or end. **Text** match only.
- If **From** is **Start** then **Offset** is the offset of the first character from the start (0 to start with the first character). If **From** is **End** then **Offset** is the offset of the last character from the end (0 to start with the last character). **Text** match only.
- Set **Matching** to a regular expression. **Regex** match only. If the expression contains capture parentheses the first capture will be extracted. Otherwise it will try to capture the whole regular expression. For example:

| Value | Regular expression | Extracted |
|---|---|---|
| `12.34.567.89` | `(\d*)\.\d*\.\d*\.\d*` | `12` |
| `12.34.567.89` | `\d*\.\d*\.\d*\.(\d*)` | `89` |
| `12.34.567.89` | `\d*\.\d*` | `12.34` |
| `ip 12.34.567.89` | `\d*\.\d*\.\d*\.\d*` | `12.34.567.89` |
| `ip 12.34.567.89` | `^\d*\.\d*\.\d*\.\d*$` | |

- Check **case sensitive** to use case sensitive matching. **Regex** match only.

## Notes

- If you can to keep the original column use Copy Cols to copy the column first.
- Whitespace is counted when calculating length. You can use Whitespace to remove whitespace before extracting.
- If you want to set a column to a fixed length use Pad and Extract together.
- Use Replace If you want to extract multiple captures from a value using a regular expression.

## See also

- Chop


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### 2.3.19 Fill

#### Description

Fill empty cells in selected columns with the adjacent non-empty values.

#### Examples

Fill down all rows:


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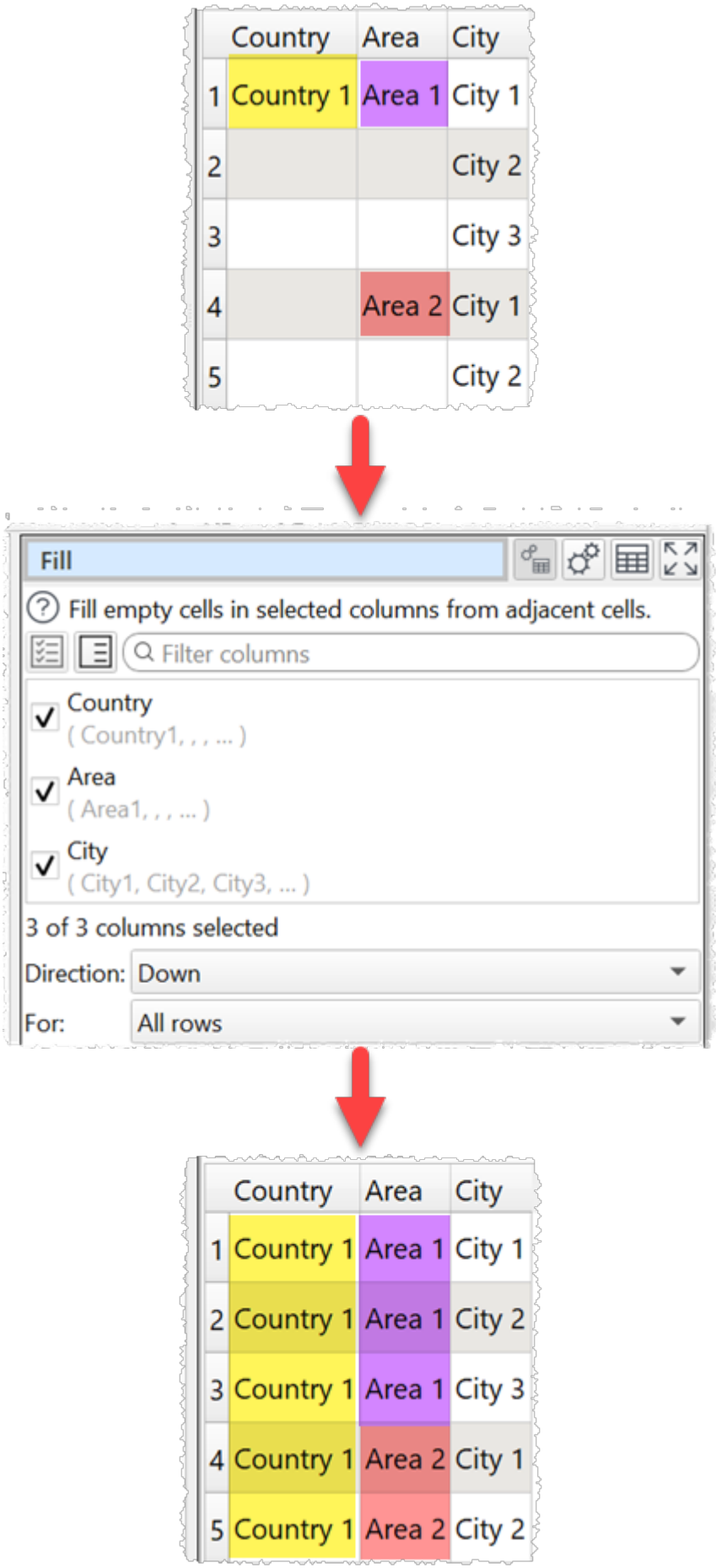



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Fill down all rows only where the value in the 'Id' column matches:


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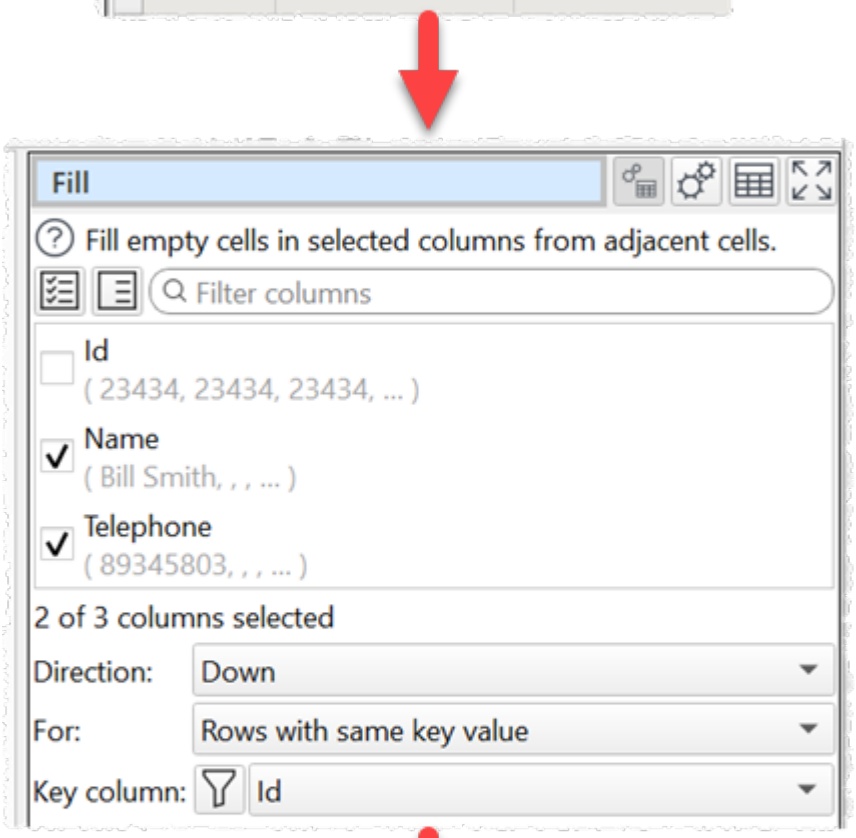
| | Id | Name | Telephone |
|---|---|---|---|
| 1 | 23434 | Bill Smith | 89345803 |
| 2 | 23434 | | |
| 3 | 23434 | | |
| 4 | 90933 | | |
| 5 | 42344 | Ken Green | |
| 6 | 42344 | | |




| | Id | Name | Telephone |
|---|---|---|---|
| 1 | 23434 | Bill Smith | 89345803 |
| 2 | 23434 | Bill Smith | 89345803 |
| 3 | 23434 | Bill Smith | 89345803 |
| 4 | 90933 | | |
| 5 | 42344 | Ken Green | |
| 6 | 42344 | Ken Green | |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### Inputs
One.

### Options
- Check the column(s) you wish to fill.
- Select **Direction** depending on the direction you wish to fill to.
- Set **For** to **Rows with same key value**, if you wish to only fill up/or down when when 2 adjacent rows have the same value in the **Key column** column.

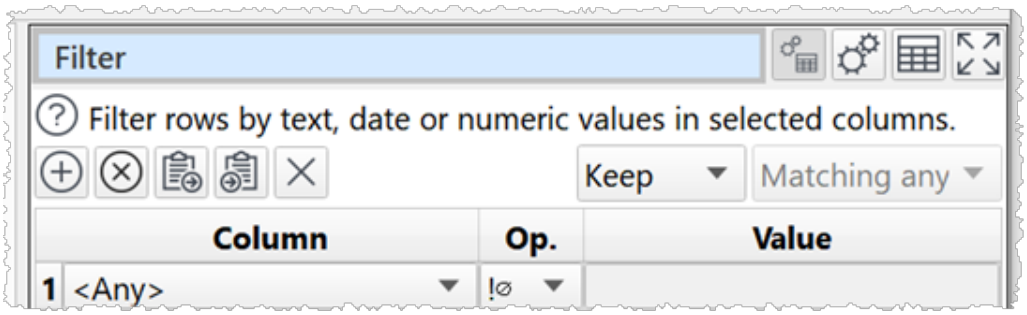
### Notes
- Cells containing whitespace are not considered empty.
- Matching for **Rows with same key value** is sensitive to case and whitespace.
- To fill empty values with something else use the **Replace** transform.

### See also
- Unfill
- Slide
- Whitespace
- Impute

## 2.3.20 Filter

### Description
Removes rows based on number, date and text values in selected columns.

### Examples
Keep rows with at least 1 non-empty value.




Keep only rows where the 'Tax' value is greater than 0 and the 'Country' value is 'US'.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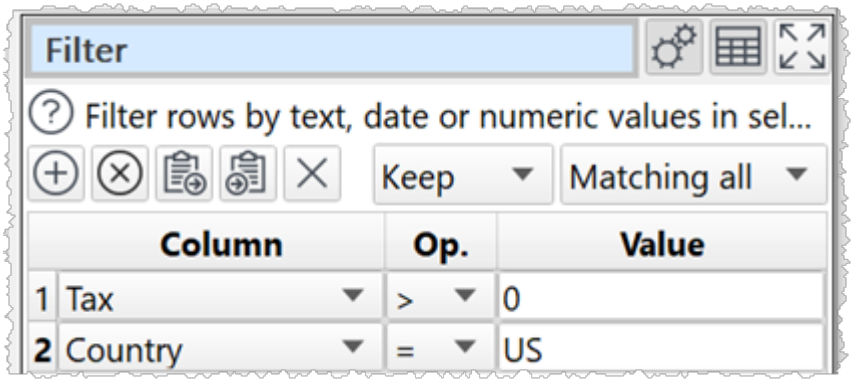
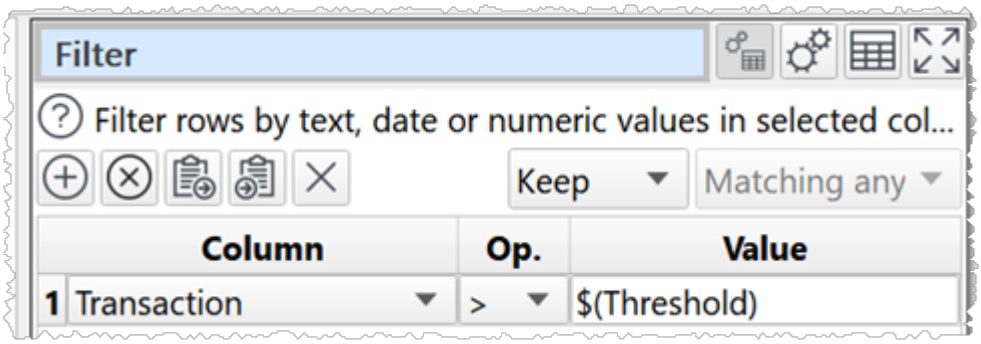



Remove rows where the 'Transaction' value is greater than the 'Threshold' value (using a column variable).




## Inputs

One.

## Options

- Click the ⊕ button to add a new filter criteria.
- Click the ⊗ button to delete the selected filter criteria.
- Click the button to copy terms to the clipboard.
- Click the button to paste terms from the clipboard.
- Click the × button to clear all terms.
- Select **Keep** if you want to keep matching rows and **Remove** to remove matching rows.
- Select **Matching all (AND)** to match on all criteria (e.g. criteria 1 and criteria 2). Select **Matching any (OR)** to require a match on one or more criteria (e.g. criteria 1 or criteria 2).
- Set **Column** to the column you wish to match.
- Set **Op.** to the comparison operator.
- Set **Value** to the value you wish to compare. You can use a column variable.
- Check **case sensitive** to use case sensitive matching for text.
- Check **disable filtering** to turn off filtering. If sampling is disabled, the transform does nothing.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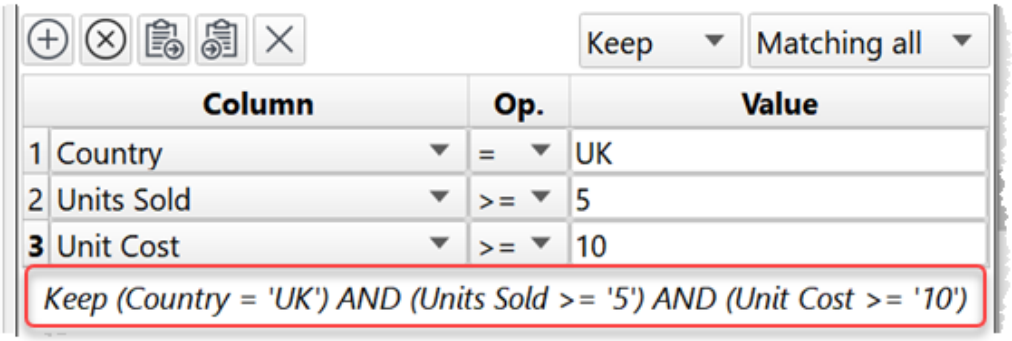
## Notes

- A text summary of the filters is shown:




- A filter row is ignored if the **Value** column is empty , except when **Op.** is **Equal to**, **Not equal to**, **Matches regex** or **Doesn't match regex.**
- Number, date and text values are treated differently for **Equal to**, **Greater than**, **Less than**, **Greater than equal, Less than equal** and **Not equal to** operations.
  - If both values are numeric, a numeric comparison will be carried out. This is accurate to approximately 16 digits of precision.
  - If both values match a supported date formats in Preferences, a date comparison will be carried out.
  - Otherwise the values will be treated as text.
  - For example, an empty value is considered less than 0, because they will be compared as text. So you might want to replace empty values with 0 or remove those rows with Filter, before comparing them.
- All values are treated as text for **Contains**, **Starts with**, **Ends with**, **Matches regex**, **Is not**, **Doesn't start with, Doesn't end with** and **Doesn't match regex** operations.
- Comparisons of text are whitespace sensitive. Cells with whitespace will not match **Is empty**. You can use Whitespace to remove whitespace before filtering and Replace to get of other unwanted characters (e.g. whitespace inside the text).
- See here for more details on Regular expressions (regex).
- You can use Subtract to see rows removed by filtering if there is unique key column.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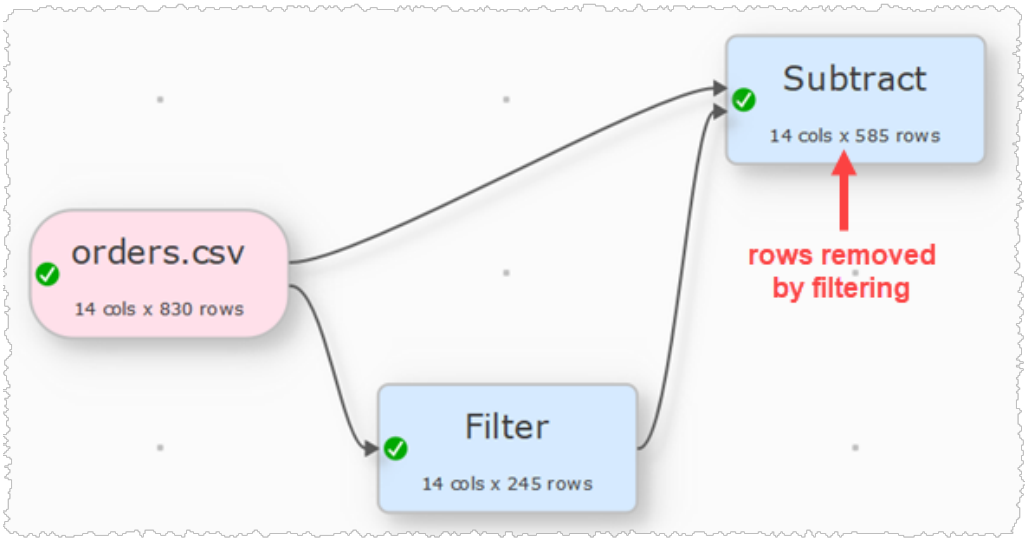


- If you are pasting in filter terms, the format expected is Comma delimited text with 3 columns.
  - The first column is the 0-based index of the **Column** drop-down list.
  - The second column is the 0-based index of the **Op.** drop-down list.
  - The third column is the **Value**.

For example, pasting in:

```
0,0,YES
```

Will add:

You can also try copying terms to the clipboard and pasting into a text file to see the format. If you only paste in 1 column of text, it will be assumed to be a list of **Value**. You can, of course, use Easy Data Transform to create the appropriate filter terms and paste them into memory.

- You can also use a Verify transform to remove rows that do or don't meet particular verification rules.

## See also

- Compare Cols
- Slice
- Video: How to clean, merge and scrub email lists


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## 2.3.21 Gather

### Description

Gather multiple columns into new key and value columns. Also called unpivot, long pivot or group by.

### Example

Gather 'Q1', 'Q2', 'Q3' and 'Q4' columns into 1 column.


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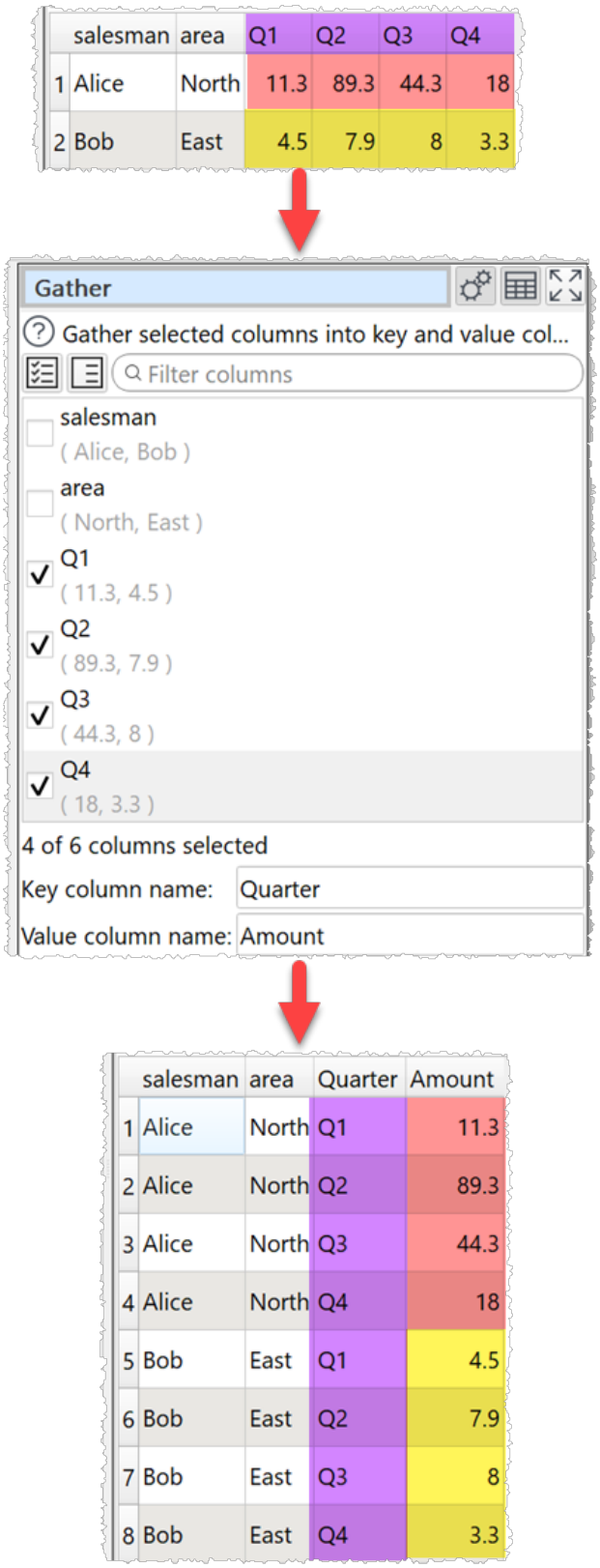


## Inputs

One.


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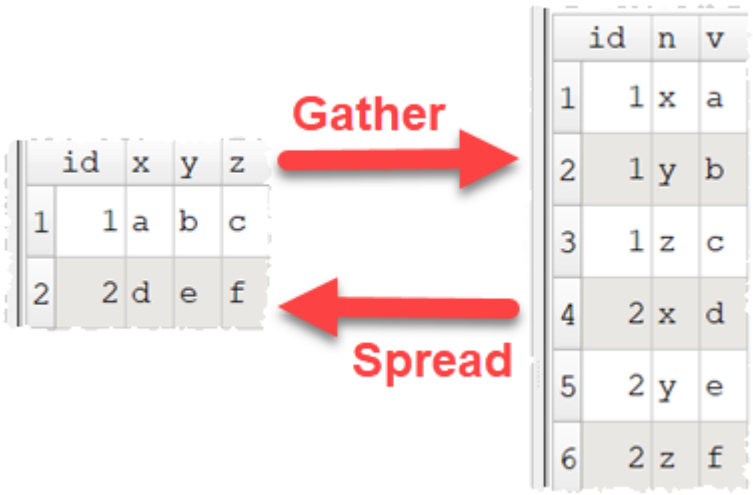
### Options

- Select the **Columns** you wish to gather.
- Set **Key column name** to the name of the new key column, which will have values based on the names of the columns selected.
- Set **Value column name** to the name of the new value column, which will have values based on the values in the columns selected.

### Notes

- New columns are added at the right end. You can change the column order with Reorder Cols.
- You can merge the value and key columns into a single column with Concat Cols.
- The opposite of **Gather** is Spread.




### See also

- Video: How to unpivot Excel
- Split Rows

## 2.3.22 Hash

### Description

Perform one-way hashing on selected columns.

### Example

Compute the MD5 hash of `<'Hello World!'>`: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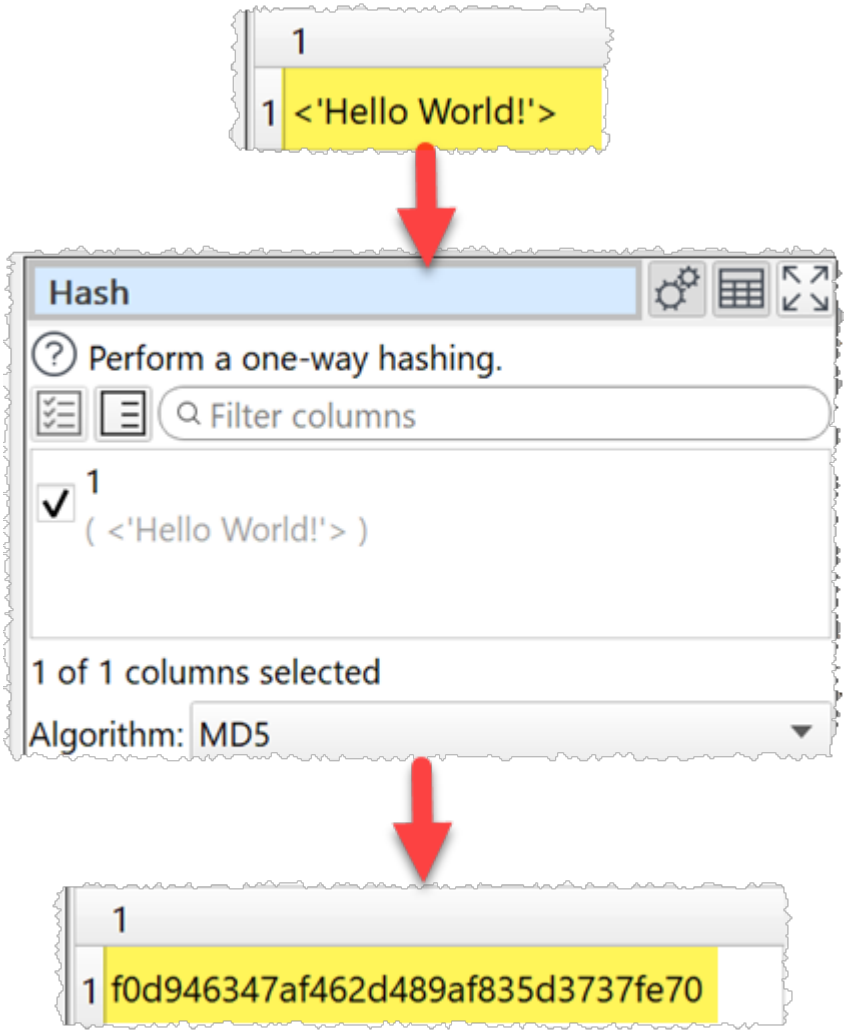


| Type | Plaintext | Secret | Hashed |
|---|---|---|---|
| SHA1 | <'Hello World!'> | | 4a700d8555aae497cc54d32f6f3d7478200a5dea |
| SHA-256 | <'Hello World!'> | | 2c6139a5d874b9626e3ae2443fa85cdfe1fc18f1480348267f8bf71a783f738a |
| SHA-512 | <'Hello World!'> | | 23728b865af0f17bb9bfaaf064f711bf00626c07e5389dcbb18365ace19c2394d7a00066c0b6a7112dab528e62106a855dd6bc41d0c2 |


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| Type | Plaintext | Secret | Hashed |
|---|---|---|---|
| | | | 62fb72e9f47e10f1652c |
| SHA3-256 | <'Hello World!'> | | 0701263723cdbdf11e1f7118e62d7d29d61f01f8490ef775e4991558634bd719 |
| SHA3-512 | <'Hello World!'> | | 61cbf6f11e864af592626d9430271a5ad6f39edf7e09719a97c57b5c3222cdf24bd70f1f6927b7b41eb948bbddfe0a4ae965688a4a6882df7be36492ad653ab0 |
| Keccak-256 | <'Hello World!'> | | 1a45dd8df9de65049692d9192509b30560b69c1fd881c57b2cf4607e85b3569f |
| Keccak-512 | <'Hello World!'> | | 2741b7ddfe0d4c4726d476cc719fdbb3b7db88fe6df1a1df00723547c546496ac49bd82e94009f4572d3a31fe0fc50bce1ee3c76d983f8ddc480b7da9cd1ed02 |
| MD5 | <'Hello World!'> | | f0d946347af462d489af835d3737fe70 |
| HMAC-MD5 | <'Hello World!'> | ABC123 | 5940ca9b5f2b47ae1972ab81db8030ac |
| HMAC-MD5 | <'Hello World!'> | abc123 | b185f719143d6380ccabe07d5d2743eb |


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### Inputs
One.

### Options
- Check the column(s) you wish to transform.
- Set **Algorithm** to the hashing algorithm you wish to use
- Set **Secret** to the secret key you wish to use (HMAC-MD5 only). The default value is randomly generated.

### Notes
- There is no known way to reverse these hashes, apart from brute force (create the hash of every possible value, then do a reverse lookup).
- As the chance of 2 different inputs generating the same hash value by chance (a 'collision') is infinitesimally small, hashing can be used to pseudonymise data or to help find duplicates of long data values.
- The MD5 algorithm is now considered weak as a cryptographic hash. But remains suitable for other non-cryptographic purposes.
- Use Copy Cols if you want to copy columns, before you hash them.

### See also
- Pseudonym

## 2.3.23 Header

### Description
Move rows from the top of the dataset into the header.

### Example
Append the first row to the header:


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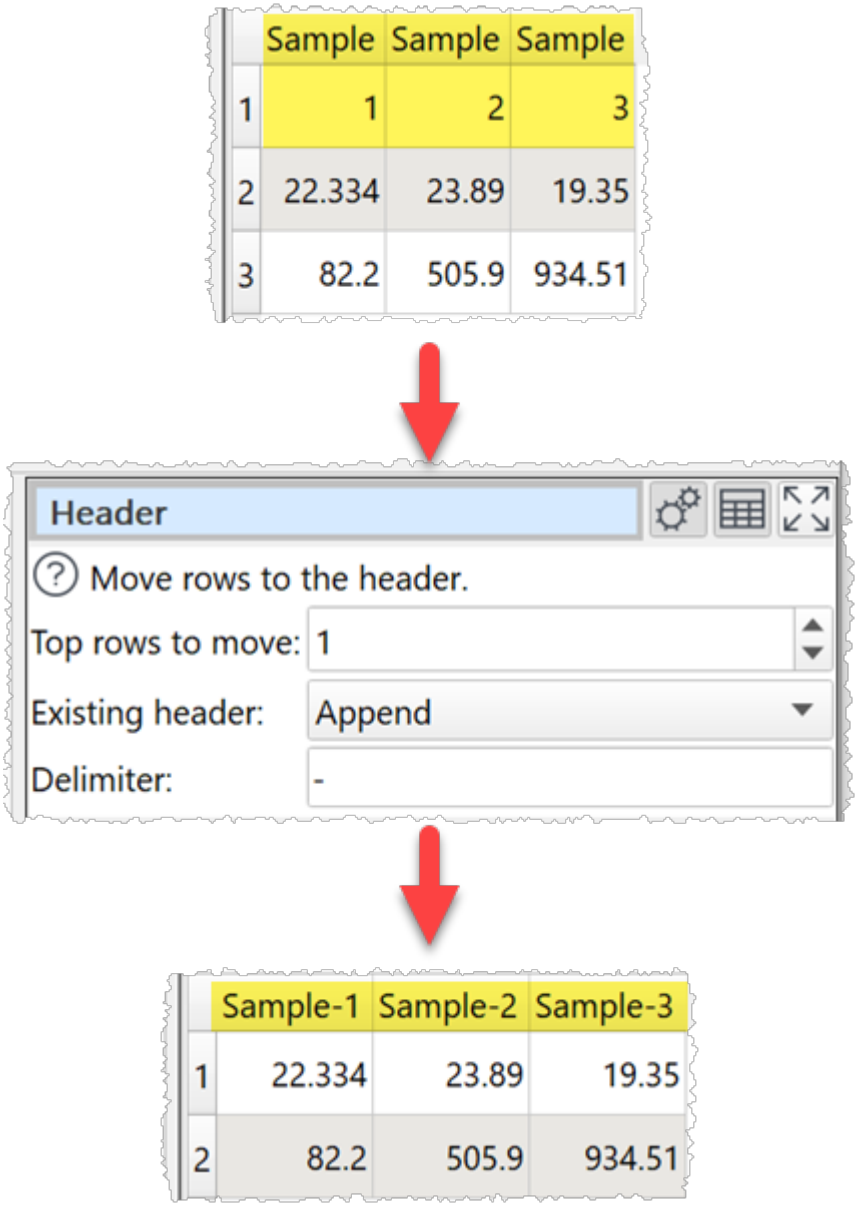


## Inputs

One.

## Options

- Set **Top rows to move** to the number of rows you want to move from the top dataset into the header. Setting it to 0 means the transform does nothing.
- Set **Existing header** to **Overwrite** to ignore the existing header values and **Append** to add to the existing header values.
- Set **Delimiter** to any text you want to put between column elements. It can be left empty. Ignored if **Existing header** set to **Overwrite** and **Top rows to move** set to **1.**


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### Notes

- Empty cells are ignored.
- You can Sort and Filter your dataset to change the top rows.
- You can add the header from one dataset to another dataset using Stack.

### See also

- Headers

## 2.3.24 If

### Description

Sets the value of a new column based conditionally on values in one or more other columns.

### Examples

Add a new column based conditionally on 'Payment' and 'Currency' columns:


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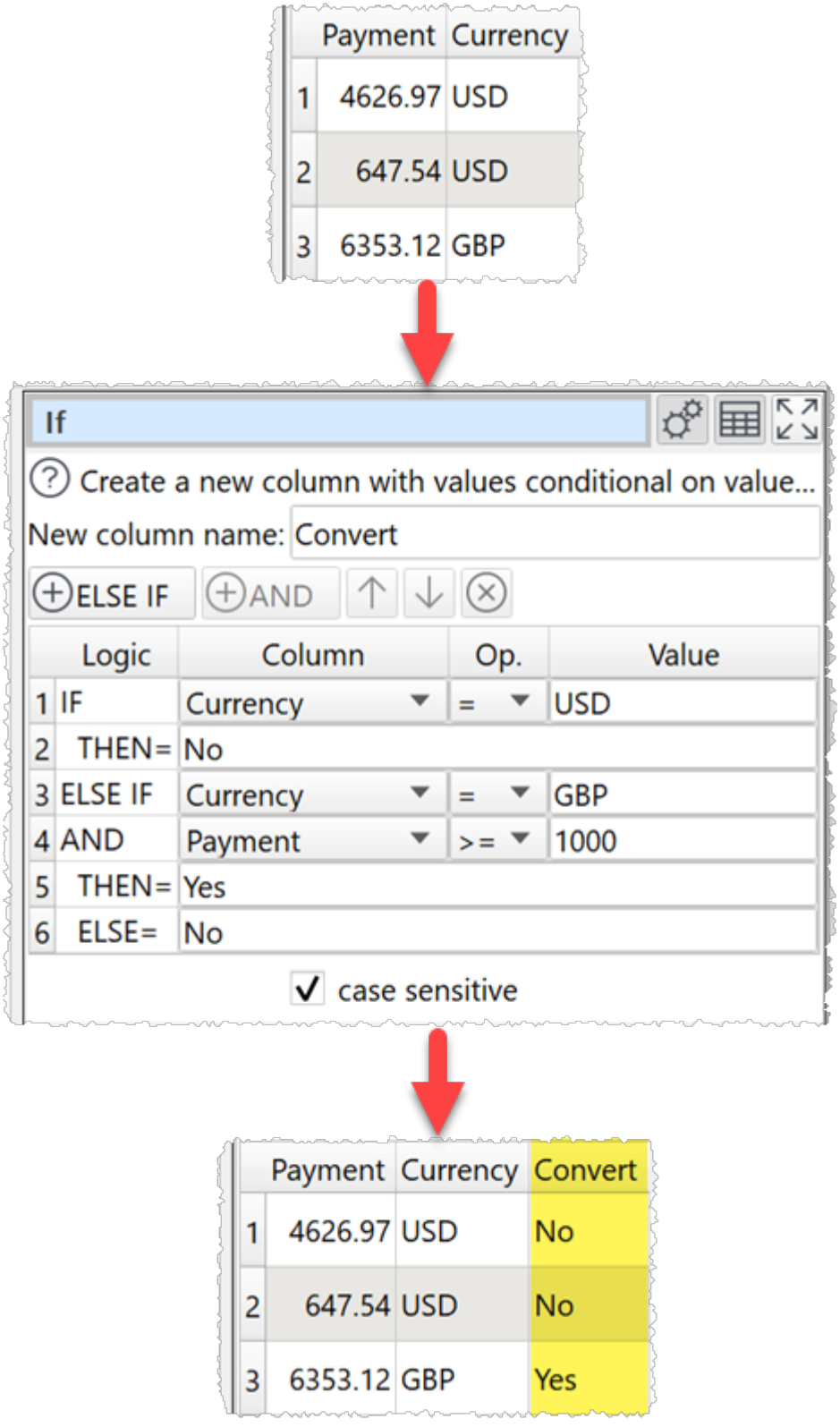


If the 'h1' and 'h2' columns have the same value then use the value of the 'h2' column, otherwise use the value of 'h3' column (using column variables).:


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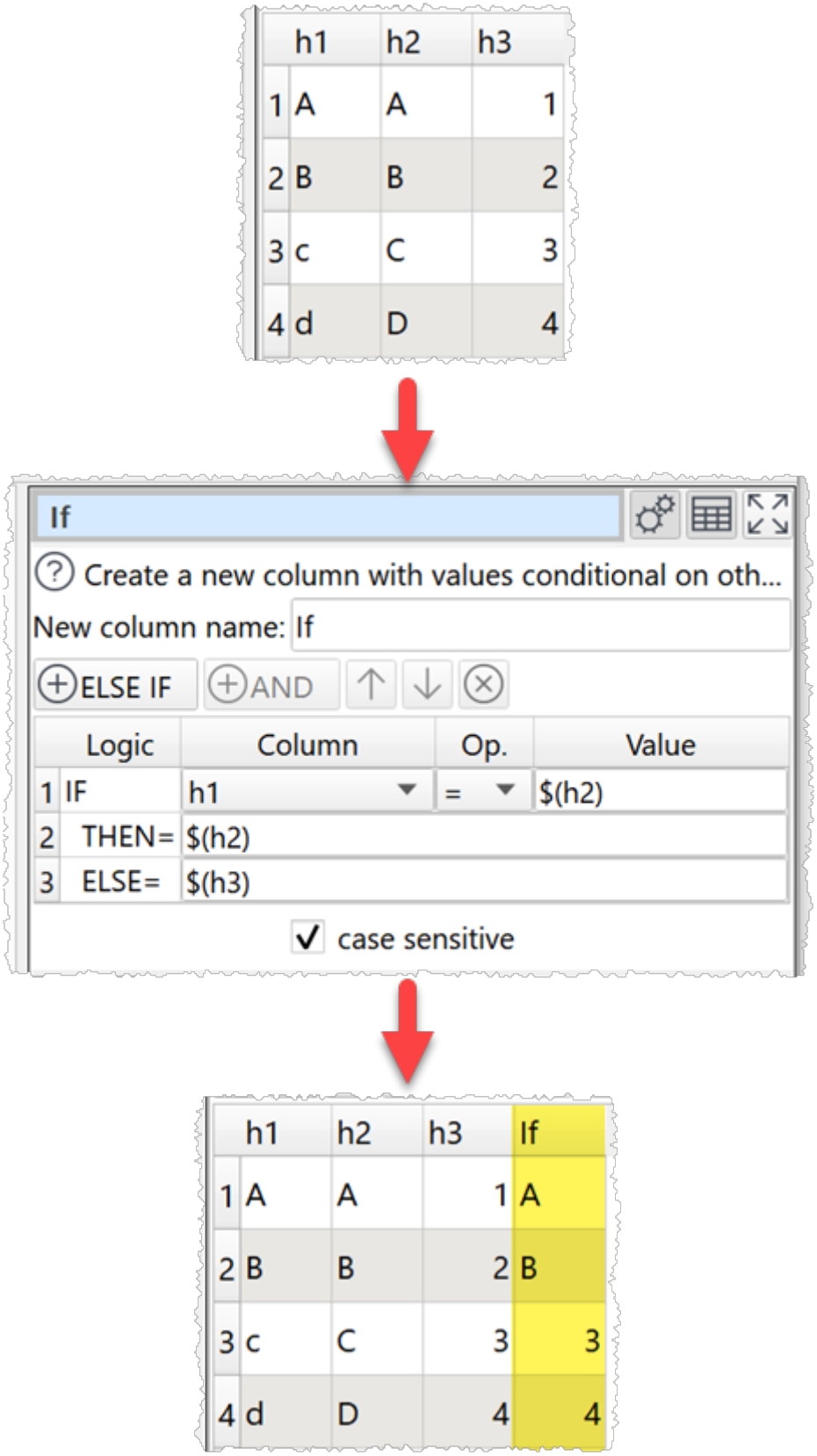


## Inputs

One.


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## Options

- Set **New column name** to the name of the new column you want to create.
- Click the ⊕**ELSE IF** button to add a new IF/ELSE IF..THEN condition.
- Click the ⊕**AND**'button to add an AND to the selected IF/ELSE IF..THEN.
- Click the ⊗ button to delete the selected IF/ELSE IF..THEN/AND.
- The **Logic** column shows the type of row.
- Set **Column** to the column you wish to match.
- Set **Op.** to the comparison operator.
- Set **Value** to the value you wish to compare.
- Check **case sensitive** to use case sensitive matching for text.

## Notes

- The **IF**, **THEN** and **ELSE** values can use column variables, as in the second example above.
- You can simulate OR with multiple IF statements. For example:

```
IF x = 1 OR y = 2
   THEN 3
```

  Is equivalent to:

```
IF x = 1
   THEN 3
ELSE IF y = 2
   THEN 3
```

- Number, date and text values are treated differently for **Equal to**, **Greater than**, **Less than**, **Greater than equal, Less than equal** and **Not equal to** operations.
  - If both values are numeric, a numeric comparison will be carried out. This is accurate to approximately 16 digits of precision.
  - If both values match a supported date formats in Preferences, a date comparison will be carried out.
  - Otherwise the values will be treated as text.
  - For example, an empty value is considered less than 0, because they will be compared as text. So you might want to replace empty values with 0 or remove those rows with Filter, before comparing them.
- All values are treated as text for **Contains**, **Starts with**, **Ends with**, **Matches regex**, **Is not**, **Doesn't start with, Doesn't end with** and **Doesn't match regex** operations.
- Comparisons of text are whitespace sensitive. Cells with whitespace will not match **Is empty**. You can use Whitespace to remove whitespace before filtering and Replace to get of other unwanted characters (e.g. whitespace inside the text).
- See here for more details on Regular expressions (regex).


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### See also

- Lookup

## 2.3.25 Impute

### Description

Infer values of missing data from other values in the same column.

### Examples

Impute the missing age of Titanic passengers based on the average age of all passengers:


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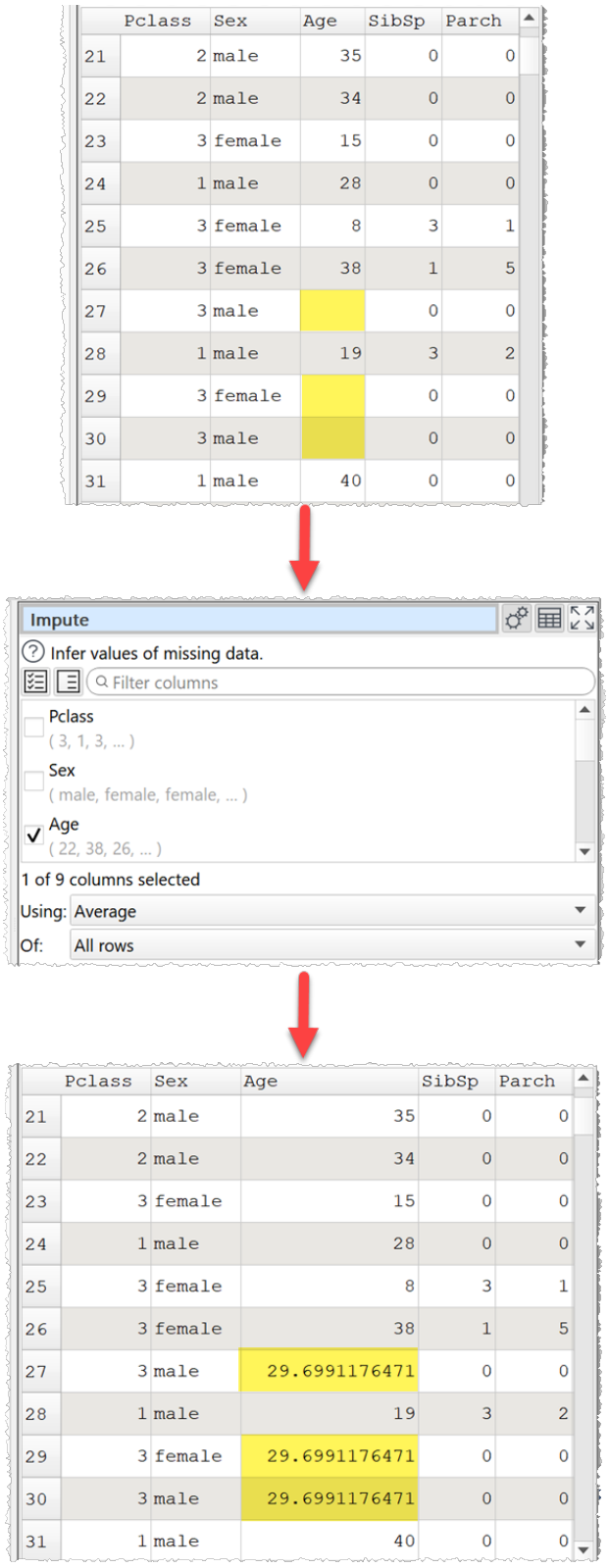


Impute the missing age of Titanic passengers based on the median age of passengers with the same passenger class and sex:


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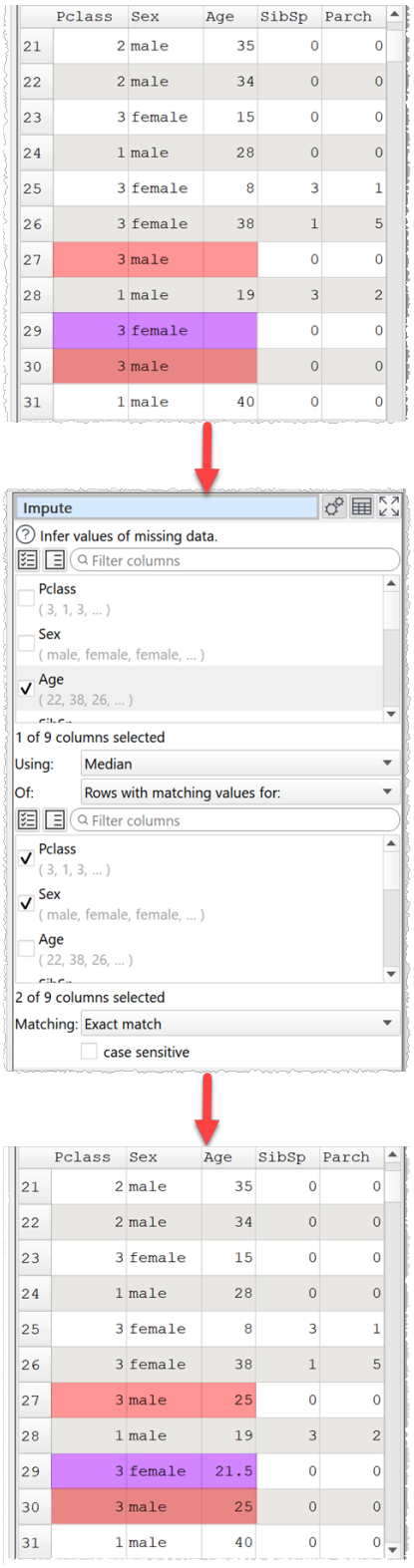


| | Pclass | Sex | Age | SibSp | Parch |
|---|---|---|---|---|---|
| 21 | 2 | male | 35 | 0 | 0 |
| 22 | 2 | male | 34 | 0 | 0 |
| 23 | 3 | female | 15 | 0 | 0 |
| 24 | 1 | male | 28 | 0 | 0 |
| 25 | 3 | female | 8 | 3 | 1 |
| 26 | 3 | female | 38 | 1 | 5 |
| 27 | 3 | male | | 0 | 0 |
| 28 | 1 | male | 19 | 3 | 2 |
| 29 | 3 | female | | 0 | 0 |
| 30 | 3 | male | | 0 | 0 |
| 31 | 1 | male | 40 | 0 | 0 |

| | Pclass | Sex | Age | SibSp | Parch |
|---|---|---|---|---|---|
| 21 | 2 | male | 35 | 0 | 0 |
| 22 | 2 | male | 34 | 0 | 0 |
| 23 | 3 | female | 15 | 0 | 0 |
| 24 | 1 | male | 28 | 0 | 0 |
| 25 | 3 | female | 8 | 3 | 1 |
| 26 | 3 | female | 38 | 1 | 5 |
| 27 | 3 | male | 25 | 0 | 0 |
| 28 | 1 | male | 19 | 3 | 2 |
| 29 | 3 | female | 21.5 | 0 | 0 |
| 30 | 3 | male | 25 | 0 | 0 |
| 31 | 1 | male | 40 | 0 | 0 |

## Inputs

One.

## Options

- Check the column(s) which have empty values you wish to impute.


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- Set **Using** to impute using the **Average** (mean), **Median** or **Mode** of non-empty data values in each column.
- Set **Of** to:
  - **All rows** to fill empty values in each column with the **Average**, **Median** or **Mode** of all non-empty values in the same column.
  - **All rows with matching values for** to fill empty values in each column with the **Average**, **Median** or **Mode** of all non-empty values in the same column where values match in the checked columns below.
- Set **Matching** to **Exact match** if every field has to match and **Best match** to use rows that have the most matching values (or all rows, if no matches). For example, if you are matching on passenger class and sex then:
  - **Exact match** will only use values from rows where the passenger class and sex both match.
  - **Best match** will use values from rows where the passenger class and sex both match, if available. Otherwise it will use values from rows where either the passenger class or sex match, if available. Otherwise it will use values from all rows.
- Check **case sensitive** to use case sensitive matching.

## Notes

- **Average** and **Median** only work on numerical data (non-numerical values are ignored).
- **Mode** treats all non-empty data values as text. Case and whitespace are taken into account.
- If **Mode** is selected and there are multiple values with the same maximum frequency, one will be picked at random.
- If you need to convert some values to empty before imputing, you can do this using a Replace transform.


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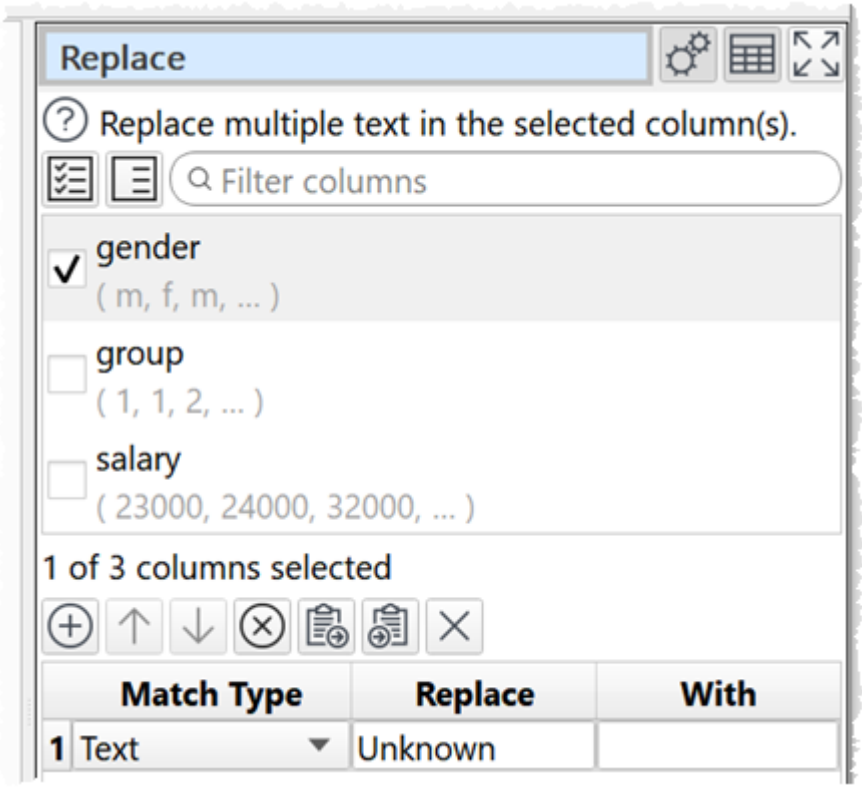


- You can use a Filter transform to remove rows with missing values instead of imputing values.
- Use a Sequence transform to add missing date or integer values in a sequence before imputing.

### See also

- Video: How to impute missing data
- Fill
- Interpolate

## 2.3.26 Insert

### Description

Append/prepend text to one or more columns.

### Example

Add 'ID-' to the front of a column of text:


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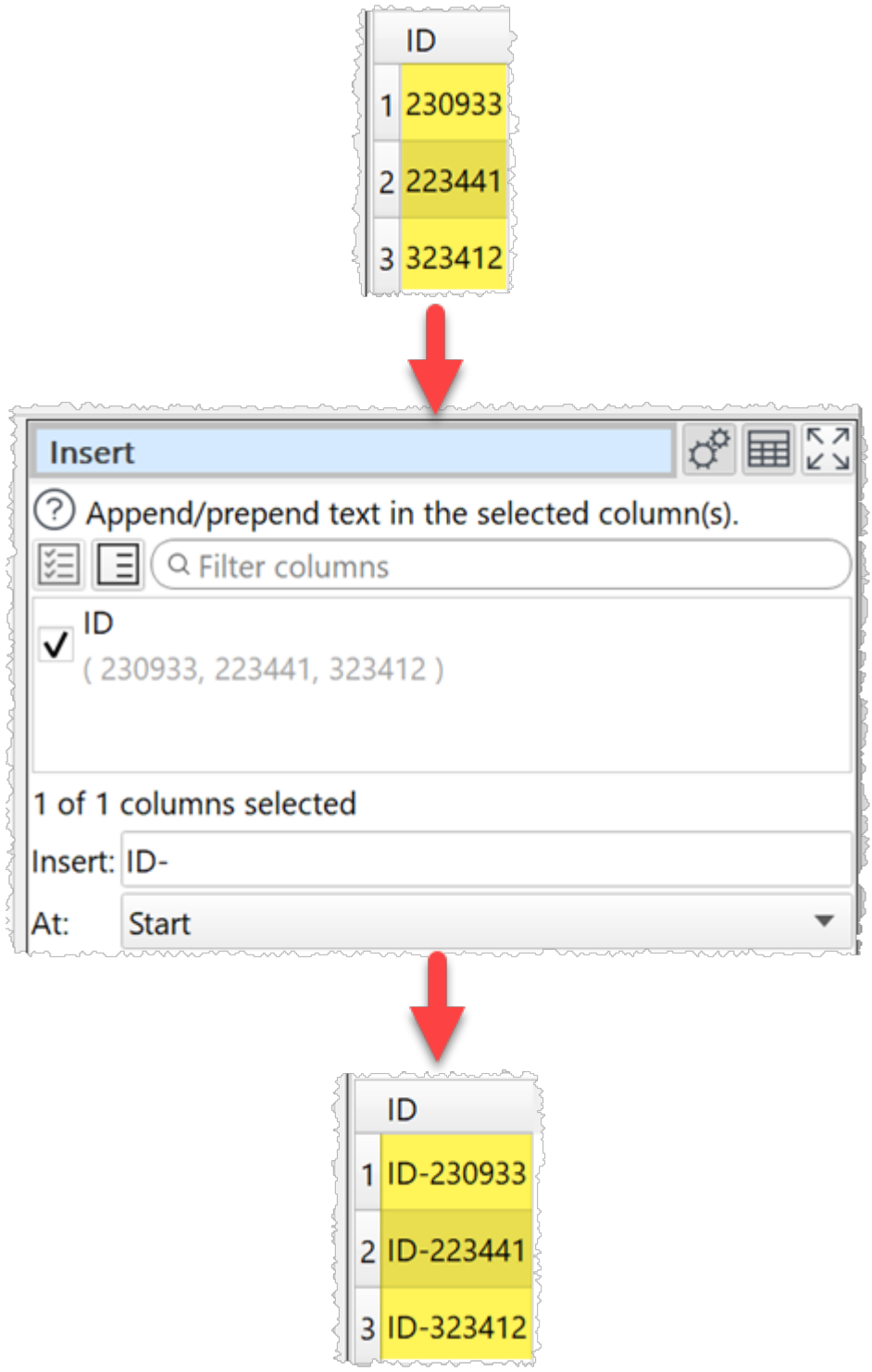


## Inputs

One.

## Options

- Check the column(s) you wish to transform.
- In **Insert** put the text you want to insert. You can use a column variable.
- In **At** put the position you want the text inserted.


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### Notes

- You can use Whitespace to remove whitespace before inserting.

### See also

- Pad
- Extract

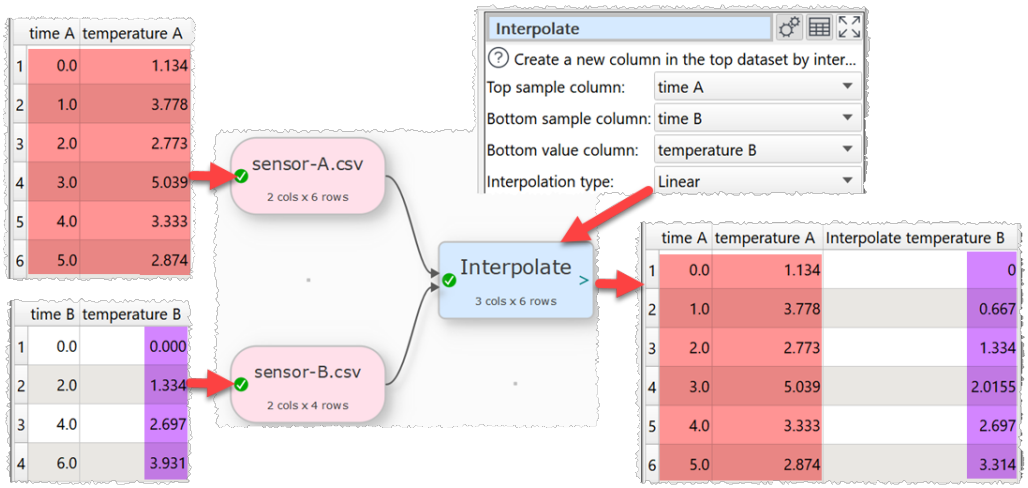
## 2.3.27 Interpolate

### Description

Interpolate values for a dataset based on numerical sample-value pairs in another dataset and puts the result in a new column.

### Example

Interpolate time and temperature datasets for sensors A and B with different sampling frequencies:




### Inputs

Two.

### Options

- Place the dataset you want to modify as the top input and the dataset you want to sample values from as the bottom input.
- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Select **Top sample column** for the column whose values you wish to sample.
- Select **Bottom sample column** for the column that matches the top sample column in the bottom dataset.
- Select **Bottom value column** for the column that contains the values.
- Set **Interpolation type** to the type of interpolation you wish to use.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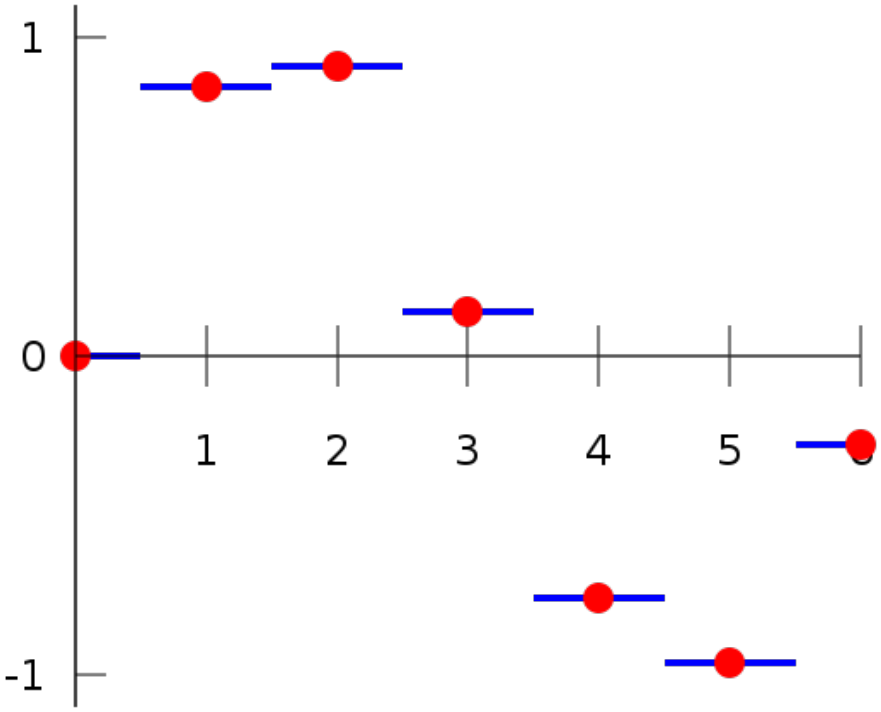
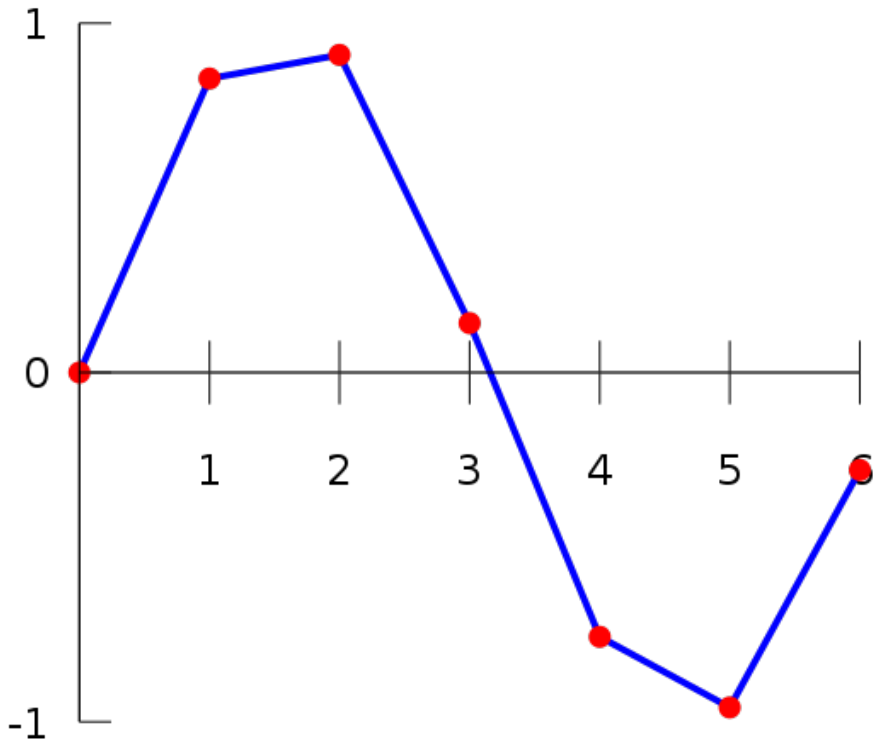



*Piecewise interpolation (image from Wikipedia)*




*Linear interpolation (image from Wikipedia)*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### Notes

- If your sample is below the first sample in the bottom dataset, the first value will be returned.
- If your sample is above the last sample in the bottom dataset, the last value will be returned.
- Easy Data Transform will try to guess sensible default values for **Top sample column**, **Bottom sample column** and **Bottom value column** based on column contents.
- If the first input has a header, this will be used for the output.
- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.
- Use Num Format to change the precision of the results.
- Messages are shown in the **Warnings** tab for non-numeric values in either dataset.
- Messages are shown in the **Info** tab for **Top sample column** outside the range of values in **Bottom sample column** .

### See also

- Lookup
- Impute
- Join

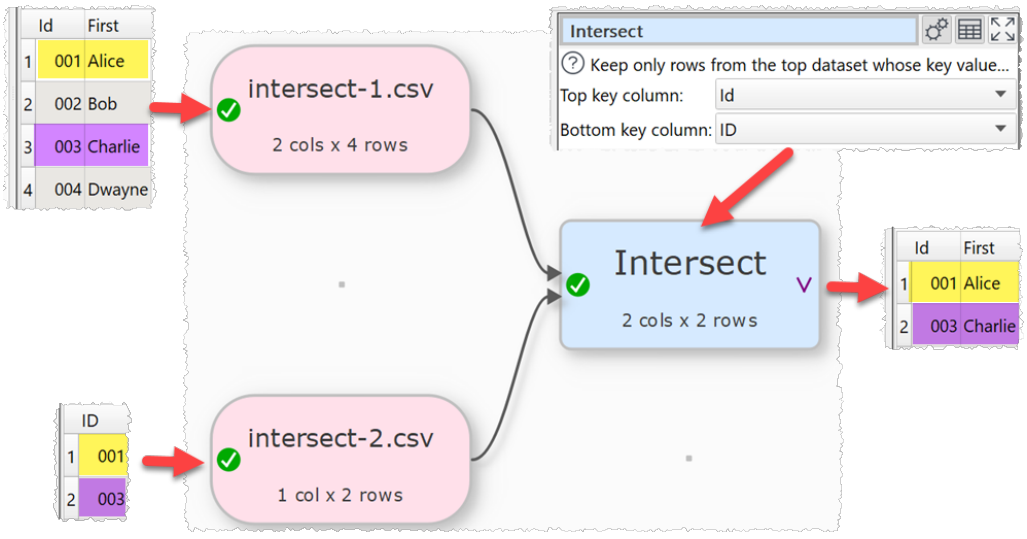
## 2.3.28 Intersect

### Description

Keep only rows from the top dataset with key values that are present in the lower dataset.

### Example

Keep rows in the top dataset that also have their IDs in the bottom dataset:





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### Inputs
Two.

### Options
- The output depends on the vertical (Y-axis) position of the inputs.
- Click **Explore Keys...** to compare key values in the 2 datasets.
- Select **Top key column** for the column you want to match in the top input dataset.
- Select **Bottom key column** for the column you want to match in the bottom input dataset.
- Check **case sensitive** to use case sensitive matching for keys.

### Notes
- If there are 10k rows or less in both datasets, Easy Data Transform will try to guess sensible default values for **Top key column** and **Bottom key column** based on column header names and contents.
- If the first input has a header, this will be used for the output.
- All values are treated as text and comparisons are whitespace sensitive. You can use Whitespace to remove whitespace before the intersect.
- Does not remove duplicates. You can use Unique to do this.
- You can use Concat Cols to join several columns together (e.g. 'first name' and 'last name' columns) to form a key column.
- You can use Row Num to create a unique key column.

### See also
- Difference
- Subtract
- Use multiple keys for Join/Lookup/Intersect/Subtract

## 2.3.29 Javascript

### Description
Create a custom transform using Javascript (ECMAScript).

Easy Data Transform allows you to carry out a wide range of data transformations without coding. But sometimes you might need a specialist transformation that can't be done with the built-in transforms. For that you can use the **Javascript** transform. It allows you to write the body of a Javascript function, to calculate a value for each row in a new column. Existing column values can be used as variables.

Javascript is a fully-fledged programming language and can perform arbitrarily complex transforms. It can handle strings (text), numbers, dates and text.


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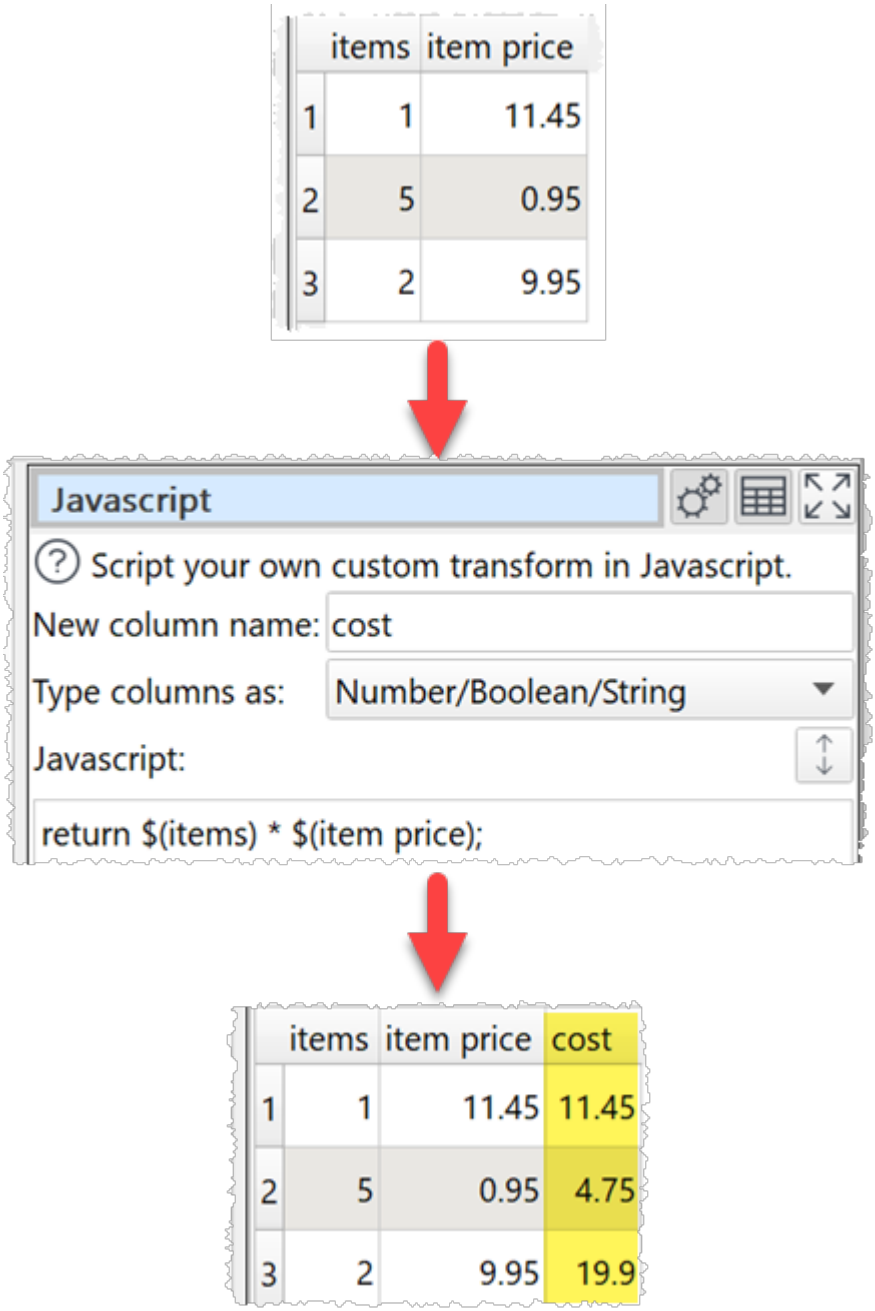
## Examples

Multiply the value in column 'items' by the value in column 'item price':




To concatenate 'last' and 'first' columns with a Comma and a Space:

```
return $(last) + ', ' + $(first);
```

To calculate the biggest of numeric columns 'v1' and 'v2':

```
return Math.max( $(v1), $(v2) );
```

To find the number of characters in column 'v1':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```
return String( $(v1) ).length;
```

To determine whether phone numbers in the 'phone_num' column are valid using a regular expression:

```
const validPhoneNum = /^[\+]?[()]?[0-9]{3}[)]?[-\s\.]?
[0-9]{3}[-\s\.]?[0-9]{4,6}$/;
if ( validPhoneNum.test( $(phone_num) ) )
   return "valid";
else
   return "invalid";
```

To replace the last Comma in the 'Location' column with a ';' using a regular expression:

```
return $(Location).replace(/(.*),([^ ]*)$/, '$1;$2');
```

To calculate the number of years difference between Javascript compatible dates in column 1 and column 2:

```
return new Date( $(1) ).getFullYear() - new
Date( $(2) ).getFullYear();
```

To calculate the number of milliseconds between a datetime in the 'datetime' column and 1st Jan 2000:

```
return new Date( $(date) ) - new Date( "2000-01-
01T00:00" );
```

To calculate the number of whole days difference between a date in the 'created' column and today (negative for future dates):

```
return Math.floor( ( new Date() - new
Date( $(created) ) ) / ( 1000*60*60*24 ) );
```

To use the value of the 'n' column if it is a number and 0 if it isn't:

```
if ( isNaN( $(n) ) )
   return 0;
else
   return $(n);
```

To reverse the text in the 'key' column:

```
var a = $(key);
var newString = "";
for (var i = a.length - 1; i >= 0; i--) {
   newString += a[i];
}
```


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```
return newString;
```

To convert meters to feet using a function:

```
function metersToFeet( x )
{
   return 3.28084 * x;
}
return metersToFeet( $(meters) );
```

## Inputs

One.

## Options

- Set **New column name** to the name of the new column you want to create.
- Set **Type column as** to:
  - **Number/Boolean/String** to pass:
    - A column that is numeric values as Javascript Number type.
    - A column that is `true` and `false` values as Javascript Boolean type.
    - Anything else as Javascript String type.
  - **String** to pass data all columns with Javascript String type.
- Enter your script into the **Javascript** field. The script should be the body of a Javascript function.
- Select a column from **Insert variable** to add that column variable into the **Javascript** field at the current cursor position.
- Click the **Evaluate** button to evaluate your Javascript expression over every row and show any errors (only available if **Run>Auto Run** is checked).

## Notes

- If **Run>Auto Run is** checked, the **Javascript** transform is calculated every time:
  - The **Evaluate** button is pressed.
  - The **Javascript** transform item is unselected in the **Center** pane and script changes have been made without the **Evaluate** button being clicked.
  - An item upstream of it changes.
- An empty string is passed as an empty Javascript string variable (""), not `null`. To test if the 'v' column has an empty value:

```
if ( $(v).length === 0 )
{
   // empty cell
}
else if ( String( $(v) ).trim().length === 0 )
{
   // blank cell (whitespace only)
}
```


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- Numeric values should use Dot ('.') as the decimal separator and have no group separator. E.g. 1234.5 is valid, but 1,234.5 and 1.234,5 are not, regardless of the locale. You can use the Num Format and Replace transforms to put numeric data in the correct format before processing a **Javascript** transform.
- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.
- The Javascript Date() object evaluates to the number of milliseconds since 1 January 1970 UTC.
- Date values passed to Javascript Date() objects should be in ISO ('yyyy-mm-dd') format, e.g. '2020-01-31' (not '2020-1-31').
- If you want to carry out your transform across more than one dataset, you should merge them first, e.g. using Join.
- The Javascript transform is very versatile and quite fast. But is not as fast as built-in transforms. So we recommend you use built-in transforms where possible.
- Javascript running in Easy Data Transform is not 'sandboxed' and has the same privileges as the Easy Data Transform executable. However the Javascript does not have access to window(), XMLHttpRequest() or ActiveXObject(). So we aren't aware of any way that a bad actor could damage your system from Javascript sent in a .transform file.
- Javascript is far too big a topic to cover here. However there are many detailed resources online. If you are stuck contact support.
- If you only want to combine text from columns, use the simpler Substitute transform.
- Warnings are shown in the **Warnings** tab for:
  - Javascript syntax errors
  - Ambiguous column references
- For simple arithmetic operations on numbers and dates use the Calculate transform.

### See also

- Find the difference between dates/datetimes

## 2.3.30 Join

### Description

Merge two inputs based on common (key) columns, e.g. on an email address or ID column present in both inputs. The bottom dataset (by vertical position) is joined to the right of the top dataset.

### Examples

Join two datasets side-by-side matching the 'ID' columns, keeping only IDs in both datasets:


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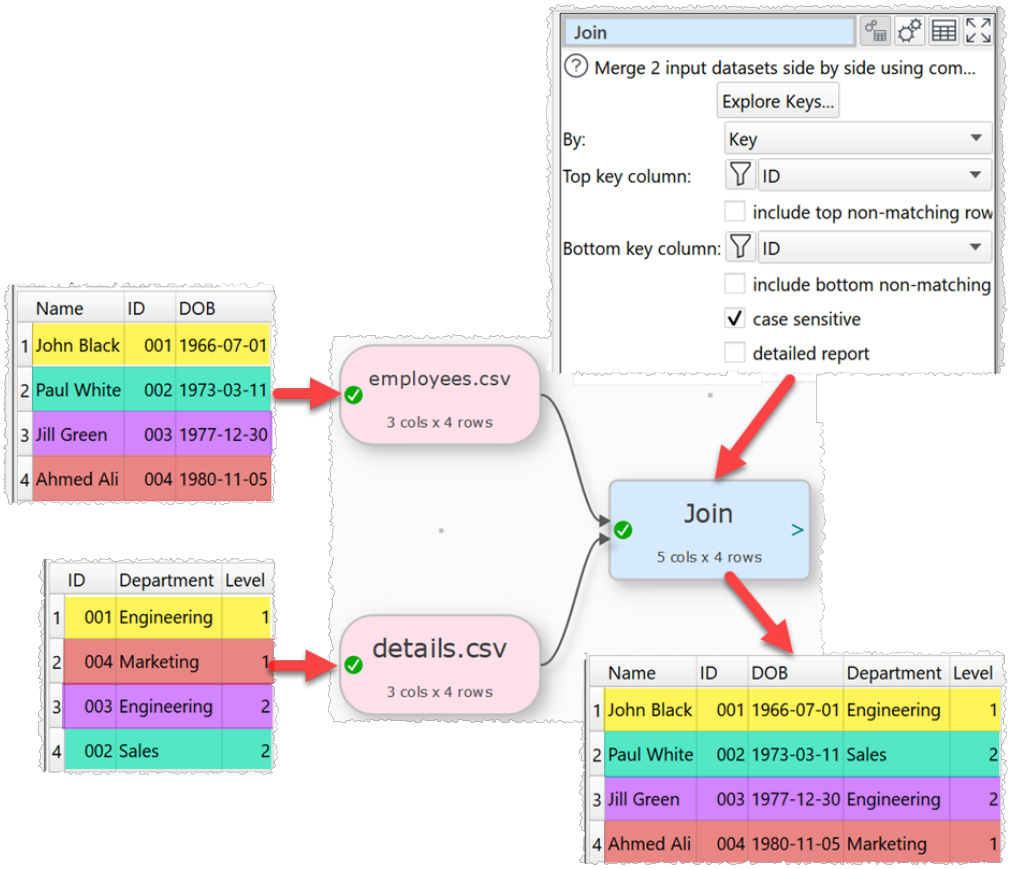
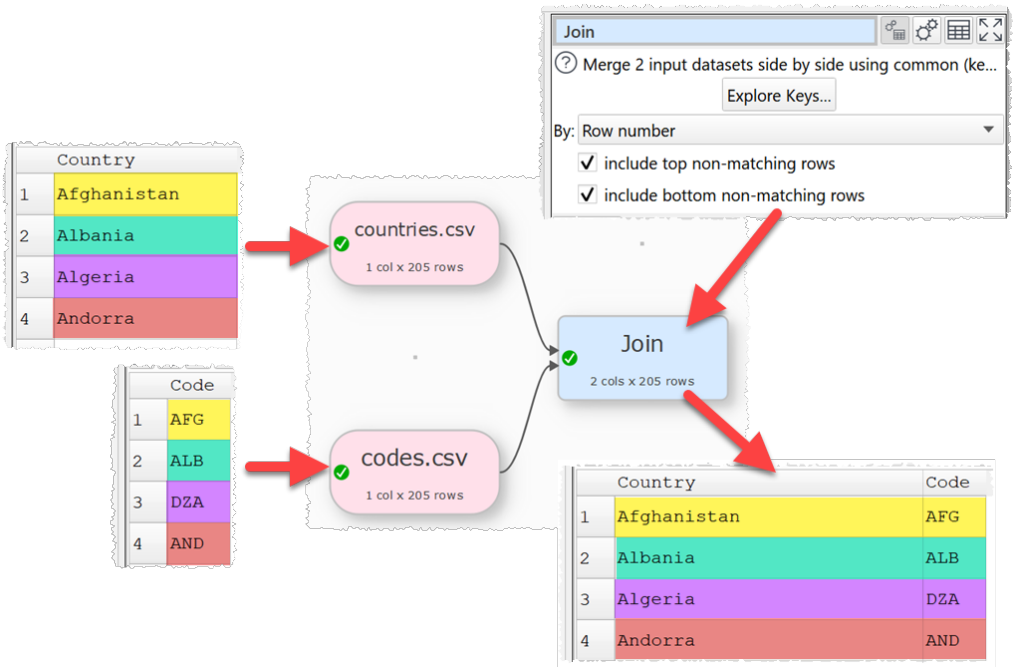



Join 2 datasets side-by-side matching the row numbers, keeping all rows:




## Inputs

Two.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## Options

- The output depends on the vertical (Y-axis) position of the inputs.
- Click **Explore Keys...** to compare key values in the 2 datasets.
- Set **By** to:
  - **Key** to join by common key columns.
  - **Row number** to join by the row number of the dataset.
- Select **Top key column** for the column you want to match in the top input dataset.
- Select **include top non-matching rows** if you want to include in the output any rows in the top input with no matching value in the bottom input.
- Select **Bottom key column** for the column you want to match in the bottom input dataset.
- Select **include bottom non-matching rows** if you want to include in the output any rows in the bottom input with no matching value in the top input.
- Check **detailed report** to show detailed information in the **Warnings** and **Info** tabs on duplicate keys in each dataset, overlap of keys in the 2 datasets and leading and trailing whitespace in keys. This slows down the join significantly.
- Check **case sensitive** to use case sensitive matching for keys.

| **include top non-matching rows** checked | **include bottom non-matching rows** checked | Also known as: |
|---|---|---|
| No | No | Inner join |
| No | Yes | Right outer join |
| Yes | No | Left outer join |
| Yes | Yes | Full outer join |

## Notes

- Join merges two datasets side-by-side (horizontally). To merge datasets one on top of the other (vertically) use Stack.
- If there are 10k rows or less in both datasets, Easy Data Transform will try to guess sensible default values for **Top key column** and **Bottom key column** based on column header names and contents.
- All values are treated as text. You can use Whitespace to remove whitespace before the join.


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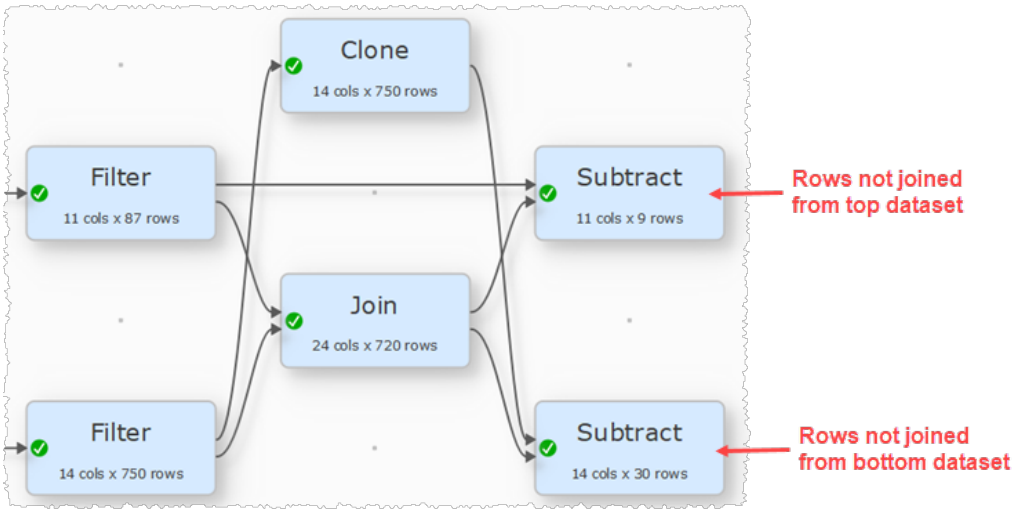
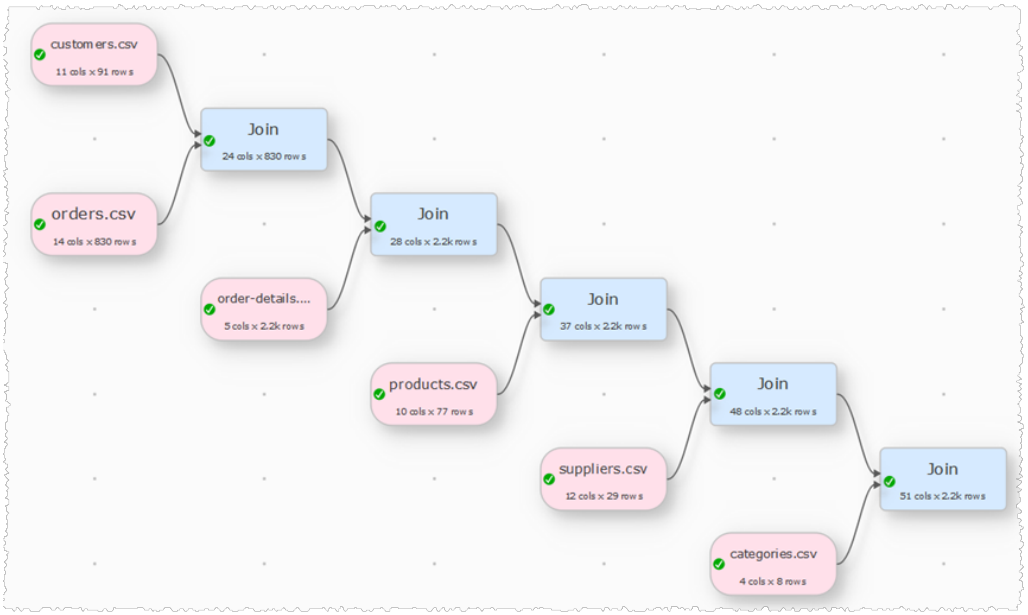
- If a key value occurs M times in the first dataset and N times in the second dataset, you will get M x N rows with this key value. You can use Unique to remove rows with duplicate key values.
- If you need more than one column for the key, use Concat Cols to create that column.
- Use Row Num to create a unique key column.
- Use Sort to sort the results.
- Use the Cross transform for cross joins.
- Messages are shown in the **Warnings** tab for keys that occur more than once in either dataset (duplicates).
- Messages are shown in the **Info** tab for keys that only occur in 1 of the 2 datasets (misses).
- Use Subtract to see rows not joined from the top or bottom dataset (an 'anti-join'). The Clone is necessary to get the correct Y position of the bottom dataset for the **Subtract**.




- Cascade multiple joins to join more than 2 datasets.





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### See also

- Video: How to join Excel files
- Cross
- Lookup
- Interpolate
- Merge datasets
- Use multiple keys for Join/Lookup/Intersect/Subtract

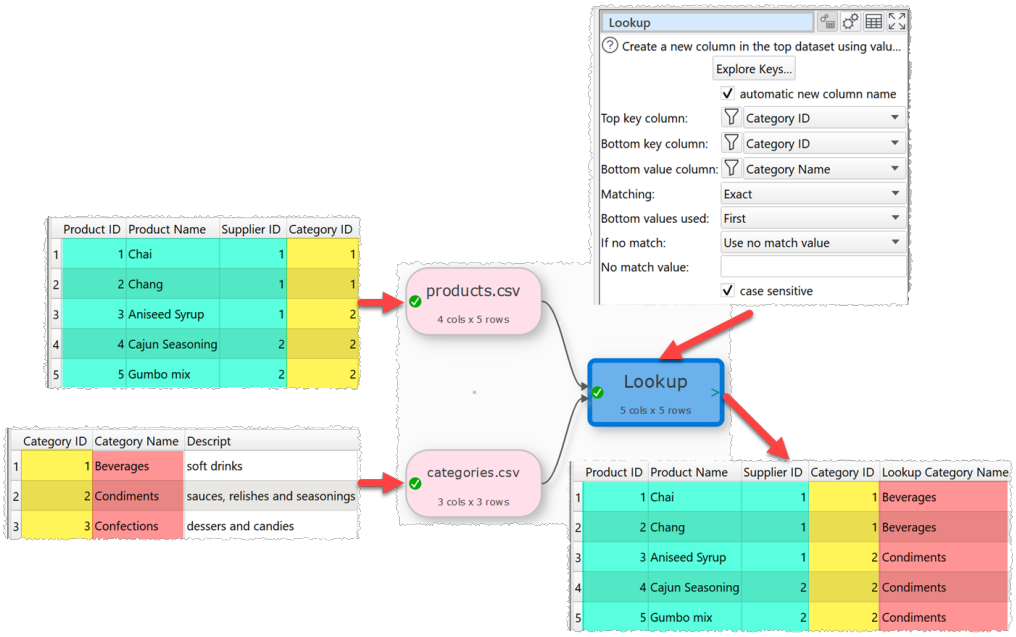
## 2.3.31 Lookup

### Description

Looks up the values of a column in the top input dataset in the bottom input dataset and puts the result in a new column.

### Examples

Lookup 'Category Name' in a second dataset using 'Category ID':




Fuzzy lookup of company stock 'Symbol' by 'Name':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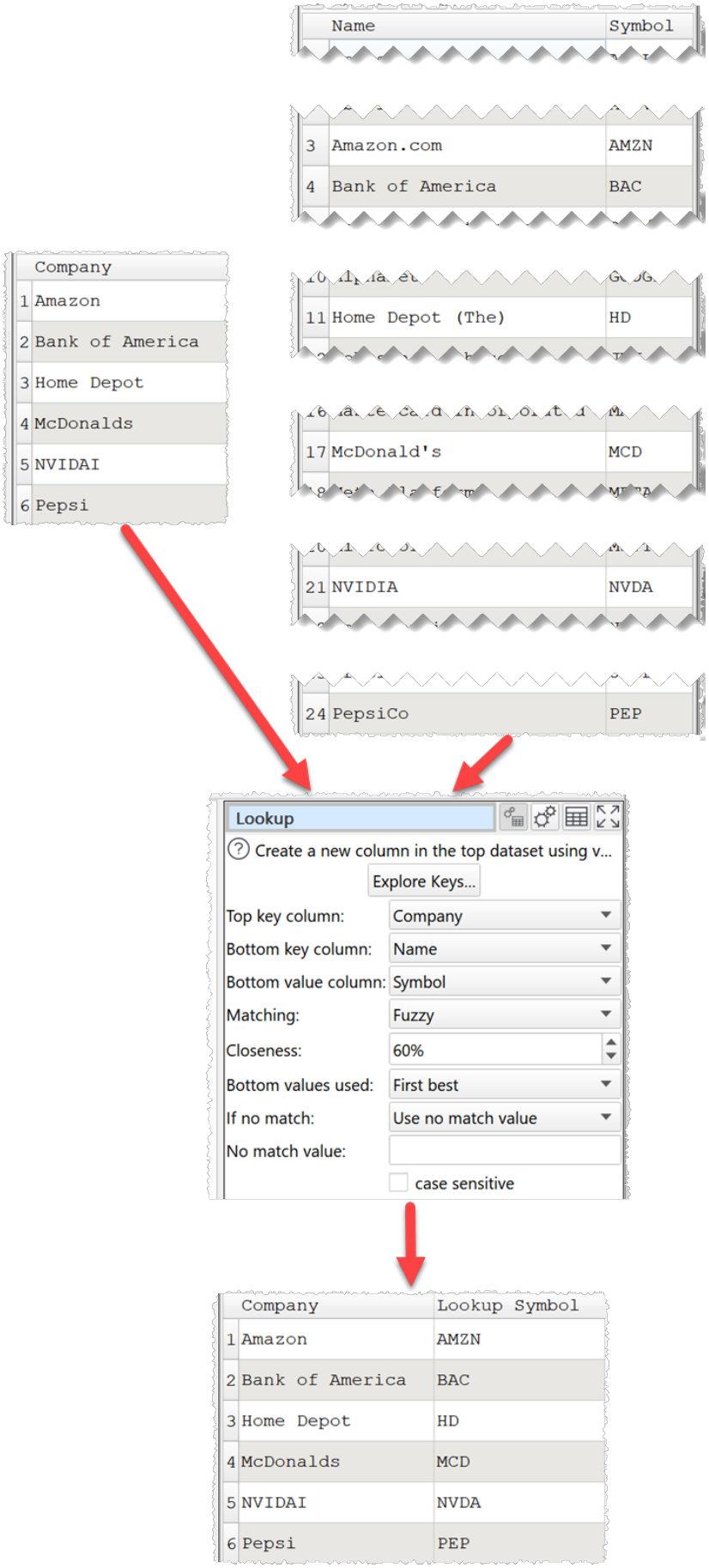



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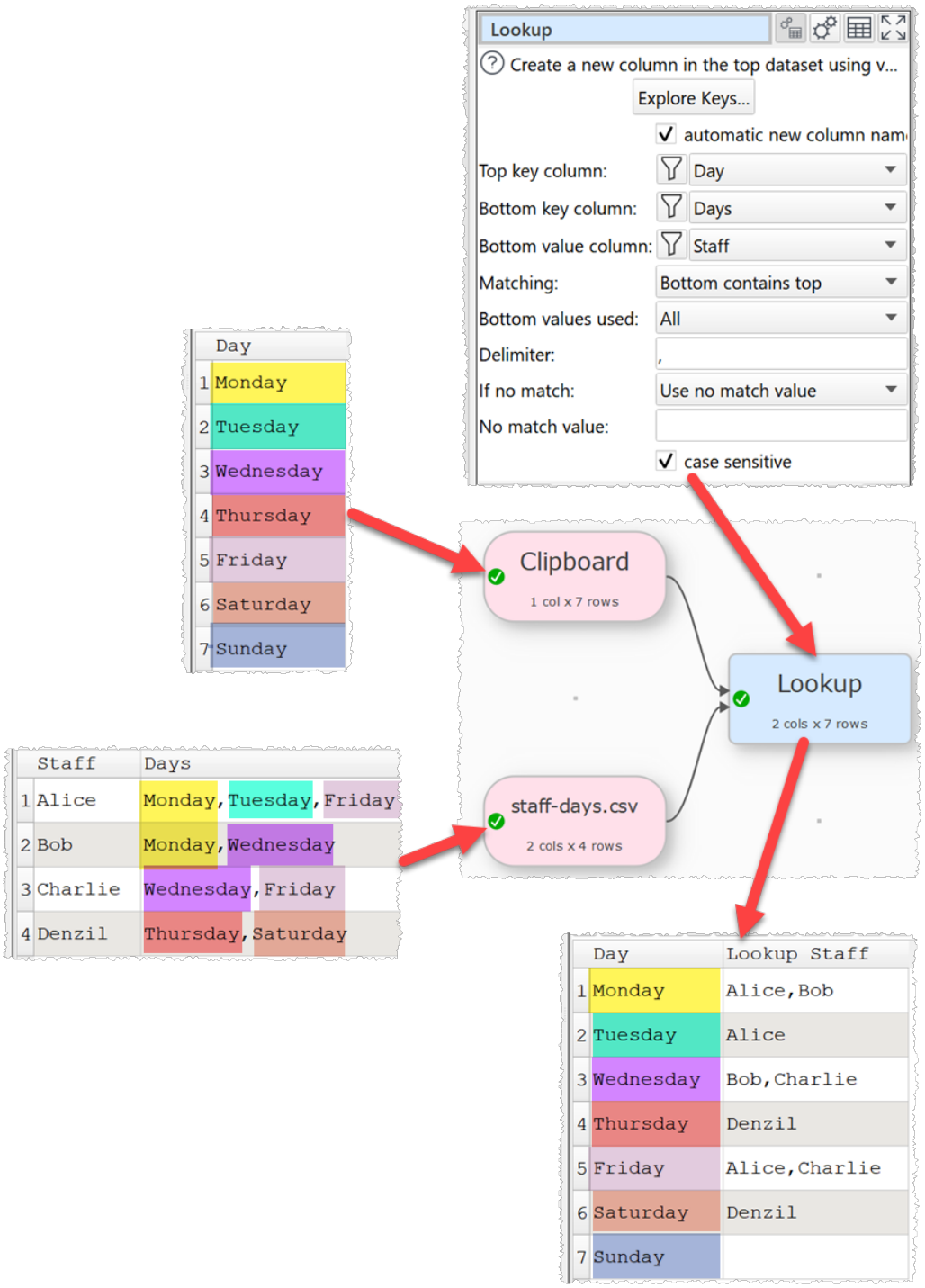
Lookup the staff assigned to each day:




## Inputs

Two.

## Options

- Place the dataset you want to modify as the top input and the dataset you want to lookup values from as the bottom input.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- Click **Explore Keys...** to compare key values in the 2 datasets.
- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Select **Top key column** for the column whose values you wish to lookup.
- Select **Bottom key column** for the column that matches the lookup in the bottom dataset.
- Select **Bottom value column** for the column that contains the values.
- Set **Matching** to how you wish to match values with the lookup table.
  - **Exact, Not exact** and the various contains, starts with and ends with matches, match as text. E.g. date values `1/1/2024` and `01/01/2024` are not considered an exact match.
  - **Equal, Not equal** and the various greater than or greater than equal matches, match date and numeric columns using date and numeric comparisons (respectively). E.g. date values `1/1/2024` and `01/01/2024` are considered equal.
  - **Exact** match is fast. Other options are likely to be much slower.
- Set **Closeness** to how close a fuzzy match has to be, to be considered a match. E.g. set it to 80% to make 2 values that are 80% the same a match. For **Fuzzy** matching only.
- Set **Bottom values used** to:
  - **All** if you want to use all matches. Duplicate values are only shown once.
  - **First** if you want use the first match in **Bottom lookup column**. For **Exact** matching only.
  - **All best** if you want to use the best matches. If there are multiple values that are equally good, use all of them. Duplicate values are only shown once. For **Fuzzy** matching only.
  - **First best** if you want to use the best match. If there are multiple values that are equally good, use the first one. For **Fuzzy** matching only.
- Set **Delimiter** to the delimiter you want to use to separate multiple values returned for **Bottom values used** of **All** or **All best**.
- Set **If no match** to **Use not match value** or **Leave unchanged**, depending on what you want to do for values in **Top lookup column** that do not match in **Bottom lookup column**.
- Set **No match value** to the value you want to use for values in **Top lookup column** that do not match in **Bottom lookup column** when **If no match** is set to **Use no match value.** You can use a column variable to use values from the top dataset.
- Check **case sensitive** to use case sensitive matching for keys.

## Notes

- Easy Data Transform will try to guess sensible default values for **Top lookup column, Bottom lookup column** and **Bottom value column**.
- **Bottom values used** is only important if there are duplicate values in the **Bottom lookup column**.


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- If the top input has a header, this will be used for the output.
- If you want to see what bottom dataset keys are matched to each top dataset key, you can set **Bottom value column** to the same column as **Bottom key column**.
- **Exact** and **Not exact** match as text. So date values "1/1/2024" and "01/01/2024" are not considered an exact match.
- **Equal** and **Not equal** match date and numeric columns using date or numeric comparisons. So date values "1/1/2024" and "01/01/2024" are considered equal.
- Text comparisons are whitespace sensitive. You can use Whitespace to remove whitespace before the lookup.
- **Exact** match is fast. Other options are slower. Fuzzy matching is much slower.
- If you want to lookup values in multiple columns, use Concat Cols to join several columns together to form new columns.
- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.
- Use Clone to lookup a dataset with itsself.
- Warnings are shown in the **Warnings** tab for:
  - Values that cannot be found in the bottom dataset (misses).
  - Values that occur more than once in the bottom dataset (duplicates), if **Bottom values used** is **First**.

### See also

- If
- Interpolate
- Join
- Match dirty data
- Use multiple keys for Join/Lookup/Intersect/Subtract

## 2.3.32 Moving

### Description

Add a new column with a moving average/median/sum/min/max/range of the selected column.

### Examples

Calculate a 7 day moving average for the sales column, leaving the first 6 days empty.


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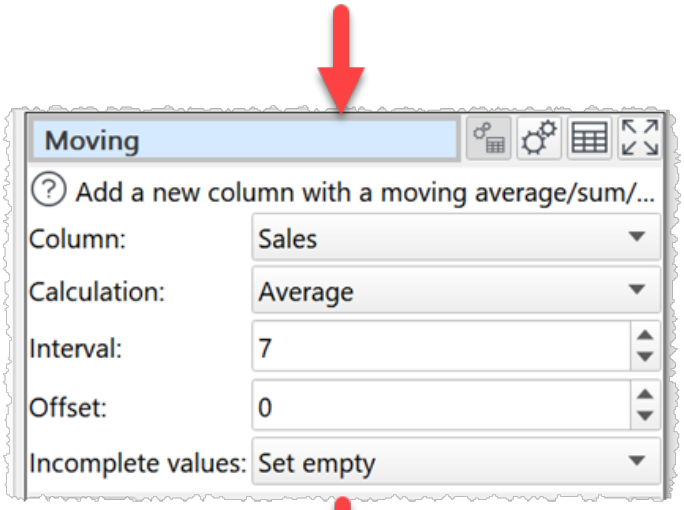
| | Date | Sales |
|---|---|---|
| 1 | 2020-07-01 | 100 |
| 2 | 2020-07-02 | 120 |
| 3 | 2020-07-03 | 90 |
| 4 | 2020-07-04 | 145 |
| 5 | 2020-07-05 | 95 |
| 6 | 2020-07-06 | 75 |
| 7 | 2020-07-07 | 125 |
| 8 | 2020-07-08 | 130 |
| 9 | 2020-07-09 | 95 |




| | Date | Sales | Moving Average Sales |
|---|---|---|---|
| 1 | 2020-07-01 | 100 | |
| 2 | 2020-07-02 | 120 | |
| 3 | 2020-07-03 | 90 | |
| 4 | 2020-07-04 | 145 | |
| 5 | 2020-07-05 | 95 | |
| 6 | 2020-07-06 | 75 | |
| 7 | 2020-07-07 | 125 | 107.1428571429 |
| 8 | 2020-07-08 | 130 | 111.4285714286 |
| 9 | 2020-07-09 | 95 | 107.8571428571 |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Calculate the sum of the current row and the rows above and below, where available, for the sales column.


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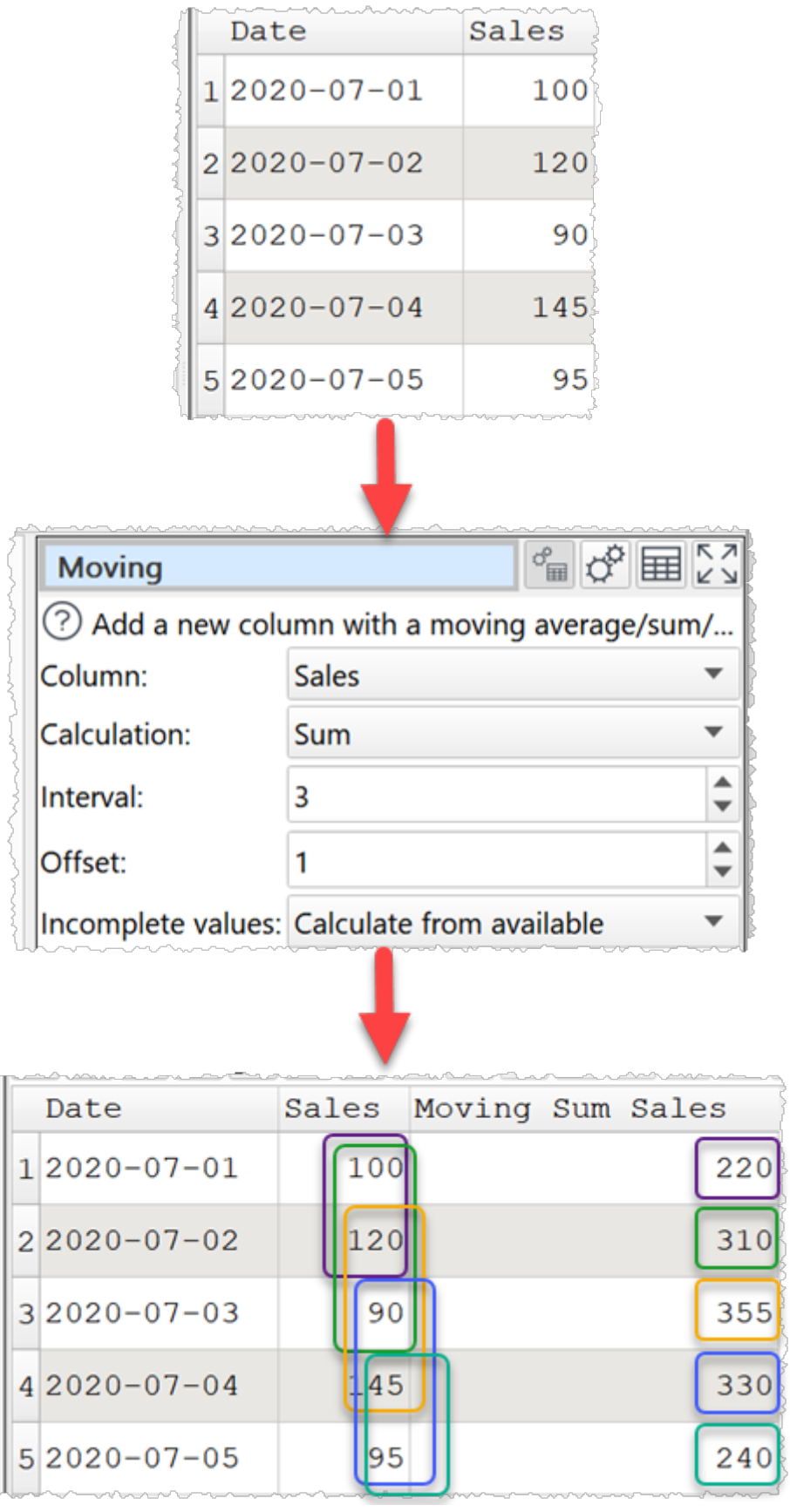



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### Inputs
One.

### Options
- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Select the **Column** you wish to calculate a moving average/median/sum/minimum/maximum for.
- Set **Calculation** to the statistic to be calculated.
  - **Average** shows the arithmetic mean of the values in the interval (Simple Moving Average).
  - **Median** shows the median of the values in the interval.
  - **Sum** show the sum of the values in the interval.
  - **Minimum** shows the smallest value in the interval.
  - **Maximum** shows the largest value in the interval.
  - **Range** shows the difference between the largest and the smallest value in the interval (always ≥ 0 ).
- Set **Interval** to the number of rows to include in each moving average/median/sum/minimum/maximum value.
- Set **Offset** to the number of rows above (if negative) or below (if positive) the current row to end each interval at.
- Set **Incomplete values** according to what you want to show for rows without a full interval of data. For example the first 6 rows when **Interval** is 7 and **Offset** is 0.

### Notes
- Non-numeric values are ignored. E.g. a 7 day moving average that includes 2 non-numeric values will be shown as an average of the 5 numeric values.
- You will be warned of any non-numerical values in the selected column.

### See also
- Video: How to calculate moving averages
- Offset
- Stats

## 2.3.33 New Col

### Description
Adds a new column, filled with a given value.

### Example
Add a new column full of '1' values:


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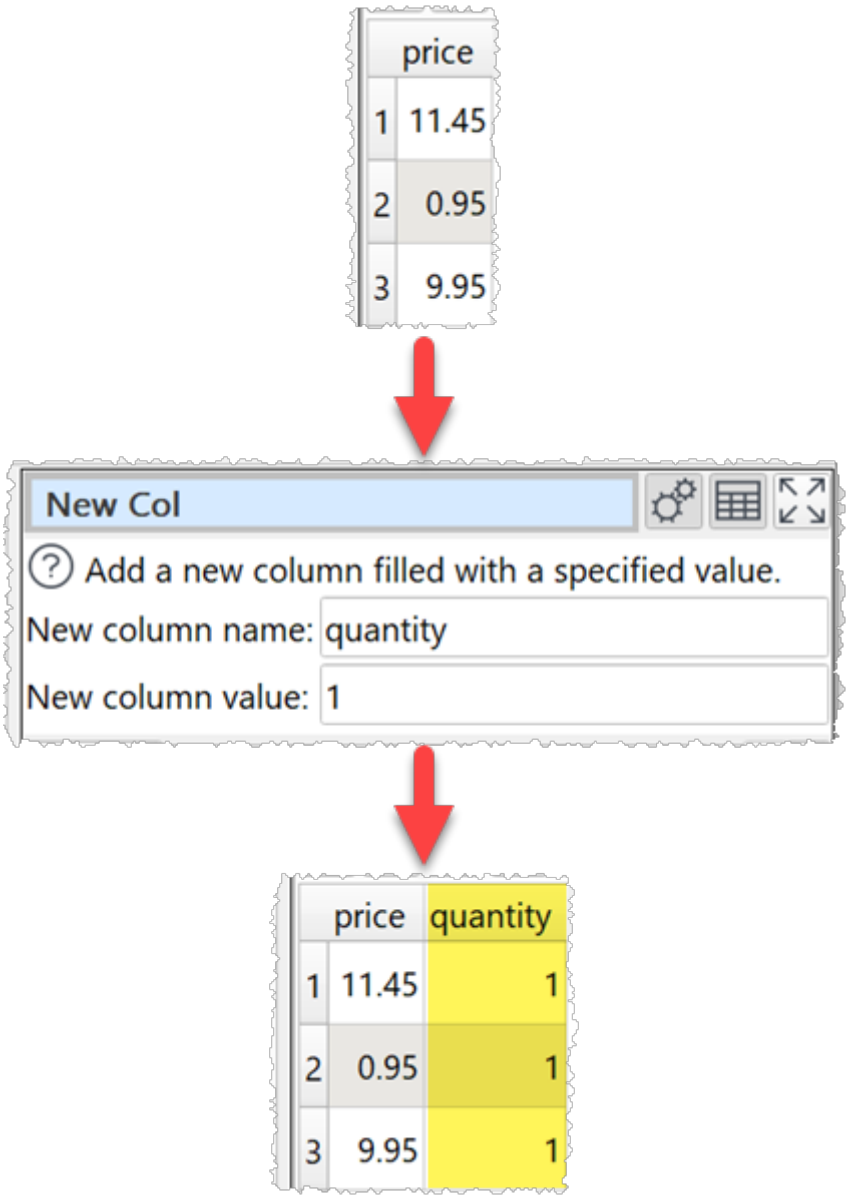


## Inputs

One.

## Options

- Set **New column name** to the name of the new column you want to create.
- Set **New column value** to the value for every cell of the new column. You can leave it empty for an empty column.

## Notes

- New columns are always added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.


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### See also

- Copy Cols
- Remove Cols

## 2.3.34 New Rows

### Description

Add new rows.

### Examples

Add an empty row above every row with an invoice number:


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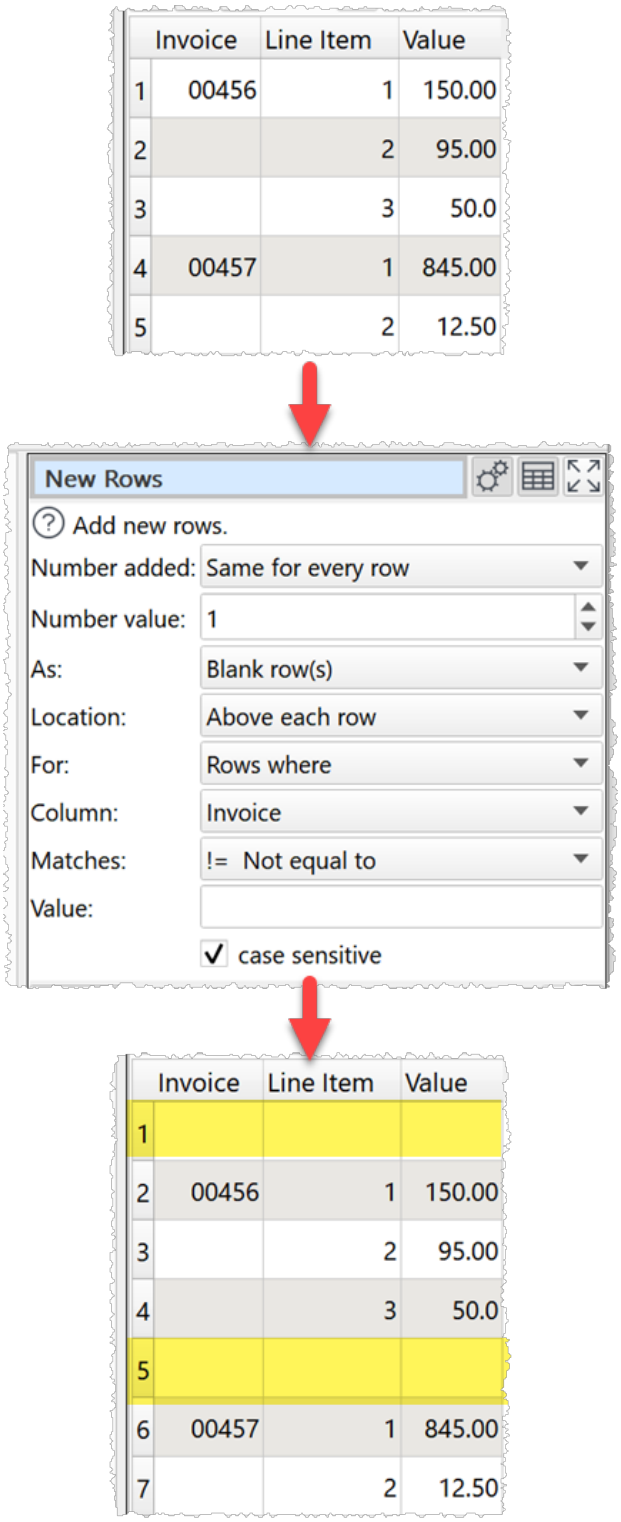


Copy each row the number of times in the 'Items' column:


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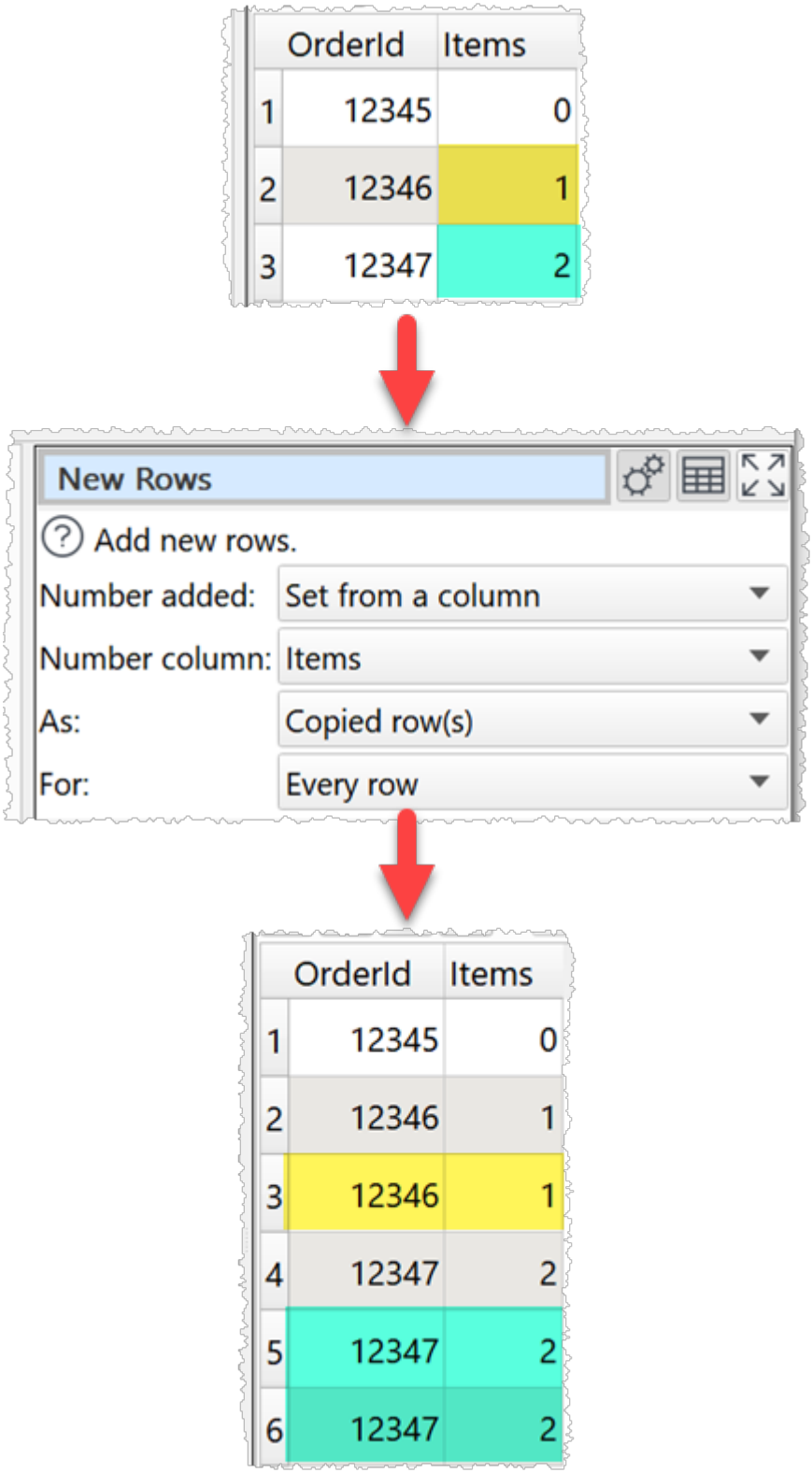


## Inputs

One.


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### Options

- Set **Number added** according how many rows to add for each existing row.
  - Set **Number value** to the number of new rows to create for each existing row (available when **Number added** is **Same for every row**).
  - Set **Number column** to get the number of new rows to create for each existing row from a column (available when **Number added** is **Set from a column**).
- Set **As** to add either blank rows, copies of existing rows or user defined rows.
- Set **With value** to set the value used for each column of the new row (available when **As** is **User defined row(s)**).
- Set **Location** depending on whether you want new rows added above or below existing rows (available when **As** is **Blank row(s)** or **User defined row(s)**).
- Set **For** depending on whether you wish to add rows to all rows, only rows that meet certain conditions or only the first or last rows.

### Notes

- You can use Calculate or Javascript transforms to calculate the number for the **Number column.** E.g. to subtract 1 from the final number of copies wanted to give the number of new rows.

### See also

- Offset
- Sequence

## 2.3.35 Ngram

### Description

Counts the number of times each sequence of consecutive words appear in the selected column.

### Examples

Find ngrams of 2 to 3 word length (bigrams and trigrams) in the 'Keywords' column:


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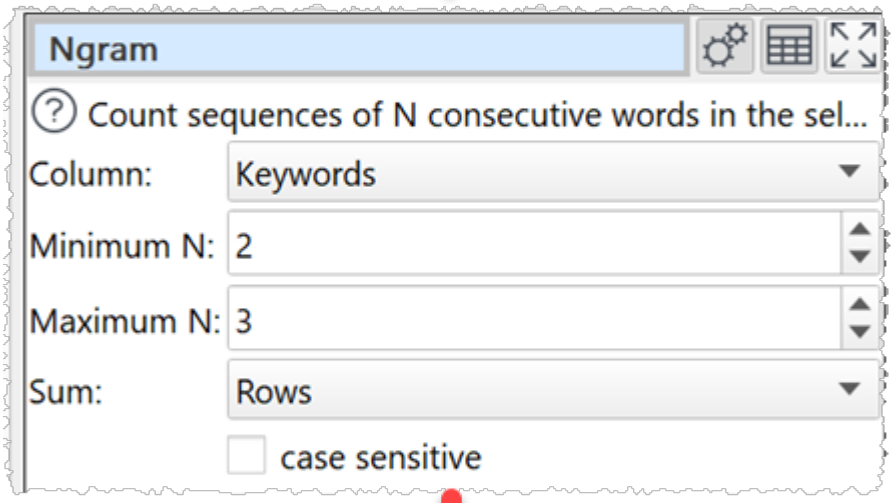
| | Keywords | Impressions |
|---|---|---|
| 1 | EDT | 47 |
| 2 | easy data transform | 1598 |
| 3 | Easy Data Transform | 964 |
| 4 | easy data transformer | 345 |
| 5 | data transformer | 19343 |
| 6 | EASY,DATA,TRANSFORM | 23 |




| | Keywords Ngrams | Words | Rows |
|---|---|---|---|
| 1 | easy data transform | 3 | 3 |
| 2 | easy data transformer | 3 | 1 |
| 3 | easy data | 2 | 4 |
| 4 | data transform | 2 | 3 |
| 5 | data transformer | 2 | 2 |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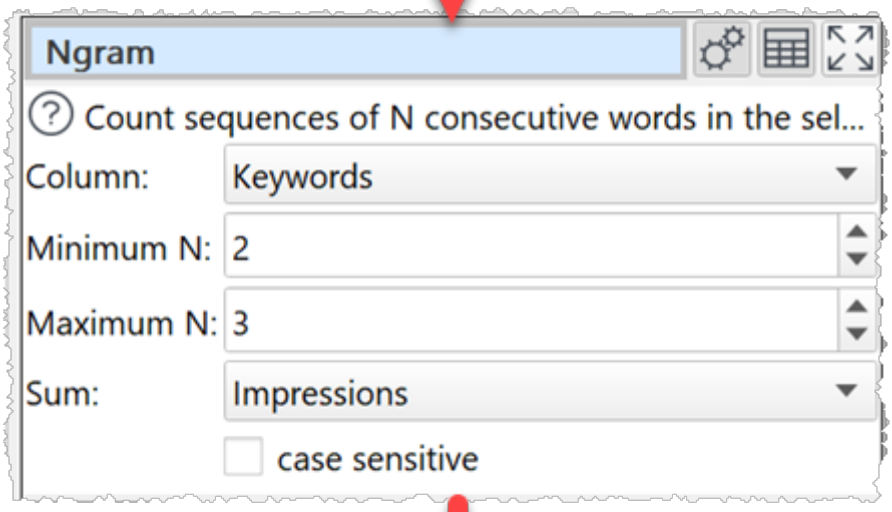
Sum the impressions associated with each 2 to 3 word ngram:

| | Keywords | Impressions |
|---|---|---|
| 1 | EDT | 47 |
| 2 | easy data transform | 1598 |
| 3 | Easy Data Transform | 964 |
| 4 | easy data transformer | 345 |
| 5 | data transformer | 19343 |
| 6 | EASY,DATA,TRANSFORM | 23 |




| | Keywords Ngrams | Words | Impressions |
|---|---|---|---|
| 1 | easy data transform | 3 | 2585 |
| 2 | easy data transformer | 3 | 345 |
| 3 | data transformer | 2 | 19688 |
| 4 | easy data | 2 | 2930 |
| 5 | data transform | 2 | 2585 |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### Inputs
One.

### Options
- Select the **Column** you wish to analyze for ngrams.
- Set **Minimum N** to the minimum number of words in an ngram.
- Set **Maximum N** to the maximum number of words in an ngram.
- Set **Sum** to:
  - **Rows** to count the number of rows containing the ngram.
  - A column to sum numeric values in that column for all rows containing the ngram.
- Uncheck **case sensitive** to convert everything to lower case before counting ngrams.
- Check **drilldown** to allow double clicking a row in the data table to drilldown to the rows that contributed to this row in the upstream data.

### Notes
- Words are made up of letters, digits and Apostrophes ('). All other characters are treated as word separators.
- All letters are converted to lower case.
- If you have set **Sum** to a column then only numeric values in that column will be summed.
- The output sorted by number of words in the ngram, then the count and then the ngram. Use a Sort transform to sort it in a different order.
- Use a Replace transform before the **Ngram** transform to remove/replace any words or letters you don't wish to analyze.

### See also
- Video: How to find NGrams in data for PPC, SEO and NPL
- Count
- Unique
- Total
- Pivot
- Stats
- Summary

## 2.3.36 Num Base

### Description
Change the number base of integer values, e.g. decimal to hexadecimal.

### Examples
Convert from decimal (base 10) to hexadecimal (base 16):


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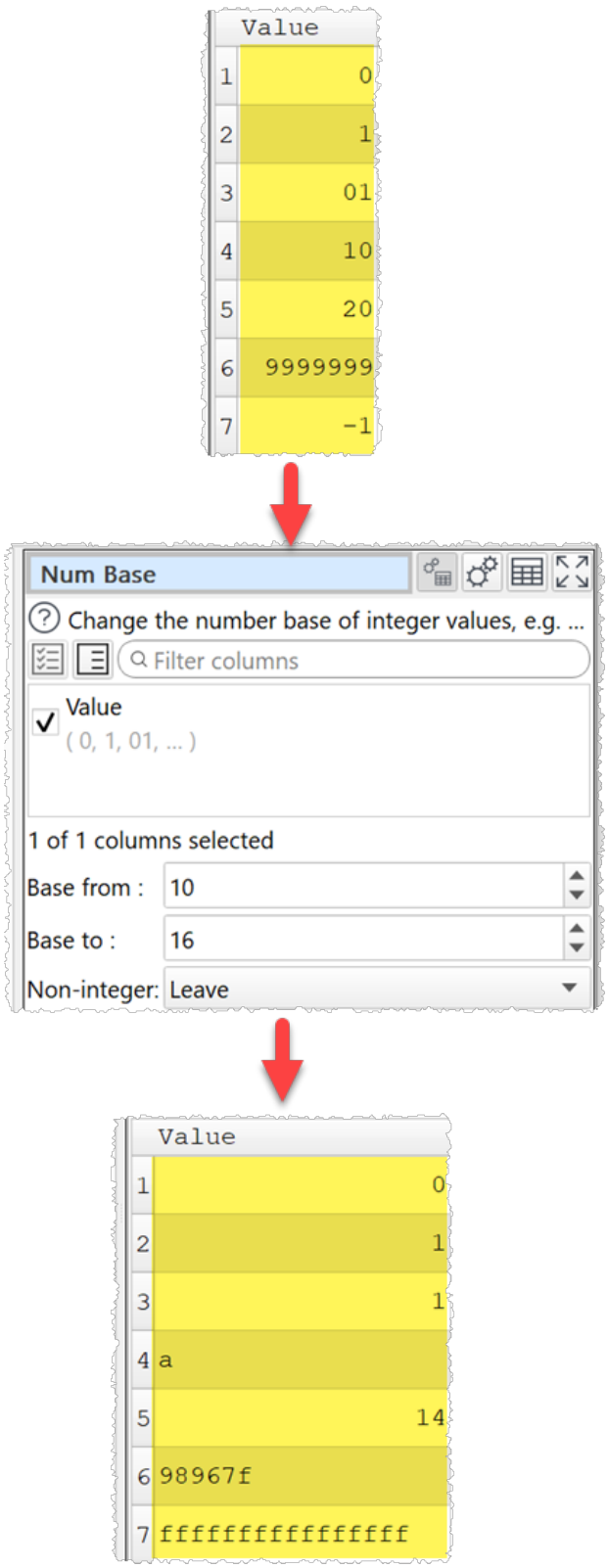


Convert from guessed base to decimal (base 10):


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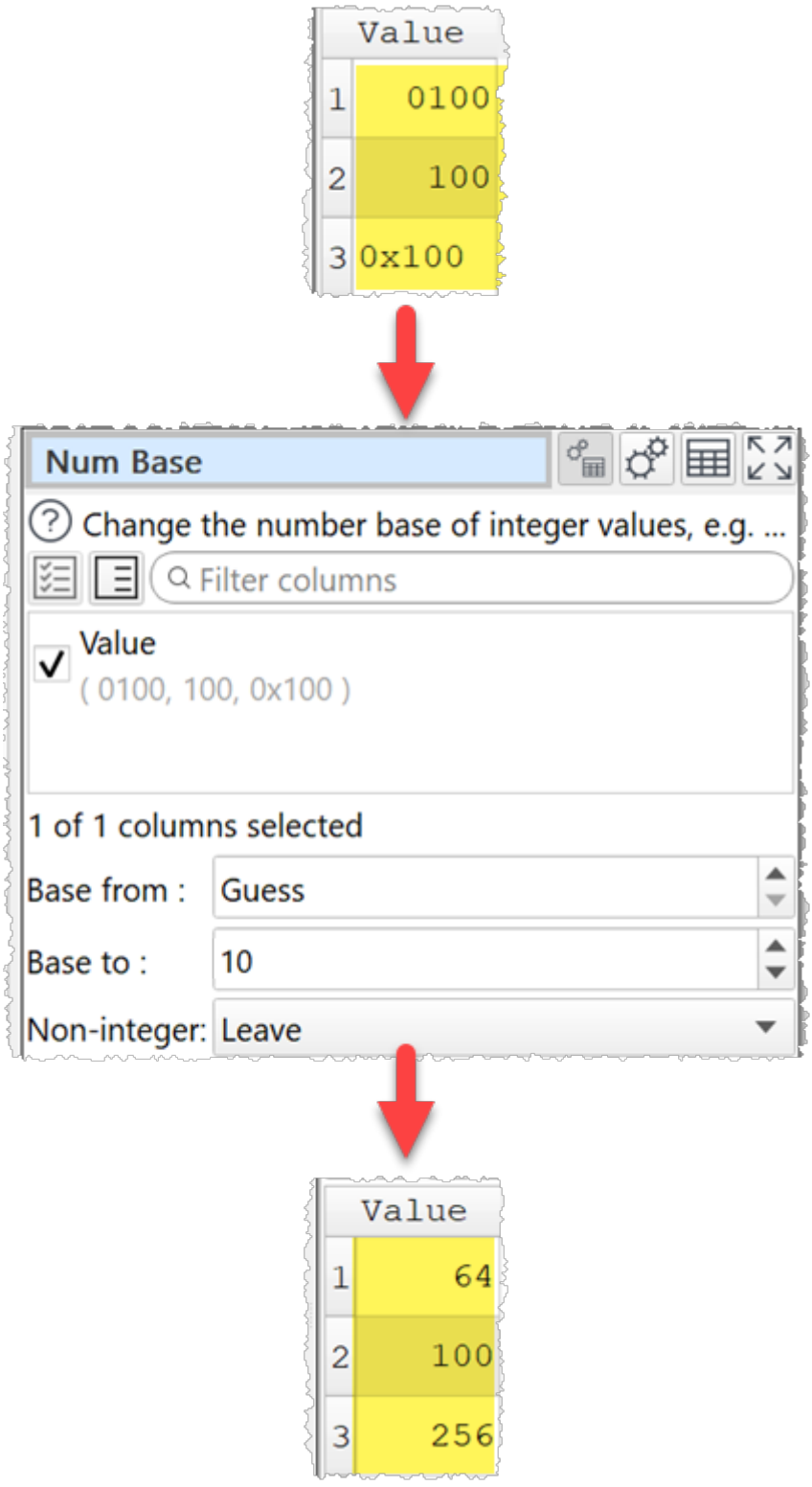


## Inputs

One.

## Options

- Check the column(s) you wish to convert.


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- Set **Base from** to the base of the current values. If you set it to **Guess**, it will guess the base for each column by looking at some of the values, Numbers starting with 0x (e.g. `0x123`) are assumed hexadecimal (base 16). The base guessed in output in the **Info** tab.
- Set **Base to** to the base wanted.

### Notes

- The values to be converted should be integers (whole values) without group separators (e.g. no Commas or decimal points).
- If **Base from** and **Base to** are the same, no change is made.
- Negative numbers are represented using unsigned values (e.g. twos complement for binary) if **Base to** is anything other than 10.
- Warnings are shown in the **Warnings** tab for non-integer values.
- Use Copy Cols to copy columns before conversion.
- Use Num Format to change the format of numbers (e.g. remove group separators).
- You can use Insert to add characters to the front of values, e.g. to add '0x' to hexadecimal values.

### See also

- Video: How to convert base
- Decode

## 2.3.37 Num Format

### Description

Change the number format in one or more columns.

### Examples

Set numeric values to 2 decimal places:


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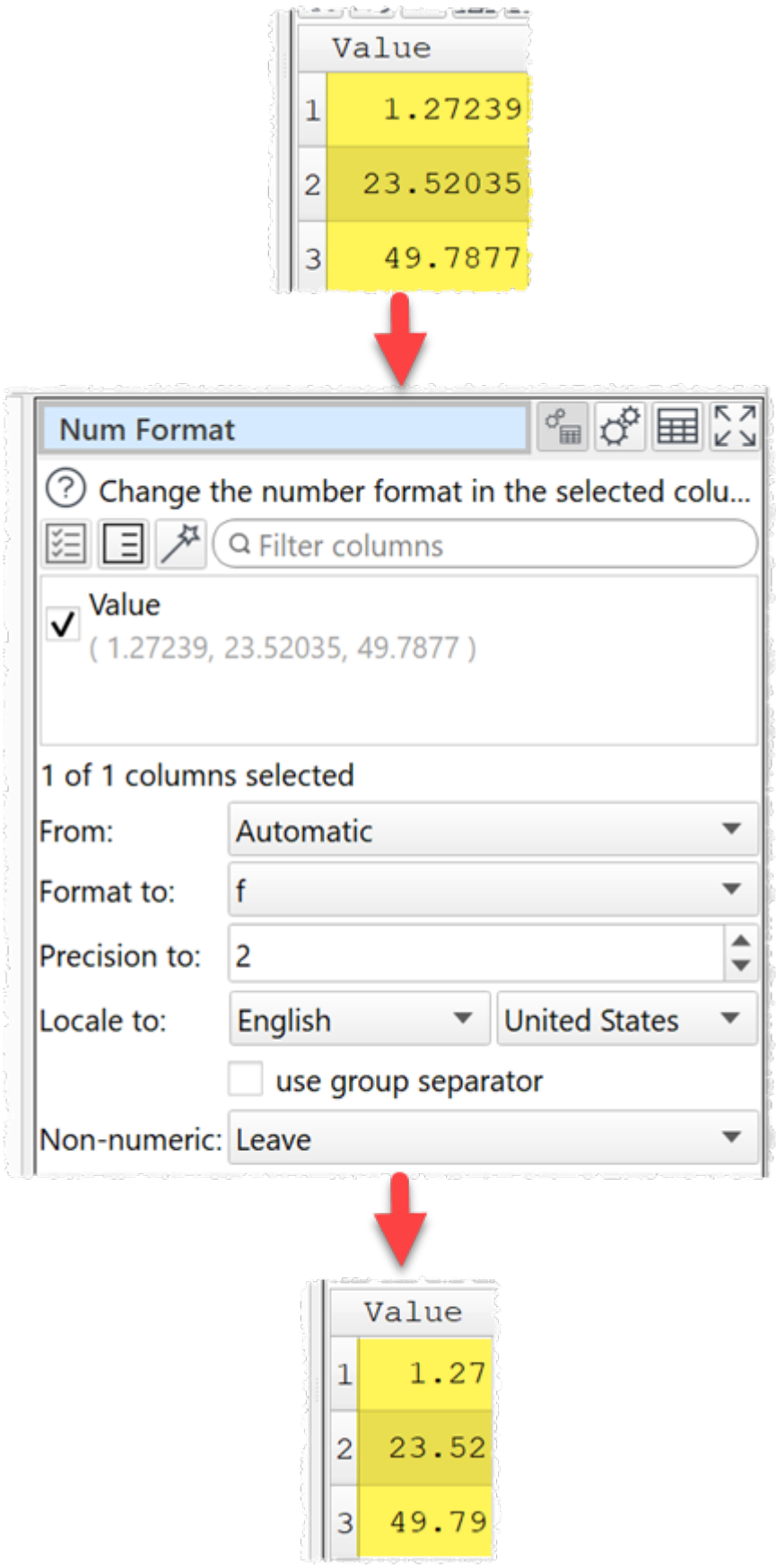


Set numeric vales to the shortest accurate number:


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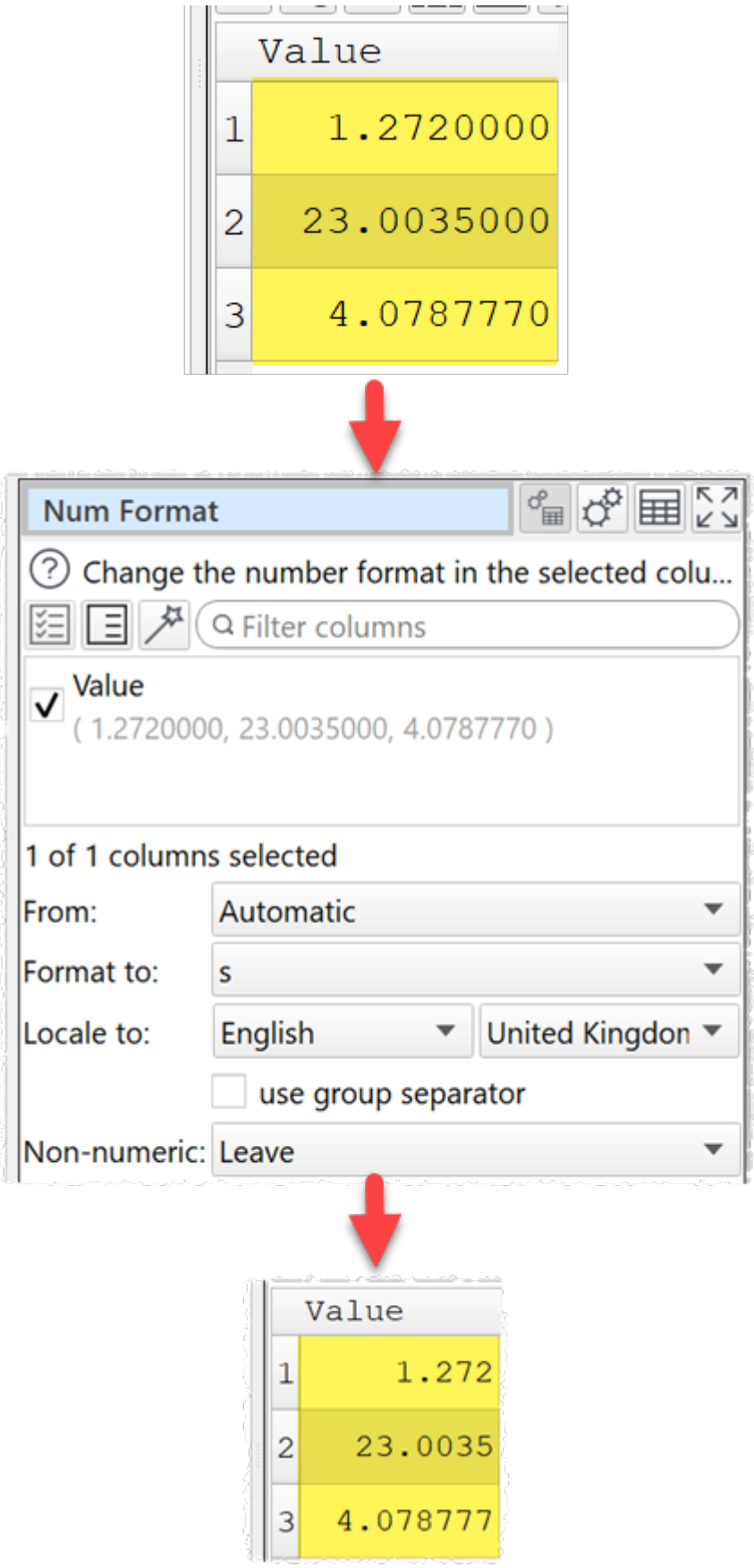



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Change European style numbers to `English/United Kingdom` locale:


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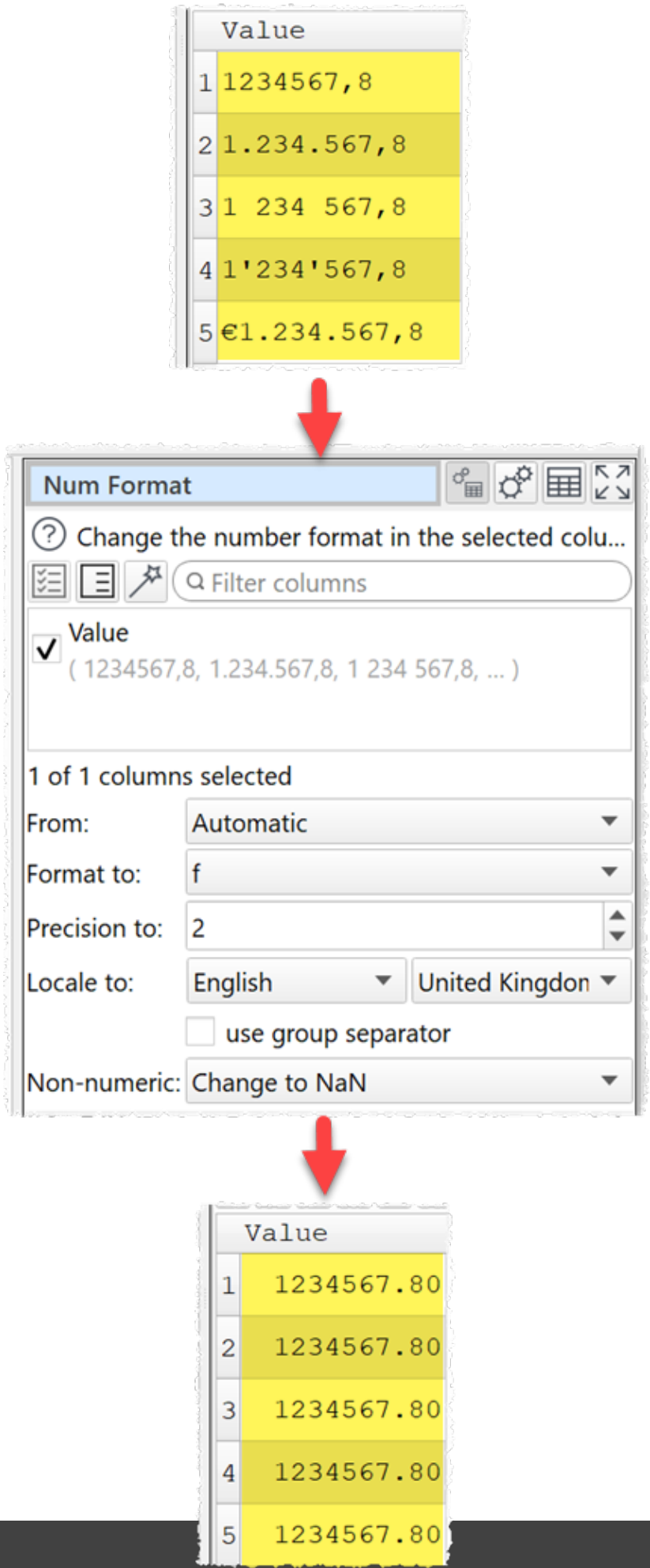



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Change numbers from `Bengali/Bangladesh` locale numbers to `Arabic/Egypt` locale:


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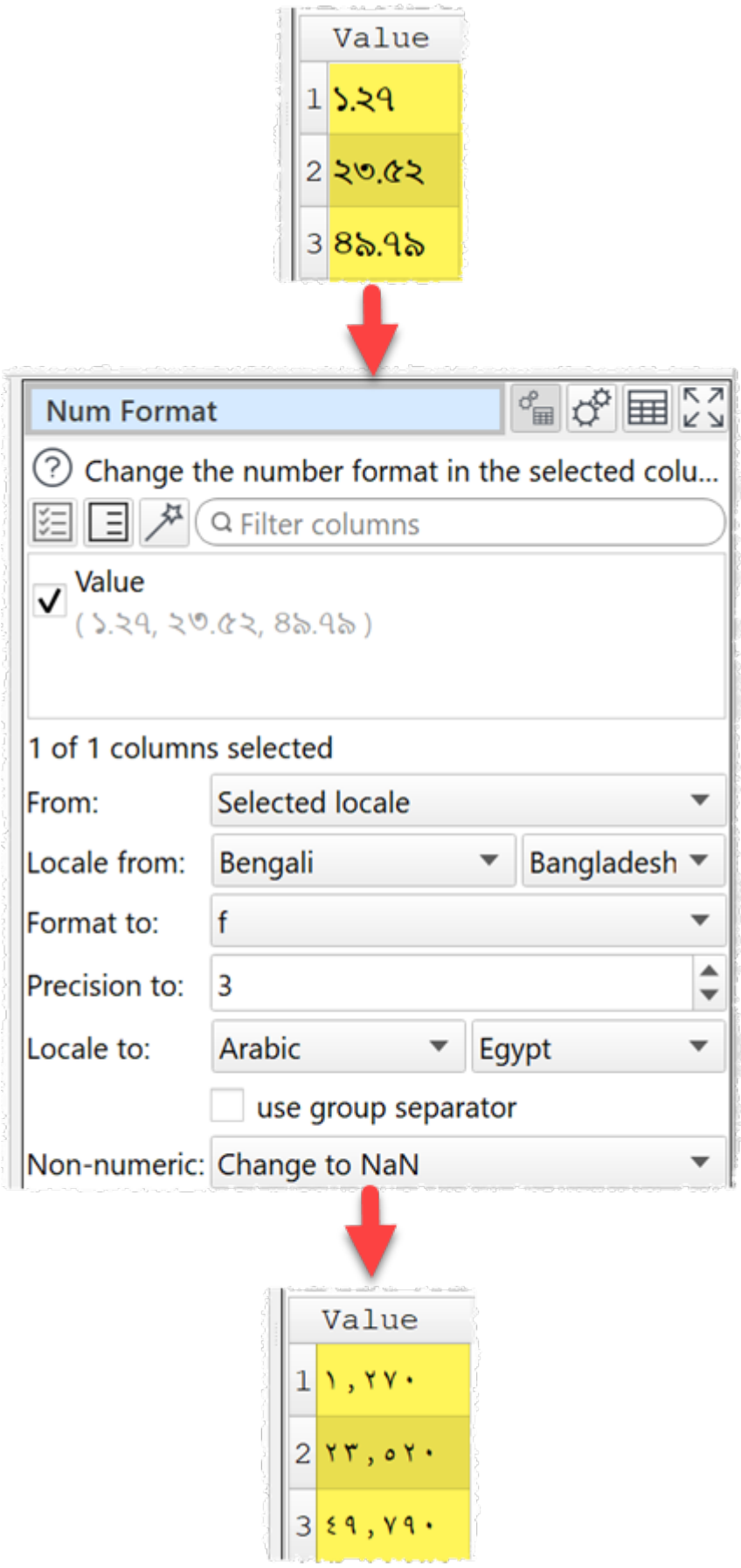



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## Inputs

One.

## Options

- Check the column(s) you wish to transform.
- Set **From** according to the numeric format in the input dataset:
  - **Automatic**: Make an intelligent guess for each column, based on the input data. This is usually the best choice.
  - **US/UK . (dot)**: Input number are US/UK style, with . (Dot) as the decimal separator.
  - **European , (comma)**: Input numbers are European style, with , (Comma) as the decimal separator.
  - **Locale in Preferences**: Interpret input numbers using the locale the Preferences window.
  - **Selected Locale**: Interpret input numbers using the locale in **Locale from**.
- Set **Locale from** to the locale of the input numbers. Available for **Selected Locale** only.
- Set **Format to** to the new number format (see below).

| Format to | Meaning |
|---|---|
| `e` | Format as [-]9.9e[+\|-]999.<br>E.g. `1234567.89` is shown as `1.235e+06`. |
| `E` | Format as [-]9.9E[+\|-]999.<br>E.g. `1234567.89` is shown as `1.235E+06`. |
| `f` | Format as [-]9.9.<br>E.g. `1234567.89` is shown as `1234567.89`. |
| `g` | Use e or f format, whichever is the most concise. |
| `G` | Use E or f format, whichever is the most concise. |
| `s` | The shortest accurate representation for the given number without exponents.<br>E.g. `1234567.00` is shown as `1234567`. |

- Set **Precision to** to the precision desired.
  - For the **e**, **E**, and **f** formats, **Precision to** represents the number of digits after the decimal point.
  - For the **g** and **G** formats, **Precision to** represents the maximum number of significant digits (trailing zeros are omitted).
  - For the **s** format **Precision to** is ignored.
- Set **Locale to** according to set the decimal and group separators and digits for the numbers output.


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- Check **use group separators** to include the group separators for the selected locale. E.g. to turn `1234567` to `1,234,567` for a `English/United States` or `English/United Kingdom` locale.
- Set **Non-numeric** according to what you want to do with non-numeric values in transformed columns. `NaN` means Not a Number.

### Notes

- Numbers should be base 10 (decimal).
- `$`, `£` and `€` characters are ignored.
- If **Decimal symbol from** is set to **Locale in Preferences** the allowed group separators are set by the locale. Otherwise Dot (if not used as the decimal separator), Comma (if not used as the decimal separator), whitespace (including Thin Space) and Apostrophe characters are ignored.
- You can also use Extract and Pad to change the number of characters.
- Warnings are shown in the **Warnings** tab for non-numeric values.

### See also

- Video: How to convert decimal separators and number formats
- DateTime Format

## 2.3.38 Offset

### Description

Moves values in selected columns up or down.

### Example

Move the 'v2' values down 1:


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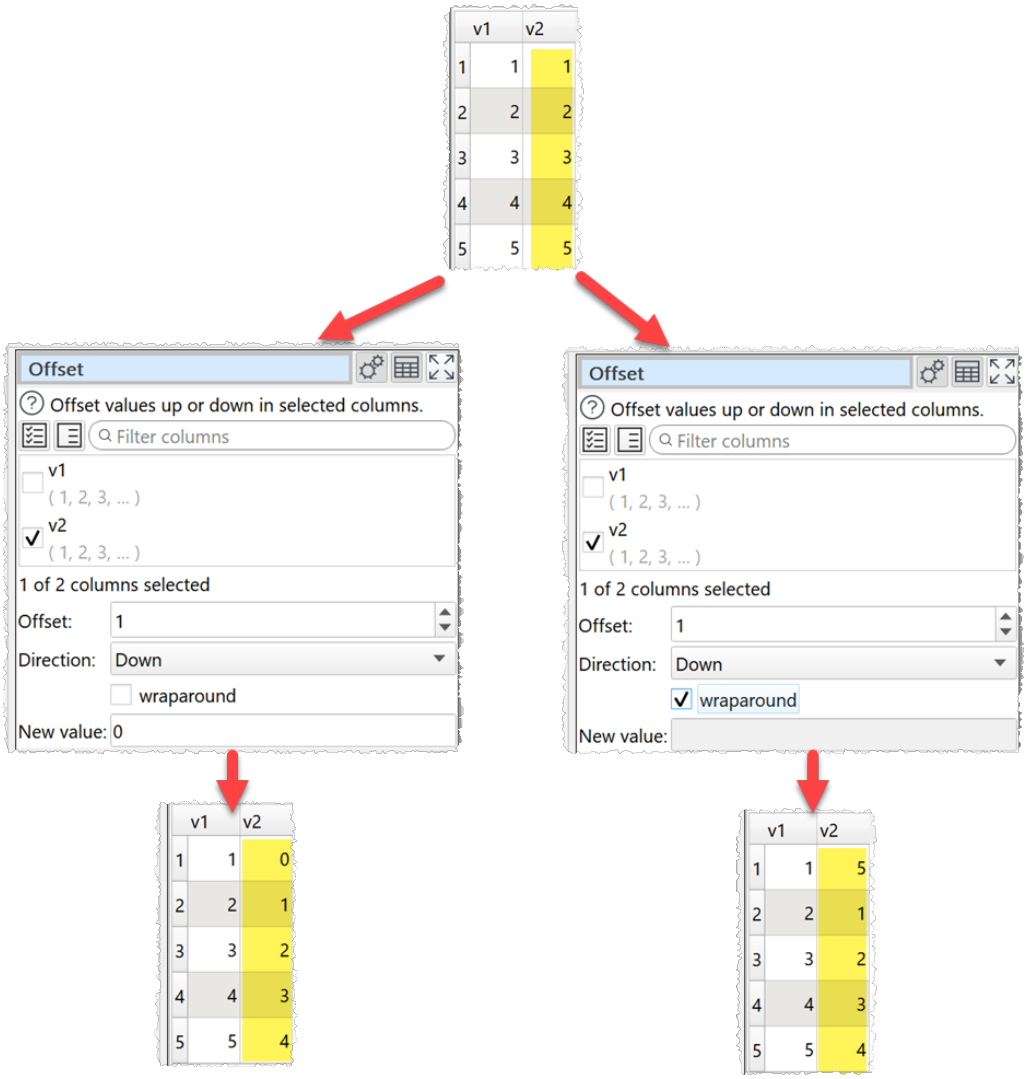


## Inputs

One.

## Options

- Check the column(s) you wish to transform.
- Set **Offset** to the number of rows you wish to offset values by.
- Set **Direction** to the direction you want to offset in.
- Check **wraparound** if you want values pushed off the bottom of the table to be added to the top or values pushed off the top to be added to the bottom.
- Set **New value** to the value you wish to set for any cells newly created by the offset.

## Notes

- You can use Copy Cols to create copies of columns before you offset them.


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### See also

- New Rows
- Slide

## 2.3.39 Outliers

### Description

Find outlier numerical values.

### Examples

Set outliers empty based on quartiles and add a column with the outlier score:


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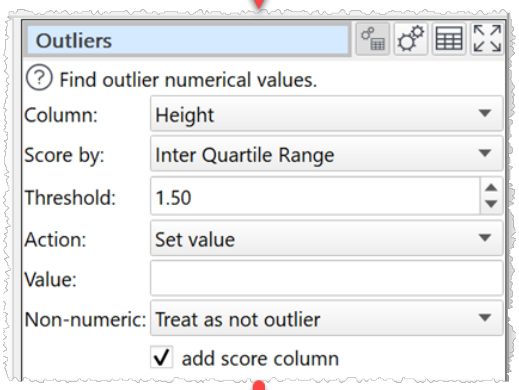
| | Height |
|---|---|
| 1 | 0.00 |
| 2 | 1.59 |
| 3 | 1.71 |
| 4 | 1.71 |
| 5 | 1.73 |
| 6 | 1.73 |
| 7 | 1.77 |
| 8 | 1.84 |
| 9 | 1.89 |
| 10 | 1.95 |
| 11 | 2.10 |
| 12 | 5.00 |




| | Height | Score |
|---|---|---|
| 1 | | -8.1428571429 |
| 2 | 1.59 | -0.5714285714 |
| 3 | 1.71 | 0 |
| 4 | 1.71 | 0 |
| 5 | 1.73 | 0 |
| 6 | 1.73 | 0 |
| 7 | 1.77 | 0 |
| 8 | 1.84 | 0 |
| 9 | 1.89 | 0 |
| 10 | 1.95 | 0.1428571429 |
| 11 | 2.10 | 0.8571428571 |
| 12 | | 14.6666666667 |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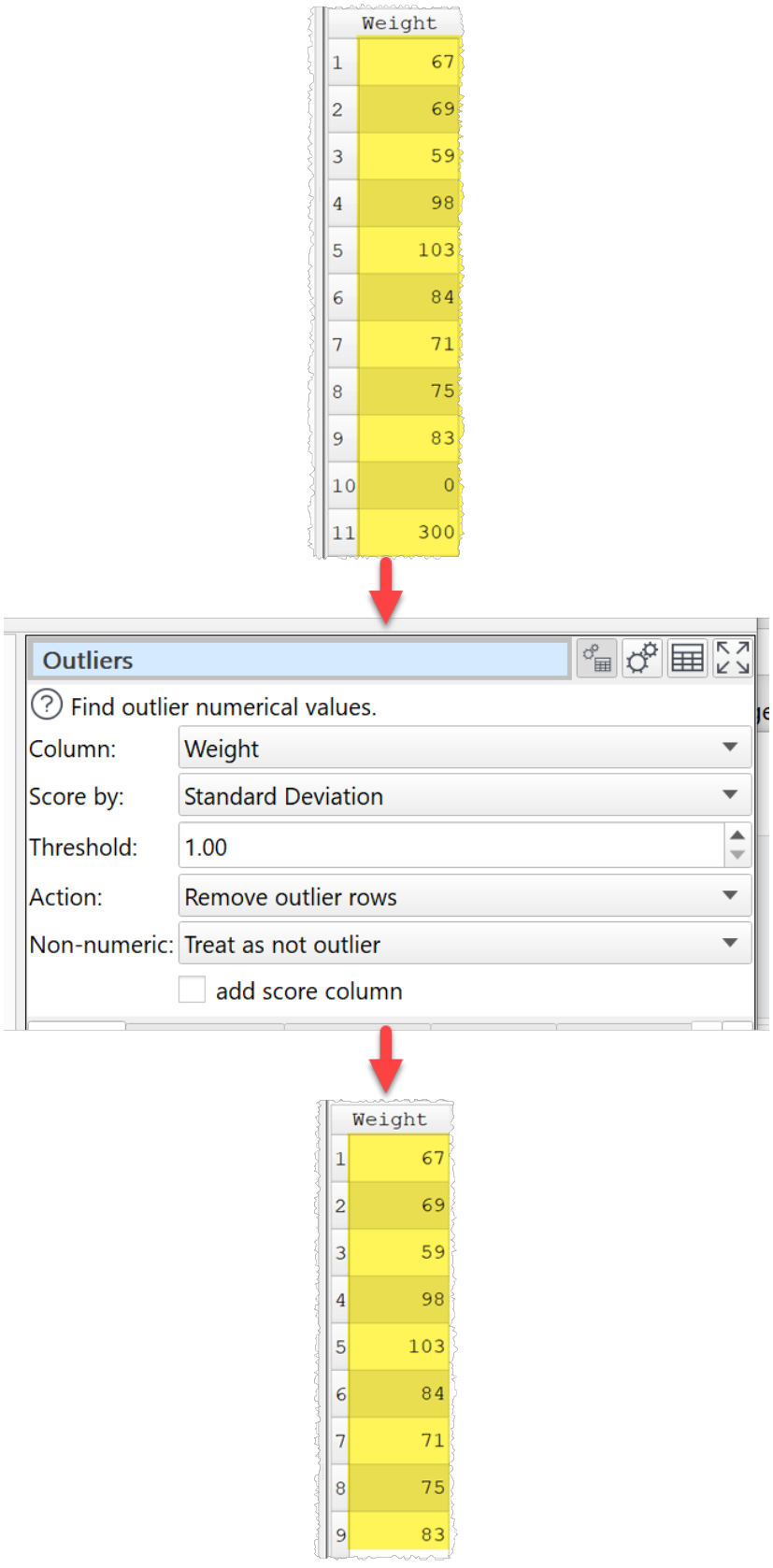
Remove rows with values that are more than 1 Standard Deviation from the mean:





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## Inputs

One.

## Options

- Select the column you wish to check for outliers.
- Set **Score by** depending on how you wish to score outliers.
  - **Inter Quartile Range** scores values on how far they are above Q3 or below Q1 as proportion of the Inter Quartile Range. For example:
    - A value 2 IQRs above Q3 scores 2.0.
    - A value 1 IQR below Q1 scores -1.0.
    - A value between Q3 and Q1 scores 0.0.
  - **Standard Deviation** scores values on how many deviations they are from the average (mean). This is also known as a Z-score. For example:
    - A value 2 Standard deviations above the average scores 2.0.
    - A value 1 Standard deviations below the average scores -1.0.
- Any score that is greater than **Threshold** or less than -**Threshold** is considered an outlier. E.g. if the threshold is 1.5 then values that scores more than 1.5 or less than -1.5 are considered outliers. The corresponding upper and lower 'fence' values are shown in the **Info** tab.
- Set **Action** to the action to take for outliers:
  - **Change to threshold**: Value greater than the upper fence value or less than the lower fence value are set to the nearest fence value. Non-numeric values are not changed, as it isn't clear which fence value to set them to.
  - **Remove outlier rows**: Rows with outlier values are removed.
  - **Keep outlier rows**: Only rows with outlier values are kept.
  - **Set value**: Outlier values are changed to the value provided in the **Value** field.
- Set **Non-numeric** depending on whether you want to treat non-numeric values as outliers.
- Check **add score column** if you want to add an extra column with the outlier scoring.

## Notes

- Warnings are shown in the **Warnings** tab for non-numeric values.
- Use Num Format to change the format of numbers (e.g. remove group separators).
- Use Impute to impute any missing values.
- Use Sort to sort by values in the score column.
- You can convert dates into numerical values (e.g milliseconds since 1970 or Julian day) using Calculate or Javascript.


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### See also

- Video: How to find outliers in data

## 2.3.40 Pad

### Description

Pad text to a minimum length in one or more columns.

### Example

Pad the 'Id' column to 10 digits using zeros:


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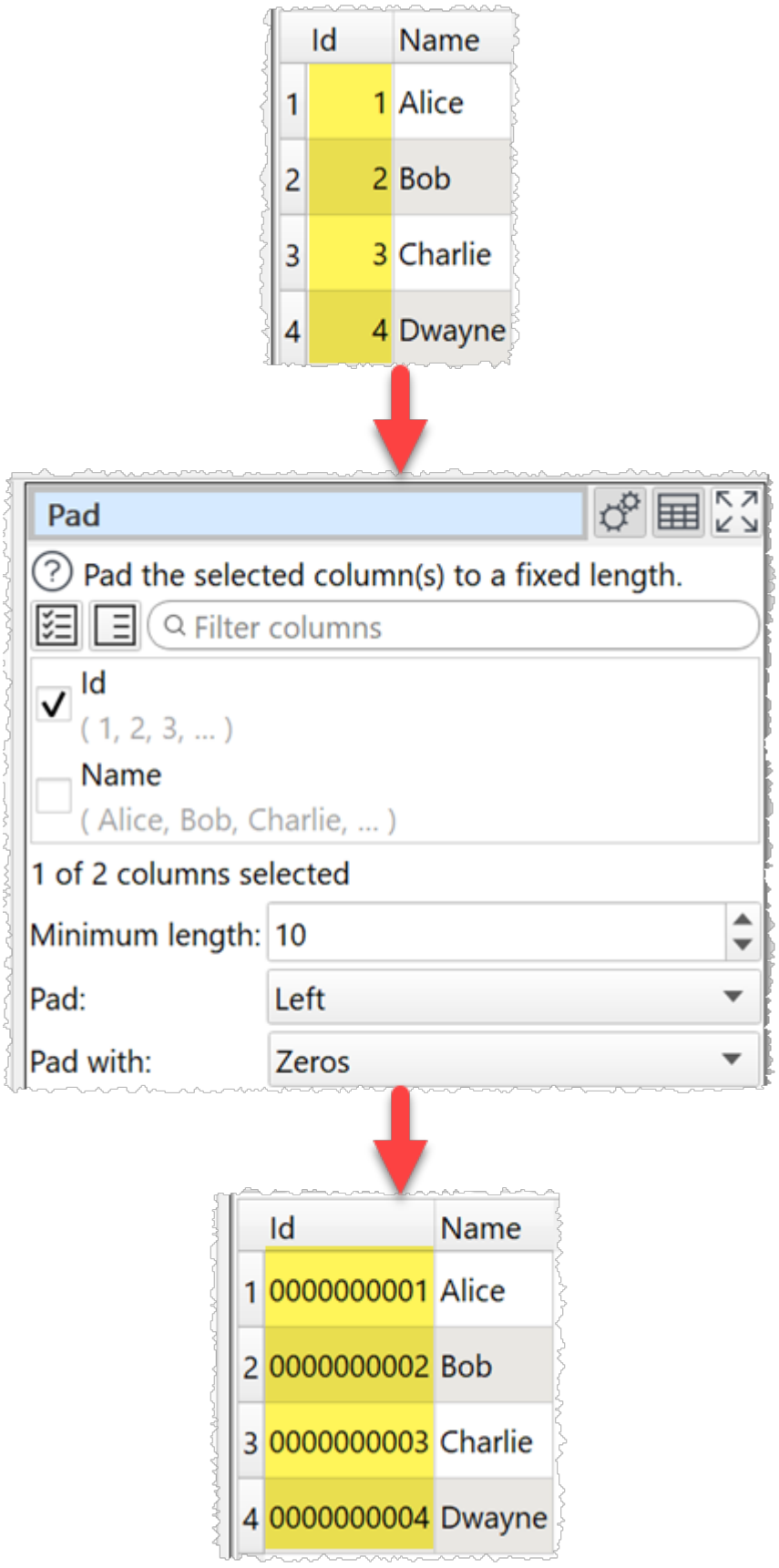



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### Inputs
One.

### Options
- Check the column(s) you wish to transform.
- Set **Minimum length** to the length you want values in selected columns padded to. Values this length or longer are unaffected.
- Set **Pad** to **Left** or **Right** depending on where you want any padding characters added.
- Set **Pad with** to the character you want to pad with.

### Notes
- Whitespace is counted when calculating length. You can use Whitespace to remove whitespace before padding.

## 2.3.41 Pivot

### Description
Creates a pivot table to summarize values for one or two columns.

### Examples
Pivot to sum 'Amount' by 'Area' and 'Currency':


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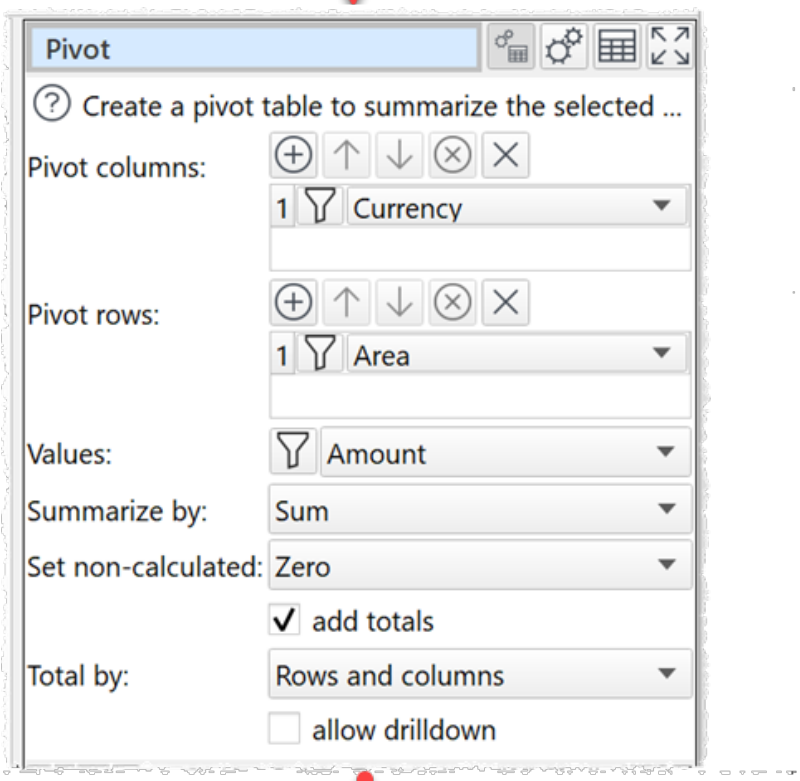
| | Area | Currency | Amount |
|---|---|---|---|
| 1 | Europe | EUR | 13937.00 |
| 2 | North America | USD | 22894.90 |
| 3 | Africa | ZAR | 12745.55 |
| 4 | North America | USD | 48356.95 |
| 5 | Europe | GBP | 1100.00 |
| 6 | Europe | EUR | 5905.80 |




| | Area | EUR | GBP | USD | ZAR | Grand Sum |
|---|---|---|---|---|---|---|
| 1 | Africa | 0 | 0 | 0 | 12745.55 | 12745.55 |
| 2 | Europe | 19842.8 | 1100 | 0 | 0 | 20942.8 |
| 3 | North America | 0 | 0 | 71251.85 | 0 | 71251.85 |
| 4 | Grand Sum | 19842.8 | 1100 | 71251.85 | 12745.55 | 104940.2 |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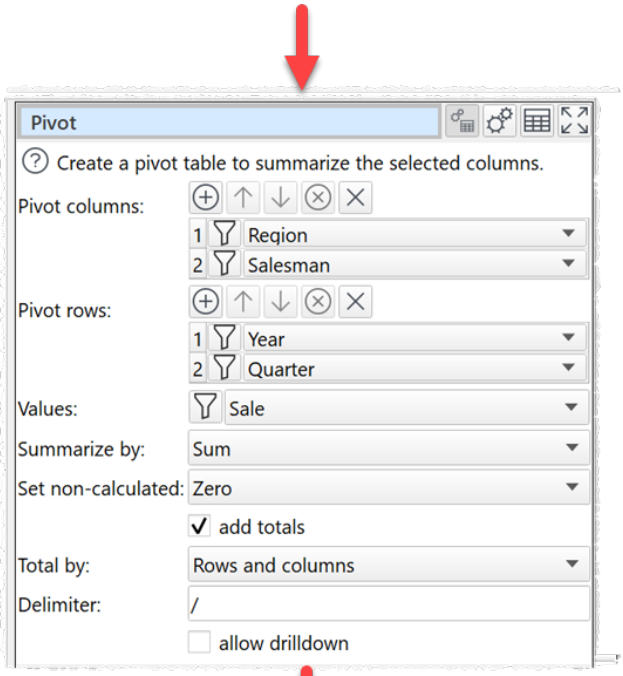
Pivot to sum 'Amount' by 'Year' + 'Quarter' and 'Area' + 'Salesman':

| | Year | Quarter | Region | Salesman | Product No | Sale |
|---|---|---|---|---|---|---|
| 1 | 2023 | Q3 | SOUTH | Alice | 1003 | 6703 |
| 2 | 2024 | Q1 | NORTH | Alice | 1010 | 2465 |
| 12 | 2024 | Q2 | SOUTH | Alice | 1004 | 7801 |
| 13 | 2024 | Q2 | NORTH | Alice | 1000 | 5271 |
| 14 | 2024 | Q1 | SOUTH | Bob | 1002 | 6481 |




| | Year/Quarter | NORTH/Alice | NORTH/Bob | SOUTH/Alice | SOUTH/Bob | Grand Sum |
|---|---|---|---|---|---|---|
| 1 | 2023/Q1 | 0 | 0 | 0 | 2345 | 2345 |
| 2 | 2023/Q3 | 0 | 0 | 6703 | 0 | 6703 |
| 3 | 2023/Q4 | 0 | 0 | 7179 | 0 | 7179 |
| 4 | 2024/Q1 | 2465 | 6721 | 0 | 6481 | 15667 |
| 5 | 2024/Q2 | 5271 | 3706 | 7801 | 9660 | 26438 |
| 6 | 2024/Q4 | 5033 | 0 | 6629 | 0 | 11662 |
| 7 | Grand Sum | 12769 | 10427 | 28312 | 18486 | 69994 |

## Inputs

One.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## Options

- Set **Pivot columns** to the columns you want to use as columns in your pivot table.
- Set **Pivot rows** to the columns you want to use as rows in your pivot table.
- Set **Values** to the column you wish to summarize.
- Set **Summarize by** to how you wish to summarize the values:
  - **Sum** show the sum of the values. Non-numeric and empty values are ignored.
  - **Minimum** shows the smallest value. Non-numeric and empty values are ignored.
  - **Maximum** shows the largest value. Non-numeric and empty values are ignored.
  - **Average** shows the arithmetic mean of the values. Non-numeric and empty values are ignored.
  - **Median** shows the median of numeric values in the column. Non-numeric and empty values are ignored.
  - **Mode** shows the mode of numeric values in the column. Non-numeric and empty values are ignored.
  - **Standard deviation** is the sample standard deviation (equivalent to Excel function stddev.s). Non-numeric and empty values are ignored.
  - **Count** shows the number of non-empty values. A value that contains whitespace or 0 is not considered empty.
  - **Count distinct** show the number of non-empty values. Duplicates are not counted. A value that contains whitespace or 0 is not considered empty.
- Set **Set non-calculated** depending on how you want to set cells not calculated by the pivot.
- Check **add totals** to add row and/or column totals.
- Set **Total by** depending on whether you want to total by **Rows and columns**, **Rows** or **Columns**. This is only available if **add totals** is checked and **Columns** and **Rows** are selected.
- Set **Delimiter** to separate column names. Only shown if more than 1 column is selected for **Pivot columns** or **Pivot rows**.
- Check **allow drilldown** to allow double clicking a cell in the data table to drilldown to the rows that contributed to this value in the upstream data.

## Notes

- Column and row values are ordered alphabetically. You can change the order after pivoting using Reorder Cols (for columns) and Sort (for rows).
- **Mode** may not work as expected with non-integer values, due to precision issues. You can fix this by using a Num Format transform first.
- Use Num Format to change the precision of the results.
- Use Scale to convert the results to percentages.
- To add a column of 1 values to **Sum** (e.g. to find out how many rows a value occurs in) use a New Col transform.


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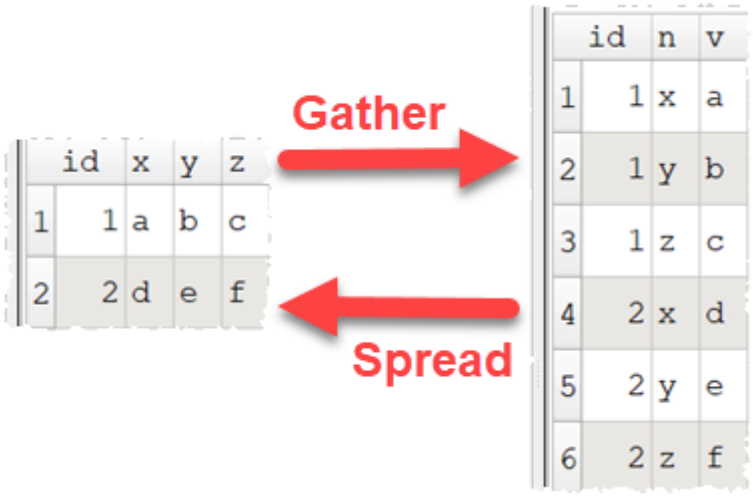
- To pivot a dataset wider see Spread. To pivot a dataset longer see Gather.




### See also

- Count
- Stats
- Summary

## 2.3.42 Pseudonym

### Description

Adds a new column with pseudonymised values for the selected column.

### Example

Pseudonymising a column of dates of birth: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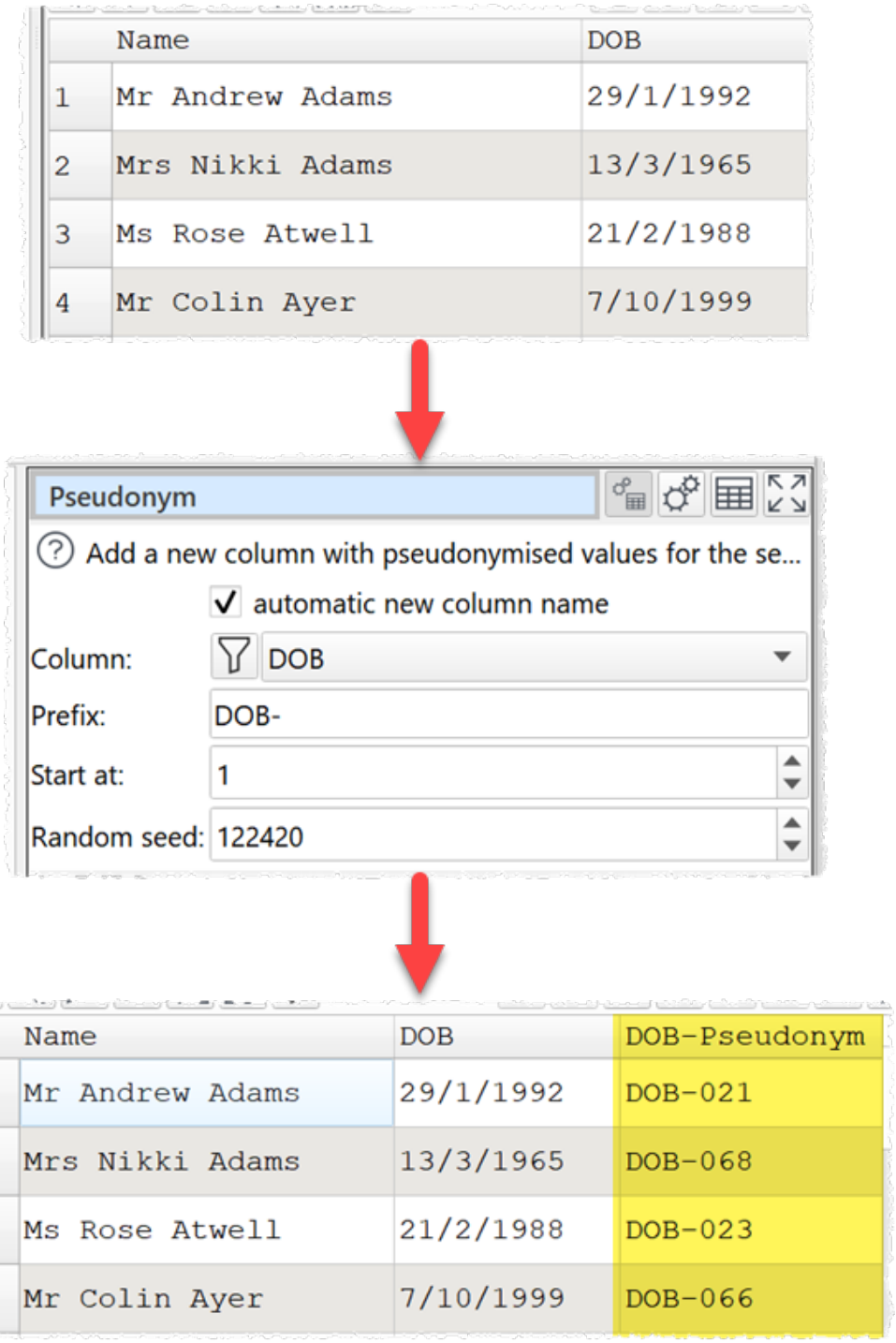


## Inputs

One.

## Options

- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Set **Column** to the column you want to pseudonymise.


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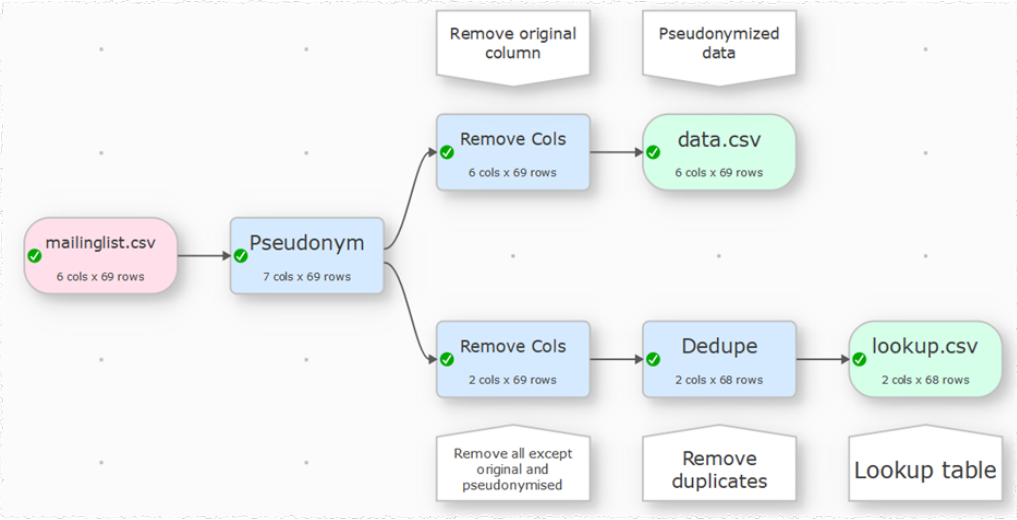
- set **Prefix** to the text to be prepended to each pseudonym. It can be left blank.
- set **Start at** for the number to start at.
- Set **Random seed** to the seed value used by the pseudo-random generator algorithm. This determines the order that pseudonyms are assigned to values.

## Notes

- The order in which pseudonyms are assigned to values is randomized, to make them harder to reverse.
- The default **Random seed** value is based on the system clock when the transform was first created.
- 0s are added to pseudonyms, where necessary, to make all them all the same length.
- You should generally use a different **Prefix** for each column pseudonymised.
- Any change to the input dataset may change the mapping between values and pseudonyms.
- To create a lookup table to reverse the pseudonymisation:
  - Use Remove Cols to remove all columns apart from the original value column and the corresponding pseudonym column.
  - Use Dedupe to remove the duplicate rows.
  - You can then output this to a file and use it with Lookup to restore the original values.




*Pseudonymizing data*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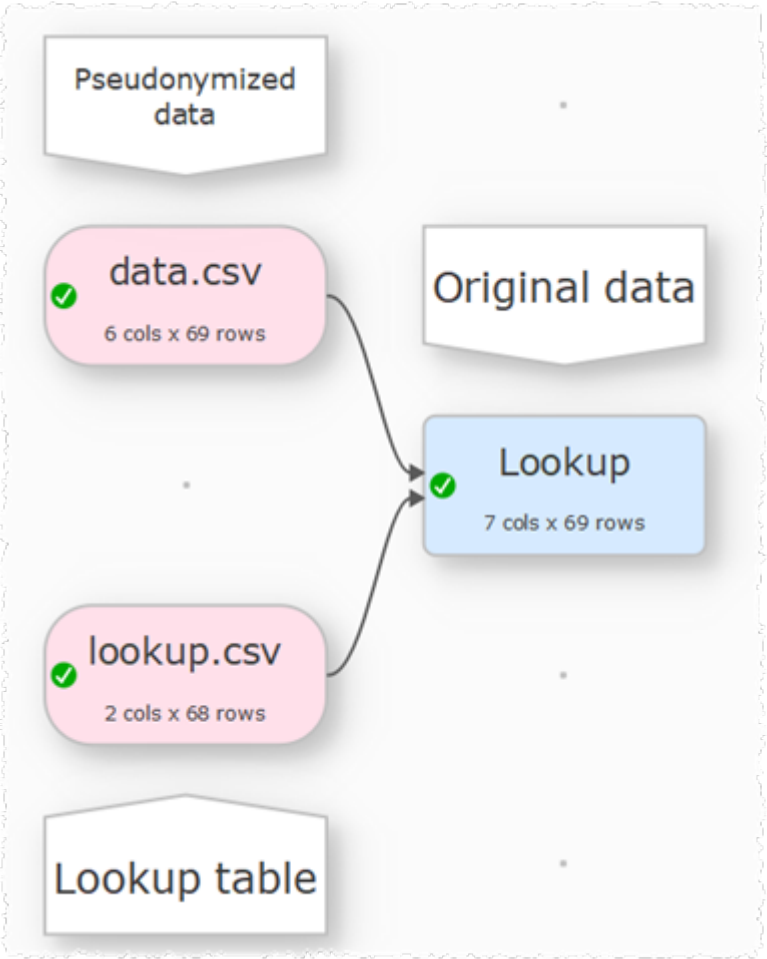


*Recovering pseudonymised data*

### See also

- Video: How to pseudonymise data
- Hash
- Row Num
- UUID

## 2.3.43 Random

### Description

Adds a new column, filled with pseudo-random values.

### Examples

Add a new column of random real values between -1 and +1:


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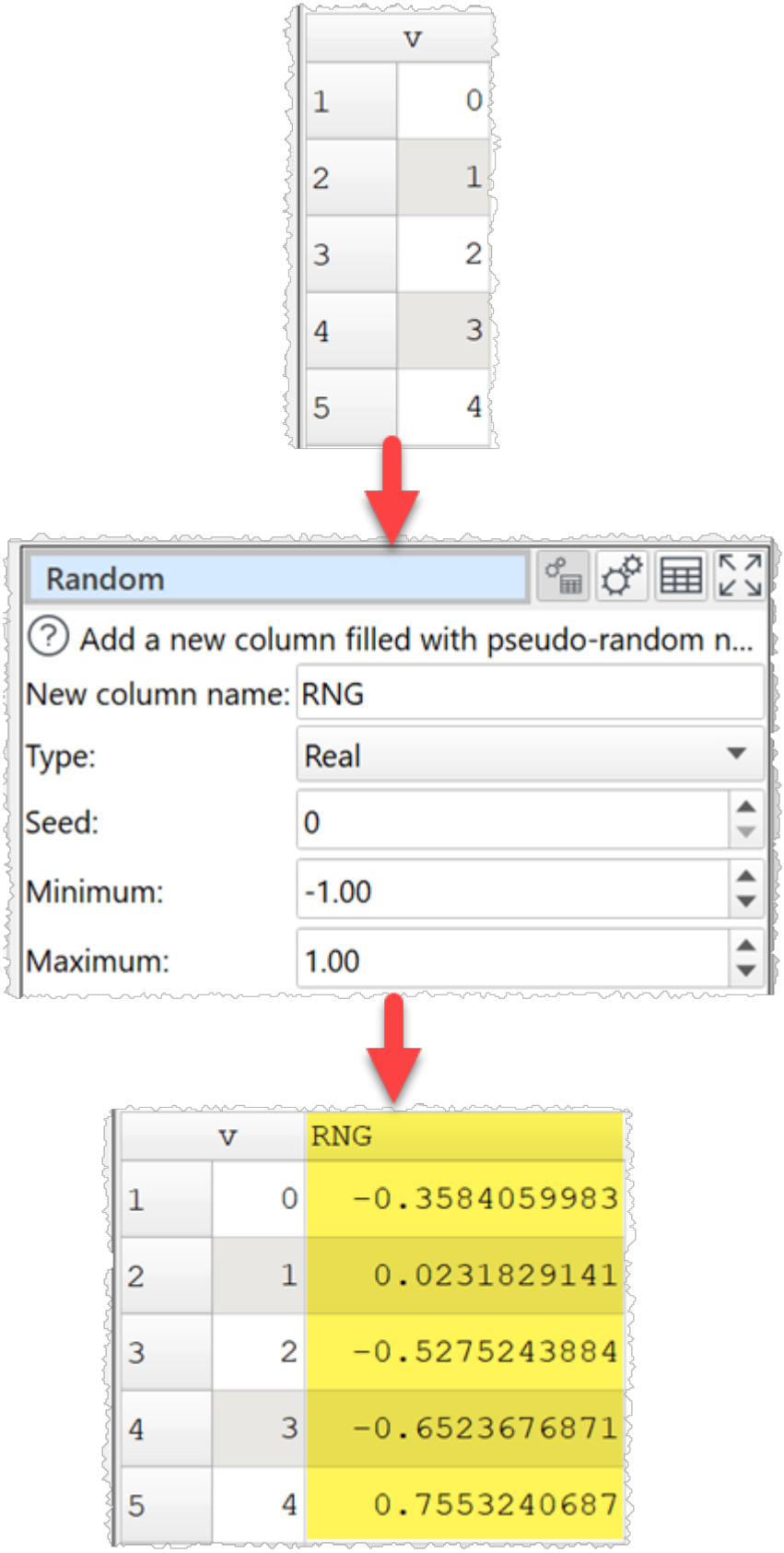


Add a new column of dates randomly chosen from 1st Jan 2000 and 10th June 2025 (inclusive):


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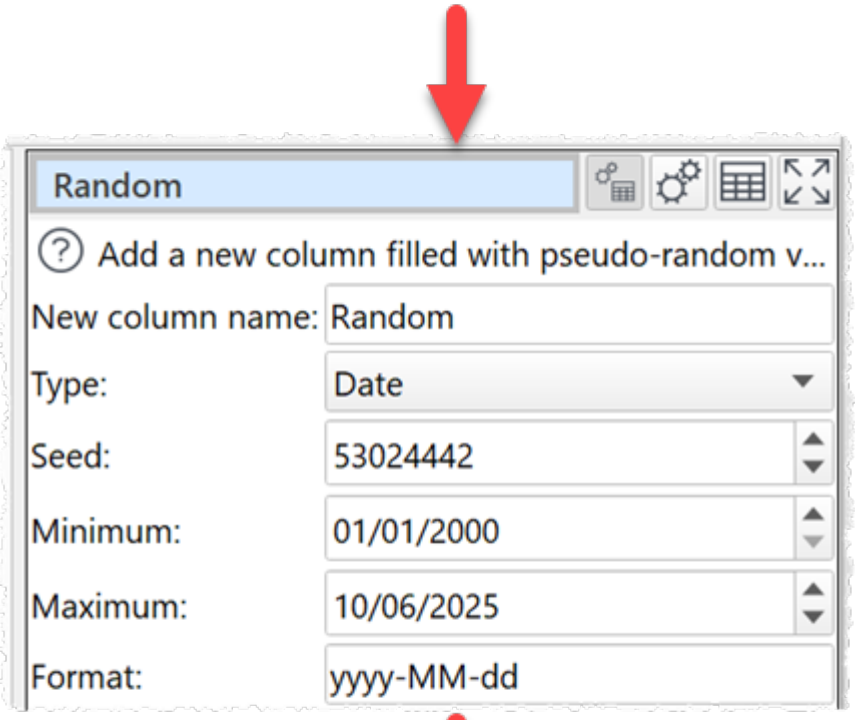
| | v |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |




| | v | Random |
|---|---|---|
| 1 | 1 | 2008-10-07 |
| 2 | 2 | 2014-03-07 |
| 3 | 3 | 2008-10-11 |
| 4 | 4 | 2018-08-18 |
| 5 | 5 | 2008-07-05 |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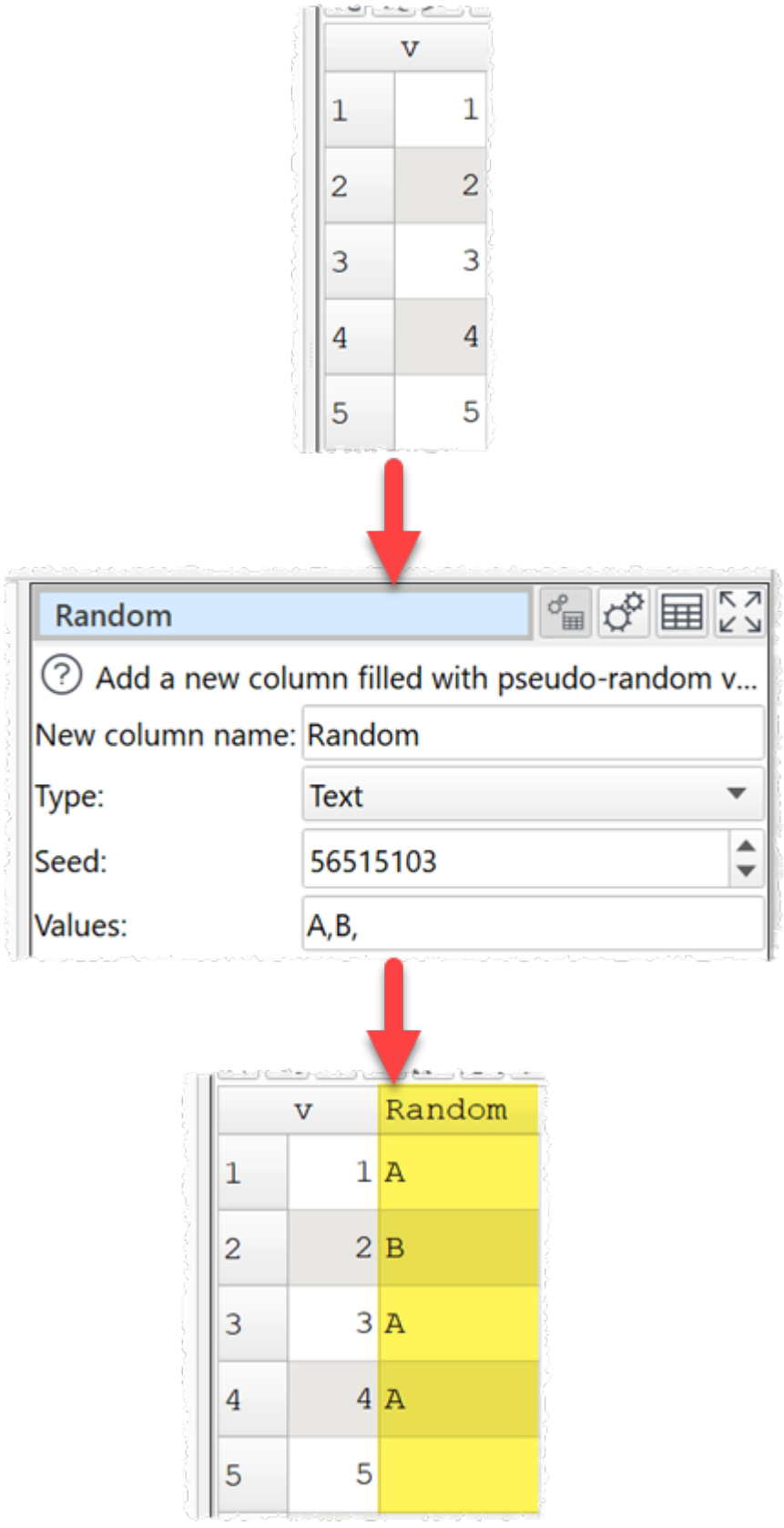
Add a new column of text values randomly chosen from 'A', 'B' or empty:





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## Inputs

One.

## Options

- Set **New column name** to the name of the new column you want to create.
- Set **Type** depending on whether you wish to generate **Real** (floating point), **Integer** (whole number), **Date** or **Text** values.
- Set **Seed** to the seed value used by the pseudo-random generator algorithm.
- Set **Minimum** to the minimum value you want to generate. The value may be equal to minimum, but not less. For **Type** is **Real**, **Integer** or **Date** only.
- Set **Maximum** to the maximum value you want to generate. The value may be equal to maximum, but not more. For **Type** is **Real**, **Integer** or **Date** only.
- Set **Format** to the date format. For **Type** is **Date** only.
- Set **Values** to a comma delimited list of values to choose from. Empty and duplicate values are allowed. Values may not contain commas. For **Type** is **Text** only.

## Notes

- The values output are a sequence of pseudo-random values based on the **Seed** value.
- The same sequence is always output for the same options.
- The default **Seed** value is based on the system clock when the transform was first created.
- If **Type** is set to **Text**, you need to provide a
- As an alternative to setting **Type** to **Text**, you can use **Random** with **Type** set to **Integer** and then use the results in conjunction with Lookup to lookup text values using an integer key.
- To generate random dates or datetimes then use **Random** with **Type** set to **Integer** and then use the results in conjunction with Calculate with **Operation** set to **MSecsToDateTime**.
- To generate passwords use **Random** in conjunction with the Hash transform.
- New columns are always added at the right end. You can change the column order with Reorder Cols.
- You can use the Correlate transform to check sets of random numbers are not correlated. This show the very low correlation between 2 sets of 1,000,000 values between 0.0 and 1.0 generated by **Random** using seeds 0 and 1:


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| | Correlation | Random | Random |
|---|---|---|---|
| 1 | Random | 1 | 0.0008029644 |
| 2 | Random | 0.0008029644 | 1 |

### See also

- Sample
- UUID

## 2.3.44 Remove Cols

### Description

Removes columns.

### Example

Remove the 'Area' column:


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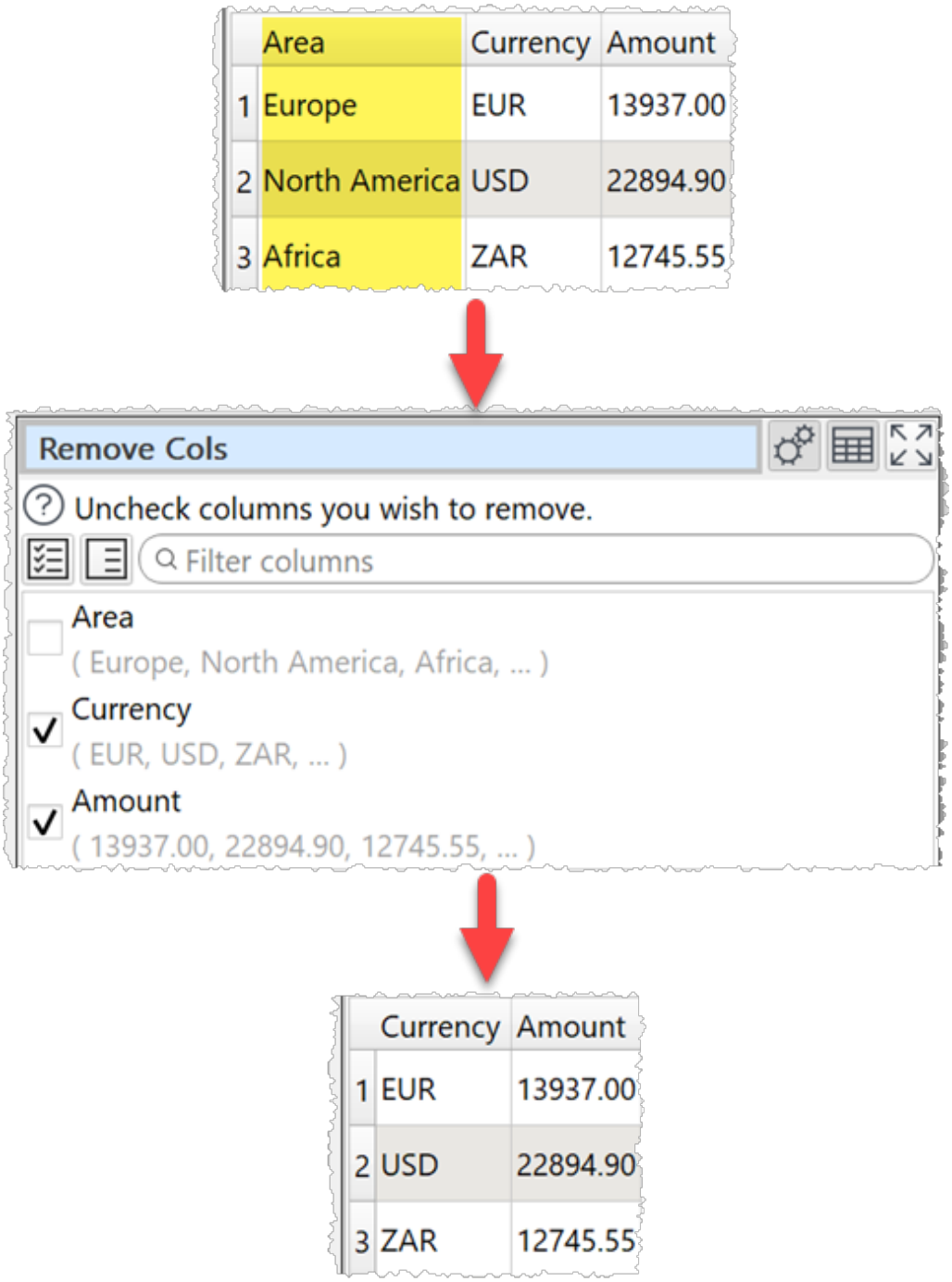


## Inputs

One.

## Options

- Uncheck the column(s) you wish to remove.

## Notes

- The column will be removed from any dataset 'downstream'.


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### See also

- New Col

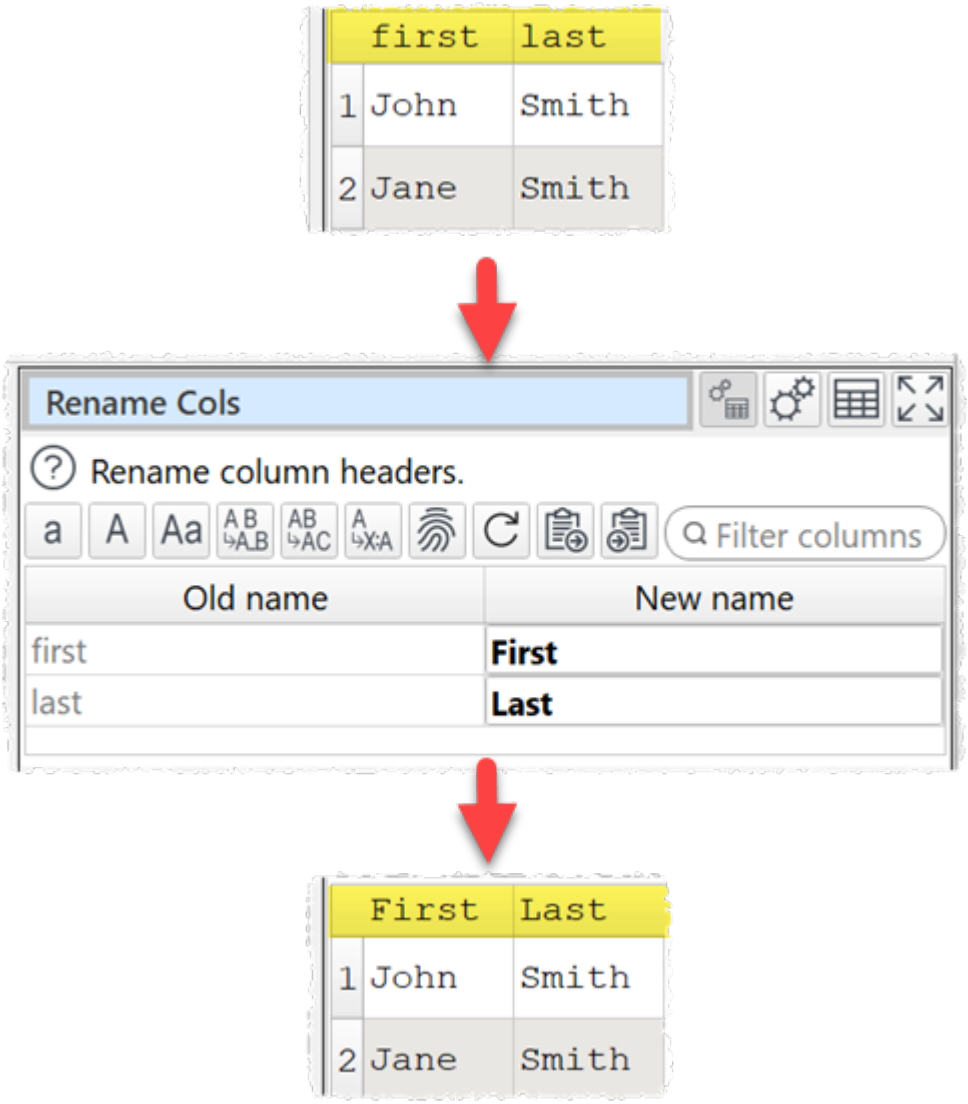
## 2.3.45 Rename Cols

### Description

Rename column headers.

### Example

Rename columns 'first' to 'First' and 'last' to 'Last':




### Inputs

One.

### Options

- Change the column headers using the **New name** column.
- Click the a button to change all the names to lower case.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- Click the A button to change all the names to upper case.
- Click the Aa button to change all the names to title case.
- Click the AB→AB button to replace space characters with underscore characters.
- Click the AB→AC button to replace name text using text, exact text or Regular expression matching.
- Click the A→XA button to add text to the front or back of all the names.
- Click the button to add '-2', '-3' etc to duplicate names, to make them unique.
- Click the button to change all the names back to their original name.
- Click the button to copy names to the clipboard.
- Click the button to paste from from the clipboard.
- Type text into the **Filter** field to temporarily hide columns whose old or new names do not contain this text.

### Notes

- The names of column headers do not have to be unique.
- Column filtering is sensitive to whitespace, but not case.
- Warnings are shown in the **Info** tab for duplicate column names (case sensitive).
- If you are pasting names, the format expected is Comma delimited text. E.g.: `name1,name2,name3.`

## 2.3.46 Reorder Cols

### Description

Reorder columns.

### Example

Reorder 'Last', 'First' and 'Title' columns:


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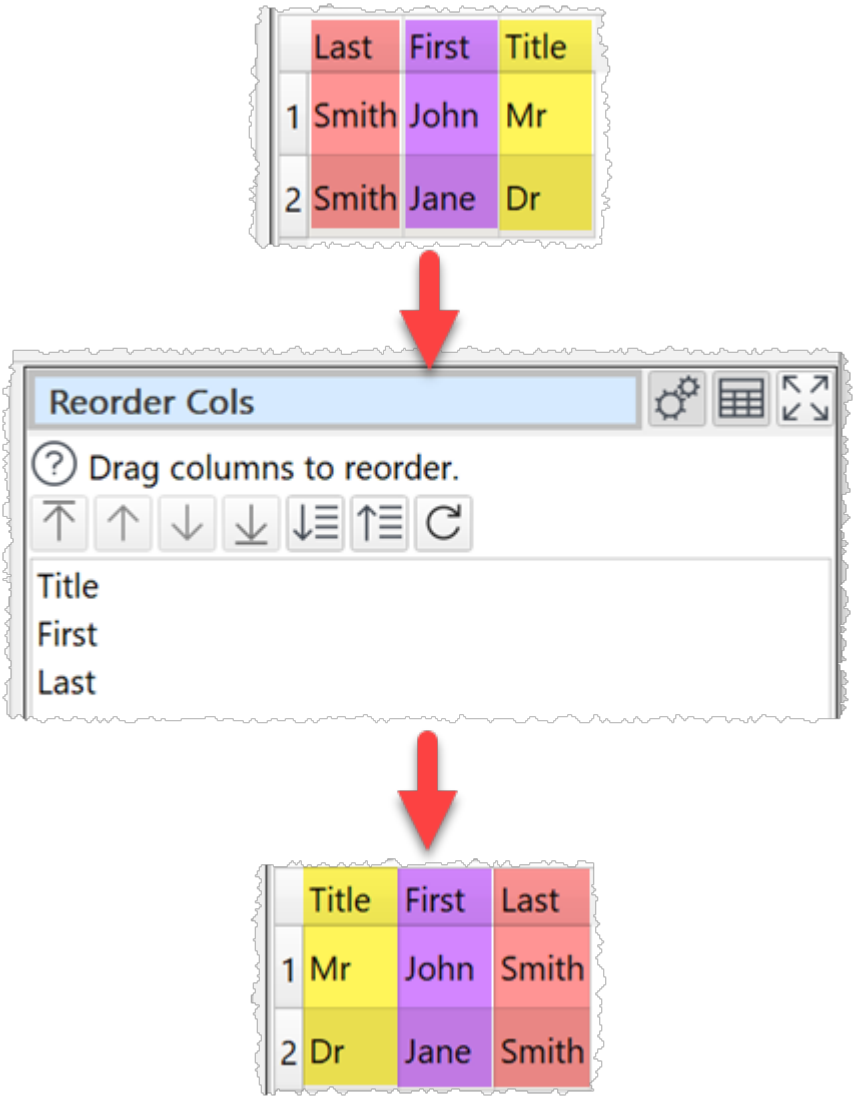


## Inputs

One.

## Options

Drag the columns into the desired order (left-most at the top).
Click the **Move first** button to move the selected columns to be first.
Click the **Move up** button to move the selected columns up one place.
Click the **Move down** button to move the selected columns down one place.
Click the **Move last** button to move the selected columns to be last.
Click the **Sort ascending** button to sort the columns in ascending order of name.
Click the **Sort descending** button to sort the columns in descending order of name.
Click the **Reset** button to restore the original column order.


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### Notes

- You can also rename columns with Rename Cols and remove unwanted columns with Remove Cols.
- Number, date and text values are treated differently for sorting purposes, when sorting columns.

## 2.3.47 Replace

### Description

Replace text in one or more columns.

### Examples

Replace US state initials in the 'Address' column:


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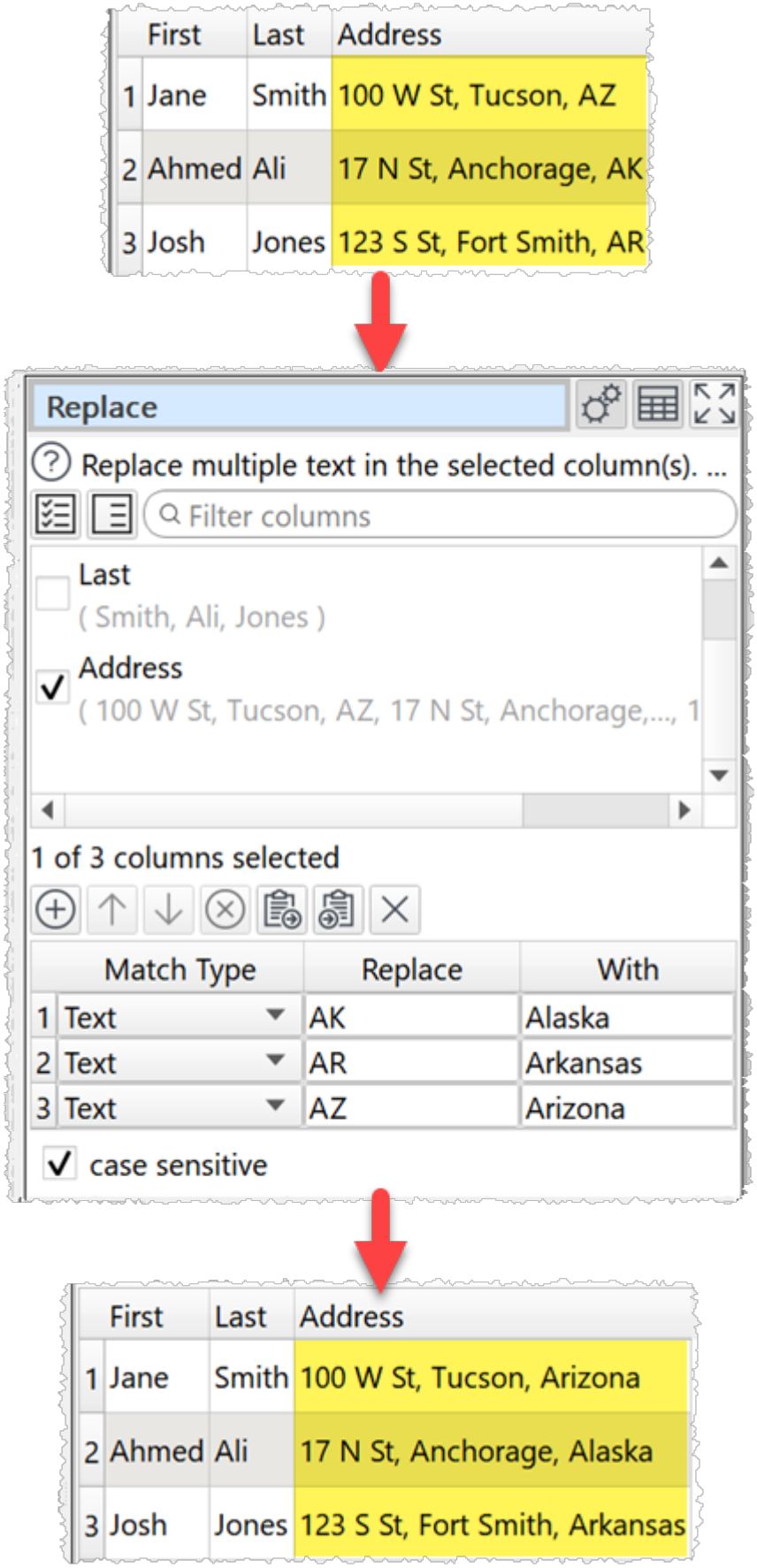



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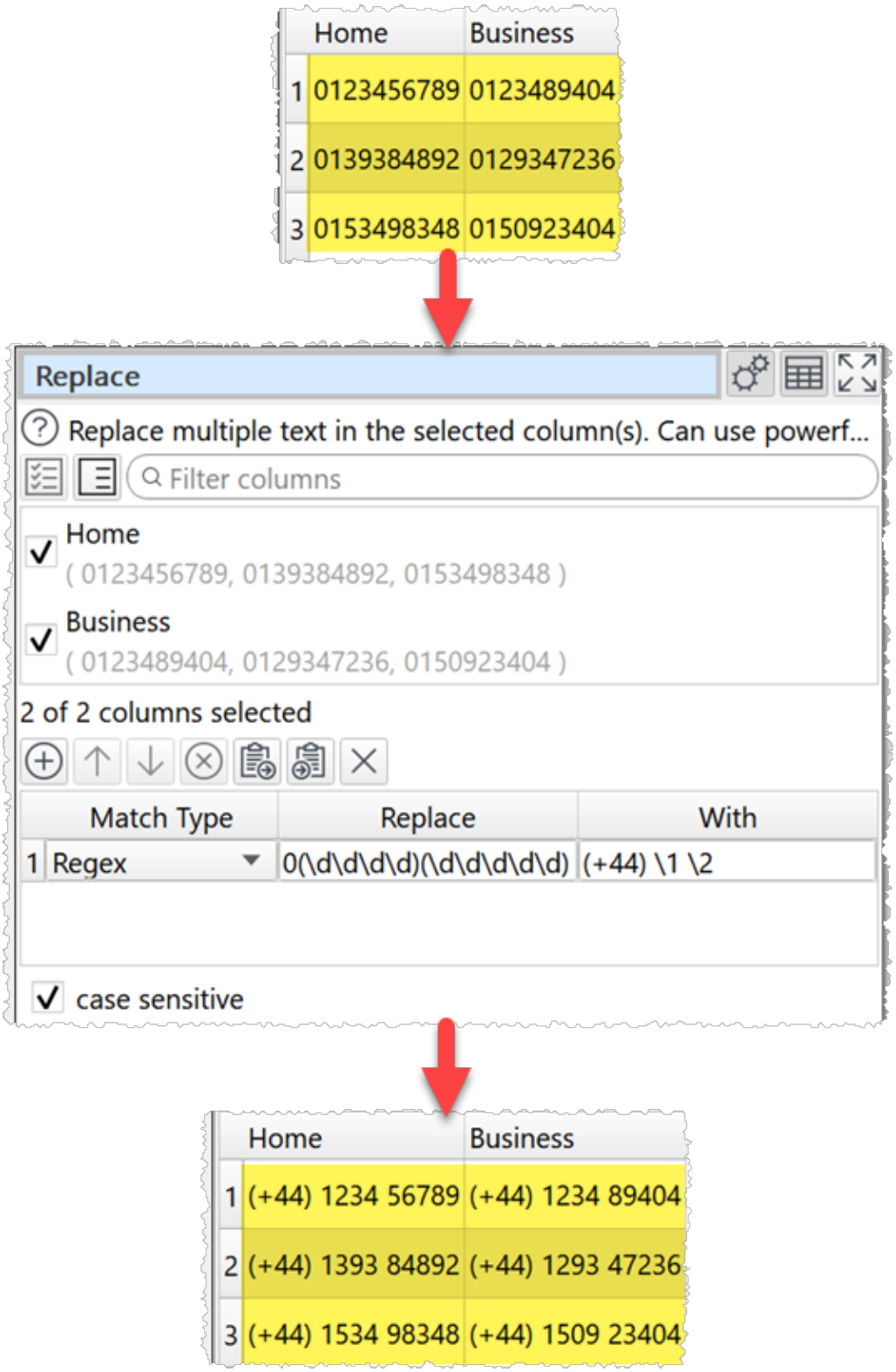
Reformat phone numbers using a regular expression:




Replace a whole word using a regular expression (\b=word boundary):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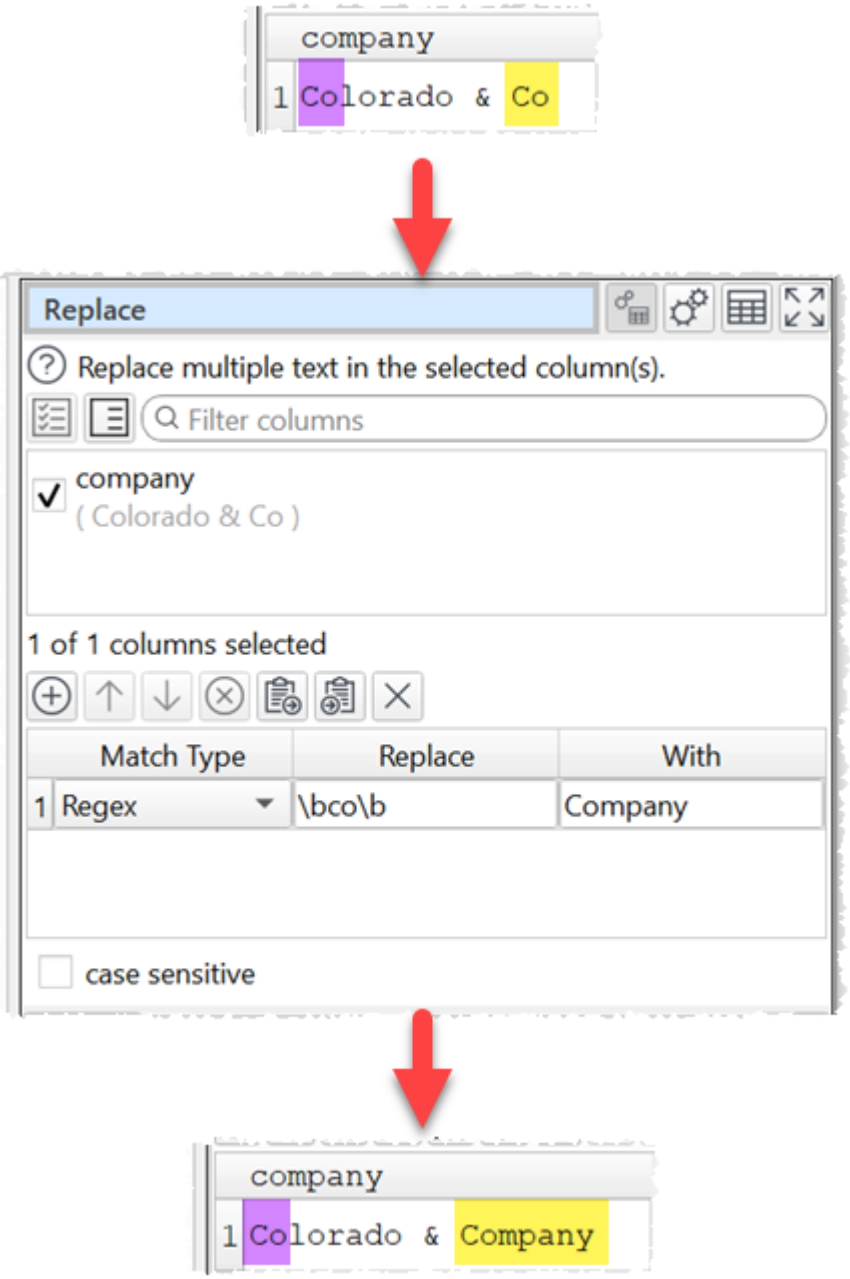


Replace empty values:


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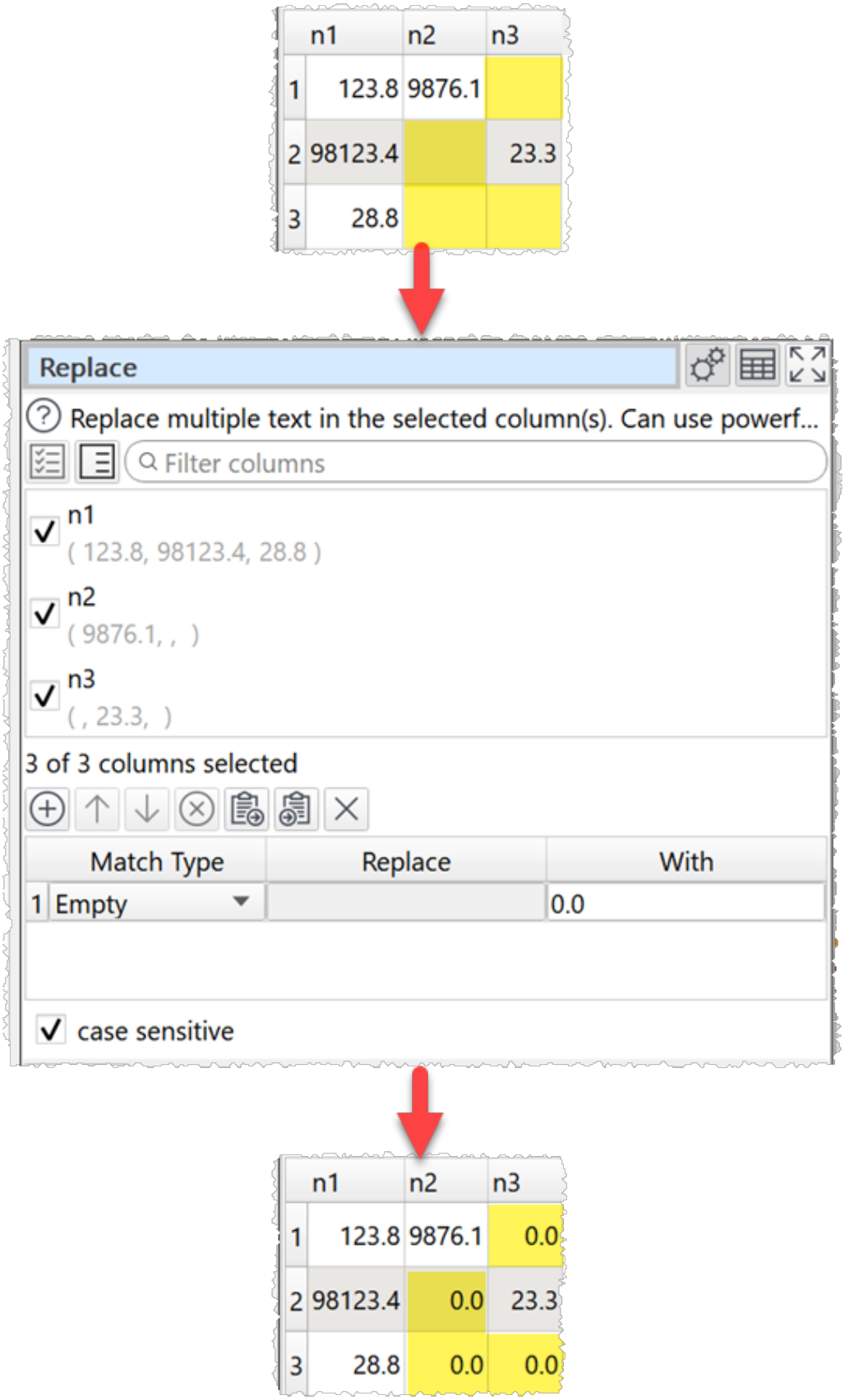


Remove symbols:


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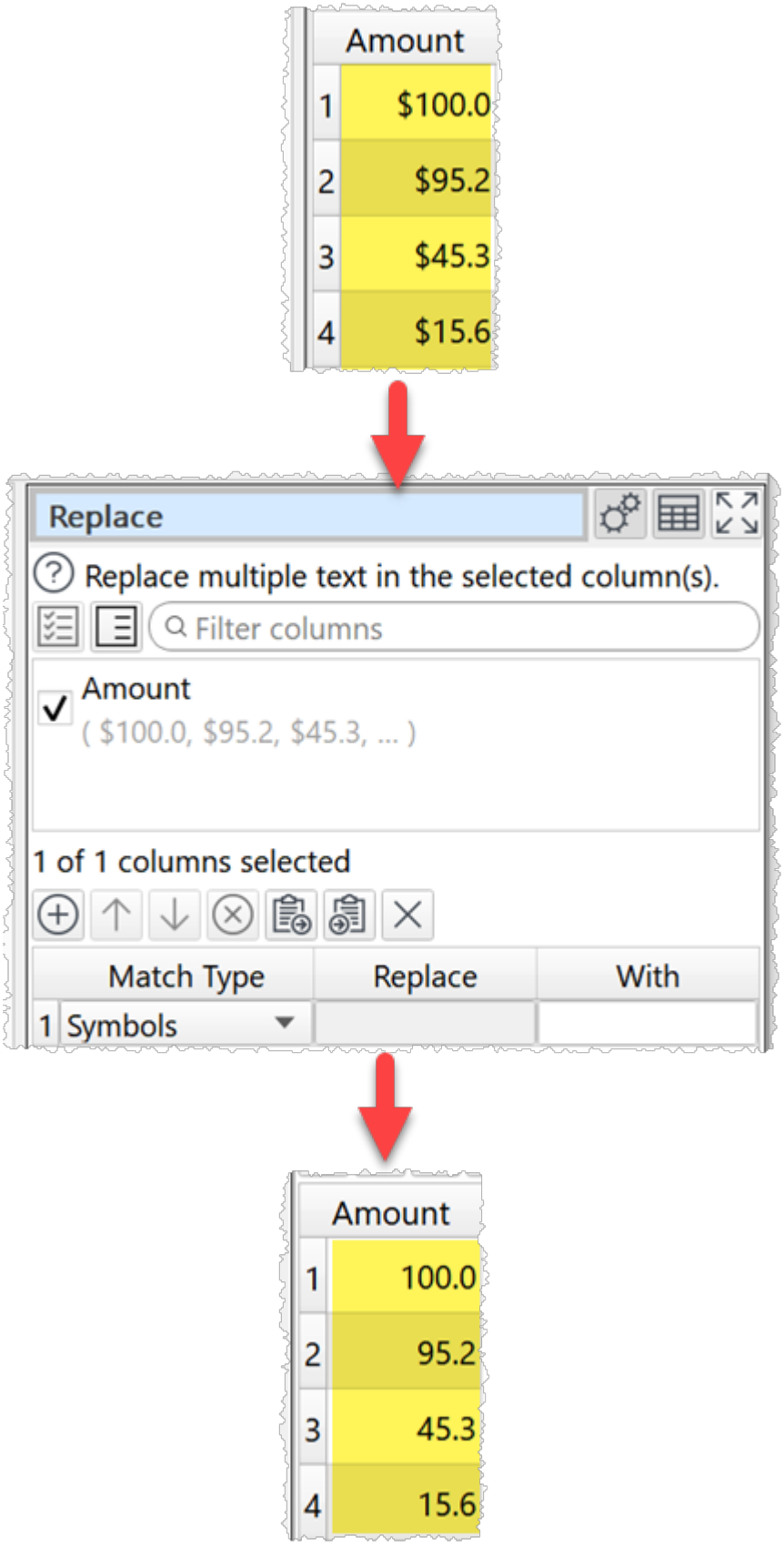


## Inputs

One.


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## Options

- Check the column(s) you wish to transform.
- Click the ⊕ button to add a new replace term.
- Click the ↑ button to move the selected terms up.
- Click the ↓ button to move the selected terms down.
- Click the ⊗ button to delete the selected terms.
- Click the button to copy all terms to the clipboard.
- Click the button to paste terms from the clipboard.
- Click the × button to clear all terms.
- Add the terms you wish to replace and how you wish to replace them.
  - Choose the **Match type** as:
    - **Text** to replace matches contained in the text.
    - **Exact text** to replace the text only if it matches exactly (whitespace sensitive).
    - **Regex** to match using a Regular expression.
    - **Empty** to match empty cells (cells with whitespace are not empty). The **Replace** value is ignored.
    - **Letters** to match letters, e.g. 'a'. The **Replace** value is ignored.
    - **Digits** to match numeric digits, e.g. '1'. The **Replace** value is ignored.
    - **Punctuation** to match punctuation characters e.g. ','. The **Replace** value is ignored.
    - **Symbols** to match symbol characters e.g. '$'. The **Replace** value is ignored.
    - **Space** to match whitespace characters. The **Replace** value is ignored.
  - In **Replace** put the text you want to replace for **Text**, **Exact text** or **Regex** matching. You can use a column variable.
  - In **With** put the text you want to replace it with. You can use a column variable.
- Check **case sensitive** to use case sensitive matching for **Text**, **Exact text** or **Regex** matching.

## Notes

- The order in which the **Replace** operations are carried out is always from the top term to the bottom term.
- If you can to keep the original column use Copy Cols to copy the column first.
- Comparisons are whitespace sensitive. You can use Whitespace to remove whitespace before replacing.
- If you are pasting in replacement terms, the format expected is Comma delimited text with 3 columns.
  - The first column is the 0-based index of the **Match Type** drop-down list.
  - The second column is the text **Replace**.
  - The third column is the text **With**.


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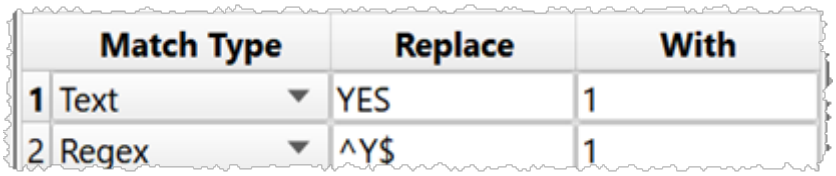
For example, pasting in:

```
0,YES,1
2,^Y$,1
```

Will add:



| | Match Type | Replace | With |
|---|---|---|---|
| 1 | Text | YES | 1 |
| 2 | Regex | ^Y$ | 1 |

You can also try copying terms to the clipboard and pasting into a text file to see the format. If you only paste in 1 column of text, it will be assumed to be a list of **Replace**. You can, of course, use Easy Data Transform to create the appropriate filter terms and paste them into memory.

### See also

- Insert
- Substitute

## 2.3.48 Reshape

### Description

Change the number of columns and rows.

### Example

Change from 3 columns x 2 rows to 2 columns x 3 rows: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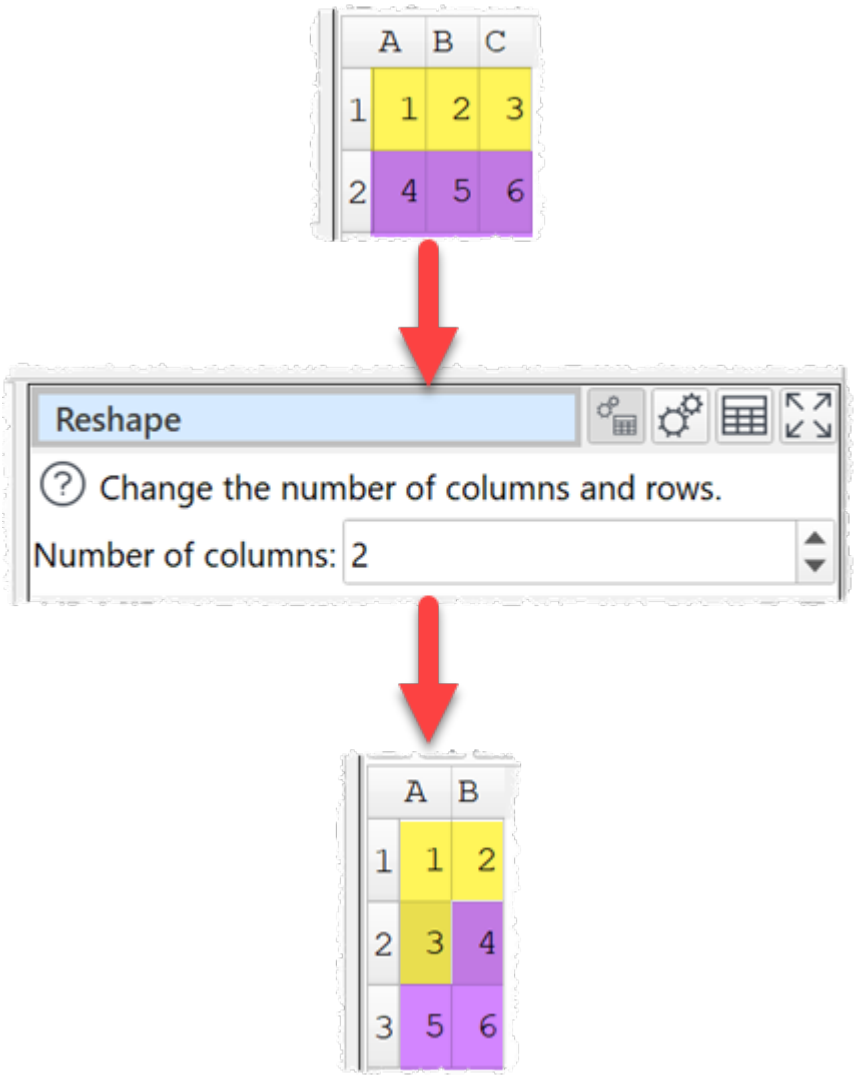


## Inputs

One.

## Options

- Set **Number of columns** to the new number of columns you want to have. The number of rows will be calculated automatically.

## Notes

- Any extra values added will be set to empty. E.g. If 7 columns x 3 rows is reshaped into 4 columns x 6 rows, the 3 new values will be set to empty.
- To get the effect you want, you may need to add empty columns with New Col, before **Reshape**.

## See also

- Concat Rows
- Split Rows


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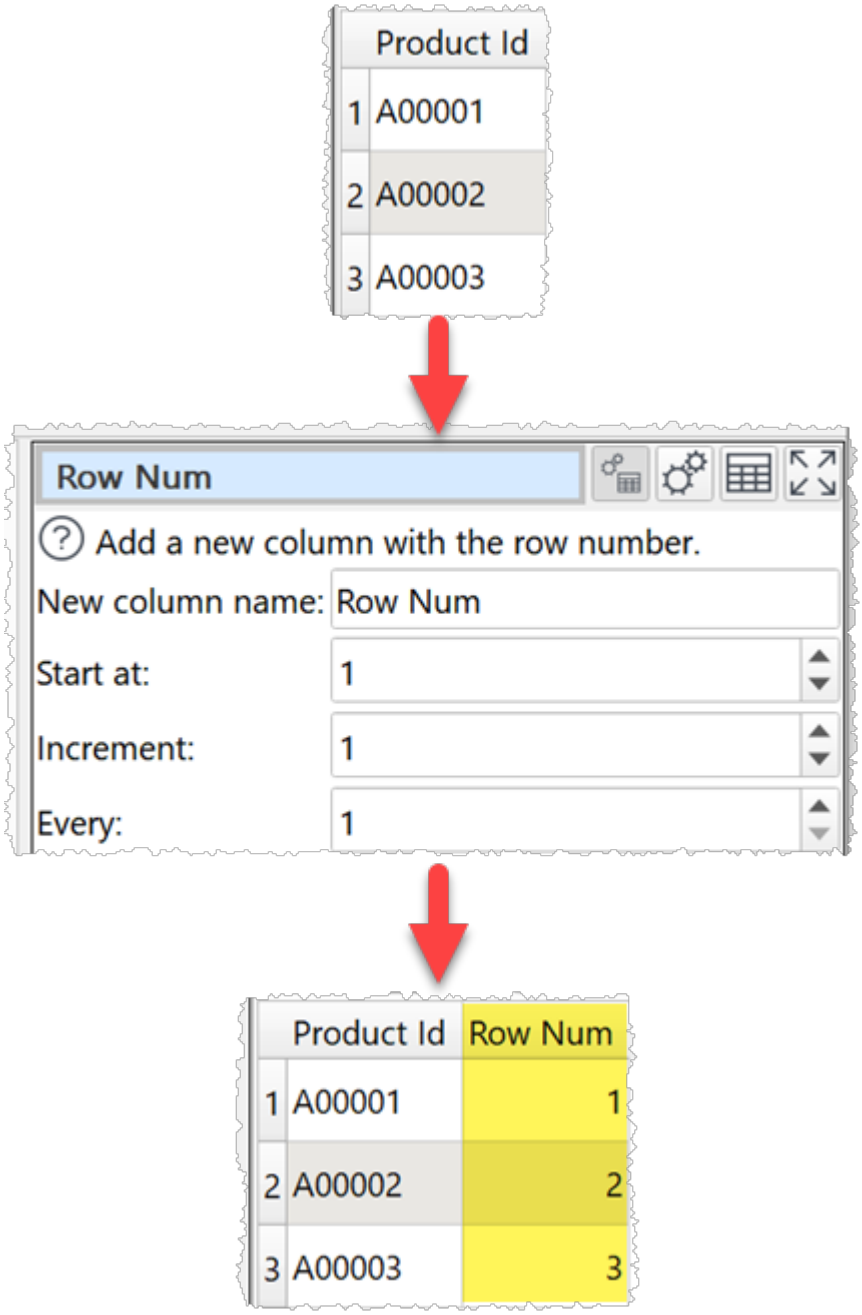
## 2.3.49 Row Num

### Description

Add a new column that contains the row number.

### Example

Add a row number starting at 1:




### Inputs

One.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### Options

- Set **New column name** to the name of the new column you want to create.
- Set **Start at** to the number you want to use for the first row.
- Set **Increment** to the amount you wish to increment by.
- set **Every** to how often to apply the increment (e.g. set to 5 to increment once every 5 rows).

### Notes

- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.
- You can Pad the row number with zeros to turn it into a column of unique Ids with a fixed length.
- You can use **Row Num** with a Calculate transform using operation **MSecsToDateTime** to create a sequence of dates.
- You can use **Row Num** with Calculate transform using operation **Modulus** and an If transform to create a sequence of repeating text.

### See also

- UUID

## 2.3.50 Sample

### Description

Selects a subset of rows from the input.

### Example

Sample 3 rows from 5:


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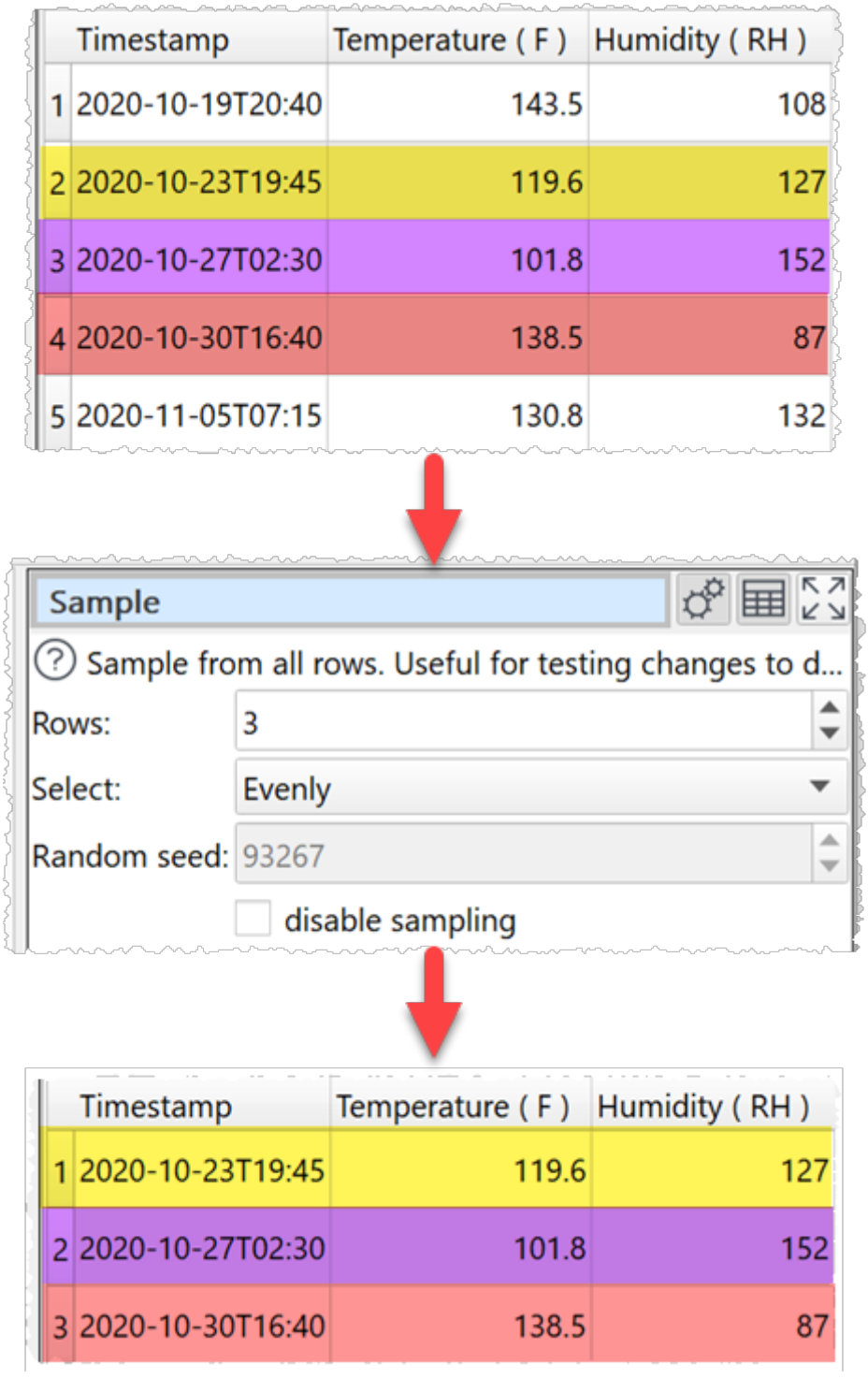


## Inputs

One.

## Options

- Set **Rows** to the number of rows you want to output. If it is the same or greater than the number of rows in the input, then the input will be unaffected.


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- Set **Select** depending on how you want the rows sampled.
- Check **disable sampling** to turn off sampling. If sampling is disabled, the transform does nothing.

### Notes

- If you set **Select** to **Randomly (for quality)** or **Randomly (for speed)**, rows will be selected using a pseudo-random number generator, initialized with **Random seed**. Changing the seed will change the rows sampled.
- With the same **Random seed** and the same **Select** value you should get the same random sampling, even across Windows and Mac versions of Easy Data Transform.
- **Random (for speed)** is significantly faster than **Randomly (for quality)**, but the results may be less random.
- If you are transforming a large dataset, then you can use **Sample** to test a small subset.
- If you need to do something more complex than **Sample** can handle (e.g. keep only rows 500 to 1000) then use Slice or Row Num followed by a Filter. For the most complex cases use **Row Num**, followed by Javascript, followed by a **Filter**. E.g. this **Javascript** function returns 1 for every 10th row between 1000 and 2000 and 0 otherwise:

```
return $(Row Num) >= 1000 & $(Row Num) <= 2000 & $(Row
Num) % 10 == 0;
```

## 2.3.51 Scale

### Description

Scale (normalize) numeric values, e.g. to a percentage or 0 to 1.

### Examples

Scale a single column to a percentage:


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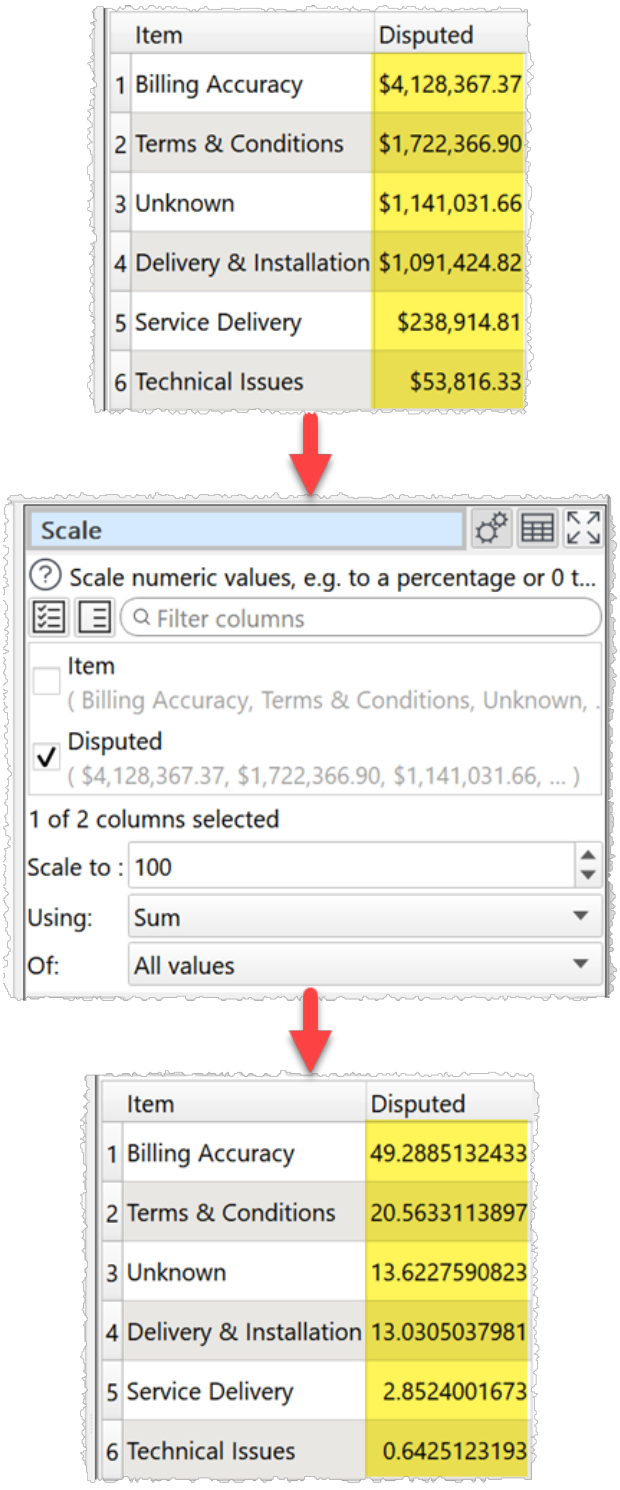


Scale a table with row, column and grand totals to a percentage (scale to 400 as each value is also added to the row total, column total and grand total):


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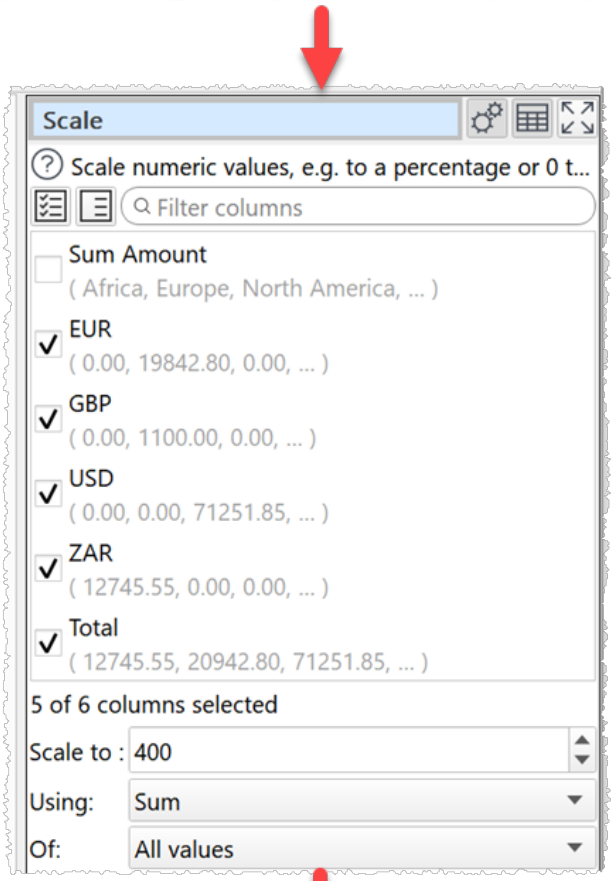
| | Sum Amount | EUR | GBP | USD | ZAR | Total |
|---|---|---|---|---|---|---|
| 1 | Africa | 0.00 | 0.00 | 0.00 | 12745.55 | 12745.55 |
| 2 | Europe | 19842.80 | 1100.00 | 0.00 | 0.00 | 20942.80 |
| 3 | North America | 0.00 | 0.00 | 71251.85 | 0.00 | 71251.85 |
| 4 | Total | 19842.80 | 1100.00 | 71251.85 | 12745.55 | 104940.20 |




| | Sum Amount | EUR | GBP | USD | ZAR | Total |
|---|---|---|---|---|---|---|
| 1 | Africa | 0 | 0 | 0 | 12.1455362197 | 12.1455362197 |
| 2 | Europe | 18.9086737018 | 1.0482160316 | 0 | 0 | 19.9568897334 |
| 3 | North America | 0 | 0 | 67.8975740469 | 0 | 67.8975740469 |
| 4 | Total | 18.9086737018 | 1.0482160316 | 67.8975740469 | 12.1455362197 | 100 |

Scale heights and weights so that the largest in each column is 1 and the smallest is 0.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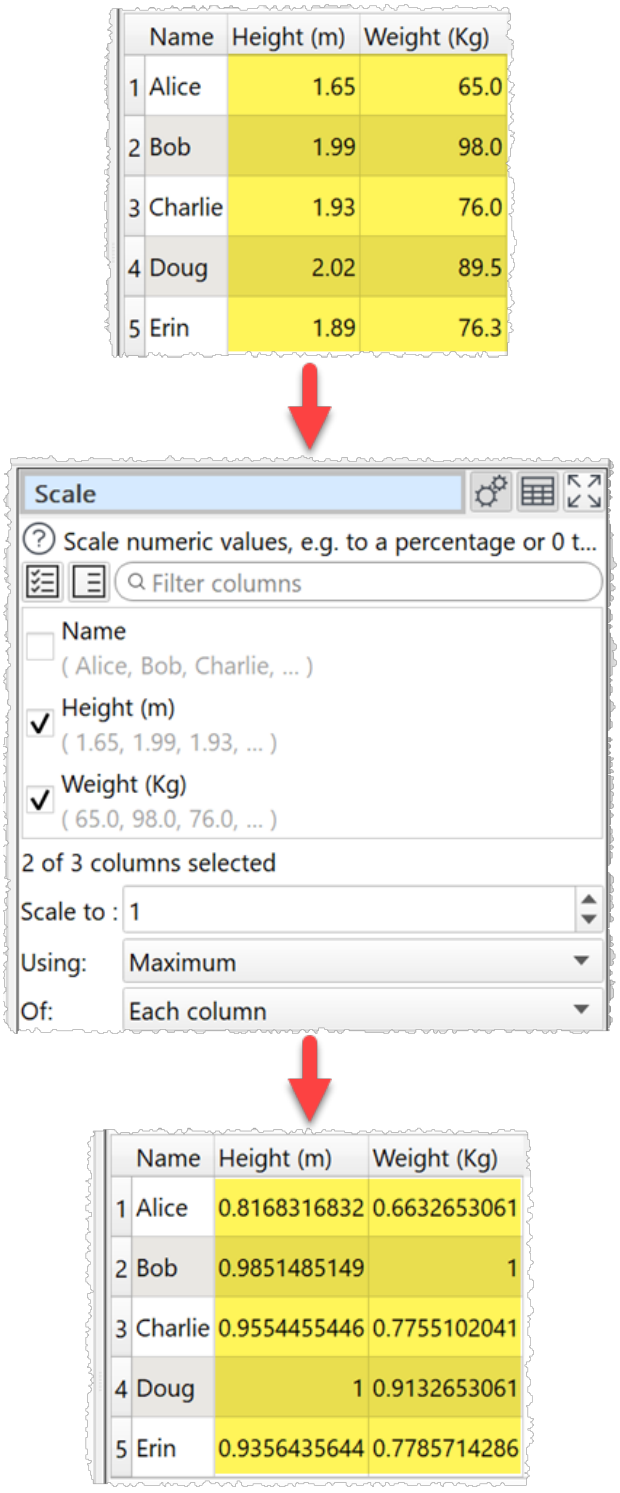


Scale heights and weights so that the largest in each column is 1 and the smallest is 0.


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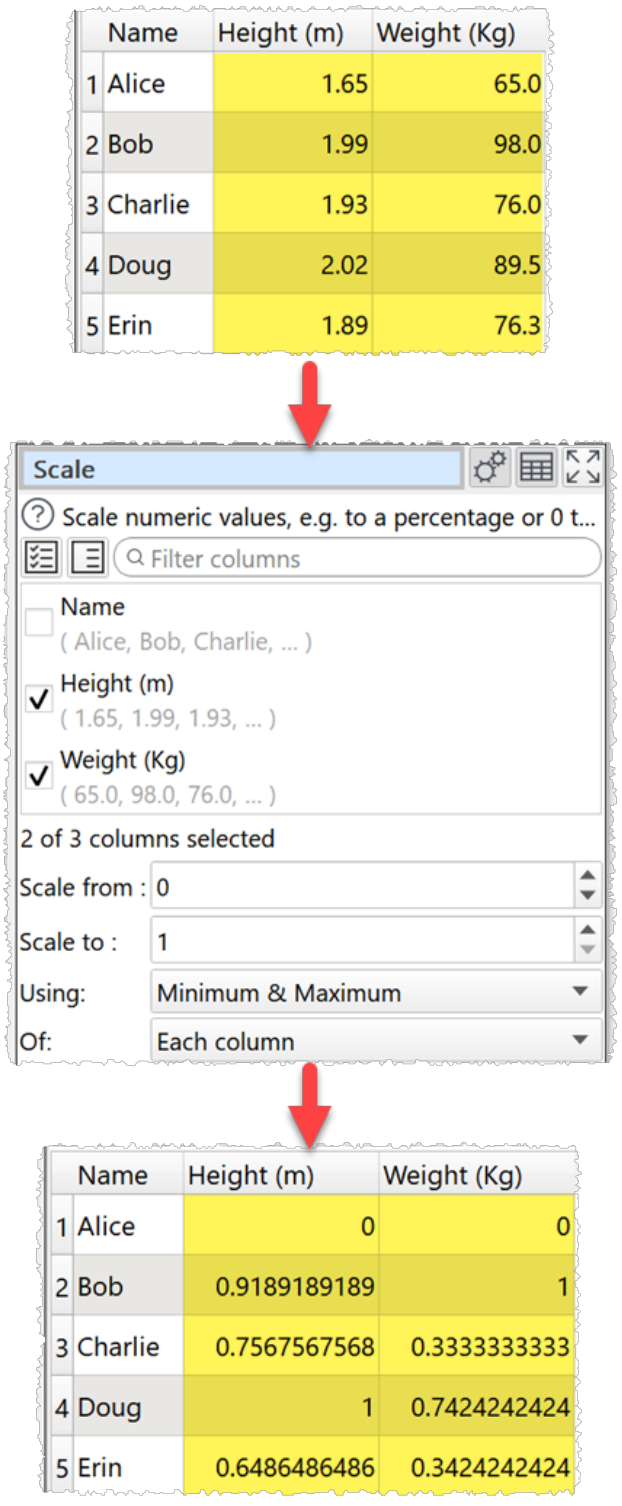


## Inputs

One.

## Options

- Set **Columns** to the columns whose values you want to scale.


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- set **Scale from** to the value you want to scale the minimum value to. E.g. 0 if you want the minimum value scaled to 0. This is only available when **Using** is set to **Minimum and Maximum**.
- Set **Scale to** to the value you want to scale the maximum or sum value to. E.g. 100 for a percentage.
- Set **Using** depending on whether you want to use the **Sum**, **Maximum** or **Minimum and Maximum** values for scaling.
- Set **Of** depending on whether you want to scale for **Each column**, **Each row** or for **All values**.

### Notes

- Whether values are interpreted as numbers depends on locale.
- Non-numeric values (including empty values) are ignored.
- To replace empty values with zeros use the Replace transform.
- To modify the numerical precision of the results use the Num Format transform.
- To add a '%' at the end of values use the Insert transform.
- To copy columns before using **Scale** use Copy Cols .
- Warnings are shown in the **Warnings** tab for non-numeric values.

### See also

- Video: How to normalize data

## 2.3.52 Sequence

### Description

Add missing rows from an integer or date sequence.

### Examples

Add missing IDs in the current range, with values copied from above:


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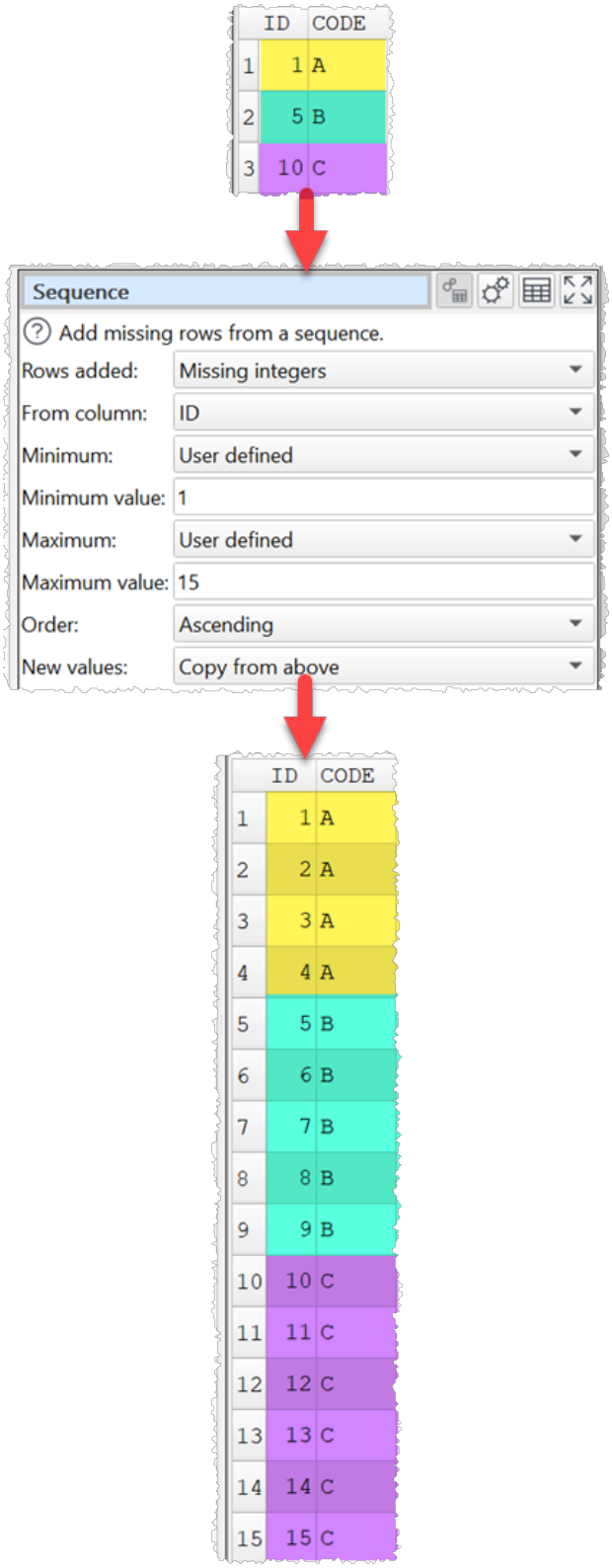


Add missing dates in a specified range as 0 sales:


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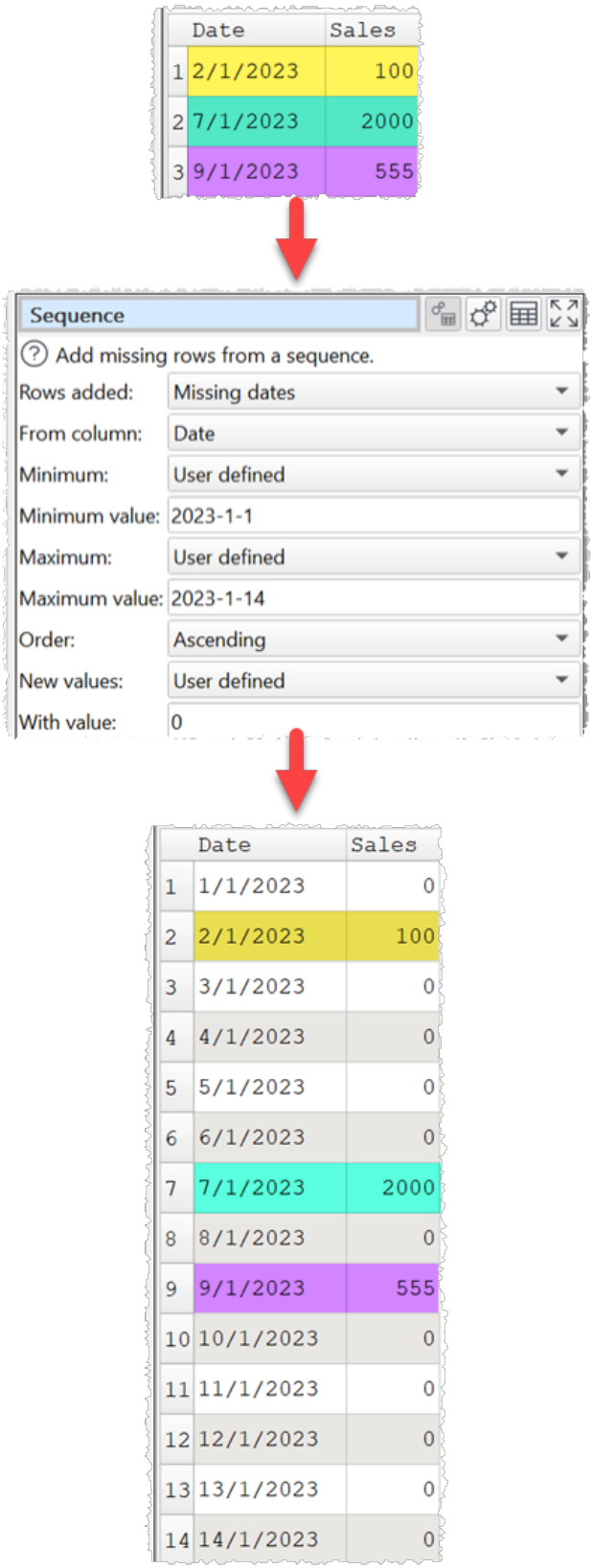


Create an integer sequence from a dataset with no rows:


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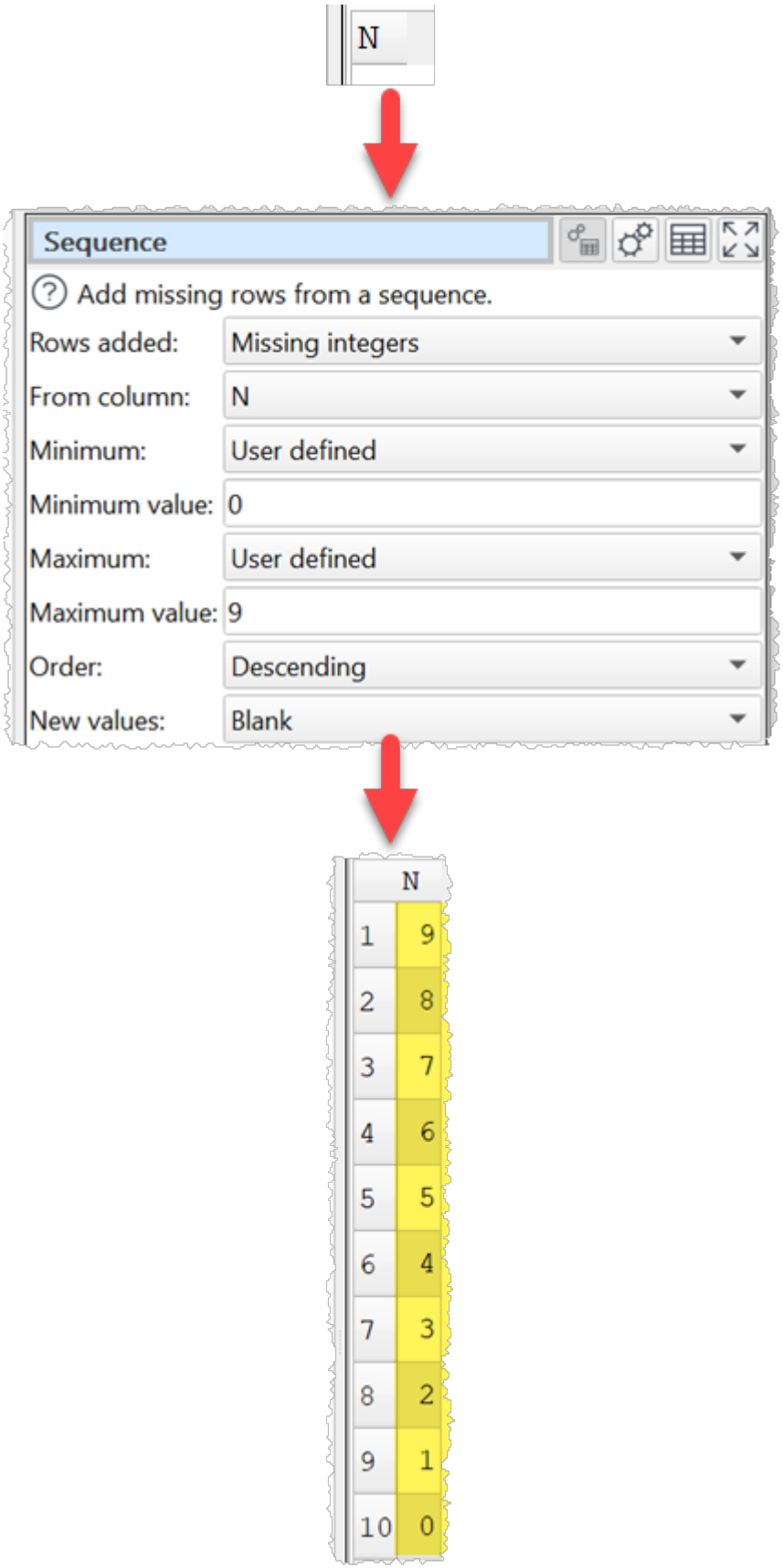


## Inputs

One.


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## Options

- Set **Rows Added** to **Missing integers** or **Missing dates** depending on the type of sequence.
- Set **From column** to the column with the incomplete sequence.
- Set **Minimum** to:
  - **From data** to set the minimum value in the sequence to the minimum value in the selected column.
  - **User defined** to set the minimum value to a value set by the user.
- Set **Maximum** to:
  - **From data** to set the maximum value in the sequence to the maximum value in the selected column.
  - **User defined** to set the maximum values to a value set by the user.
- Set **Order** according to whether you want the dataset sorted **Ascending** or **Descending** by the selected column.
- Set **New values** to:
  - **Blank** to set new row values to empty.
  - **Copy from above** to set new row values to the same as the next row sorted above from the input dataset.
  - **Copy from below** to set new row values to the same as the next row sorted below from the input dataset.
  - **User defined** to allow the user to choose a value for new row values. Set **With value** for the new value to use.

## Notes

- Existing sequence values are unchanged.
- You can add leading zeros to integers values created using the Pad transform.
- Dates added will try to follow the format of existing dates, using the date formats listed in the **Dates** tab of the **Preferences** window. If you want ISO dates, make sure `yyyy-MM-dd` is above `yyyy-M-d` in the **Dates** tab of the **Preferences** window.
- You can change the format of dates created using the DateTime format transform.
- If you only want to add some values from a sequence (e.g. odd numbers or weekdays) then you can do this by using **Sequence** followed by Filter to remove the unwanted values. You might need to use Calculate with the **Modulus** and/or **Day of week** operation to create a column to filter on.
- Use the Cross transform if you want to combine multiple sequences. E.g. to cross hourly times (00:00, 01:00 ... 23:00 ) with a date sequence.

## See also

- Video: How to insert missing dates
- New rows


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- Fill
- Impute
- Interpolate

### 2.3.53 Slice

#### Description

Keep or remove a continuous section of rows.

#### Example

Keep only the rows between the 'YEAR' rows:


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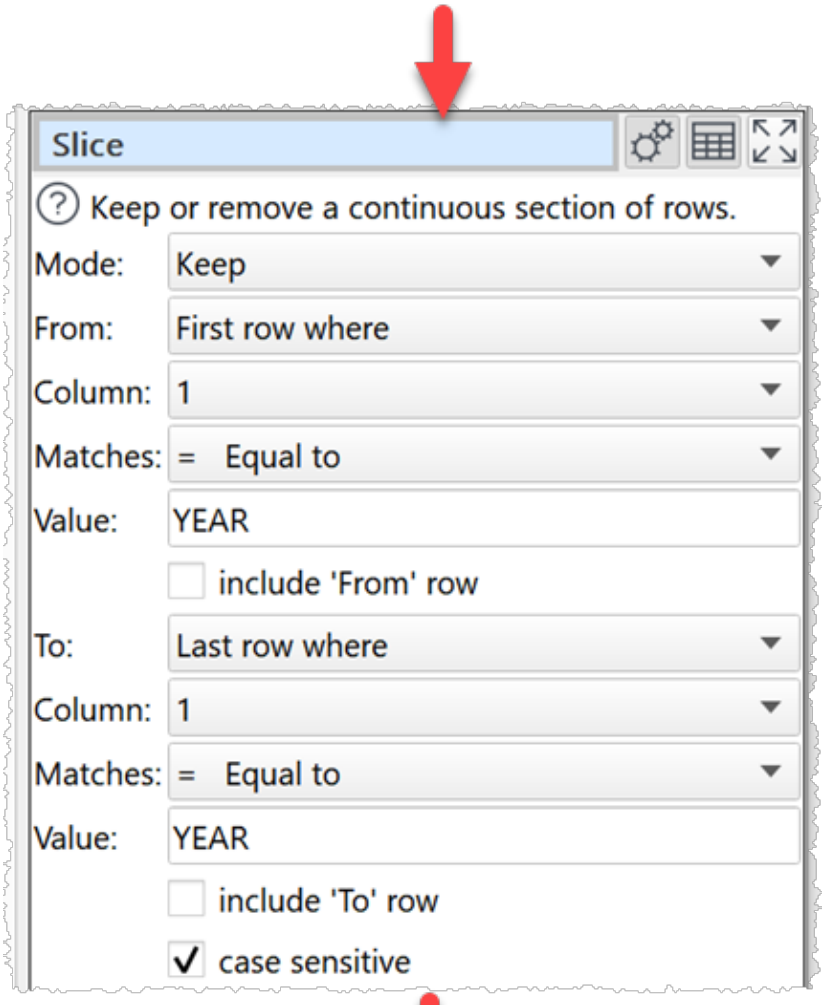
| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1 | YEAR | JAN | FEB | MAR |
| 2 | 1980 | 256.9 | 238.5 | 275.4 |
| 3 | 1981 | 248.9 | 224.9 | 259.1 |
| 4 | YEAR | JAN | FEB | MAR |
| 5 | 1982 | 258.6 | 230.0 | 280.4 |
| 6 | 1983 | 275.9 | 234.9 | 251.9 |




| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1 | 1980 | 256.9 | 238.5 | 275.4 |
| 2 | 1981 | 248.9 | 224.9 | 259.1 |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## Inputs

One.

## Options

- Set **Mode** depending on whether you want to keep or remove the slice.
- Set **From** according to how you want to choose the first row of the slice.
- Set **Column**, **Matches** and **Value** to match the first row. You can use a column variable for either **Value**.
- Uncheck **Include 'From' row** if you don't want to include the first row in the slice.
- Set **To** according to how you want to choose the last row of the slice.
- Set **Column**, **Matches** and **Value** to match the last row.
- Uncheck **Include 'To' row** if you don't want to include the last row in the slice.
- Check **case sensitive** to use case sensitive matching for text.

## Notes

- If there is no match for the **From** or **To** row:
  - **Mode**=**Keep** will remove all rows
  - **Mode**=**Remove** will keep all rows
- Number, date and text values are treated differently for **Equal to**, **Greater than**, **Less than**, **Greater than equal, Less than equal** and **Not equal to** operations.
  - If both values are numeric, a numeric comparison will be carried out. This is accurate to approximately 16 digits of precision.
  - If both values match a supported date formats in Preferences, a date comparison will be carried out.
  - Otherwise the values will be treated as text.
  - For example, an empty value is considered less than 0, because they will be compared as text. So you might want to replace empty values with 0 or remove those rows with Filter, before comparing them.
- All values are treated as text for **Contains**, **Starts with**, **Ends with**, **Matches regex**, **Is not**, **Doesn't start with, Doesn't end with** and **Doesn't match regex** operations.
- Comparisons of text are whitespace sensitive. Cells with whitespace will not match **Is empty**. You can use Whitespace to remove whitespace before filtering and Replace to get of other unwanted characters (e.g. whitespace inside the text).
- See here for more details on Regular expressions (regex).
- If you want to keep or remove a selection of rows by row number, use a Row Num transform followed by a Filter transform.


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### 2.3.54 Slide

#### Description

Move non-empty values in selected columns to adjacent non-empty cells.

#### Examples

Move all non-empty values to the top:


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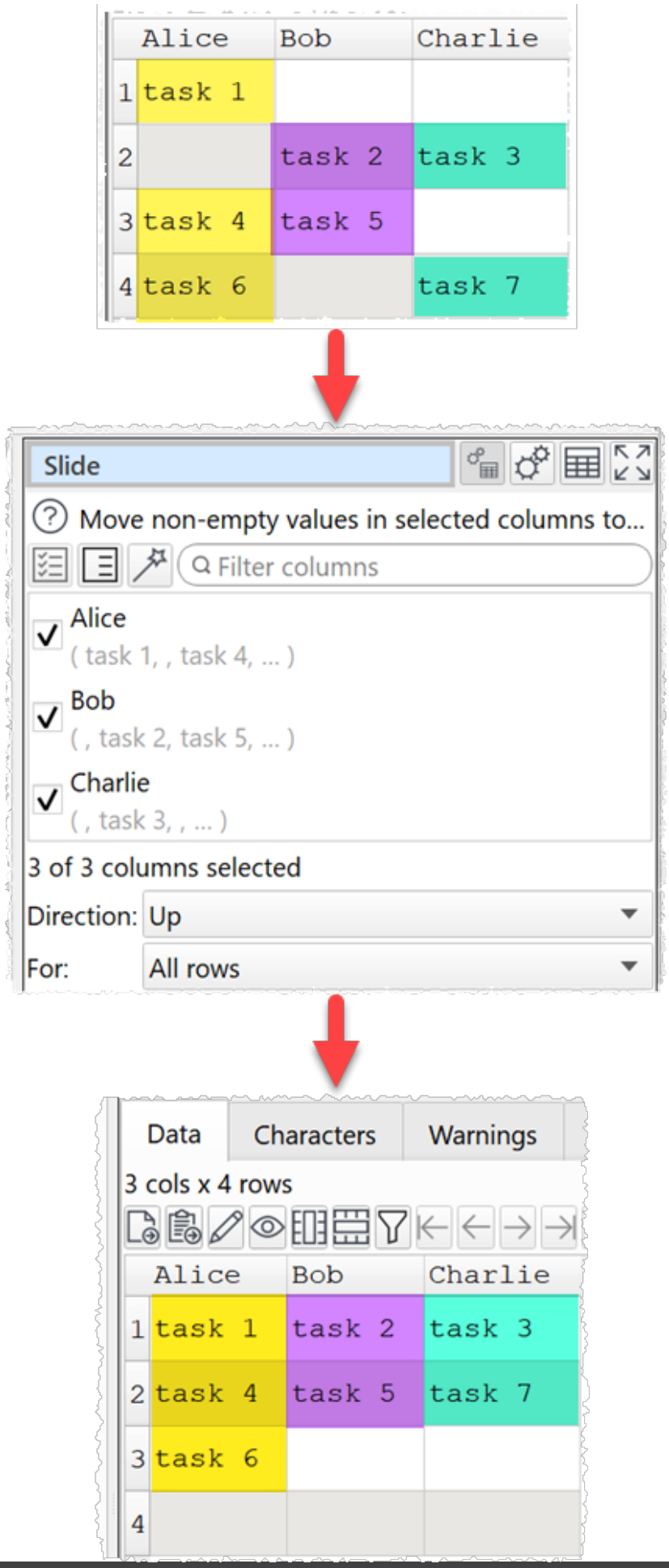



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Move all non-empty values to the top within rows of same priority:


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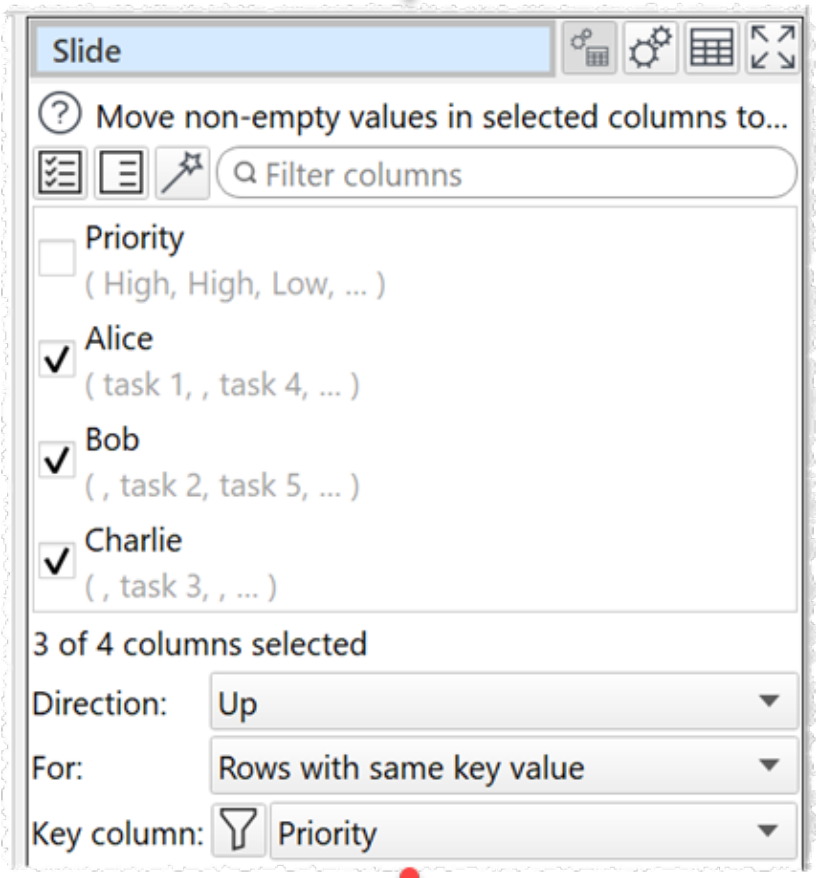
| | Priority | Alice | Bob | Charlie |
|---|---|---|---|---|
| 1 | High | task 1 | | |
| 2 | High | | task 2 | task 3 |
| 3 | Low | task 4 | task 5 | |
| 4 | Low | task 6 | | task 7 |




| | Priority | Alice | Bob | Charlie |
|---|---|---|---|---|
| 1 | High | task 1 | task 2 | task 3 |
| 2 | High | | | |
| 3 | Low | task 4 | task 5 | task 7 |
| 4 | Low | task 6 | | |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### Inputs
One.

### Options
- Check the column(s) you wish to move values in.
- Select **Direction** depending on the direction you wish to move values.
- Set **For** to **Rows with same key value**, if you wish to only slide up/or down when when 2 adjacent rows have the same value in the **Key column** column.

### Notes
- Cells containing whitespace are not considered empty.
- Matching for **Rows with same key value** is sensitive to case and whitespace.
- You can delete rows left empty using Filter and columns left empty using Remove Cols.
- To fill empty values with something else use the **Replace** transform.

### See also
- Offset
- Fill
- Whitespace

## 2.3.55 Sort

### Description
Sorts rows by one or more columns.

### Examples
Sort by 'Last' and then First' columns:


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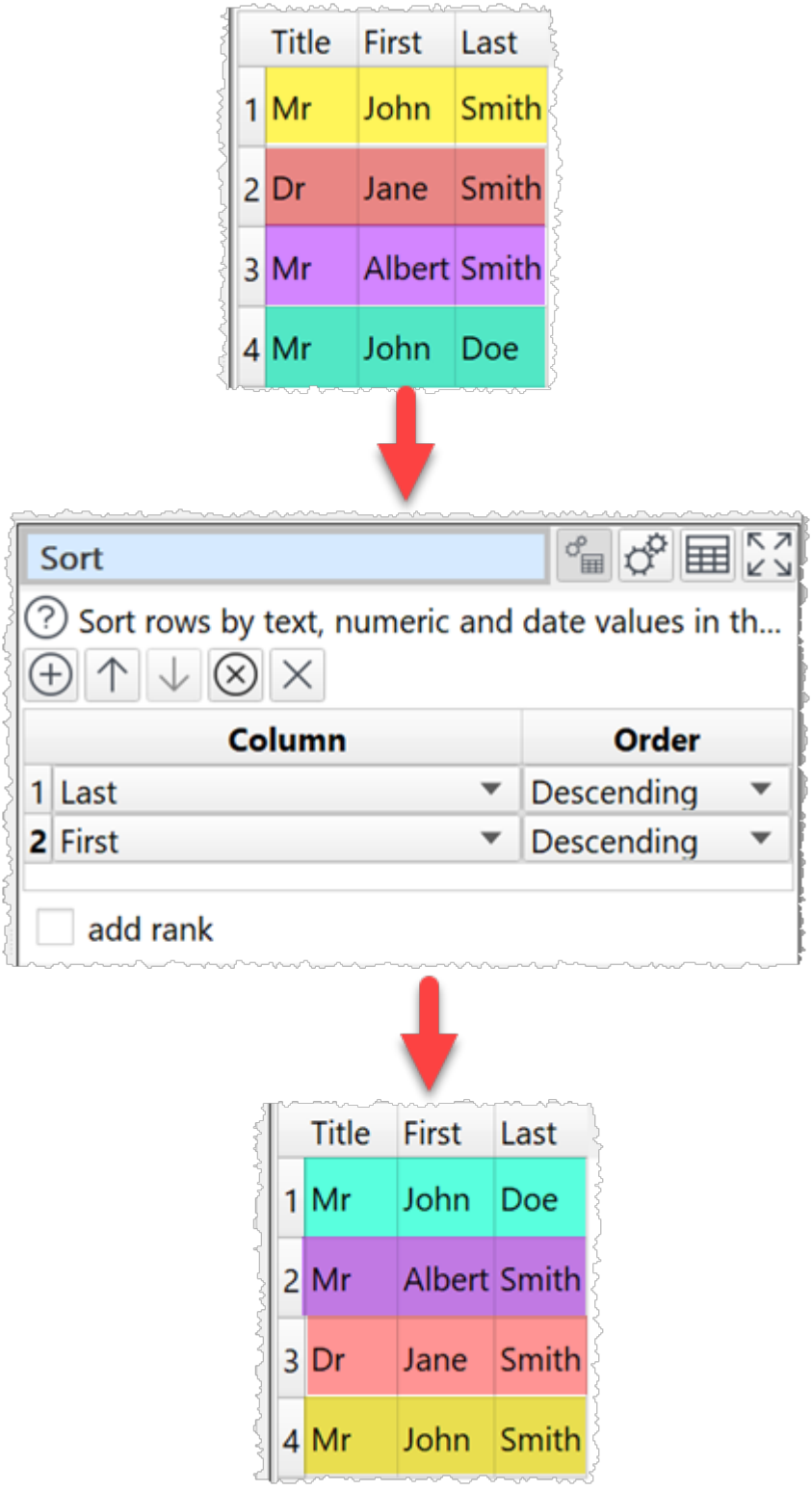


Sort by 'Category' and then 'Score' columns. Rank for each distinct 'Category' value:


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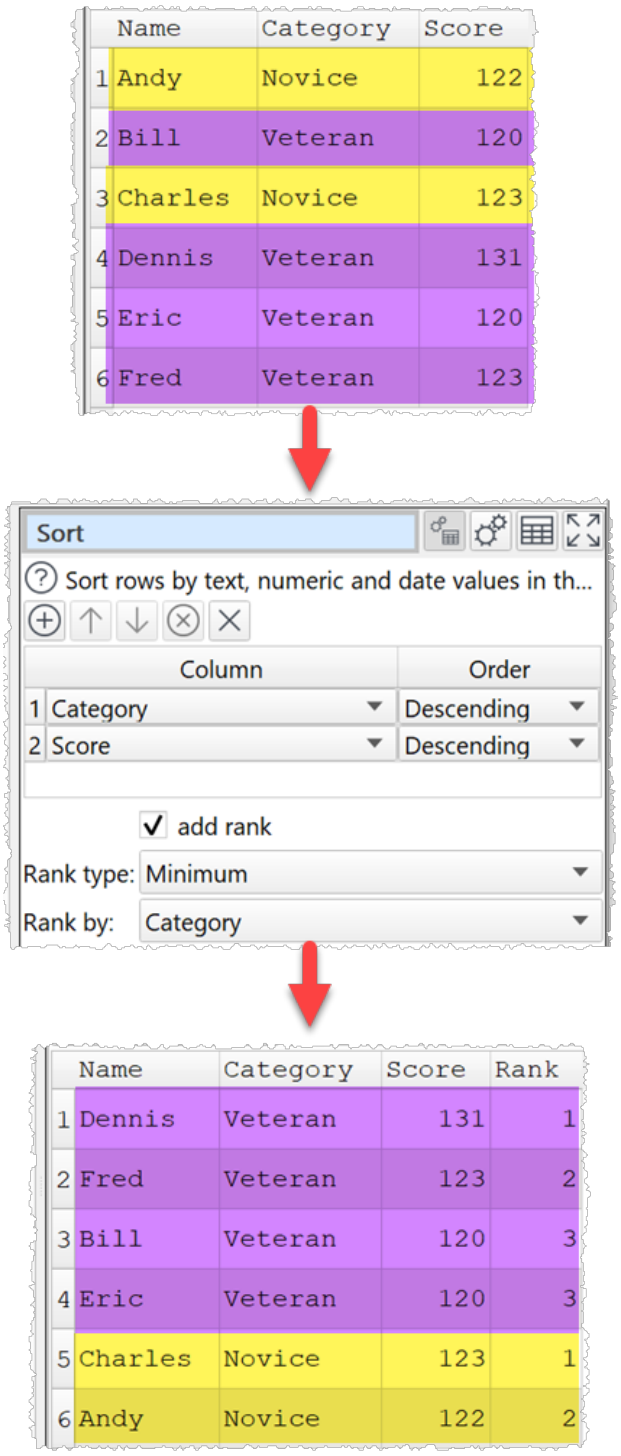


## Inputs

One.

## Options

- Click the ⊕ button to add a new sort level.
- Click the ↑ button to move the selected sort levels up.
- Click the ↓ button to move the selected sort levels down.


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- Click the ⊗ button to delete the selected sort level(s).
- Click the ✕ button to clear all sort levels.
- Set **Column** to the column you want to sort by.
- Set **Order** depending on whether you want to sort this column **Ascending** or **Descending**.
- Check **add rank** to add a ranking column
  - Set **Rank type** according to how you wish to do the ranking:
    - **Minimum**: Uses the minimum rank of each group.
    - **Average**: Uses the average rank of each group.
    - **Maximum**: Uses the maximum rank of each group.
    - **Dense**: Each successive rank is only incremented by 1. There are no gaps.
    - **Cumulative**: Shows the proportion of rows (0 to 1) with the same or lower numbered rank.

For example:

| | Sorted score |
|---|---|
| 1 | 131 |
| 2 | 123 |
| 3 | 123 |
| 4 | 123 |
| 5 | 120 |
| 6 | 120 |

Gives the following rankings, depending on **Rank type**:


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| | Rank type | | | | |
|---|---|---|---|---|---|
| **Sorted score** | **Minimum** | **Average** | **Maximum** | **Dense** | **Cumulative** |
| **131** | 1 | 1 | 1 | 1 | 0.167 |
| **123** | 2 | 3 | 4 | 2 | 0.667 |
| **123** | 2 | 3 | 4 | 2 | 0.667 |
| **123** | 2 | 3 | 4 | 2 | 0.667 |
| **120** | 5 | 5.5 | 6 | 3 | 1 |
| **120** | 5 | 5.5 | 6 | 3 | 1 |

- Set **Rank by** to rank separately for each distinct value in this column. Leave as `<None selected>` if you only want a single ranking for all rows.
- Check **intelligent sort** to sort dates as dates and numbers as numbers. Otherwise everything will be alphabetically sorted as text.


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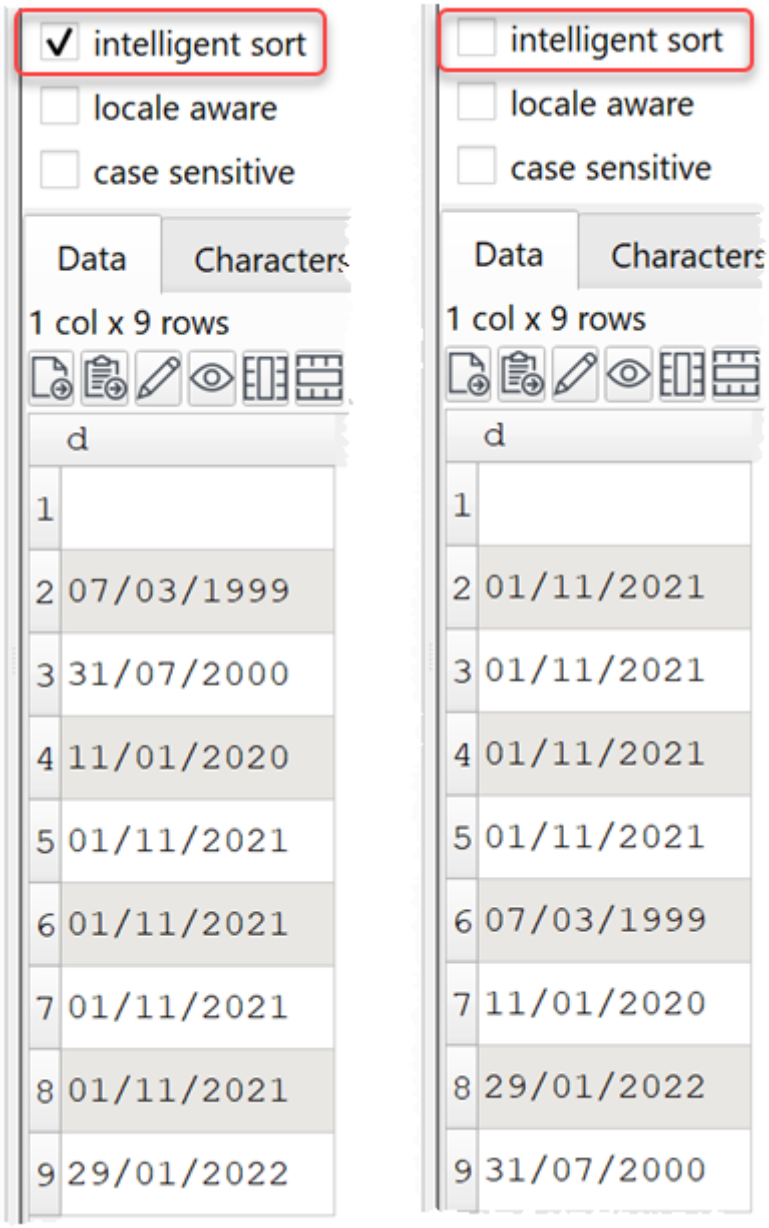


- Check **locale aware** to use the Locale set in Preferences to determine the sorting order. If this is unchecked the sorting will be by Unicode character value, which is a lot faster.
- Check **case sensitive** for case sensitive sorting. This option is not available if **locale aware** is checked.

## Notes

- If you add multiple levels, it will sort by level 1 then level 1 values that are the same will be sorted by level 2 etc.
- Number, date and text values are treated differently for sorting purposes.
- Any values that can be converted to numbers will be treated as numbers.
- Any values that match the supported date formats in Preferences will be treated as dates.


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- Comparisons of text are case and whitespace sensitive. You can use Case to change the case and Whitespace to remove whitespace before sorting.
- If you want to rank rows without losing the original order, use Row Num to add a row number before the **Sort**, and then use another **Sort** on the **Row Num** column to return to the original order.
- Columns that are not being sorted, can be sorted into any order and this may vary between different releases of Easy Data Transform and Windows and Mac versions.

### See also

- Video: How to rank data

## 2.3.56 Split Col

### Description

Split a column into multiple new columns or rows.

### Examples

Split the 'Courses' column into multiple columns or rows:


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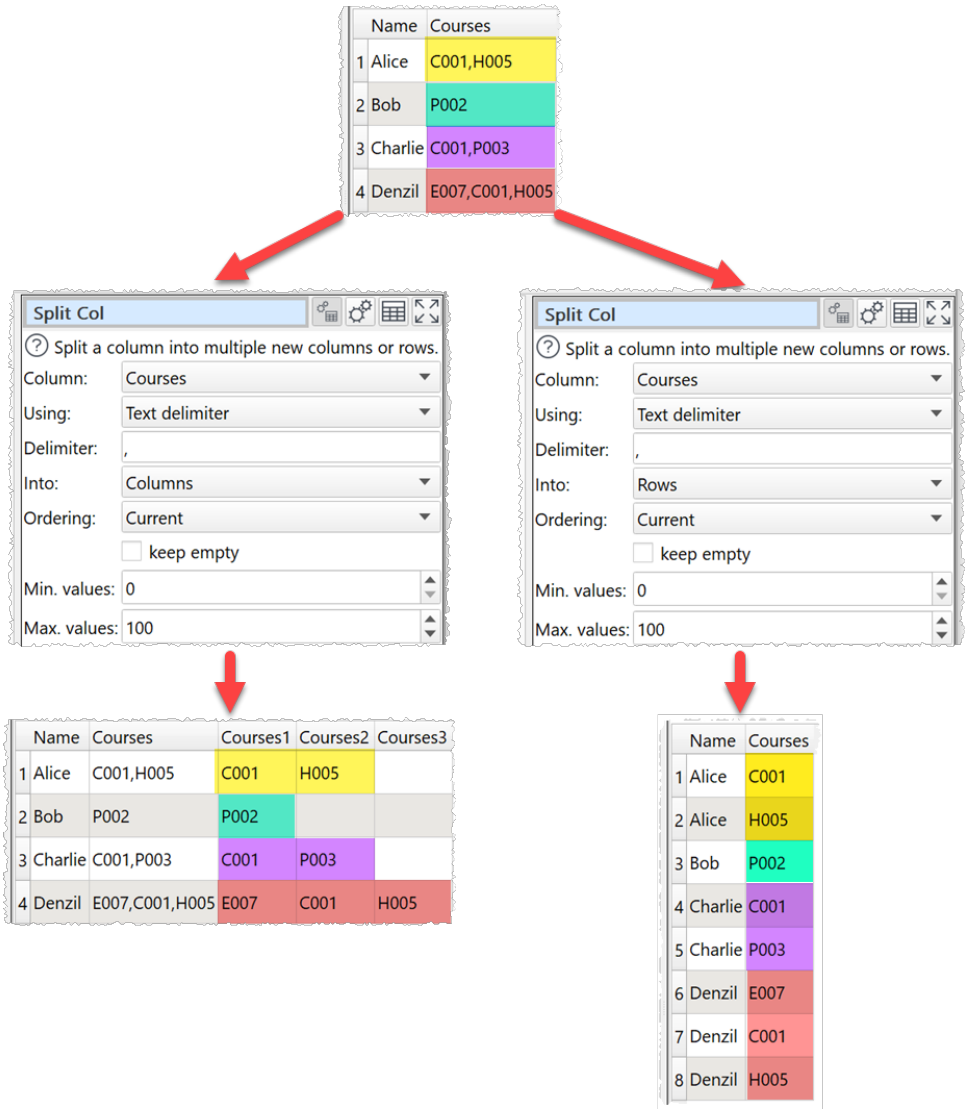


Split the 'URL' column into multiple columns using colon, slash, question mark or ampersand:


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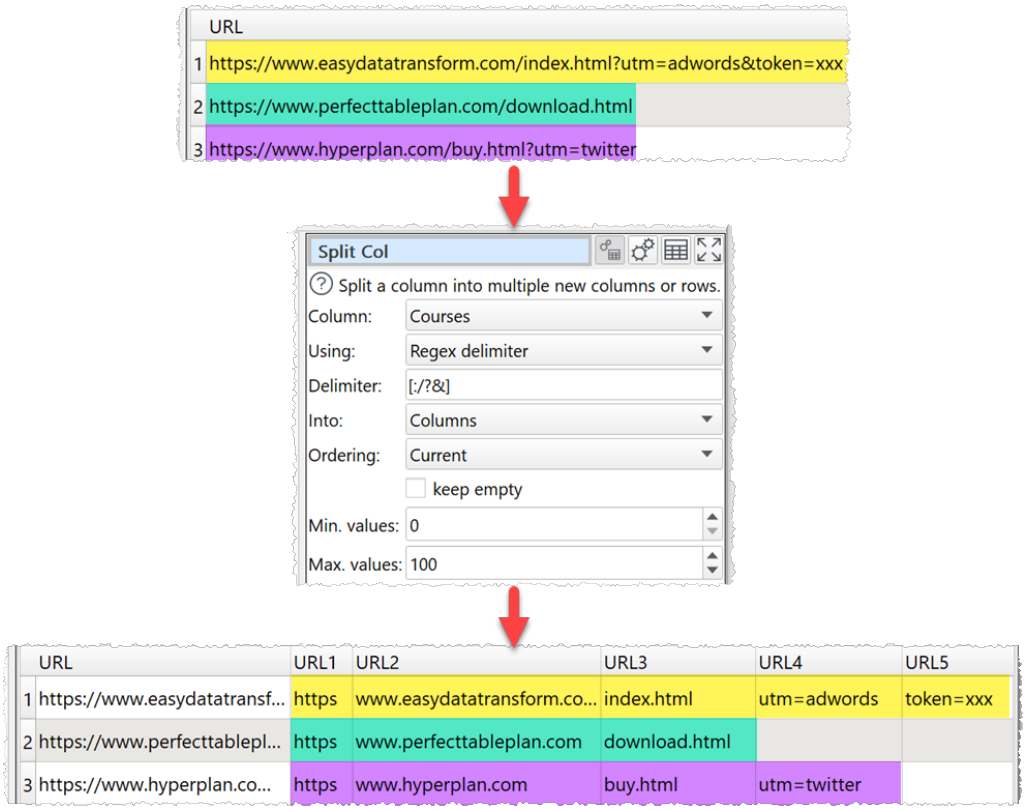


Split characters 4 to 13 and 15 onward into new columns:


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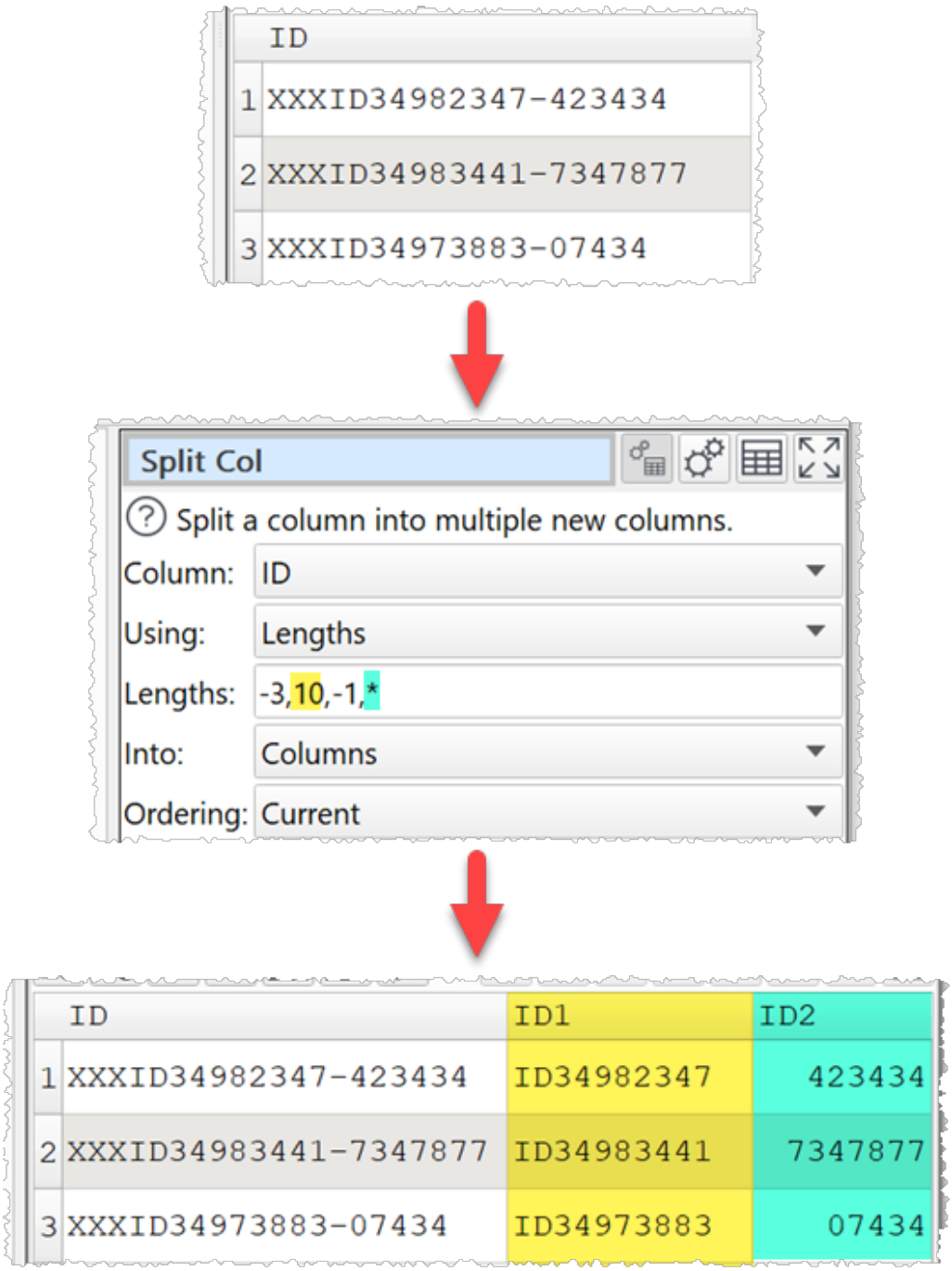


## Inputs

One.

## Options

- Select the **Column** you wish to split.
- Set **Using** depending on whether you wish to split using a **Text delimiter** (usually a single character), a **Regex delimiter** or **Lengths** of each column.
- Set the **Delimiter** for splitting the column. E.g. , (Comma). For **Text delimiter** or **Regex delimiter** only.


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- Set **Lengths** as a Comma separated list of the number of characters in each new column. Put - in front of a value to ignore it. Use * as a wildcard to mean 'the rest of the value'. Only 1 * can be used. For **Lengths** only. For example:
  - `3,5,4` will create 3 columns with characters 1-3, 4-8 and 8-11
  - `-3,5,-4,*` will create 2 columns with characters 4-8 and 12 onward
  - `-*,3` will create 1 column with the last 3 characters
  - `2,-*,2` will create 2 columns with the first 2 and last 2 characters
- Set **Into** to:
  - **Columns** to create a new column for each split value.
  - **Rows** to create a new row for each split value (the original row is removed).
- Set **Ordering** depending on how you want to order values after splitting.
- Check **keep empty** if you wish to keep empty values (e.g. honor delimiters with nothing in between). For **Text delimiter** or **Regex delimiter** only.
- set **Min. values** to the minimum number of columns/rows you wish to split each value into. For **Text delimiter** or **Regex delimiter** only.
- set **Max. values** to the maximum number of columns/rows you wish to split each value into (ignored if less than minimum). For **Text delimiter** or **Regex delimiter** only.

### Notes

- Set **Min. values** to the same as **Max. values** to always create the same number of columns.
- To split a column by Carriage Returns or Tabs set **Using** to **Regex delimiter** and set **Delimiter** to `\n` or `\t`, respectively.
- If **Into** is **Columns**, new columns are added at the right end. You can change the column order with Reorder Cols.
- If there is a header, the header of the new column is based on the original header. You can change the column name with Rename Cols.
- The opposite of **Split Col** with **Into** as **Columns** is Concat Cols.
- The opposite of **Split Col** with **Into** as **Rows** is Unique.

### See also

- Split Name
- Split Rows

## 2.3.57 Split Name

### Description

Split a column containing people's names into separate columns for first name, last name etc.


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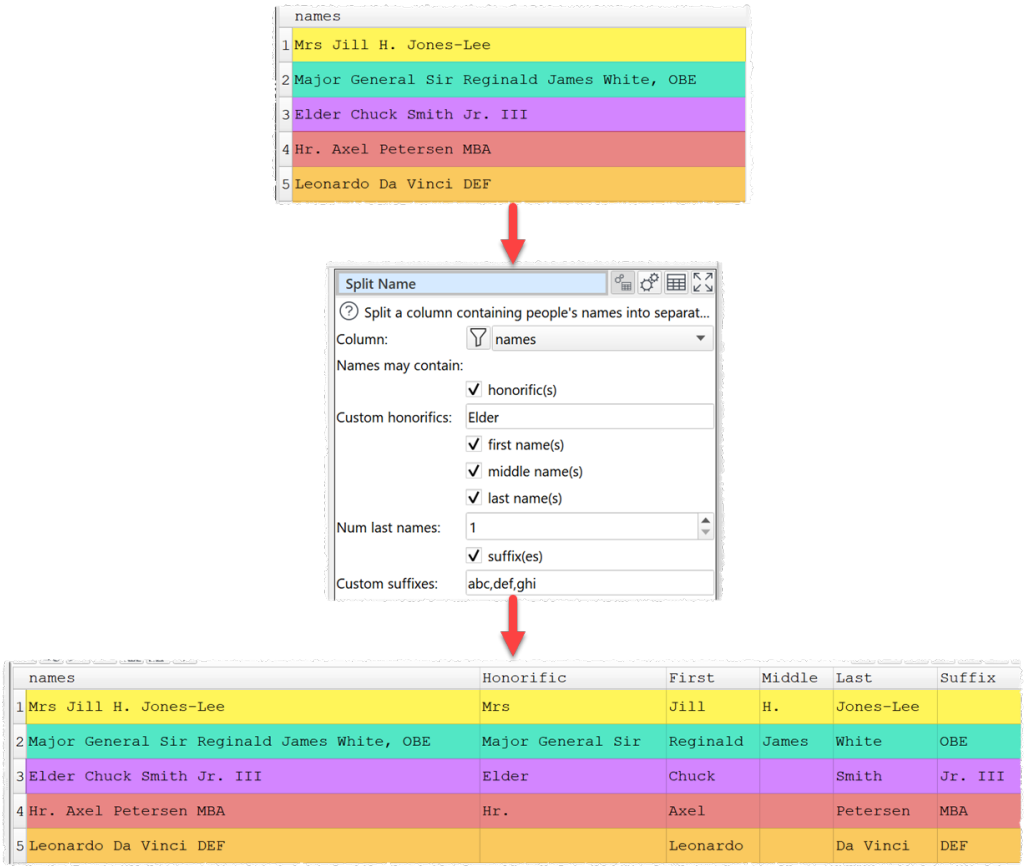
## Examples

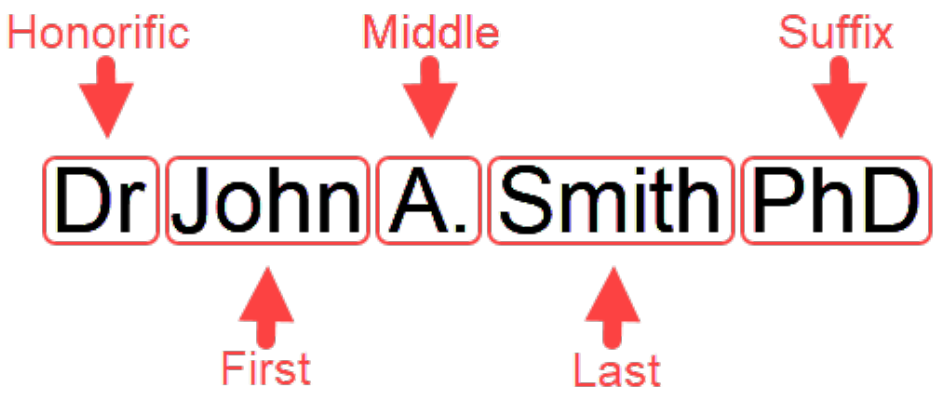
Split the 'names' column into separate columns for honorifics, first names, middle names, last names and suffixes.




## Inputs

One.

## Options




- Select the **Column** with the names you wish to split.
- Check **honorific(s)** if names may contain honorifics/titles.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- In **Custom honorifics** add any honorifics that Easy Data Transform does not recognize, as a comma separated list. Case is not important.
- Check **first name(s)** if names may contain first/given names.
- Check **middle name(s)** if names may contain middle names.
- Check **last name(s)** if names may contain last/family names.
- Set **Num last names** to the number of last names expected for each name (not including particules). E.g. this will typically be 1 for UK and US names and 2 for Spanish names.
- Check **suffix(es)** if names may contain suffixes/post-nominal titles.
- In **Custom suffixes** add any suffixes that Easy Data Transform does not recognize, as a comma separated list. Case is not important.

### Notes

- The **Split Name** transform uses various heuristics (rules of thumb) to split a name into parts. It expects each value to be a single name in the order: `honorific(s) -> first name(s) -> middle name(s) -> last name(s) -> suffix(es)`, separated by whitespace or commas. Some of the name parts can be missing, but they must be in this order.
- **Split Name** cannot guarantee to be 100% accurate. For example it is impossible to know for sure if the 'Lee' In 'John Lee Hooker' is a first name, middle name or last name. In such situations it will make a guess.
- The splitting algorithm knows about:
  - Common honorifics in a range of languages, such as: 'Mr', 'Mrs', 'Miss', 'Ms', 'Herr' and 'Frau', and their abbreviations.
  - Military, political, religious and other honorifics, such as: 'Major General' and 'Rabbi'.
  - 'Particules' at the start of last names, such as: 'de' and 'von'.
  - Common suffixes, such as: 'MBA', 'PhD' and 'Jr'.
- If values can contain multiple names (e.g. 'Mr John Smith & Mrs Jane Smith') you will need to split the column using Split Col, before you use **Split Name**.
- To combine the columns created back into a single column, with additional text and in a different order, using Substitute.

### See also

- Video: How to separate names in Excel
- Split Col
- Case

## 2.3.58 Split Rows

### Description

Split each row into multiple rows.


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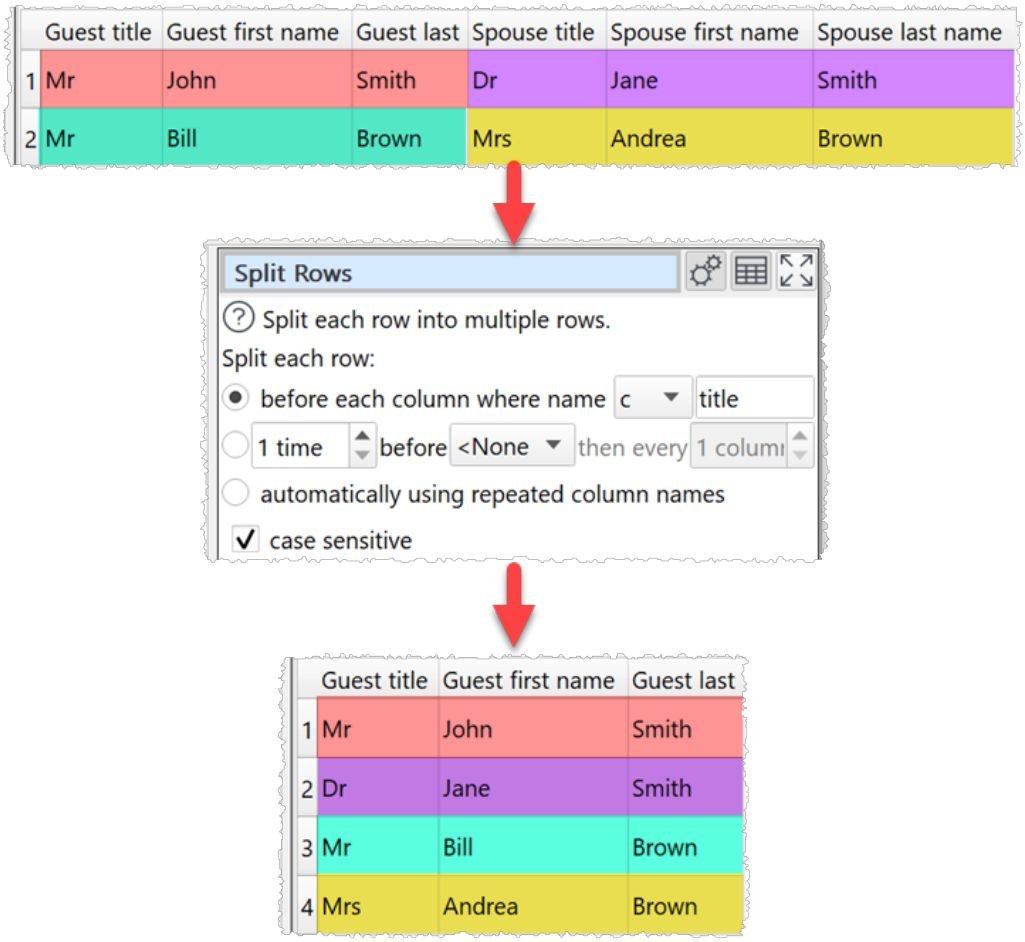
## Examples

Split rows before each column containing 'title':




Split rows using repeated column names: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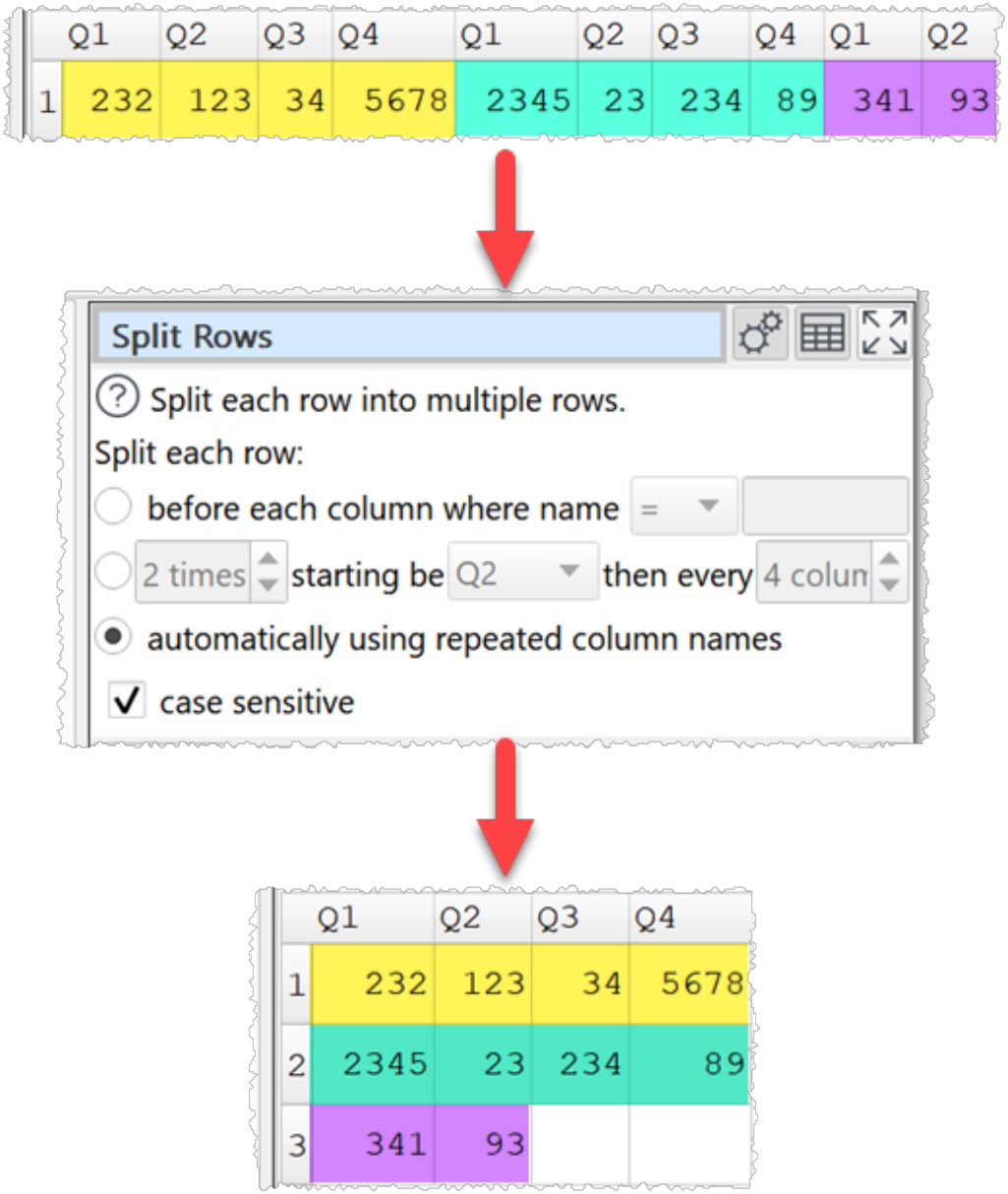


## Inputs

One.

## Options

- Split by column name:
  - Each row will be split before each column that matches the criteria.
- Split a fixed number of times:
  - Define the number of **times** you want to split each row, **starting before** which column and **then every** N columns.
  - The split is added before the designated columns.
  - Splits after the last column are ignored. So you can set **times** to a large number if you don't know how many columns there will be.
- Split automatically:


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    - Find the first column name that appears more than once and split each row before each column with that name.
- Check **case sensitive** to use case sensitive matching for column names.

### Notes

- Comparisons of column names are whitespace sensitive.
- Use the keyboard `Up` and `Down` arrow keys to move the focus between the 'radio' buttons.
- Splits added before the first column are ignored, as there is already a split there.
- Use New Col or Rename Cols if you need to add additional columns or rename columns before splitting rows.
- The opposite of **Split Rows** is Concat Rows.

### See also

- Reshape
- Gather
- Split Col

## 2.3.59 Spread

### Description

Spread a column into multiple new columns. Also called wide pivot or crosstab.

### Example

Spread 'Quarter' and 'Amount' columns to multiple columns:


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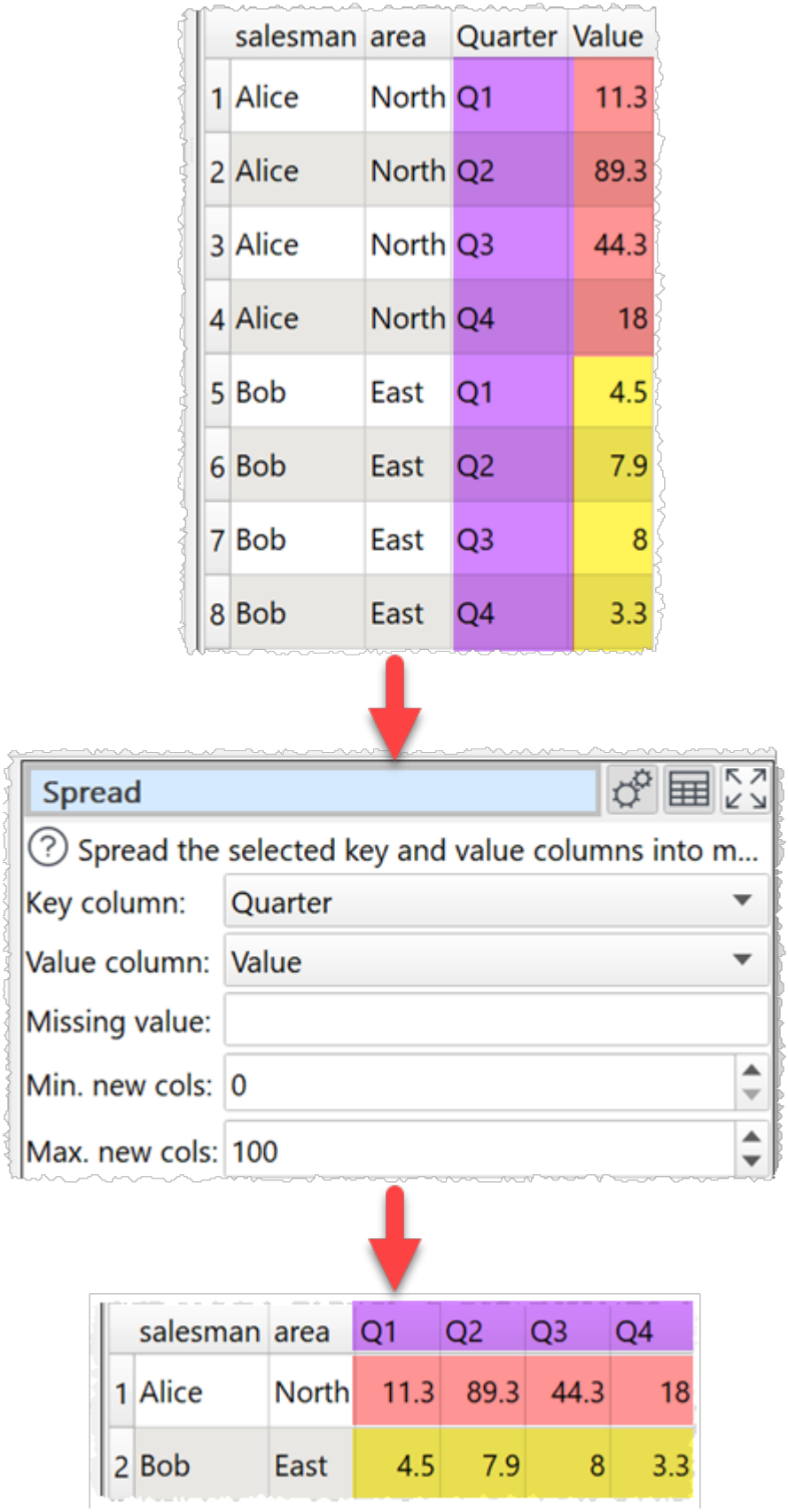


## Inputs

One.


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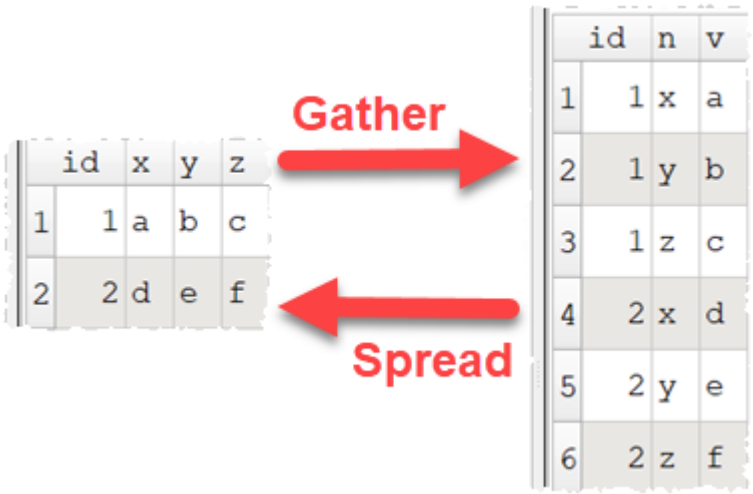
### Options

- Select the **Key column** and **Value column** you wish to spread.
- **Missing values** is used for values missing from the input dataset.
- set **Min. new cols** to the minimum number of new columns you wish to add, compared to the original dataset.
- set **Max. new cols** to the maximum number of new columns you wish to add, compared to the original dataset. Ignored if less than minimum.

### Notes

- Set **Min. values** to the same as **Max. values** to always create the same number of columns.
- Use Sort on the key column before this transform if you need to control the order of columns created.
- If there are rows that are duplicates, apart from the value column, this will cause errors.
- New columns are added at the right end. You can change the column order with Reorder Cols.
- You can merge the new columns into a single column with Concat Cols.
- The opposite of **Spread** is Gather.




## 2.3.60 Stack

### Description

Merge rows from inputs, one on top of the other.

### Examples

Stack 3 employee datasets by header name: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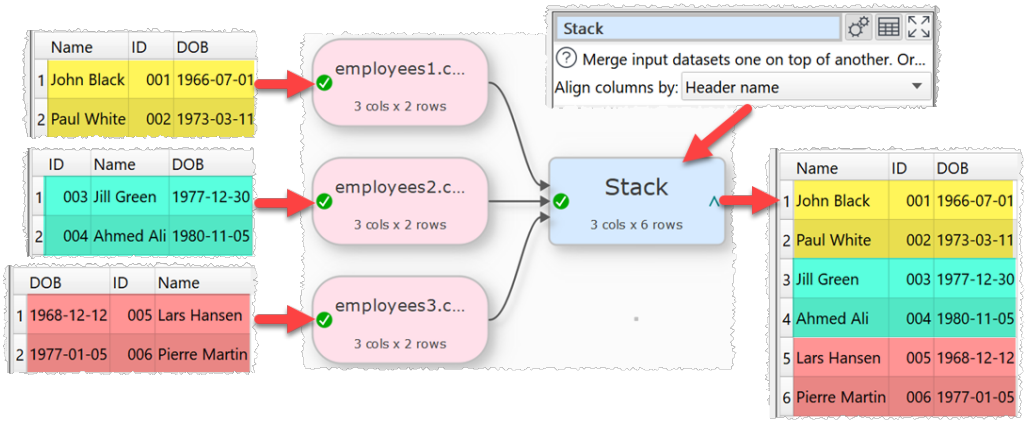
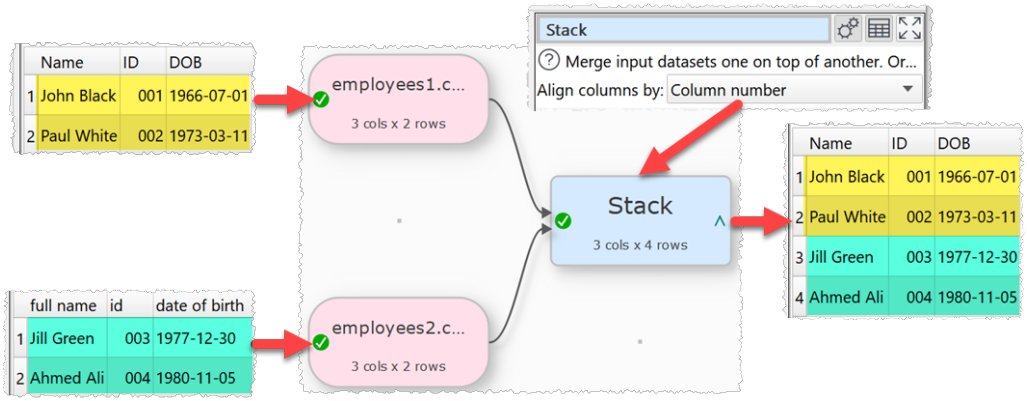
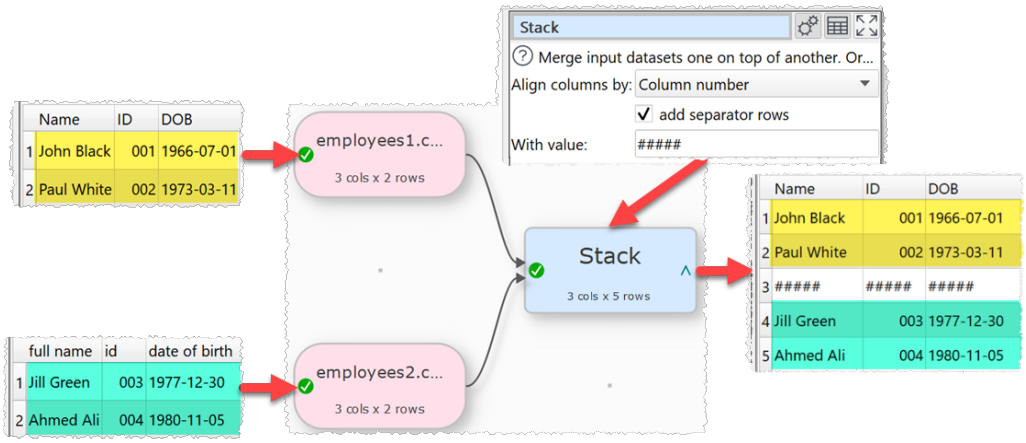



Stack 2 employee datasets by column number:




Stack 2 employee datasets with a separator row:




## Inputs

One or more.

## Options

- Select **Align columns by** to **Header name** if you want line up column values by header name (e.g. the 'id' column in input 1 with the 'id' column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in input 2) and **Column number** to align by the column number (e.g. the first column of input 1 with the first column of input 2). The headers will be matched in order:
  - case and whitespace sensitive (e.g. 'ID' to 'ID'); then
  - case insensitive and whitespace sensitive (e.g. 'Id' to 'ID'); then
  - case sensitive and whitespace insensitive (e.g. 'ID' to ' ID '); then
  - case and whitespace insensitive (e.g. 'Id' to ' ID ')
- Check **use only top dataset columns** to ignore columns not in the first dataset.
- Check **add separator rows** to extra rows to separate the inputs. The value entered for **With value** is used for each column of the separator rows.

### Notes

- The stacking order depends on the vertical (Y-axis) position of the inputs.
- Stack merges datasets one on top of the other (vertically). To merge datasets side-by-side (horizontally) use Join.
- If you align by **Column number** the header of the first input is used.
- Messages are shown in the **Warnings** tab for:
  - duplicated column names within an input dataset when **Align columns by** is set to **Header name**
  - columns stacked under columns with different names when **Align columns by** is set to **Column number**
  - differing numbers of columns between input datasets
- It is sometimes useful to **Stack** a single dataset, so you can add more inputs later.

### See also

- Cross
- Join
- Merge datasets
- Schemas
- Video: How to clean, merge and scrub email lists

## 2.3.61 Stamp

### Description

Adds a stamp with time, date and other information as a new row or a new column.

### Examples

Add the current date to the end of each row:


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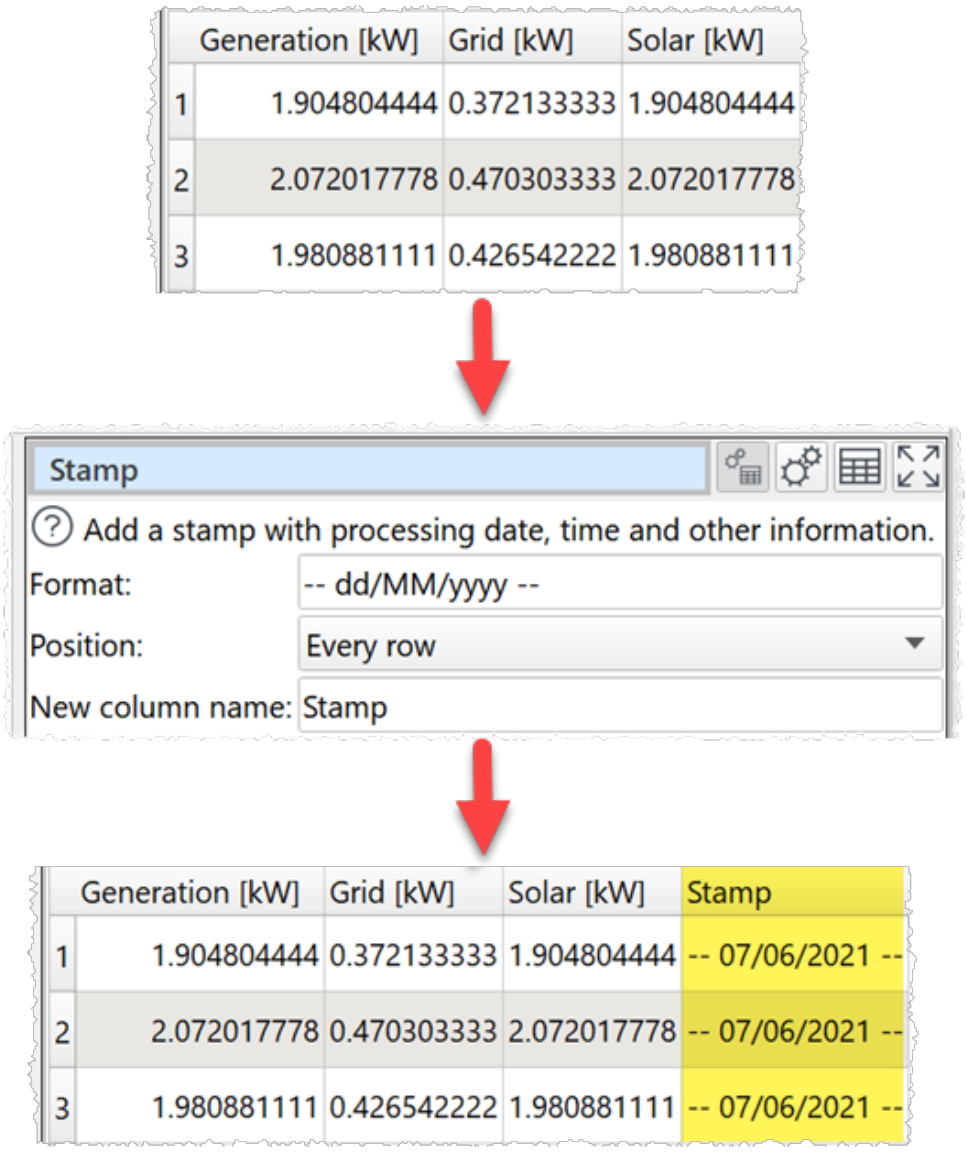


Add the current date and time to the top of a dataset with a comment:


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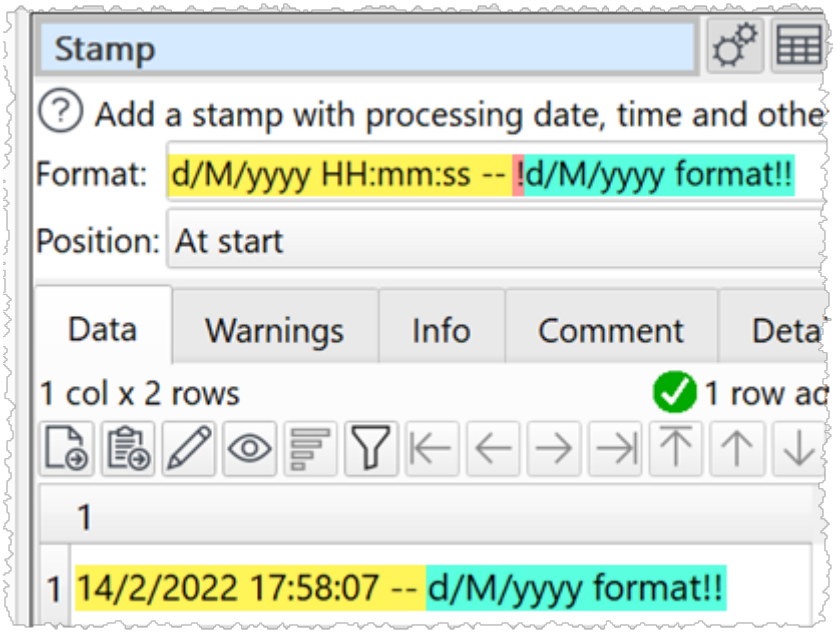


## Inputs

One.

## Options

- Supply the stamp format in **Format** (see below).

| Format | Meaning |
|---|---|
| `d` | The day as number without a leading zero (1 to 31) |
| `dd` | The day as number with a leading zero (01 to 31) |
| `ddd` | The abbreviated localized day name (e.g. 'Mon' to 'Sun'). Uses the locale to localize the name. |
| `dddd` | The long localized day name (e.g. 'Monday' to 'Sunday'). Uses the locale to localize the name. |
| `M` | The month as number without a leading zero (1 to 12). |
| `MM` | The month as number with a leading zero (01 to 12) |
| `MMM` | The abbreviated localized month name (e.g. 'Jan' to 'Dec'). Uses the |


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| Format | Meaning |
| --- | --- |
| | locale to localize the name. |
| MMMM | The long localized month name (e.g. 'January' to 'December'). Uses the locale to localize the name. |
| yy | The year as two digit number (00 to 99). |
| yyyy | The year as four digit number. If the year is negative, a minus sign is prepended in addition. |
| h | The hour without a leading zero (0 to 23 or 1 to 12 if AM/PM display). |
| hh | The hour with a leading zero (00 to 23 or 01 to 12 if AM/PM display). |
| H | The hour without a leading zero (0 to 23, even with AM/PM display). |
| HH | The hour with a leading zero (00 to 23, even with AM/PM display). |
| m | The minute without a leading zero (0 to 59). |
| mm | The minute with a leading zero (00 to 59). |
| s | The whole second without a leading zero (0 to 59). |
| ss | The whole second with a leading zero where applicable (00 to 59). |
| z | The fractional part of the second, to go after a decimal point, without trailing zeroes (0 to 999). Thus "s.z" reports the seconds to full available (millisecond) precision without trailing zeroes. |
| AP or A | The fractional part of the second, to millisecond precision, including trailing. |


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| Format | Meaning |
|---|---|
| `ap or a` | Use am/pm display. a/ap will be replaced by either "am" or "pm". |
| `t` | The timezone (for example "CEST"). |
| `$(c)` | The computer name. |
| `$(f)` | The location (path) of the .transform file, e.g. `C:\Users\andy\Desktop\mytransform.transform`. |
| `$(u)` | The name of the user (from the `USER` or `USERNAME` environment variable). |
| `!` | Anything after the first `!` (Exclamation) character won't be substituted. |

- Select from **Position** whether you want the stamp row added to the start or end of the dataset or to every row in a new column.
- Set **New column name** to the name of the new column you want to create (only for **Position** = **Every row**).

### Notes

- If you add the stamp to **Every Row** you can move the column using Reorder Cols.
- The **Format** text is case sensitive.

### See also

- Meta information
- Stack

## 2.3.62 Stats

### Description

Calculates statistics by column and/or row in one or more selected columns.

### Example

Calculate column and row averages:


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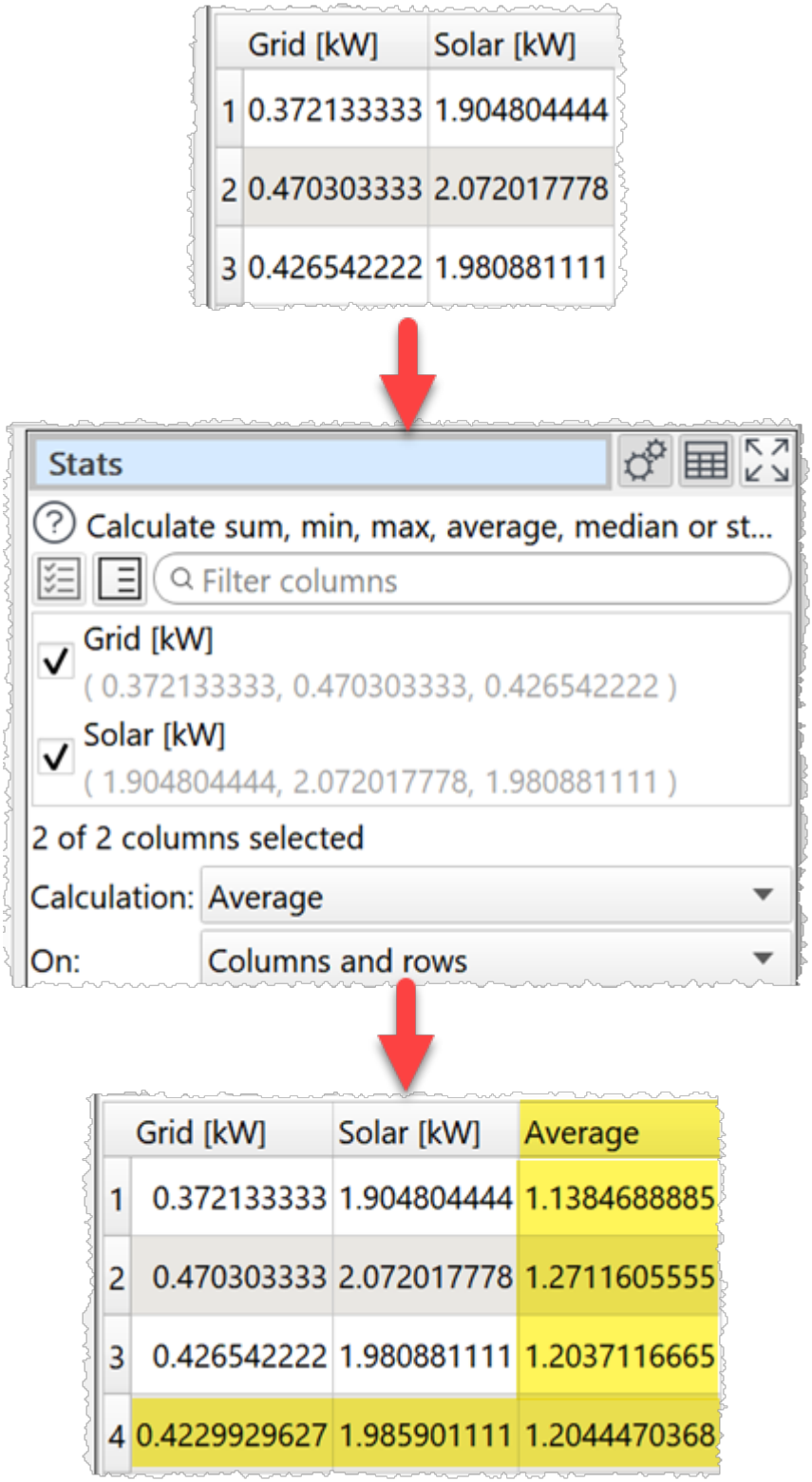


## Inputs

One.

## Options

- Check the column(s) you wish to calculate stats for.


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- Set **Calculation** to the statistic you want to calculate:
  - **Sum** show the sum of the values.
  - **Minimum** shows the smallest value.
  - **Maximum** shows the largest value.
  - **Average** shows the arithmetic mean of the values.
  - **Median** shows the median of numeric values in the column.
  - **Mode** shows the mode of numeric values in the column.
  - **Standard deviation** is the sample standard deviation (equivalent to Excel function stddev.s).
  - **Variance** is the square of the sample standard deviation.
  - **Q1** is the first quartile (calculated using Method 1 here).
  - **Q3** is the third quartile (calculated using Method 1 here).
  - **IQR** is the Inter Quartile Range.
  - **Skew** is the alternative Pearson Mode Skewness (3 * (Mean – Median) / Standard Deviation ).
  - **Percentile (inclusive)** is an interpolated value at which the specified **Percentile** of values are below or equal to this value. It is similar to the Excel `PERCENTILE.INC()` function.
  - **Percentile (exclusive)** is an interpolated value at which the specified **Percentile** of values are below this value. It is similar to the Excel `PERCENTILE.EXC()` function.
- **Percentile** is the percentile value to use in **Percentile (inclusive)** and **Percentile (exclusive)** calculation.
- Set **On** depending on whether you wish to calculate the statistics for columns, rows or both.
  - If **On** is set to **Columns** an extra row with the results is added to the bottom.
  - If **On** is set to **Rows** an extra column with the results is added to the right.
  - If **On** is set to **Columns and rows** an extra row with the results is added to the bottom and extra column with the results is added to the right. The bottom right cell contains the calculation across all values.

## Notes

- Non-numerical and empty values are ignored.
- **Mode** may not work as expected with non-integer values, due to precision issues. You can fix this by using a Num Format transform first.
- Use Num Format to change the precision of the results.
- Use Scale to convert the results to percentages.
- If you want to compute the sum, minimum, maximum or average for each distinct value in 1 or more columns you can use Unique.

## See also

- Correlate


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- Count
- Pivot
- Summary

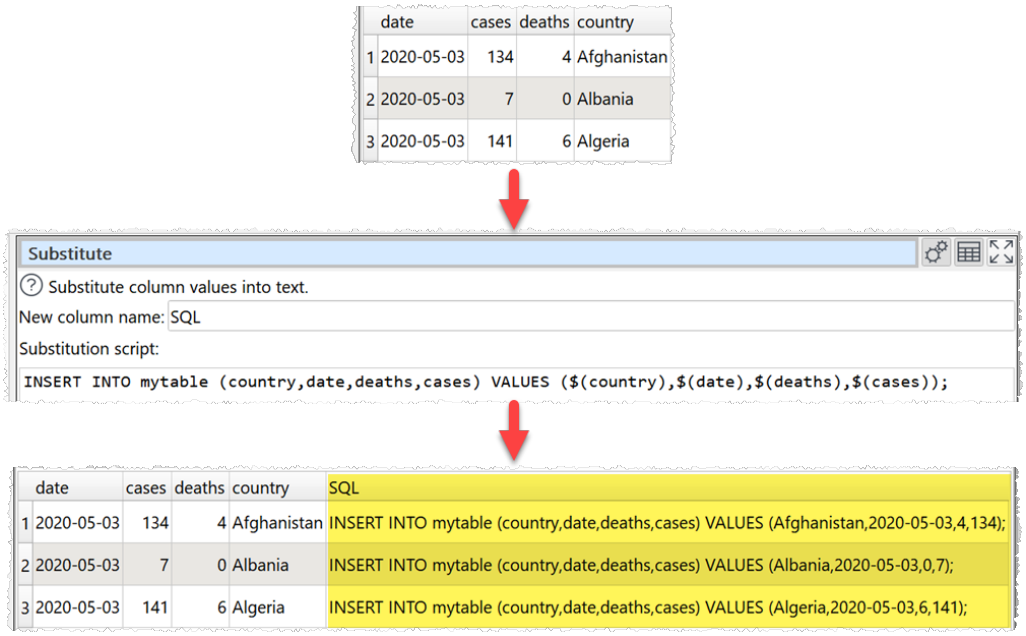
## 2.3.63 Substitute

### Description

Substitute column values into text.

### Example

Create an SQL statement to insert 'date', 'cases', 'deaths' and 'country' values into 'mytable':




| | date | cases | deaths | country |
|---|---|---|---|---|
| 1 | 2020-05-03 | 134 | 4 | Afghanistan |
| 2 | 2020-05-03 | 7 | 0 | Albania |
| 3 | 2020-05-03 | 141 | 6 | Algeria |

| | date | cases | deaths | country | SQL |
|---|---|---|---|---|---|
| 1 | 2020-05-03 | 134 | 4 | Afghanistan | INSERT INTO mytable (country,date,deaths,cases) VALUES (Afghanistan,2020-05-03,4,134); |
| 2 | 2020-05-03 | 7 | 0 | Albania | INSERT INTO mytable (country,date,deaths,cases) VALUES (Albania,2020-05-03,0,7); |
| 3 | 2020-05-03 | 141 | 6 | Algeria | INSERT INTO mytable (country,date,deaths,cases) VALUES (Algeria,2020-05-03,6,141); |

### Inputs

One.

### Options

- Set **New column name** to the name of the new column you want to create.
- Enter your substitution script into the **Substitution script** field.
- Select a column from **Insert variable** to add that column variable into the **Substitution script** field at the current cursor position.
- Click the **Evaluate** button to evaluate your script over every row and show any errors (only available if **Run>Auto Run** is checked).

### Notes

- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.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- If you want to carry out your transform across more than one dataset, you should Join them first.
- If you need to do something more complex than this transform allows, try the Javascript transform.
- Warnings are shown in the **Warnings** tab for ambiguous column references.

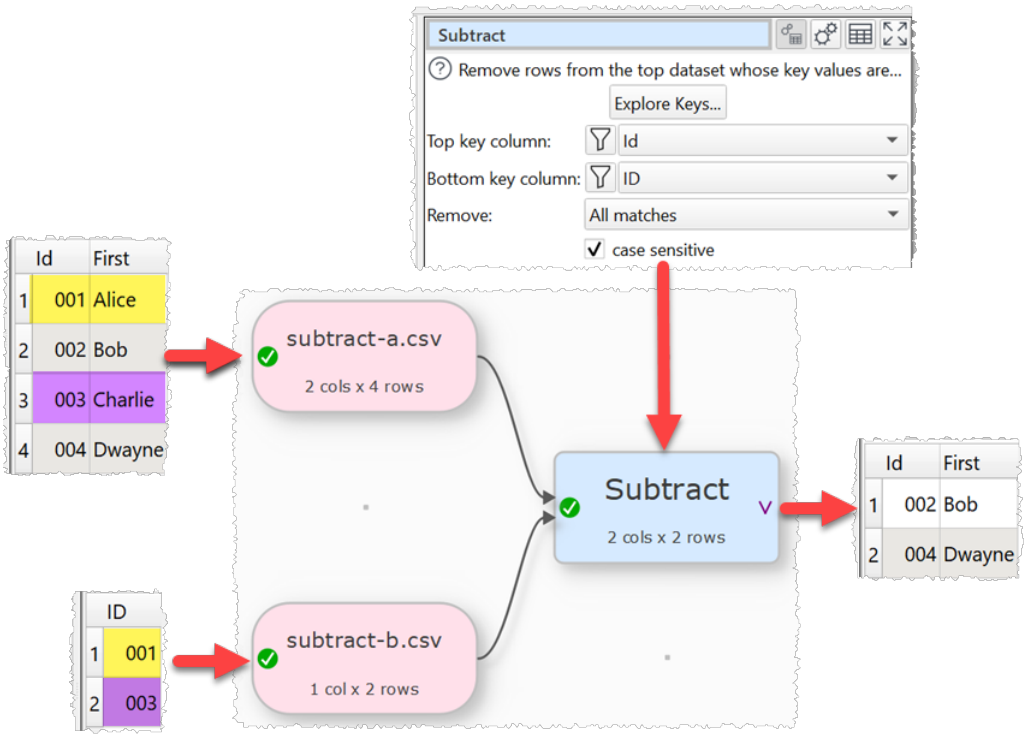
## 2.3.64 Subtract

### Description

Remove rows from the top dataset with key values that are present in the lower dataset.

### Example

Subtract from the top dataset all the rows with IDs in the bottom dataset:




### Inputs

Two.

### Options

- The output depends on the vertical (Y-axis) position of the inputs.
- Click **Explore Keys...** to compare key values in the 2 datasets.
- Select **Top key column** for the column you want to match in the top input dataset.
- Select **Bottom key column** for the column you want to match in the bottom input dataset.
- Set **Remove** according to which row matches you wish to remove: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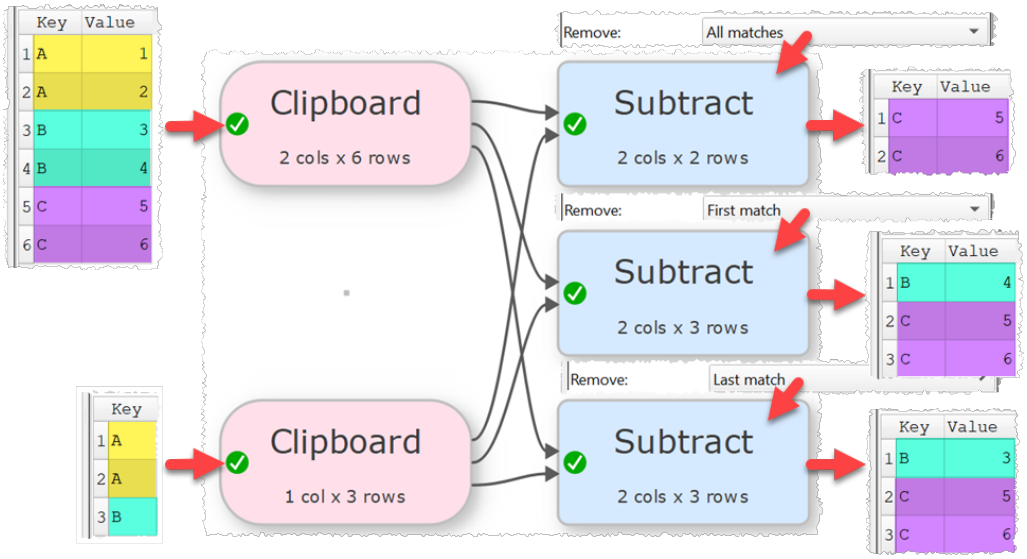
- **All matches** to remove every row from the top dataset where the key exists in the bottom dataset.
- **First match** to remove 1 row in the top dataset for each matching key in the bottom dataset, proceeding from first to last row in the top dataset.
- **Last match** to remove 1 row in the top dataset for each matching key in the bottom dataset, proceeding from last to first row in the top dataset.




- Check **case sensitive** to use case sensitive matching for keys.

## Notes

- The **Info** tab shows some examples of rows removed.
- This transform is sometimes called an anti-join.
- If there are 10k rows or less in both datasets, Easy Data Transform will try to guess sensible default values for **Top key column** and **Bottom key column** based on column header names and contents.
- If the first input has a header, this will be used for the output.
- All values are treated as text and comparisons are whitespace sensitive. You can use Whitespace to remove whitespace before the subtract.
- All rows in the top dataset with a given key value are removed if that key value occurs 1 or more times in the bottom dataset.
- You can use Concat Cols to join several columns together (e.g. 'first name' and 'last name' columns) to form a key column.
- You can use Row Num to create a unique key column.
- Use a second **Subtract** transform to see what was subtracted: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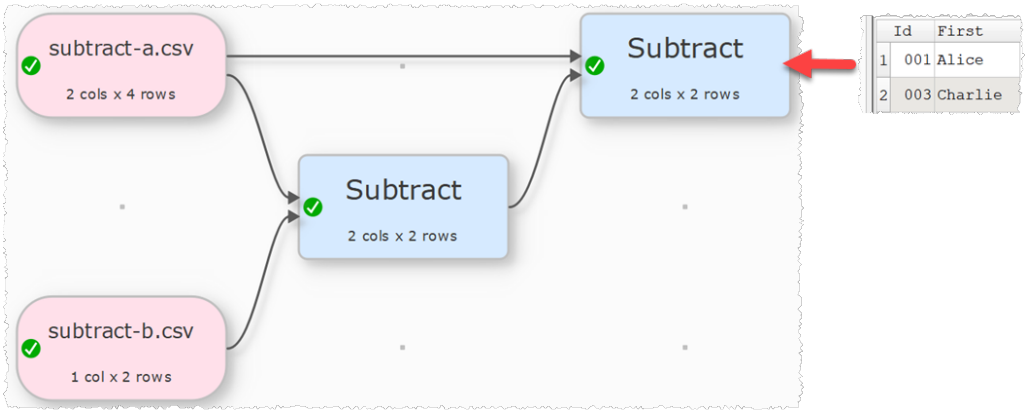


### See also

- Difference
- Intersect
- Use multiple keys for Join/Lookup/Intersect/Subtract
- Video: How to clean, merge and scrub email lists

## 2.3.65 Summary

### Description

Summarize the values in the selected columns.

### Example

Create a summary, including dates and statistics:


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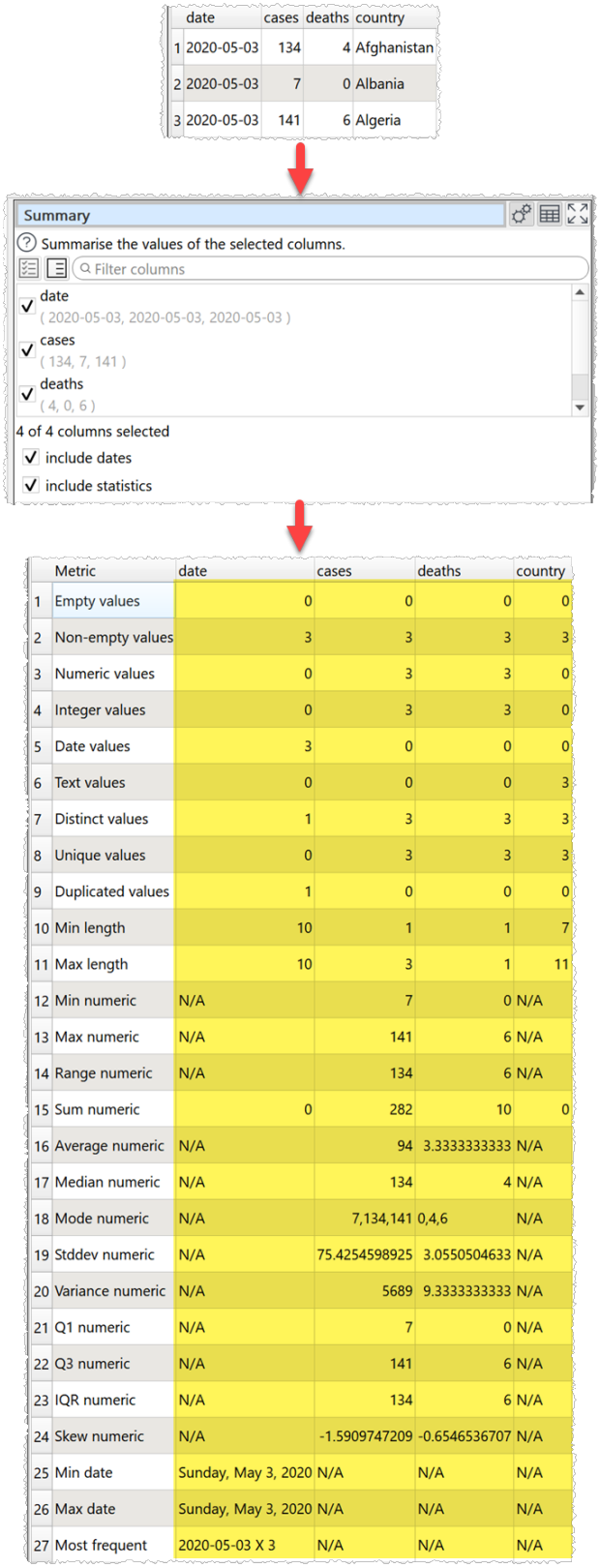


| | date | cases | deaths | country |
|---|---|---|---|---|
| 1 | 2020-05-03 | 134 | 4 | Afghanistan |
| 2 | 2020-05-03 | 7 | 0 | Albania |
| 3 | 2020-05-03 | 141 | 6 | Algeria |

| | Metric | date | cases | deaths | country |
|---|---|---|---|---|---|
| 1 | Empty values | 0 | 0 | 0 | 0 |
| 2 | Non-empty values | 3 | 3 | 3 | 3 |
| 3 | Numeric values | 0 | 3 | 3 | 0 |
| 4 | Integer values | 0 | 3 | 3 | 0 |
| 5 | Date values | 3 | 0 | 0 | 0 |
| 6 | Text values | 0 | 0 | 0 | 3 |
| 7 | Distinct values | 1 | 3 | 3 | 3 |
| 8 | Unique values | 0 | 3 | 3 | 3 |
| 9 | Duplicated values | 1 | 0 | 0 | 0 |
| 10 | Min length | 10 | 1 | 1 | 7 |
| 11 | Max length | 10 | 3 | 1 | 11 |
| 12 | Min numeric | N/A | 7 | 0 | N/A |
| 13 | Max numeric | N/A | 141 | 6 | N/A |
| 14 | Range numeric | N/A | 134 | 6 | N/A |
| 15 | Sum numeric | 0 | 282 | 10 | 0 |
| 16 | Average numeric | N/A | 94 | 3.3333333333 | N/A |
| 17 | Median numeric | N/A | 134 | 4 | N/A |
| 18 | Mode numeric | N/A | 7,134,141 | 0,4,6 | N/A |
| 19 | Stddev numeric | N/A | 75.4254598925 | 3.0550504633 | N/A |
| 20 | Variance numeric | N/A | 5689 | 9.3333333333 | N/A |
| 21 | Q1 numeric | N/A | 7 | 0 | N/A |
| 22 | Q3 numeric | N/A | 141 | 6 | N/A |
| 23 | IQR numeric | N/A | 134 | 6 | N/A |
| 24 | Skew numeric | N/A | -1.5909747209 | -0.6546536707 | N/A |
| 25 | Min date | Sunday, May 3, 2020 | N/A | N/A | N/A |
| 26 | Max date | Sunday, May 3, 2020 | N/A | N/A | N/A |
| 27 | Most frequent | 2020-05-03 X 3 | N/A | N/A | N/A |

## Inputs

One.


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## Options

- Select the **Columns** you wish to summarize.
- Check **include dates** if you wish to check for date values using supported date formats. This can be slow for large datasets.
- Check **include statistics** if you wish to add the sum, average, median and standard deviation for numeric values.

## Notes

- Whether values are interpreted as number or dates depends on **Supported date formats** and locale.
- **Empty values** is the number of values in the column that are completely empty. Values with whitespace do not count as empty.
- **Non-empty values** is the number of values in the column that are not completely empty. Values with whitespace do not count as empty.
- **Numeric values** is the number of numeric of values in the column that can be interpreted as a number.
- **Integer values** is the number of numeric of values in the column that can be interpreted as integers (whole numbers). "1.0" (depending on your locale), "0", "-1" and "1e3" are considered integers.
- **Real values** is the number of numeric values in the column that can be interpreted as reals (floating point numbers). "1.2345" (depending on your locale) and "1e-3" are considered reals.
- **Boolean values** is the number of values in the column that can be interpreted as booleans (true/false). "TRUE", "True" and "false" are considered booleans.
- **Date values** is the number of values in the column that can be interpreted as a date. Only shown if **check for dates** is checked.
- **Text values** is the number of values in the column that cannot be interpreted as empty, numeric or date.
- **Distinct values** is the number of different values in the column. All values are treated as text (e.g. '7' is treated as different to '7.0' and '1/1/2020' is treated as different to '01/01/2020'). Comparison between values is sensitive to case and whitespace.
- **Unique values** is the number of values that only occur once in the column. Date and numeric values are treated as text. Comparison between values is sensitive to case and whitespace.
- **Duplicated values** is the number of values that occur more than once in the column. Date and numeric values are treated as text. Comparison between values is sensitive to case and whitespace.


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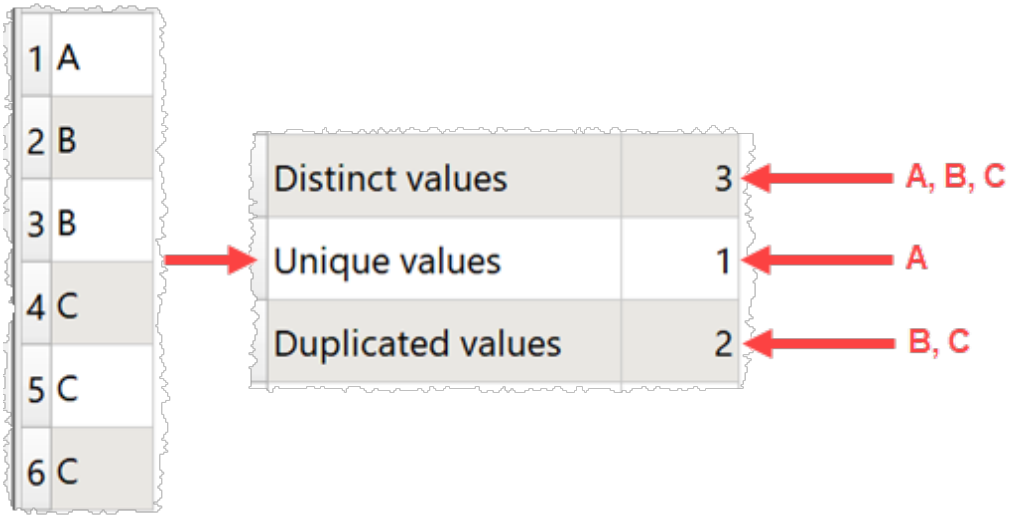


- **Min length** is the minimum number of characters of non-empty values in the column. Whitespace is counted. Date and numeric values are treated as text.
- **Max length** is the maximum number of characters of values in the column. Whitespace is counted. Date and numeric values are treated as text.
- **Average length** is the arithmetic mean of the number of characters of non-empty values in the column. Whitespace is counted. Date and numeric values are treated as text.
- **Min numeric** is the minimum numeric value in the column. Non-numeric and empty values are ignored.
- **Max numeric** is the maximum numeric value in the column. Non-numeric and empty values are ignored.
- **Range numeric** is **Max numeric - Min numeric.**
- **Negative numeric** is the number of negative numeric values in the column. 0 is not considered negative here.
- **Zero numeric** is the number of numeric zero values in the column.
- **Positive numeric** is the number of positive numeric values in the column. 0 is not considered positive here.
- **Sum numeric** is the sum of numeric values in the column. Non-numeric and empty values are ignored. Only shown if **include statistics** is checked.
- **Average numeric** is the arithmetic mean of numeric values in the column. Non-numeric and empty values are ignored. Only shown if **include statistics** is checked.
- **Median numeric** is the median of numeric values in the column. Non-numeric and empty values are ignored. Only shown if **include statistics** is checked.
- **Mode numeric** is the mode of numeric values in the column. Non-numeric and empty values are ignored. Only shown if **include statistics** is checked.
- **Stddev numeric** is the sample standard deviation (equivalent to Excel function stddev.s) of numeric values in the column. Non-numeric and empty values are ignored. Only shown if **include statistics** is checked.


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- **Variance numeric** is the square of the sample standard deviation. Only shown if **include statistics** is checked.
- **Q1 numeric** is the first quartile (calculated using Method 1 here). Only shown if **include statistics** is checked.
- **Q3 numeric** is the third quartile (calculated using Method 1 here). Only shown if **include statistics** is checked.
- **IQR numeric** is the Inter Quartile Range. Only shown if **include statistics** is checked.
- **Skew numeric** is the alternative Pearson Mode Skewness (3 * (Mean – Median) / Standard Deviation ). Only shown if **include statistics** is checked.
- **Format date** is the inferred format of dates in the column. Only shown if **include dates** is checked.
- **Min date** is the minimum date value in the column. Only shown if **include dates** is checked.
- **Max date** is the maximum date value in the column. Only shown if **include dates** is checked.
- **Range date** is **Max date** - **Min date** + 1**.** Only shown if **include dates** is checked.
- **Distinct dates** is the number of distinct date values. 01/01/2000 and 1/1/2000 is only 1 distinct date. Only shown if **include dates** is checked.
- **Missing dates** is the number of missing dates in sequence from **Min date** to **Max date**. Only shown if there is no row sampling and **include dates** is checked.
- **Most frequent** lists the most common text in the column. Empty values are not counted. Date and numeric values are treated as text. Comparison between values is sensitive to case and whitespace.

## Notes

- If your dataset is large, you might want to Sample it first.
- Use Num Format to change the precision of numerical results.
- You can use Whitespace to remove any whitespace at the start or end of values before **Summary**.
- If you wish to have a row displayed per column you can Transpose the table first.
- **Mode** may not work as expected with non-integer values, due to precision issues. You can fix this by using a Num Format transform first.

## See also

- Correlate
- Count
- Ngram
- Pivot
- Stats


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## 2.3.66 Total

### Description

Add a new column with a running (cumulative) total of the selected column.

### Examples

Total the 'transaction' column:


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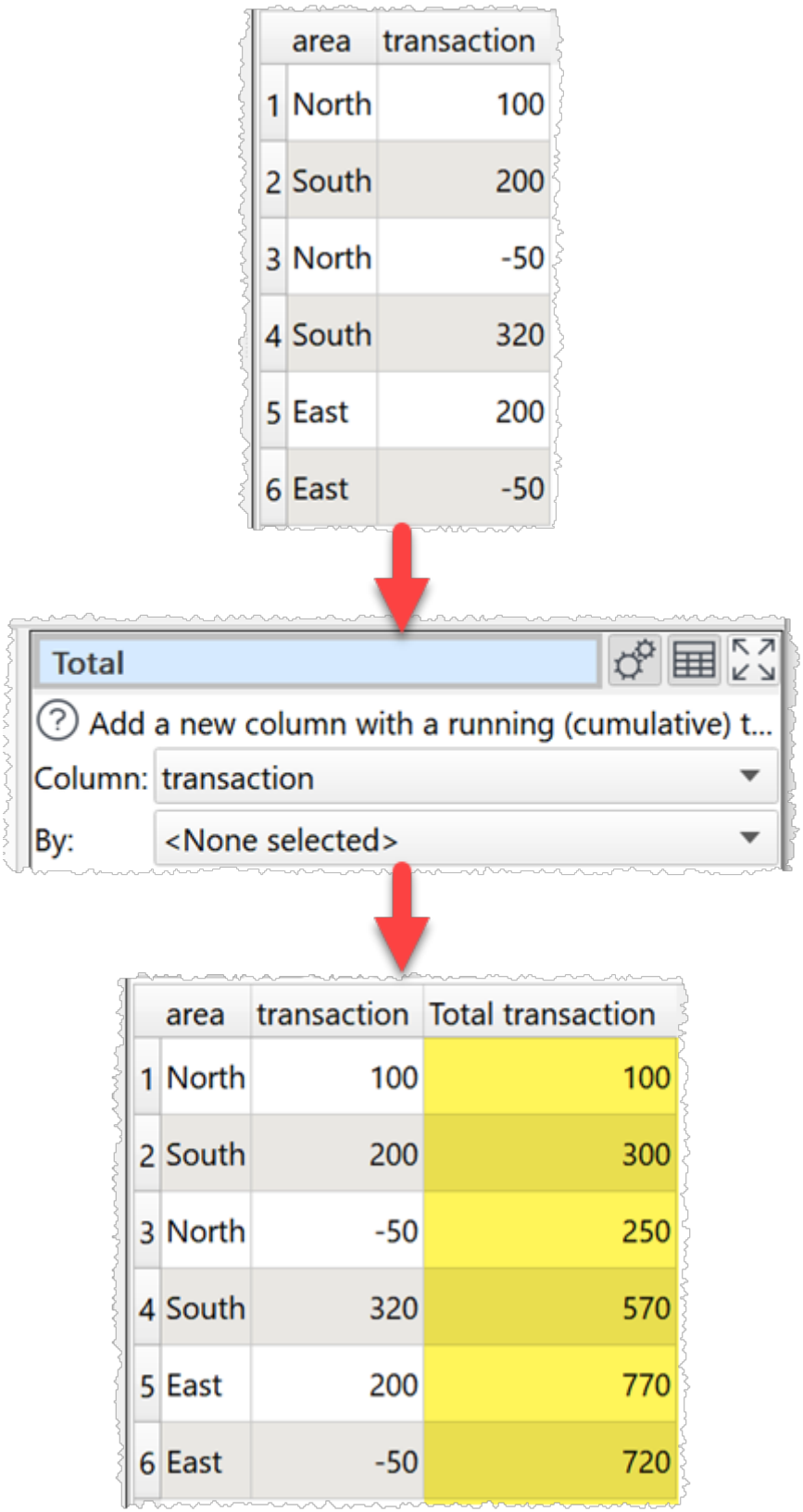


Total the 'transaction' column separately for each 'area' value:


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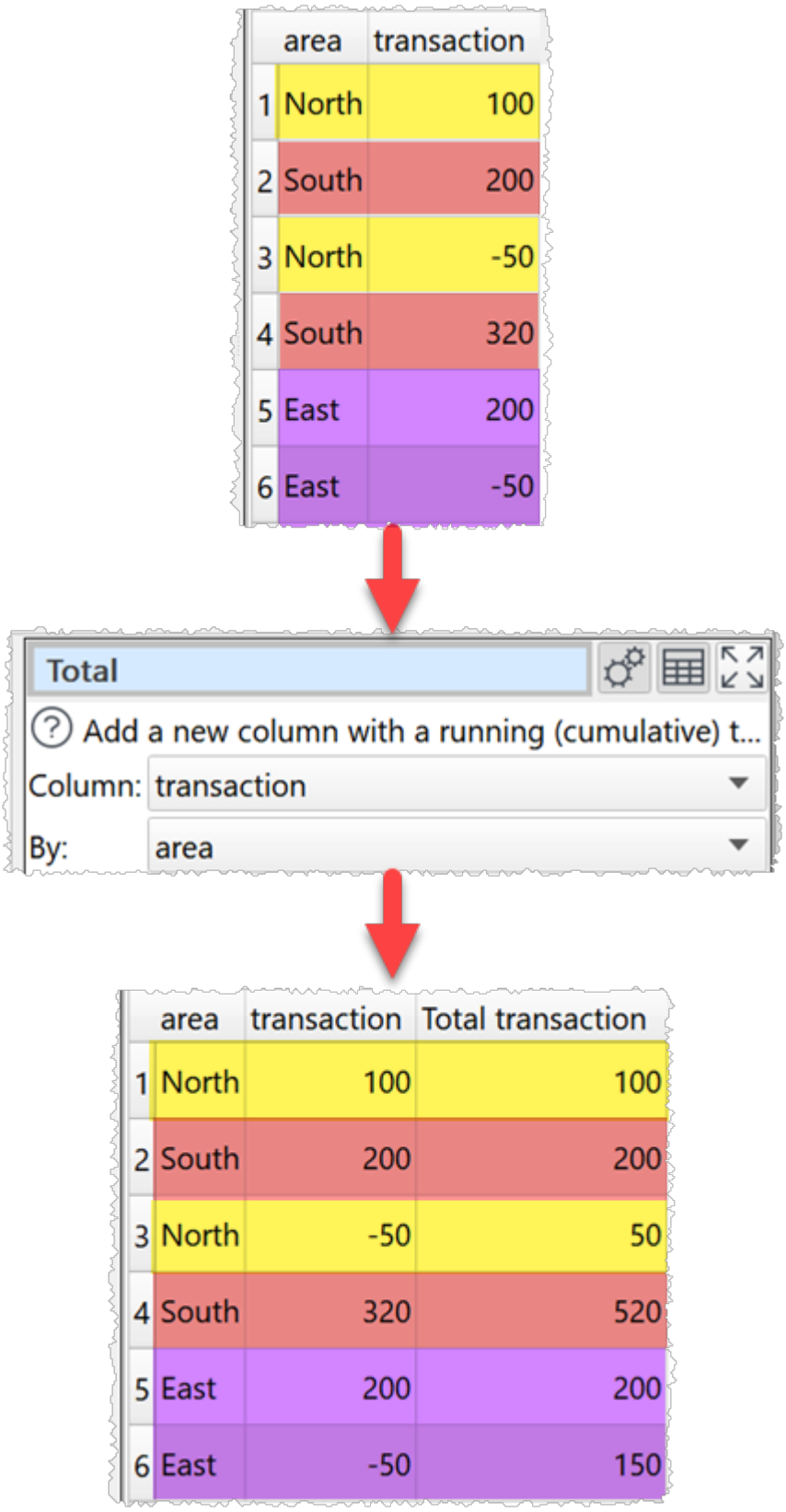


## Inputs

One.


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### Options

- Uncheck **automatic new column name** to set a name for the newly created column in **New column name**.
- Set **Column** to the column you want to total.
- Set **By** to a column if you want a separate running total per value in that column. Leave as **<None selected>** if you only want a single running total.

### Notes

- Non-numerical values are ignored.
- The **By** column takes account of case and whitespace in values.
- The new column is added at the right end. You can change the column order with Reorder Cols and the column name with Rename Cols.

### See also

- Count
- Pivot
- Stats

## 2.3.67 Transpose

### Description

Swap (rotate) rows and columns, so that each row becomes a column and each column becomes a row.

### Example

Swap rows and columns:


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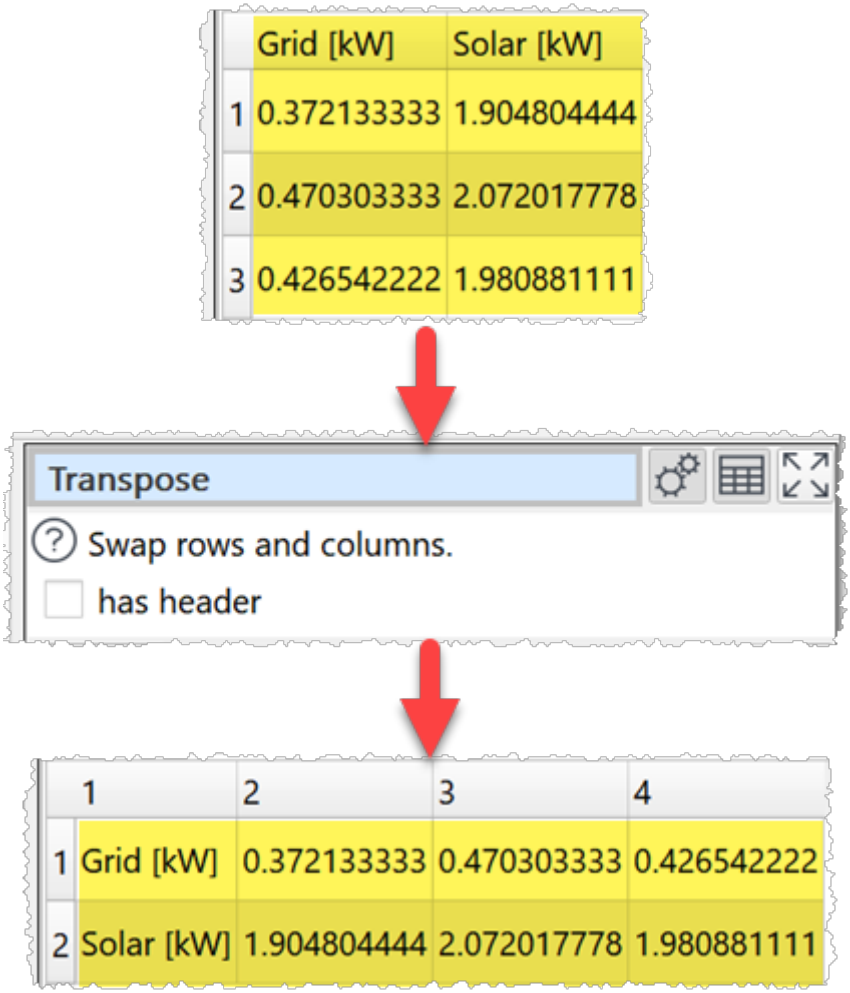


### Inputs
One.

### Options
- Check **has header** to make the new first row into a header.

### Notes
- If the input dataset has a header, it will become the new first column. Use Remove Cols to remove it.

## 2.3.68 Unfill

### Description
Set adjacent cells with identical values to empty in selected columns.

### Example
Unfill down all rows:


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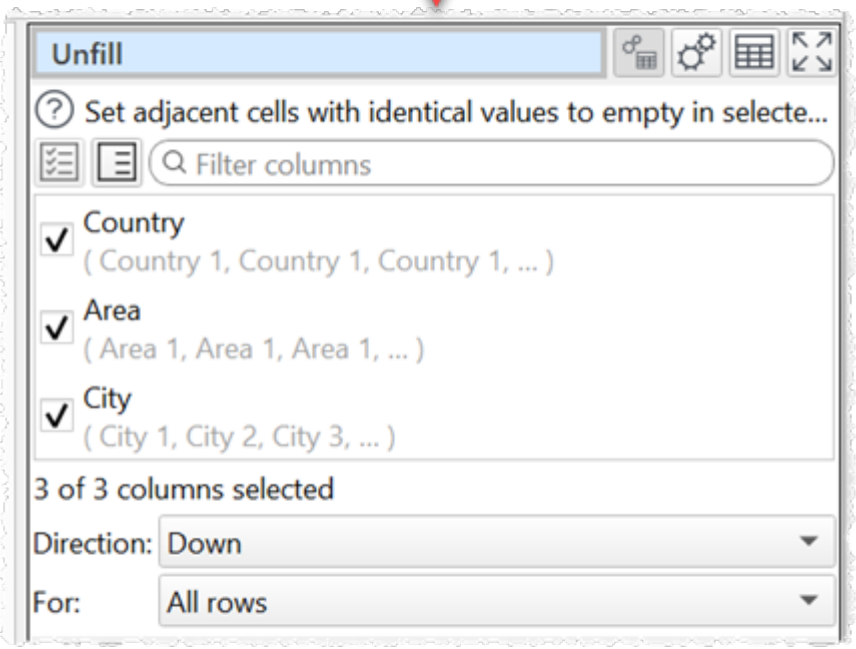
| | Country | Area | City |
|---|---|---|---|
| 1 | Country 1 | Area 1 | City 1 |
| 2 | Country 1 | Area 1 | City 2 |
| 3 | Country 1 | Area 1 | City 3 |
| 4 | Country 1 | Area 2 | City 1 |
| 5 | Country 1 | Area 2 | City 2 |




| | Country | Area | City |
|---|---|---|---|
| 1 | Country 1 | Area 1 | City 1 |
| 2 | | | City 2 |
| 3 | | | City 3 |
| 4 | | Area 2 | City 1 |
| 5 | | | City 2 |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Unfill down all rows only where the value in the 'Country' column matches:


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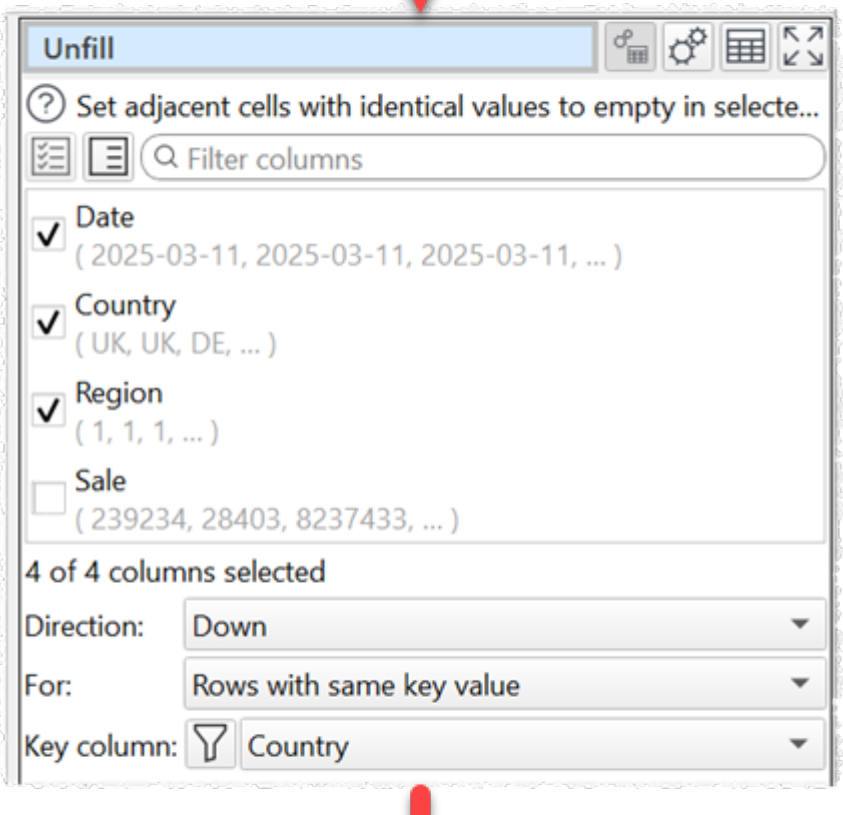
| | Date | Country | Region | Sale |
|---|---|---|---|---|
| 1 | 2025-03-11 | UK | 1 | 239234 |
| 2 | 2025-03-11 | UK | 1 | 28403 |
| 3 | 2025-03-11 | DE | 1 | 8237433 |
| 4 | 2025-03-11 | DE | 2 | 982347 |
| 5 | 2025-03-11 | DE | 2 | 83433 |




| | Date | Country | Region | Sale |
|---|---|---|---|---|
| 1 | 2025-03-11 | UK | 1 | 239234 |
| 2 | | | | 28403 |
| 3 | 2025-03-11 | DE | 1 | 8237433 |
| 4 | | | 2 | 982347 |
| 5 | | | | 83433 |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### Inputs
One.

### Options
- Check the column(s) you wish to unfill.
- Select **Direction** depending on the direction you wish to unfill to.
- Set **For** to **Rows with same key value**, if you wish to only unfill up/or down when when 2 adjacent rows have the same value in the **Key column** column.

### Notes
- Matching for **Rows with same key value** is sensitive to case and whitespace.
- You can delete rows left empty using Filter and columns left empty using Remove Cols.
- To fill empty values with something else use the **Replace** transform.

### See also
- Fill
- Slide

## 2.3.69 Unique

### Description
Aggregate rows that have matching values in one or more selected columns.

### Example
If you have a dataset of orders and you want to:
- keep one row per Customer Id
- keep the first listed Name for each Customer Id
- concatenate Product Ids for each Customer Id, delimited by a Comma
- sum the Costs for each Customer Id
- keep the latest Date for each Customer Id
- add a Count column showing how many rows in the input correspond to each row in the output


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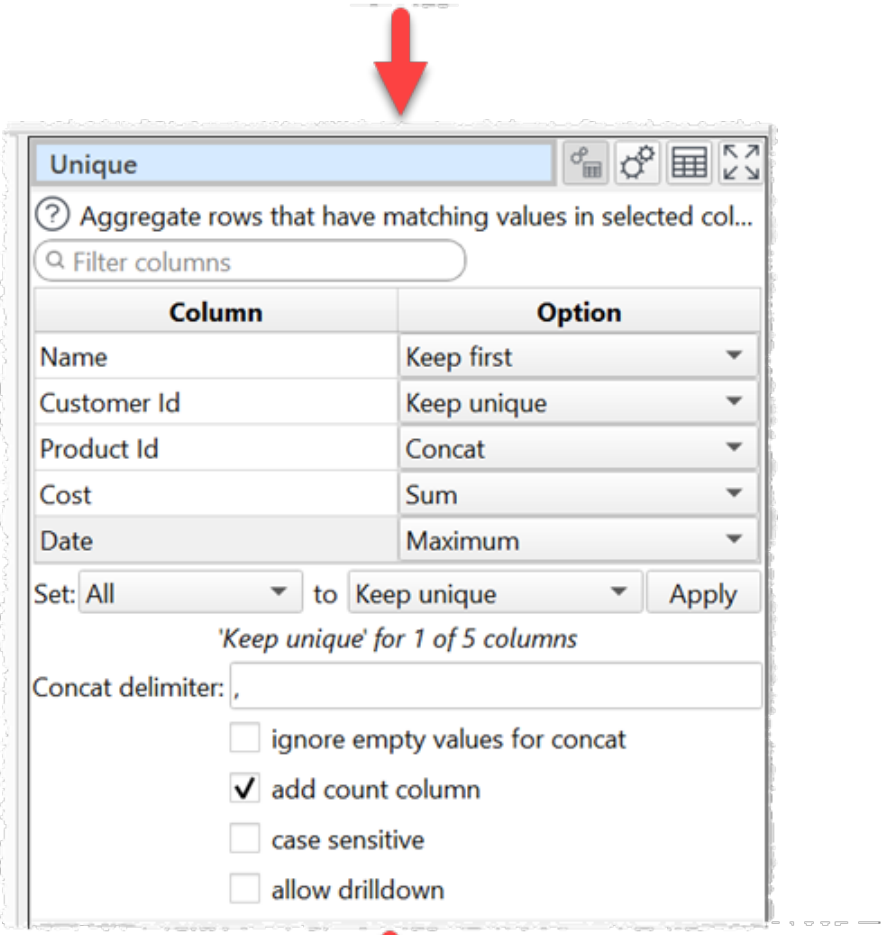
| | Name | Customer Id | Product Id | Cost | Date |
|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 |
| 2 | Bob Brown | C018917 | 89456 | 10.55 | 01/10/2020 |
| 3 | Charlie Jones | C017783 | 96352 | 19.95 | 02/10/2020 |
| 4 | Robert Brown | C018917 | 98526 | 10.00 | 02/10/2020 |
| 5 | Charles Jones | C017783 | 38746 | 25.00 | 03/10/2020 |




| | Name | Customer Id | Product Id | Cost | Date | Count |
|---|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 | 1 |
| 2 | Bob Brown | C018917 | 89456,98526 | 20.55 | 02/10/2020 | 2 |
| 3 | Charlie Jones | C017783 | 96352,38746 | 44.95 | 03/10/2020 | 2 |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## Inputs

One.

## Options

- Type text into the **Filter** field to temporarily hide columns whose names do not contain this text.
- Set an **Option** for each column:
  - Only 1 row is kept where all the **Keep unique** columns have the same value. Empty is counted as a value.
  - **Keep first** keeps the first value in the current sort order. Empty is counted as a value.
  - **Keep first non-empty** keeps the first value in the current sort order that is not empty.
  - **Keep last** keeps the last value in the current sort order. Empty is counted as a value.
  - **Keep last non-empty** keeps the last value in the current sort order that is not empty.
  - **Sum** sums any numerical values. Empty values are ignored.
  - **Maximum** keeps the maximum numerical or date value. Empty values are ignored.
  - **Minimum** keeps the minimum numerical or date value. Empty values are ignored.
  - **Average** takes the average (mean) of any numerical values. Empty values are ignored.
  - **Concat** to concatenate values. Duplicate values are kept. All values are treated as text. Empty is counted as a value.
  - **Concat distinct** to concatenate values. Duplicate values are ignored. All values are treated as case sensitive text. Empty is counted as a value.
  - **Count unique** to count distinct values with no duplicate. E.g. `A,A,B,C` has 2 unique values: `B,C`. All values are treated as case sensitive text. Empty is counted as a value.
  - **Count duplicate** to count distinct values with duplicates. E.g. `A,A,B,C` has 1 duplicate value: `A`. All values are treated as case sensitive text. Empty is counted as a value.
  - **Count distinct** to count distinct values. E.g. `A,A,B,C` has 3 distinct values: `A,B,C`. All values are treated as case sensitive text. Empty is counted as a value.
  - **Count empty** to count empty values. Values containing whitespace are not empty.
  - **Count non-empty** to count non-empty values. Values containing whitespace are not empty.
  - **Set empty** sets the value to empty.
- Use the **Apply** button to quickly set the option value for multiple columns.


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- Set **Concat delimiter** to add a delimiter between **Concat** and **Concat distinct** values.
- Check **ignore empty values for concat** to ignore empty values in **Concat** and **Concat distinct** columns.
- Check **add count column** to add a column showing how many rows in the input dataset created each unique row.
- Check **case sensitive** for case sensitive **Keep unique** matching.
- Check **allow drilldown** to allow double clicking a row in the data table to drilldown to the rows in the upstream data that contributed to this row.

### Notes

- Rows are considered duplicates if they have exactly the same value in all the columns set to **Keep unique**. Comparisons are case and whitespace sensitive. You can use Case and Whitespace to change case and whitespace before deduping.
- If no columns are set to **Keep unique** the transform won't do anything.
- If you are using **Keep first**, **Keep last**, **Keep first non-empty** or **Keep last non-empty** the sort order is important. You can use Sort to change the sort order before this transform.
- Cells containing whitespace are not considered empty.
- Column filtering is sensitive to whitespace, but not case. Columns hidden by filtering are unselected.
- The Dedupe transform is a less powerful (but simpler and faster) alternative to **Unique**.
- You can reverse **Unique** concatenation using Split Col with **Into** as **Rows**

### See also

- Dedupe a dataset

## 2.3.70 Units

### Description

Change units of time, length, temperature etc.

### Example

Convert the 'Temperature' column from Celsius to Fahrenheit:


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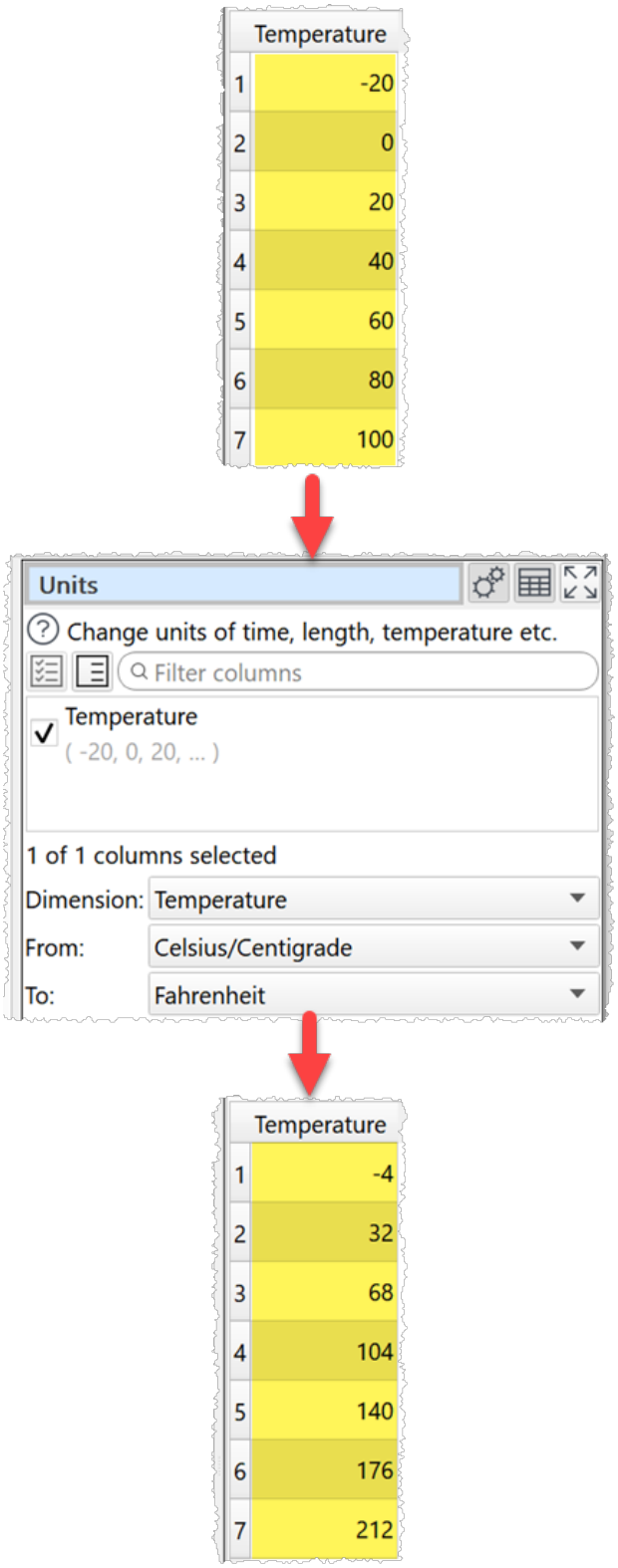


## Inputs

One.

## Options

- Check the column(s) you wish to transform.


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- Set **Dimension** to the dimensions of the units you wish to convert.
- Set **From** to the units you wish to convert from.
- Set **To** to the units you wish to convert to.

### Notes

- The locale is used to decide how the number is represented (e.g. decimal separators).
- Unit disambiguation:
  - **Years** are 365.25 days.
  - **Calories** are thermal/small/gram (not nutritional) Calories.
  - **Miles** are International/Statute Miles.
  - **Nautical miles** are International Nautical Miles.
  - **Gallons (US)** are liquid gallons.
  - **Pints (US)** are liquid pints.
- Warnings are shown in the **Warnings** tab for non-numeric values.
- Non-numerical and empty values are not changed.
- Use Copy Cols to copy columns before you transform them.
- Use Num Format to change the number format of the results.
- Use Extract or Split Col to remove any unit symbols from the value before conversion, e.g. to change "0.0 Kg" to "0.0".
- If you want to convert units not covered here you can do it using the Javascript transform.

## 2.3.71 UUID

### Description

Adds a new column, filled with Universally Unique Identifiers.

### Example

Add a column of UUIDs:


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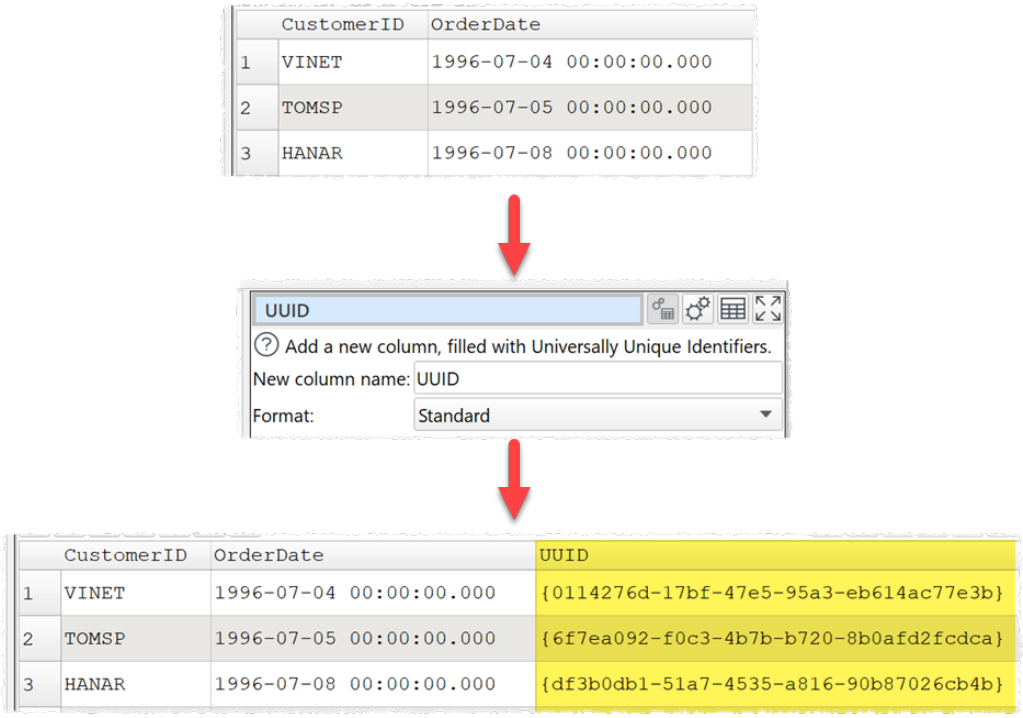


## Inputs

One.

## Options

- Set **New column name** to the name of the new column you want to create.
- Set **Format** according to how you want the UUIDs to look:
  - **Standard**: `{xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx}`
  - **Without braces**: `xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx`
  - **Without braces or dashes**: `xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx`

## Notes

- A Universally Unique Identifier (UUID) is used to uniquely identify objects in computer systems. It is also known as a Globally Unique Identifier (GUID).
- On Windows, UUIDs are generated by the Windows API.
- Each time the transform is run it will create a different set of UUIDs.
- Theoretically, it is possible to generate the same UUID twice. But you are more likely to hit by a meteorite on your way to collect your lottery winnings.

## See also

- Video: How to generate UUIDs
- Pseudonym
- Row Num
- Random


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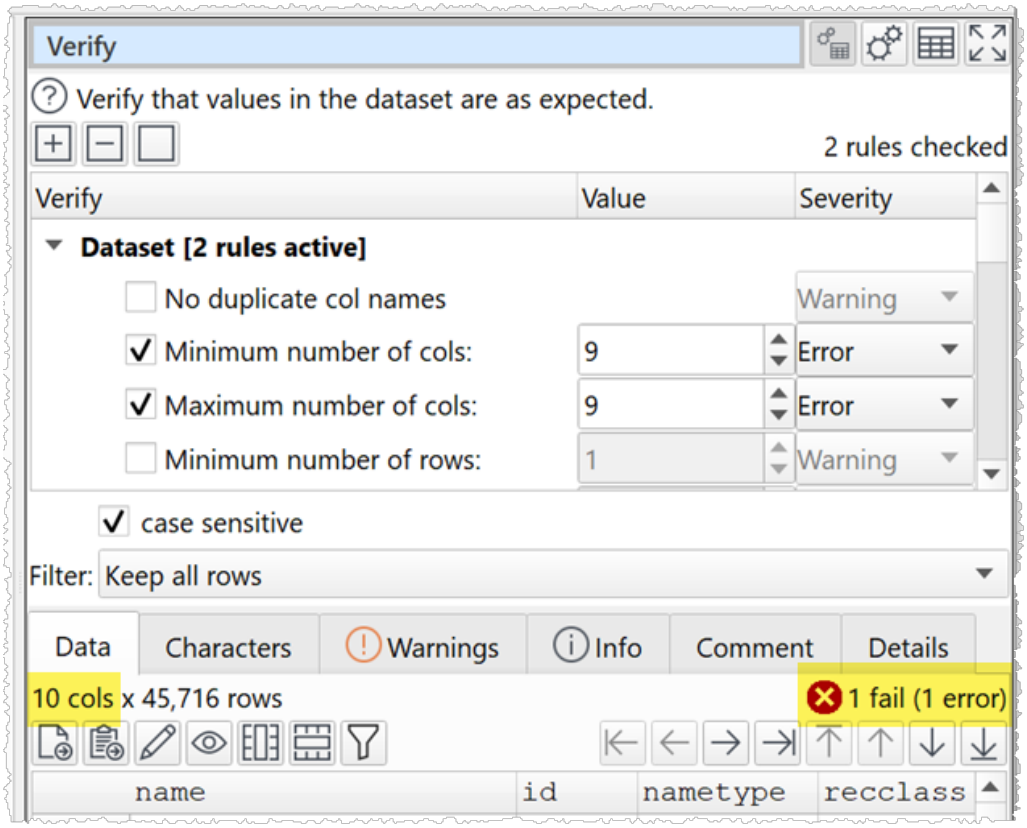
## 2.3.72 Verify

### Description

Verify that values in the dataset are as expected.

### Examples

Show an error and stop processing if the dataset doesn't have 9 columns:




Remove any rows where there is an empty (0 length) value in the 'name' column: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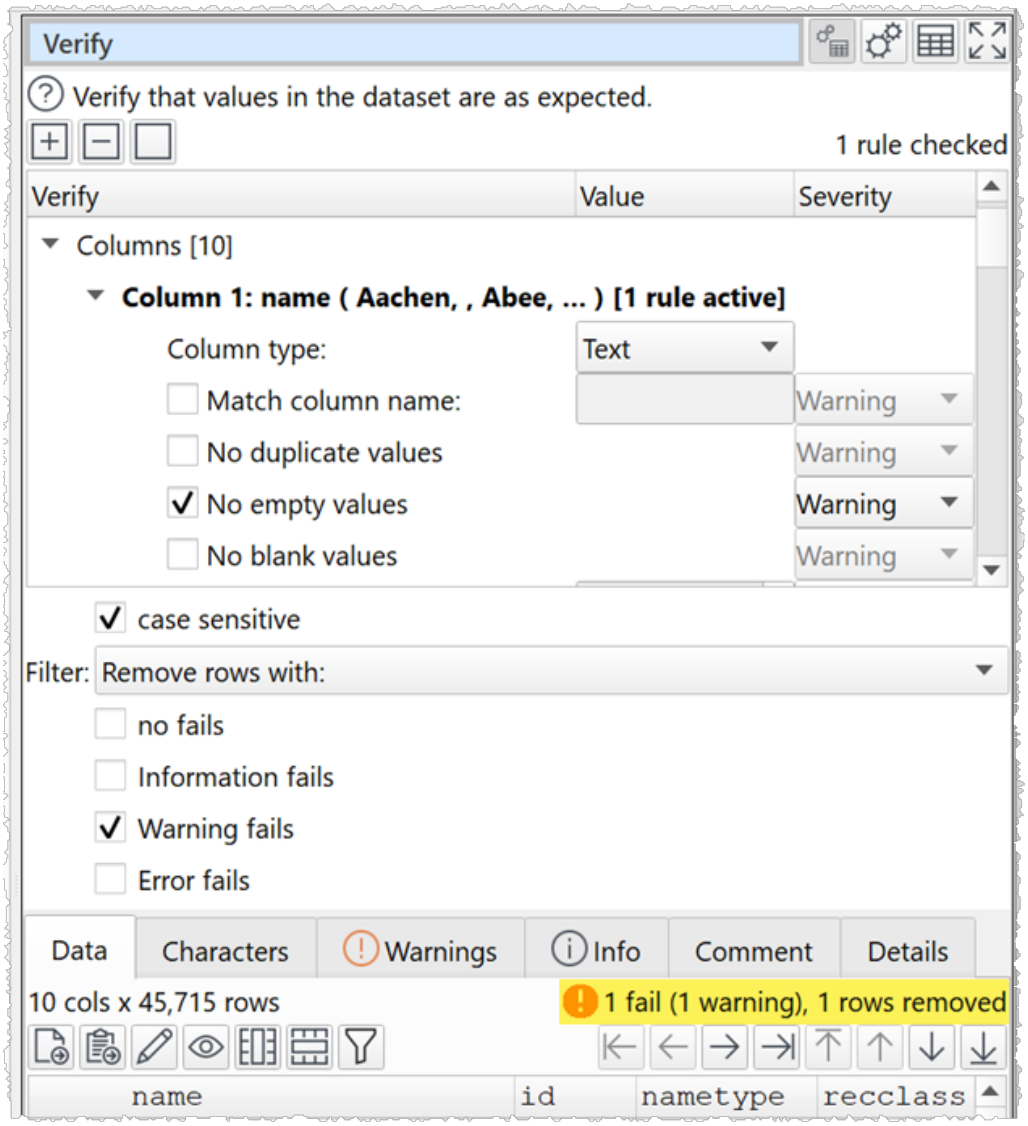


Show a warning message and color any duplicate values in the 'id' column:


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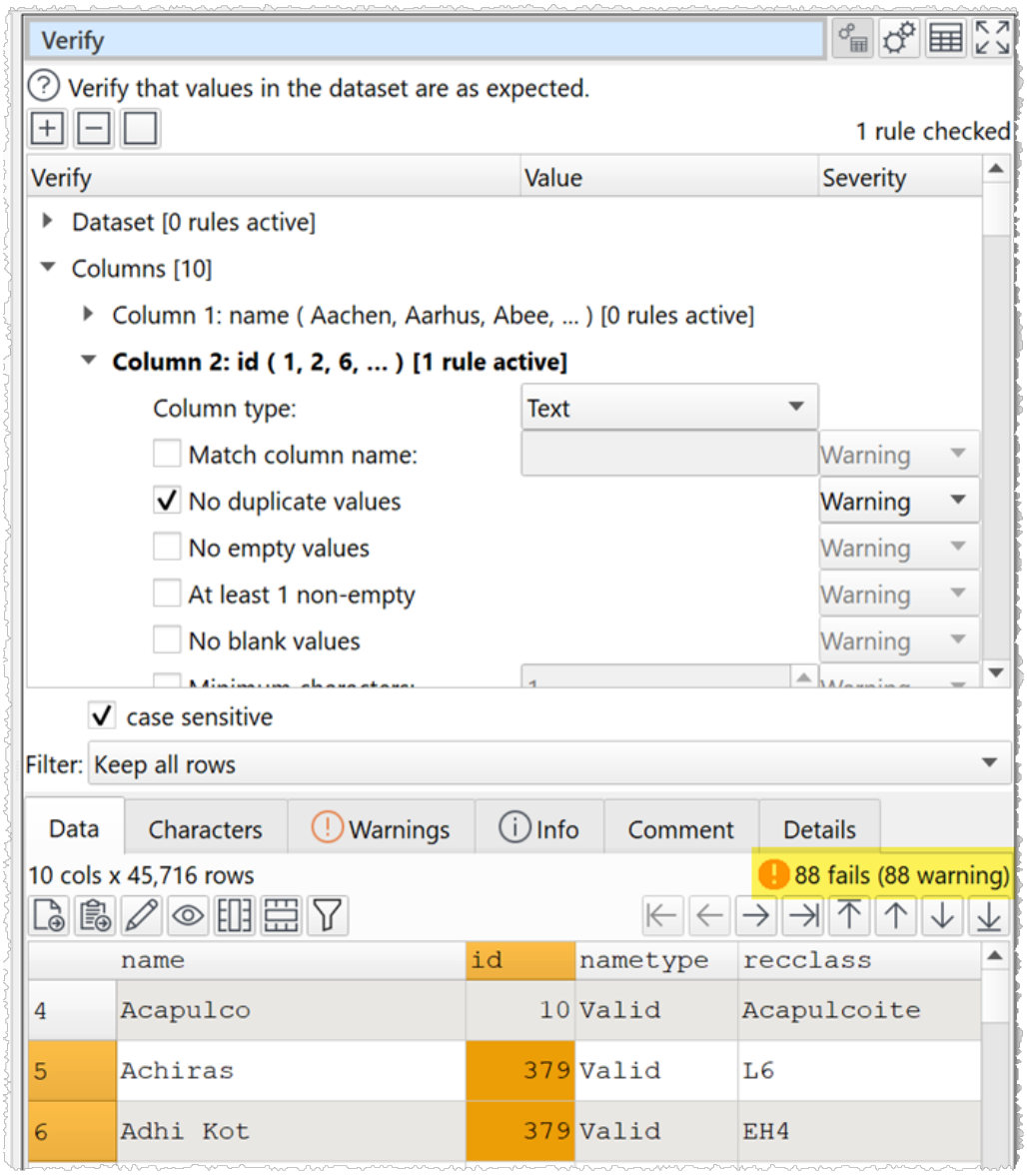


Check for invalid telephone numbers or email addresses and keep only rows with validation fails:


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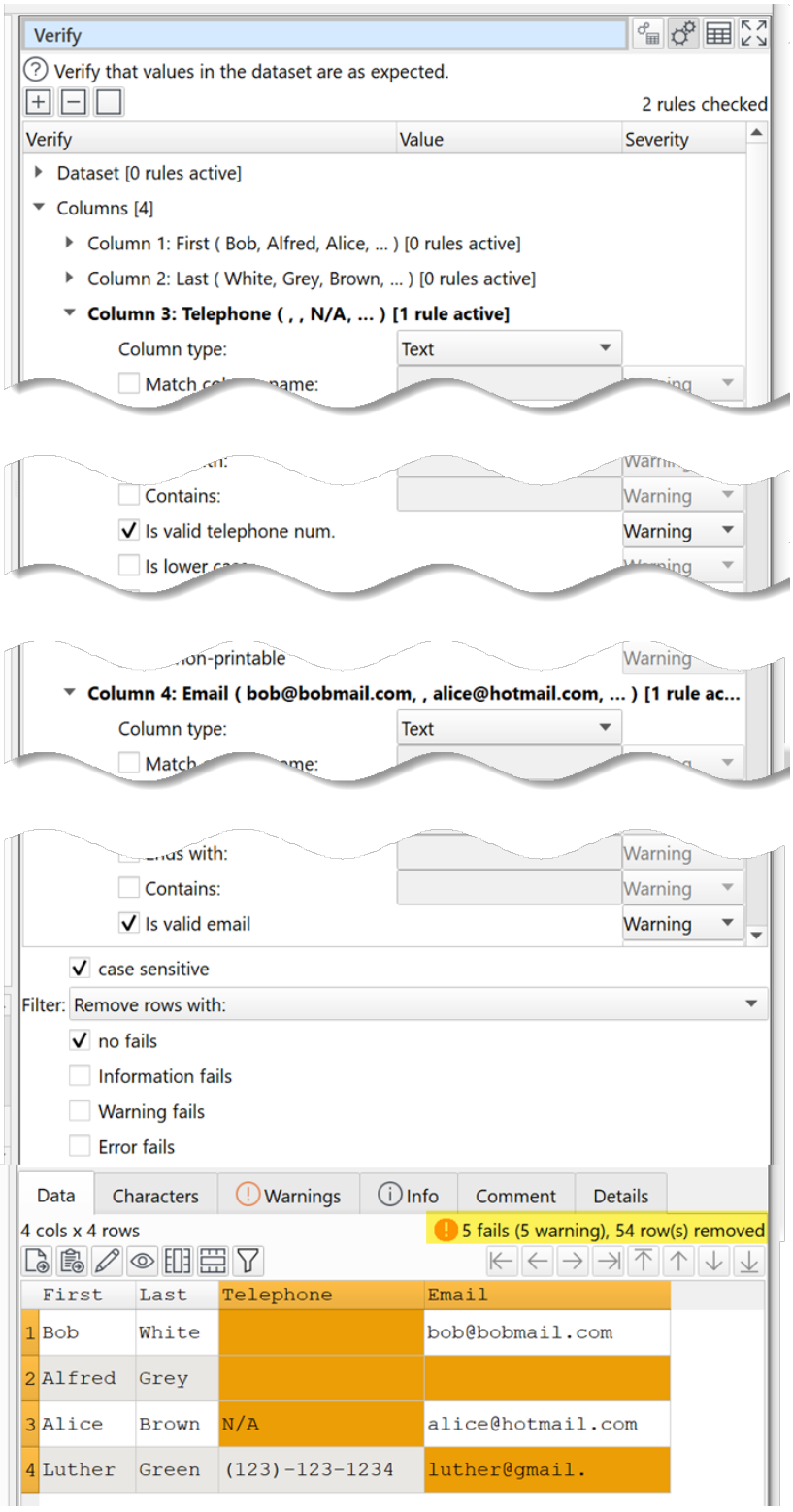


## Inputs

One.

## Options

- Choose the rules you wish to verify, for the dataset and for each column.


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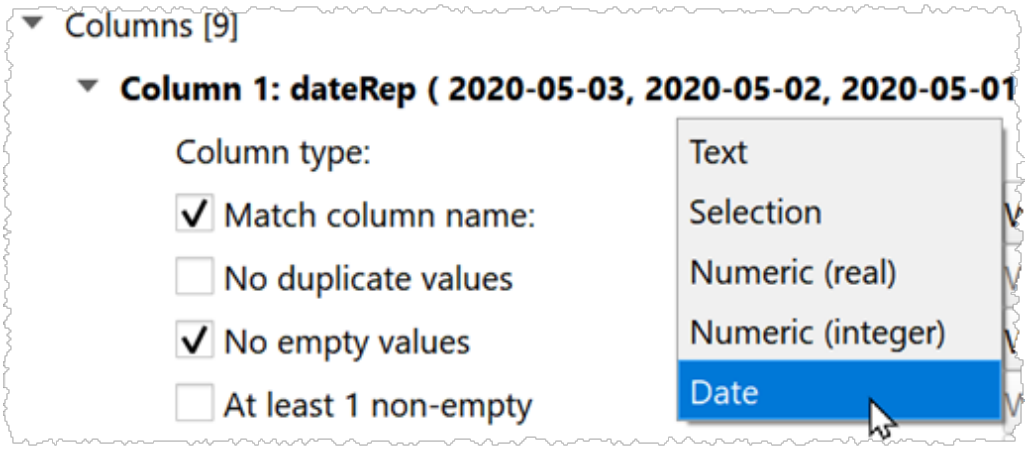
  - Check each verification rule you wish to apply.
  - Set **Value** for rules that require a value.
  - Set **Severity** according to the severity of a rule fail.
  - Hover over the rules to see tooltips with more information on each rule.
- Type text into the columns **Filter** field to temporarily hide columns whose old or new names do not contain this text.

The rules available for each column depends on the **Column type** selected.




| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| All empty values | Verify that every value in the column is empty. A value containing whitespace is not considered empty. | Column type=Text Column type=Numeric (real) Column type=Numeric (integer) Column type=Date | No | Per value in column |
| At least 1 non-empty | Verify that at least 1 value in the column is not empty. A value containing whitespace is not considered empty. | Column type=Text Column type=Numeric (real) | No | Per column |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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | | Column type=Numeric (integer) Column type=Date | | |
| Contains | Verify that every value in the column contains the text supplied. Matching is sensitive to whitespace. | Column type=Text Column type=Numeric (real) Column type=Numeric (integer) | Yes | Per value in column |
| Don't allow listed values | Verify that no values in the column belong to this list. Separate multiple values by Commas. Matching is sensitive to whitespace. | Column type=Text | Yes | Per value in column |
| Ends with | Verify that every value in the column ends with the text supplied. Matching is sensitive to whitespace. | Column type=Text Column type=Numeric (real) Column type=Numeric (integer) | Yes | Per value in column |
| Integer except listed | Verify that every value in the column is an integer (whole) number or belongs to the list | Column type=Numeric (integer) | Yes (for listed special values) | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | of special values supplied. Separate multiple values by Commas. List matching is sensitive to whitespace. | | | |
| Is local file | Verify that every value in the column is the location (path) of an existing file on this computer. | Column type=Text | No | Per value in column |
| Is local folder | Verify that every value in the column is the location (path) of an existing folder on this computer. | Column type=Text | No | Per value in column |
| Is lower case | Verify that any letters are lower case. | Column type=Text | No | Per value in column |
| Is sentence case | Verify that any values are sentence case. E.g.: `Sentence case.` | Column type=Text | No | Per value in column |
| Is title case | Verify that any values are title case. E.g.: `Title Case.` | Column type=Text | No | Per value in column |
| Is upper case | Verify that any letters are upper case. | Column type=Text | No | Per value in column |
| Is valid ASIN | Verify that every value in the column is a valid Amazon | Column type=Text | Yes | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | Standard Identification Number (10 characters A-Z ,0-9). Expects upper case letters if case sensitive checked. Does not check ISBN checksums. Does not check if the product actually exists. Whitespace is ignored. | | | |
| Is valid EAN13 | Verify that every value in the column is a valid EAN13 barcode number (13 digits, including a valid checksum digit). Does not check if the product actually exists. Whitespace is ignored. | Column type=Text Column type=Numeric (integer) | No | Per value in column |
| Is valid email | Verify that every value in the column is a valid email address. E.g.:<br>• `email@email.com`<br>• `EMAIL@EMAIL.COM`<br>Does not check if the email actually exists. | Column type=Text | No | Per value in column |
| Is valid GTIN | Verify that every value in the column is a valid GTIN | Column type=Text | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | barcode number (8, 12,13 or 14 digits, including a valid checksum digit). Does not check if the product actually exists. Whitespace is ignored. | Column type=Numeric (integer) | | |
| Is valid IBAN | Verify that every value in the column is a valid IBAN code. E.g.:<br>• `GB82WEST1234 5698765432`<br>• `IE64 IRCE 9205 0112 3456 78`<br>Some small countries (such as pacific islands) may not be included. Expects upper case letters if case sensitive checked. Does not verify the BBAN checksum. Does not check if the bank account actually exists. Whitespace is ignored. | Column type=Text | Yes | Per value in column |
| Is valid ISBN | Verify that every value in the column is a valid ISBN-10 or ISBN-13 number (10 or 13 characters, including a valid | Column type=Text Column type=Numeric (integer) | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | checksum digit).<br>E.g.:<br>• `152935112X`<br>• `978-1-60309-502-0`<br>• `979-8-886-45174-0`<br>ISBN-13 numbers should start with `978` or `979`.<br>Does not check if the ISBN number actually exists.<br>Whitespace and dashes are ignored. | | | |
| Is valid telephone num. | Verify that every value in the column is a valid telephone number. E.g.:<br>• `(123)-123-1234`<br>• `1-123-123-1234`<br>• `123.123.1234`<br>• `+12 (123) 123-1234`<br>• `11231231234`<br>• `+1 123 123-1234`<br>Does not check if the phone number actually exists. | Column type=Text<br>Column type=Numeric (integer) | No | Per value in column |
| Is valid UPC-A | Verify that every value in the column is a valid UPC-A barcode number (12 digits, including a valid checksum digit). Does not check if the product | Column type=Text<br>Column type=Numeric (integer) | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | actually exists. Whitespace is ignored. | | | |
| Match column name | Verify that column has the supplied name. Matching is sensitive to whitespace. | Column type=Text Column type=Selection Column type=Numeric (real) Column type=Numeric (integer) Column type=Date | Yes | Per column |
| Matches regex | Verify that every value in the column matches the regular expression supplied. E.g. `$x.*$` to match values that start with `x`. Matching is sensitive to whitespace. | Column type=Text | Yes | Per value in column |
| Maximum characters | Verify the maximum number of characters in each value in the column. Whitespace characters are counted. | Column type=Text Column type=Numeric (real) Column type=Numeric (integer) | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | | Column type=Date | | |
| Maximum number of cols | Verify the maximum number of columns in the dataset. | Dataset | No | Per dataset |
| Maximum number of rows | Verify the minimum number of rows in the dataset. | Dataset | No | Per dataset |
| Maximum value | Verify the maximum value in the column. Numbers equal to this value are ok. Non-numeric values are ignored. | Column type=Numeric (real) | No | Per value in column |
| | Verify the maximum value in the column. Numbers equal to this value are ok. Non-numeric values are ignored. | Column type=Numeric (integer) | No | Per value in column |
| | Verify the last allowed date in the column. Dates equal to this value are ok. Non-date values are ignored. | Column type=Date | No | Per value in column |
| Minimum characters | Verify the minimum number of characters in each value in the column. Whitespace characters are counted. | Column type=Text Column type=Numeric (real) Column type=Num | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | | eric (integer) Column type=Date | | |
| Minimum number of cols | Verify the minimum number of columns in the dataset. | Dataset | No | Per dataset |
| Minimum number of rows | Verify the minimum number of rows in the dataset. | Dataset | No | Per dataset |
| Minimum value | Verify the minimum value in the column. Numbers equal to this value are ok. Non-numeric values are ignored. | Column type=Numeric (real) | No | Per value in column |
| | Verify the minimum value in the column. Numbers equal to this value are ok. Non-numeric values are ignored. | Column type=Numeric (integer) | No | Per value in column |
| | Verify the first allowed date in the column. Dates equal to this value are ok. Non-date values are ignored. | Column type=Date | No | Per value in column |
| No blank values | Verify that no value is all whitespace characters. | Column type=Text | No | Per value in column |
| No Carriage | Verify that values do not contain | Column type=Text | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| Returns | Carriage Return characters. | | | |
| No currency | Verify that values do not contain currency characters. E.g. `$`, `£` or `€`. | Column type=Text | No | Per value in column |
| No digits | Verify that values do not contain digit characters E.g. `0` or `9`. | Column type=Text | No | Per value in column |
| No double spaces | Verify that values do not contain consecutive Space characters. | Column type=Text | No | Per value in column |
| No duplicate col names | Verify that no 2 column names in the dataset are the same. Matching is sensitive to whitespace. | Dataset | Yes | Per column |
| No duplicate values | Verify that no value in the column appears more than once. Matches as text. Matching is sensitive to whitespace. | Column type=Text | Yes | Per value in column |
| | Verify that no value in the column appears more than once. Matches as integers. E.g. `1`, `+1`, and `01` are duplicates. | Column type=Numeric (integer) | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | Verify that no value in the column appears more than once. Matches as dates. E.g. `01/01/2000` and `1/1/2000` are duplicates. | Column type=Date | No | Per value in column |
| No empty rows | Verify that no rows in the dataset have an empty value for every column. A value containing whitespace is not considered empty. | dataset | No | Per row |
| No empty values | Verify that no values in the column are empty. A value containing whitespace is not considered empty. | Column type=Text Column type=Numeric (real) Column type=Numeric (integer) Column type=Date | No | Per value in column |
| No gaps in values | Verify every possible value between the minimum and maximum values in the column occurs at least once. E.g. `4`, `1`, `2`, `4` has a gap at `3`. | Column type=Numeric (integer) | No | Per column |
| | Verify every possible date | Column type=Date | No | Per column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | between the minimum and maximum values in the column occurs at least once. E.g. for `dd/MM/yyyy` format `01/01/2000`, `02/01/2000` and `04/01/2000` has a gap at `03/01/2000`. | | | |
| No leading/trailing whitespace | Verify that values do not contain leading or trailing whitespace characters. | Column type=Text | No | Per value in column |
| No Line Feeds | Verify that values do not contain Line Feed characters. | Column type=Text | No | Per value in column |
| No non-ASCII | Verify that values do not contain non-ASCII characters. | Column type=Text | No | Per value in column |
| No non-printable | Verify that values do not contain non-printable characters, such as Null. | Column type=Text | No | Per value in column |
| No punctuation | Verify that values do not contain punctuation characters. E.g. `!`, `;` or `.`. | Column type=Text | No | Per value in column |
| No symbols | Verify that values do not contain | Column type=Text | No | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| | symbol characters. E.g. $, +, = or >. | | | |
| No Tab characters | Verify that values do not contain Tab characters. | Column type=Text | No | Per value in column |
| No whitespace | Verify that values do not contain whitespace characters. E.g. Space, Tab, Carriage Return or Line Feed. | Column type=Text Column type=Numeric (real) Column type=Numeric (integer) Column type=Date | No | Per value in column |
| Numeric except listed | Verify that every value in the column is a real number or belongs to the list of special values supplied. Separate multiple values by Commas. List matching is sensitive to whitespace. | Column type=Numeric (real) | Yes (for special listed values) | Per value in column |
| Only allow listed values | Verify that all values in the column belong to this list. Separate multiple values by Commas. Matching is sensitive to whitespace. | Column type=Selection | Yes | Per value in column |


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| Description (in alphabetic order) | Notes | Available for | Case sensitive option applies | Applies |
|---|---|---|---|---|
| Require listed values | Verify that every listed value appears at least once in the column, matching as text. Separate multiple values by Commas. Matching is sensitive to whitespace. | Column type=Text Column type=Numeric (integer) | Yes | Per column |
| Starts with | Verify that every value in the column starts with the text supplied. Matching is sensitive to whitespace. | Column type=Text Column type=Numeric (real) Column type=Numeric (integer) | Yes | Per value in column |
| Valid date in format | Verify that every value in the column is a valid date in the supplied date format. The rule will fail if either:<br>• The date is in the wrong format. E.g. `31/01/2000` does not match format `yyyy/MM/dd`.<br>• The date is in the right format, but does not exist. E.g. `2000/02/30` is a non existent date in format `yyyy/MM/dd`. | Column type=Date | No | Per value in column |


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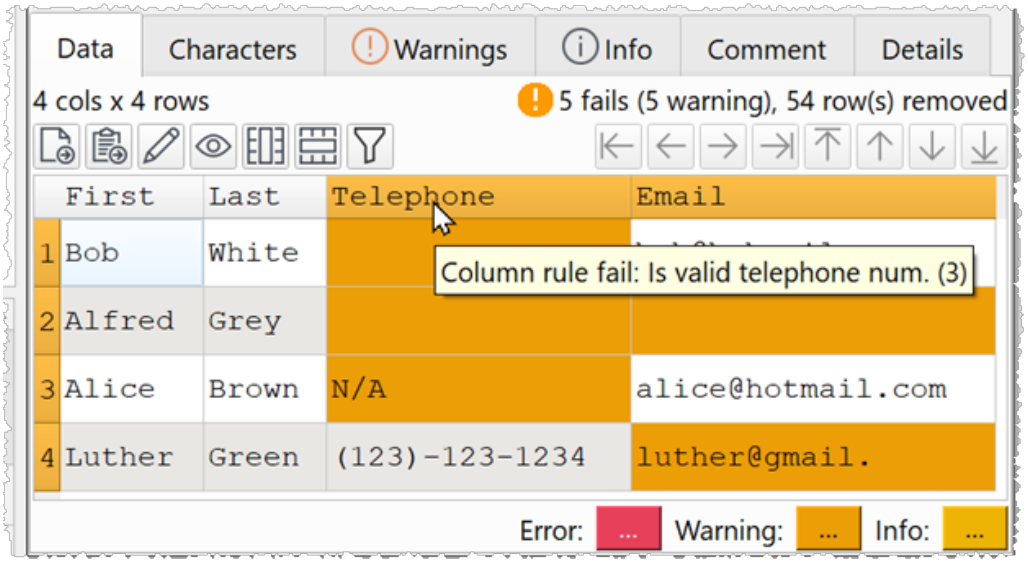
- Check **case sensitive** to use case sensitive matching. Case sensitivity is only relevant to some rules (see the table above).
- Set **Filter** according to which rows you wish to keep. E.g. you might want to remove rows with warnings.

## Notes

- Column filtering is sensitive to whitespace, but not case.
- Any verification fails are color-coded in the **Right** pane data table. Hover over a header or value for information on the rule(s) failed. Click on the color buttons to change the colors used.




- A summary of all the verification rules and whether they passed or failed is output to the **Info** tab.
- A summary of failed verification rules with **Severity** set to **Warning** or **Error** is output to the **Warning** tab.
- Checking a rule may hide other, mutually exclusive, rules. E.g. checking **No empty values** for a column will hide the **Minimum characters** rule.
- All date verification rules use the date format in **Valid date in format rule**, if set. Otherwise Easy Data Transform will attempt to infer the date format from **Preferences>Dates** and the values in each column.
- The locale is used to decide the validity of numbers and dates. E.g. '1,234.5' is a valid real number in some locales.
- Some rules have associated lists of values. The list is Comma separated, consequently, values cannot contain Commas.
- If you want to verify the relationship between 2 columns (e.g. the value is column A is always greater than the value in column B for the same row) use a transform, such as Compare Cols or If and then use **Verify** on the new column.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### See also

- Video: How to verify data
- Video: How to check ISBN numbers
- Video: How to check IBAN account numbers
- Video: How to clean, merge and scrub email lists
- Schemas
- Filter

## 2.3.73 Whitespace

### Description

Tidy whitespace (Spaces, Tabs, Carriage Returns etc) in the selected column(s).

### Example

Tidy Tabs, Carriage Returns and repeated Spaces:


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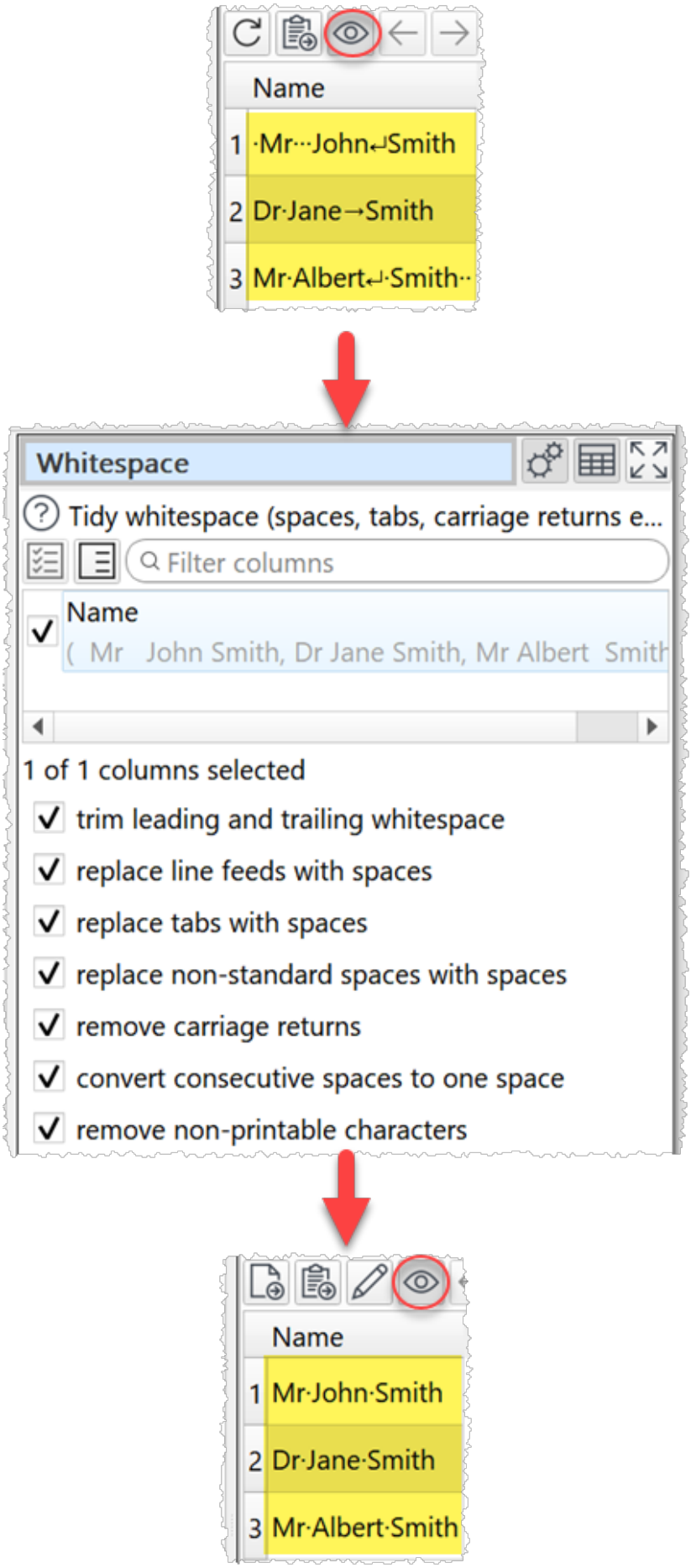



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## Inputs

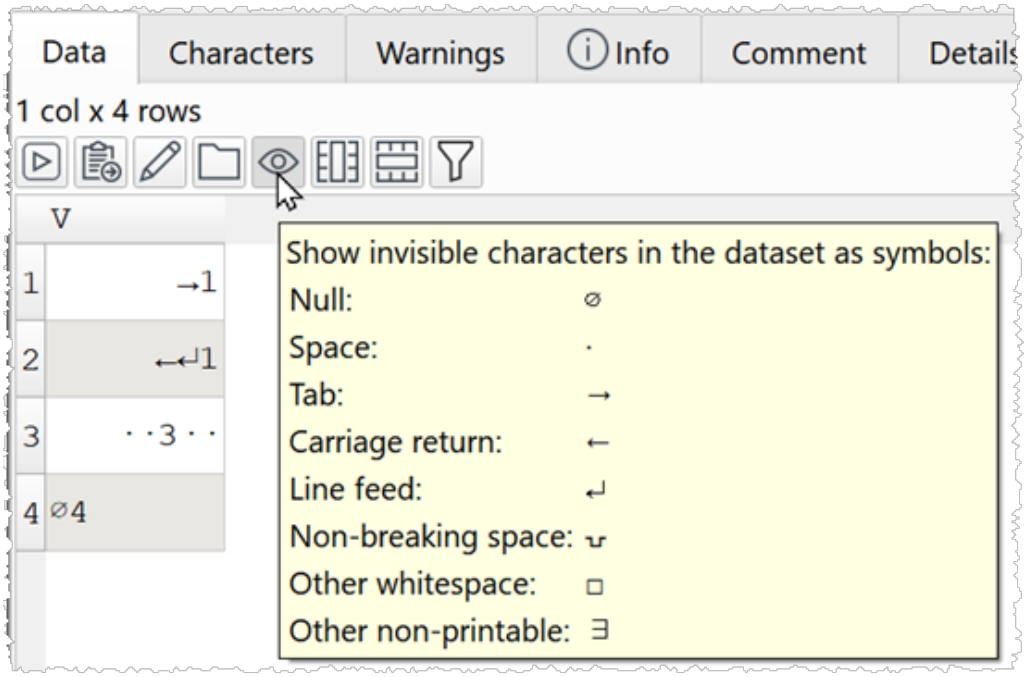
One.

## Options

- Check the column(s) you wish to transform.
- Check **trim leading and trailing whitespace** to remove whitespace characters, such as Space and Tab.
- Check **replace Line Feeds with Spaces** to replace LF (\n) characters with Spaces.
- Check **replace Tabs with Spaces** to replace Tab (\t) characters with Spaces.
- Check **replace non-standard spaces with Spaces** to replace non-standard Spaces (such as non-breaking Space, thin Space etc) with Spaces.
- Check **remove Carriage Returns** to remove CR (\r) characters.
- Check **convert consecutive Spaces to one Space** to replace 2 or more consecutive Spaces with a single Space.
- Check **remove non-printable characters** to remove characters of Unicode type Other_*. This include ASCII codes 0 to 31, such as Tab, Line Feed, Carriage Return, Bell and Backspace. It does not remove Spaces.

## Notes

- The operations are carried out in top to bottom order, e.g. **Replace Line Feeds with Spaces** is carried out before **Convert consecutive Spaces to one Space**.
- Click the eye icon in the **Right** pane to show whitespace in the data.





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### See also

- Case

## 2.4 Output

### 2.4.1 Output data

Once you have finished transforming your data you can output it in the following formats:

- CSV
- Excel
- JSON
- HTML
- Markdown
- Plain text
- TSV
- vCard
- XML
- YAML

To create an output, select 1 input and/or transform item in the Center pane and then click the **To File** button at the bottom of the Left pane. You can choose the file type in the **Save as type** drop-down list of the **Output** window.

You can select the output item in the **Center** pane and change any options related to the output in the Right pane.


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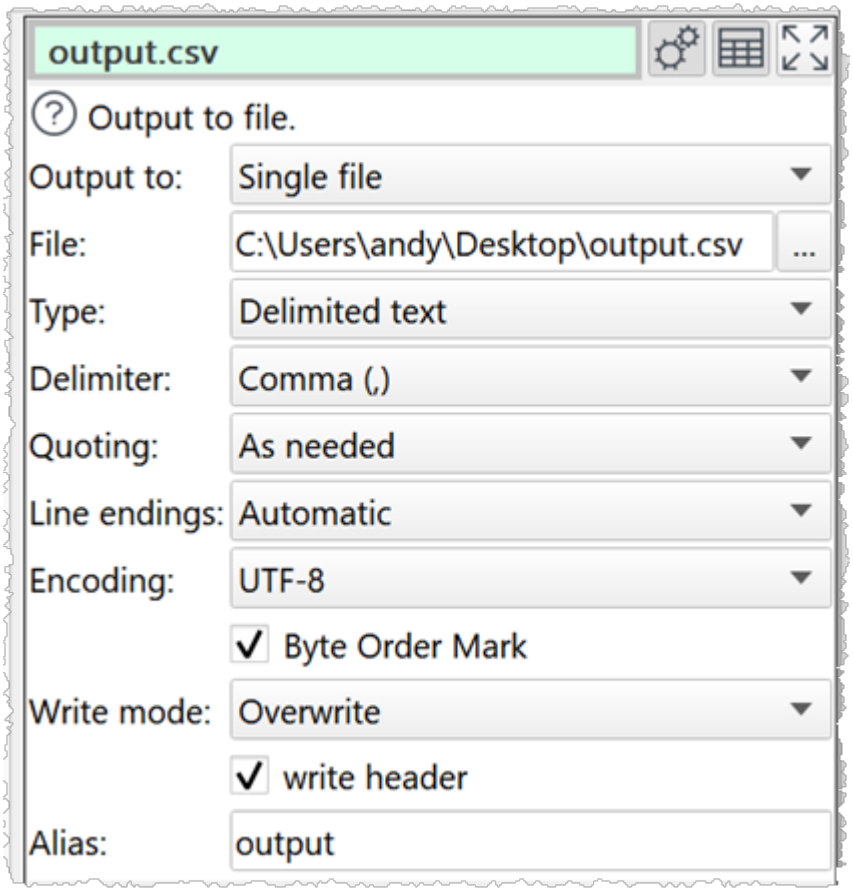


Set **Output to** depending on whether you want to output the dataset to a single file or multiple files.

Set **File** to the location of the file you want to output (only available when **Output to** set to **Single file**). The location can use file name variables to dynamically change output file names based on input file names.

Set **Files column** to the column containing the location of the files you want to output to (only available when **Output to** set to **Multiple files**).

- This column is not output.
- The location can be an absolute location (e.g. `c:\users\andy\output.csv`) or a location relative to the .transform file location (e.g. `results\output.csv`).
- The location can use file name variables to dynamically change output file names based on input file names.
- Folders output to, must already exist.
- Empty or invalid locations (e.g. file names with illegal characters) are ignored.
- Check **Confirm files** if you want to manually confirm before writing to output files (ignored for command line processing).


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If you are writing to an Excel file the output will be written to a sheet called 'Easy Data Transform' by default. You can change this by adding the sheet name inside [], e.g. `myfile.xlsx[mysheet]`.

Set **Type** to the file type. The type will be set by default according to the file extension and the settings in the **Output Extensions** tab of the Preferences window.

Set **Value types** depending on how you want to set JSON types (only available for JSON files).

- **Automatic** to let Easy Data Transform decide the JSON type depending on the contents of each column.
- **String** to set the JSON type for all columns to String
- **Manual** to choose the JSON type of each column as:
  - Automatic (based on column contents).
  - Boolean.
  - Number.
  - String.

If you output a column as Boolean or Number, any values not of that type will be output as null.

Set **Delimiter** to the delimiter you wish to use (only available for delimited text files, such as CSV and TSV).

Set **Quoting** depending how you want to use quoting in the output (only available for delimited text files, such as CSV and TSV).

- **As needed** to add quotes (") around values that contain the delimiter character, quote characters  or Carriage Returns.
- **Always** to add " quotes around every value.
- **Never** to never add " quotes around values (delimiters and Carriage Returns with values are replaced with Spaces).

Set **Line endings** to the control characters you wish to use to denote line endings (only available for text files).

- **Automatic** to choose the standard line ending for the current operating system.
- **Windows (CRLF)** to choose the standard Windows line ending, Carriage Return+Line Feed (`\r\n`).
- **Mac\Unix (LF)** to choose the standard macOS/Unix line ending, Line Feed (`\n`).
- **Old Mac (CR)** to choose the standard classic (pre mac OS X) Mac line ending, Carriage Return (`\n`).
- **Record separator (0x1E)** to choose the ASCII record separator character.


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Set **Encoding** to the text encoding you wish to use (only available for text files).

Set **Formatting** depending on how you want to set the Excel cell formatting (only available for Excel files).

- **Automatic** to let Easy Data Transform decide cell formatting depending on the contents of each column.
- **General** to set the cell format for all columns to 'General'.
- **Manual** to choose the cell format of each column as:
  - Automatic (based on column contents).
  - Boolean (expects `true` or `false`, not case sensitive)
  - Date (expects a date format in Preferences).
  - General.
  - Number (expects a real or integer number, e.g. `123` or `123.456`)
  - Text.
  - Formula (expects starting with =).
  - Time (expects `hh:mm:ss` or `hh:mm`, e.g. `13:59:01` or `13:59`).
  - Hyperlink (expects a hyperlink, e.g. `https://www.easydatatransform.com`).

Set **Byte Order Mark** checked to write a Unicode Byte Order Mark to the file (only available for UTF encodings and ignored when appending to an existing file).

Set **Escape special characters** checked to escape HTML special characters (for example < and >) so they are rendered correctly in the HTML (only available for HTML files). Uncheck it to write 'raw' HTML. Note that you can also set **Change** to **To escaped HTML** to escape selected columns in the Decode transform.

Check **remove empty** to recursively remove any nodes that have an empty value and no children (only available for JSON and XML files). For example:

| | A | A.B | A.B.C |
|---|---|---|---|
| 1 | | | |
| 2 | | 1 | |
| 3 | | | 1 |

Is output to XML with **remove empty** checked as:

```
<root>
  <record>
```


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```
    <A>
      <B>1</B>
    </A>
  </record>
  <record>
    <A>
      <B>
        <C>1</C>
      </B>
    </A>
  </record>
</root>
```

Is output to XML with **remove empty** unchecked as:

```
<root>
  <record>
    <A>
      <B>
        <C></C>
      </B>
    </A>
  </record>
  <record>
    <A>
      <B value="1">
        <C></C>
      </B>
    </A>
  </record>
  <record>
    <A>
      <B>
        <C>1</C>
      </B>
    </A>
  </record>
</root>
```

For XML output you can set **Root name**, **Below root** and **Row name** depending on the name you want to use for the root and row records and any extra information you want to add below the root.


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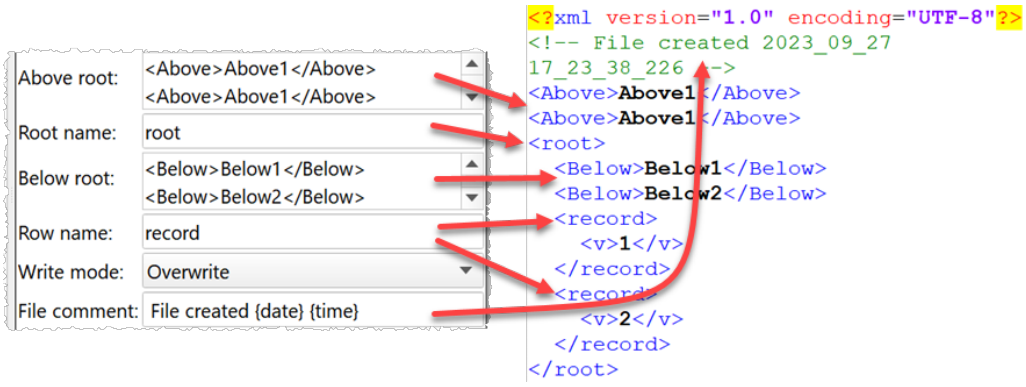


Use **Write mode** to determine how existing files are treated:

| **Write mode** for Excel files | **File exists with named sheet** | **File exists without named sheet** | **File does not exist** |
|---|---|---|---|
| **Overwrite / File** | Overwrite named sheet, delete all other sheets | Add named sheet, delete all other sheets | Create file with only named sheet |
| **Overwrite / Sheet** | Overwrite named sheet* | Add named sheet | Create file with only named sheet |
| **Append** | Append to named sheet | Add named sheet | Create file with only named sheet |
| **New** | Do nothing | Do nothing | Create file with only named sheet |
| **Disabled** | Do nothing | Do nothing | Do nothing |

*Overwriting a named sheet is slower than creating a new file and can cause the file size to increase each time (due to indexing by Excel). If this becomes a problem, you can delete the file and re-output it. Because of this you should use **Overwrite / File** if the file will only have 1 sheet.


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| **Write mode** for non-Excel files | **File exists** | **File does not exist** |
|---|---|---|
| **Overwrite** | Overwrite file | Create file |
| **Append** | Append to file | Create file |
| **New** | Do nothing | Create file |
| **Disabled** | Do nothing | Do nothing |

Check **write header** to write the header (only available for Excel, Delimited text, HTML and Markdown files). If **Write mode** is **Append** you can check **if empty** to only write the header if the file (sheet for Excel files) is currently empty or does not exist (and not for subsequent appends).

Set **File comment** to any comment you wish to output to the file (only available for HTML, Markdown, XML and YAML files). This can include file name variables such as `{date}`. Leave it empty to output no comment.

Use **Alias** to identify the file for batch processing or command line processing.

## 2.5 File formats

### 2.5.1 File formats

Easy Data Transform supports the following data file formats:

| **Format** | **Input** | **Output** |
|---|---|---|
| Delimited text (including CSV and TSV) | Yes | Yes |
| Excel XLSX/XLS | Yes | Yes |
| Fixed width | Yes | No |
| JSON | Yes | Yes |
| HTML | No | Yes |
| Markdown | No | Yes |
| Plain text | Yes | Yes |
| vCard | Yes | Yes |
| XML | Yes | Yes |


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| Format | Input | Output |
|---|---|---|
| YAML | No | Yes |

You can manage the default file type for different file extensions in the **Input Extensions** and **Output Extensions** tabs of the Preferences window.

### 2.5.2 CSV format

Easy Data Transform can input from and output to CSV format files. Default file extension ".csv".

CSV (Comma Separated Value) format is commonly used for exchanging tabular data between programs.

CSV is a type of delimited text file format. The column delimiter is usually a Comma, but not always. The row delimiter is Line Feed, Carriage Return or Carriage Return+Line Feed.

Easy Data Transform supports the following column delimiters:
- Comma (,)
- Semi-colon (;)
- Colon (:)
- Pipe (|)
- Caret (^)
- Tab (\t) (used for TSV format)
- ASCII Unit separator (0x1F)
- Space ( )
- Custom (choose your own)

For files padded to fixed column widths with Spaces see Fixed width format.
For file with no column delimiters see Plain text format.

To output to a CSV file you should typically set **Delimiter** to **Comma (,)** and **Quoting** to **As needed** in the **Right** pane.

For example:

| | CategoryID | CategoryName | Description | In stock |
|---|---|---|---|---|
| 1 | 1 | Beverages | Soft drinks, coffees & teas | true |
| 2 | 2 | Condiments | Sweet and savory sauces | false |
| 3 | 3 | Confections | Candies and sweet breads | true |


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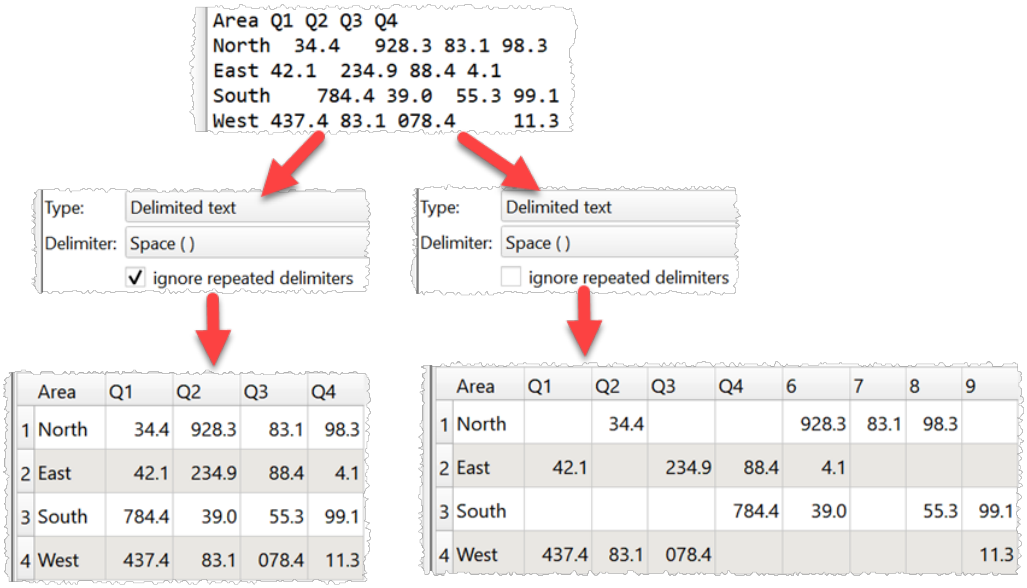
Is output with **Delimiter** set to **Comma (,)** and **Quoting** set to **As needed** as:

```
CategoryID,CategoryName,Description,In stock
1,Beverages,"Soft drinks, coffees & teas",true
2,Condiments,Sweet and savory sauces,false
3,Confections,Candies and sweet breads,true
```

Note that " quotes have been used to enclose values that contain delimiter characters.

Check **ignore repeated delimiters** if you want to treat 2 or more consecutive delimiters as a single delimiter. For example, this might be useful if values are separated by a variable number of spaces:

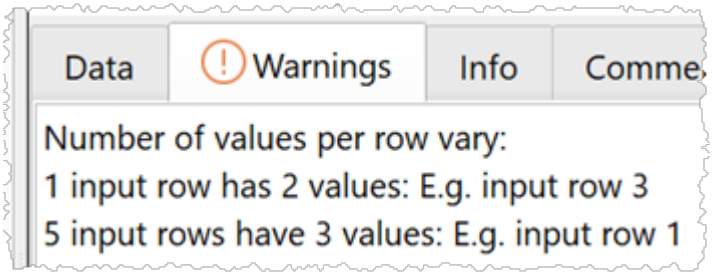



| | Area | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|---|
| 1 | North | 34.4 | 928.3 | 83.1 | 98.3 |
| 2 | East | 42.1 | 234.9 | 88.4 | 4.1 |
| 3 | South | 784.4 | 39.0 | 55.3 | 99.1 |
| 4 | West | 437.4 | 83.1 | 078.4 | 11.3 |

| | Area | Q1 | Q2 | Q3 | Q4 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | North | | 34.4 | | | 928.3 | 83.1 | 98.3 | |
| 2 | East | 42.1 | | 234.9 | 88.4 | 4.1 | | | |
| 3 | South | | | | 784.4 | 39.0 | | 55.3 | 99.1 |
| 4 | West | 437.4 | 83.1 | 078.4 | | | | | 11.3 |

Set **Quoting** to **Always** if you want to quote every value. Set **Quoting** to **Never** if you don't want to quote values (delimiters, Line Feeds and Carriage Returns within values will be changed to spaces, unless the delimiter is Space in which case they will be changed to underscore).

You will be warned when inputting a CSV format file that has a different number of values per row. This may be a sign that there are problems with the data (e.g. incorrect quoting).





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You can also input a file as plain text and split it using delimiters yourself:
1. Input it with a delimiter unlikely to be in the text, e.g. caret (^), to input it as a single column
2. Use the Split Col transform to transform it into multiple columns using the appropriate delimiter.

Many CSV file are not well formed. For example, they have unescaped quotes. As the CSV format is not well-defined, badly formed CSV files can be interpreted in more than one way. Easy Data Transform will do the best it can in these circumstances.

See also:
- Video: How to convert CSV to JSON
- Video: How to convert CSV to Markdown
- Video: How to convert CSV to Tab delimited
- Video: How to convert CSV to vCard
- Video: How to convert CSV to XML
- Video: How to convert Excel to pipe delimited
- Video: How to convert fixed column width to CSV or Excel
- Video: How to convert JSON to CSV
- Video: How to convert Tab delimited to CSV
- Video: How to convert XML to CSV
- Video: How to split CSV into multiple files
- Video: How to change CSV file text encoding
- TSV format

### 2.5.3 Excel format

Easy Data Transform can input from and output to Excel ".xlsx" and ".xls" format files, even if you don't have Excel installed.

Excel format is the native format of the Microsoft Excel spreadsheet application. It is commonly used for exchanging tabular data.

You can specify the sheet name when inputting or outputting Excel files using square brackets, for example:
- `MySpreadsheet.xlsx[Sheet1]` means the sheet named `Sheet1` of file `MySpreadsheet.xlsx` (the sheet name is not case sensitive).
- `MySpreadsheet.xlsx[1]` means sheet named `1` of file `MySpreadsheet.xlsx` (if it exists) or else the first sheet.
- `MySpreadsheet.xlsx` means the first sheet of file `MySpreadsheet.xlsx`.

Hyperlinks are read in from Excel in the form `anchor|hyperlink`.


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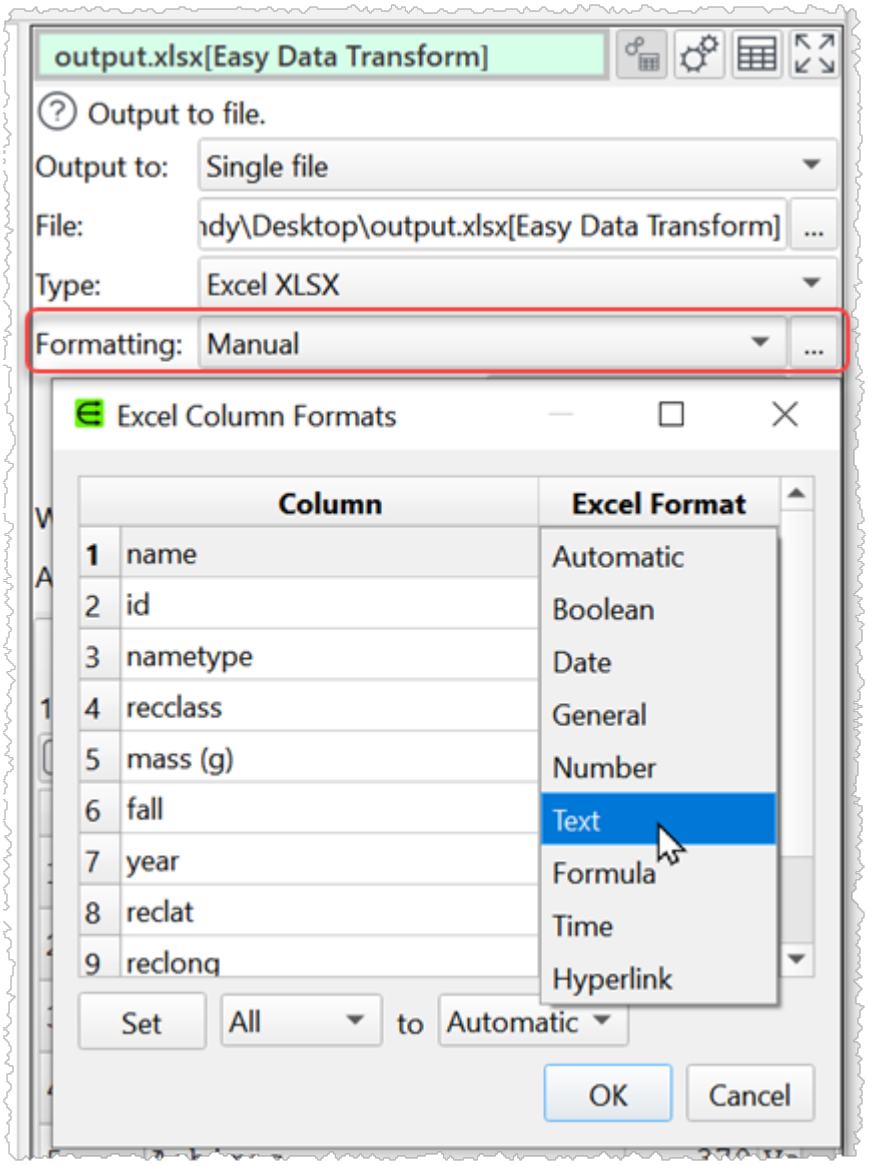
Easy Data Transform will try to infer the Excel column format from the data in the column. But you can set the Excel format explicitly:




You can specify how to format columns when outputting to Excel using the **Formatting** option.

Check **use style template** to copy the styling from another Excel sheet, including:

- column widths
- row heights
- column/row hidden status
- cell merging
- text orientation
- fonts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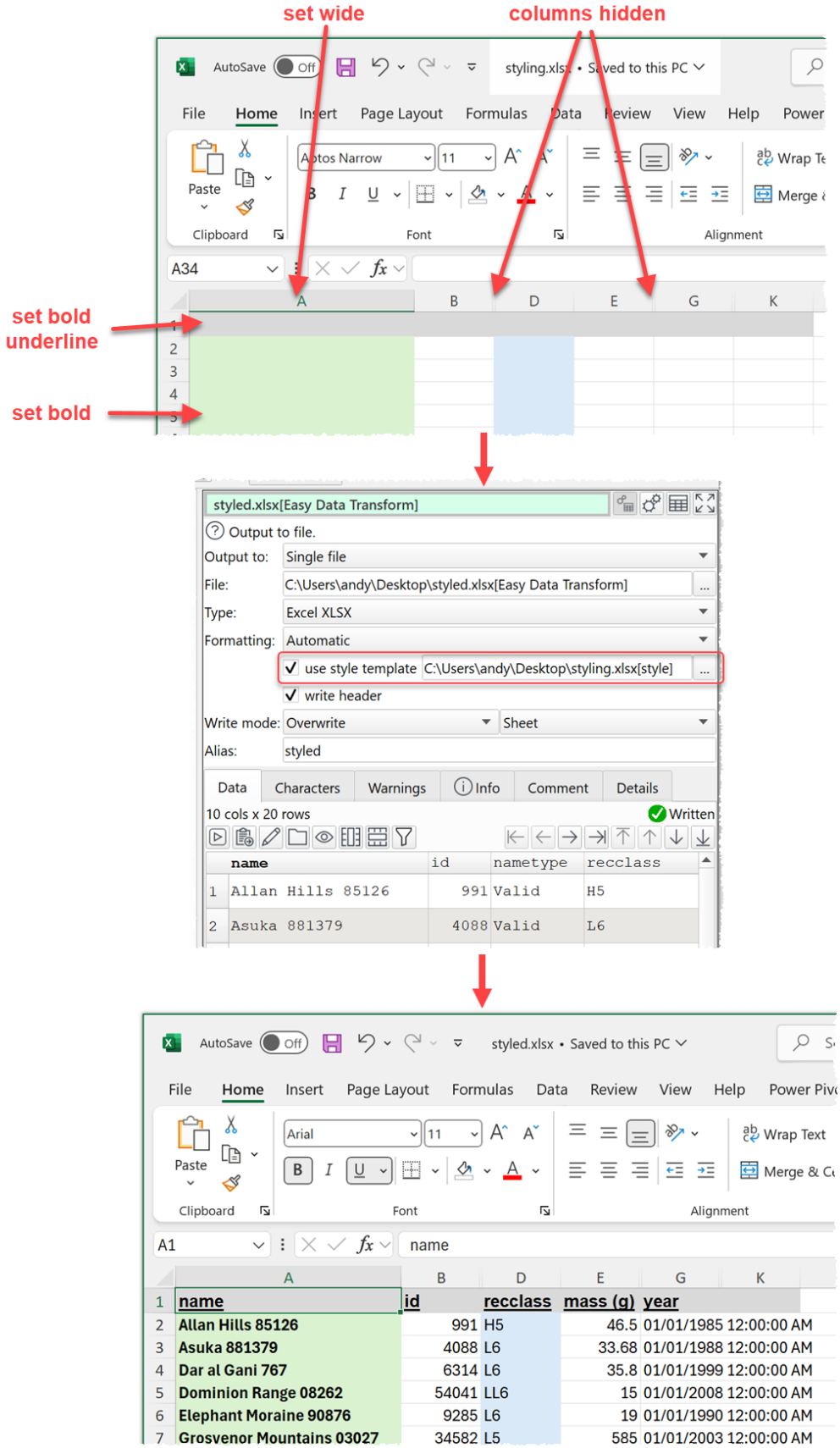



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You can use a relative location for the template file (relative to the *.transform* file):

Please note the following limitations of Excel:

- Excel .xlsx files are limited to 1,048,576 rows and 16,384 columns.
- Excel .xls files are limited to 65,536 rows and 256 columns.
- Date values are input using ISO date format yyyy-MM-dd, regardless of your locale.
- Datetime values are input using ISO date format yyyy-MM-ddThh:mm:ss, regardless of your locale.
- The sheet name:
  - cannot be more than 31 characters long
  - cannot be empty
  - cannot contain the following characters: `\ / * [ ] : ?`
  - cannot start or end with an apostrophe
  - cannot be 'history' (reserved name)

Note that reading and writing Excel files is at least an order of magnitude slower than reading and writing delimited text files, such as CSV or TSV.

See also:

- Video: How to combine columns in Excel
- Video: How to compare Excel sheets
- Video: How to convert Excel to JSON
- Video: How to convert Excel to Markdown
- Video: How to convert Excel to pipe delimited
- Video: How to convert Excel to XML
- Video: How to convert Excel to YAML
- Video: How to convert fixed column width to CSV or Excel
- Video: How to join Excel files
- Video: How to convert JSON to Excel
- Video: How to convert XML to Excel
- Video: How to remove Excel duplicates
- Video: How to split a column in Excel

### 2.5.4 Fixed width format

Easy Data Transform can input from fixed width format files, also known as fixed column width format. Default file extension ".txt". It is also possible to output to fixed width format (see below).


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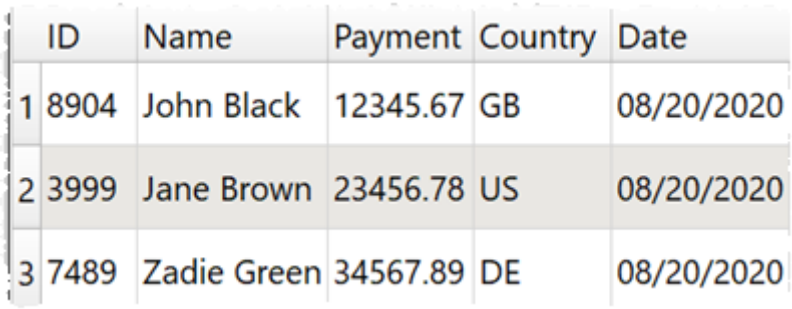
Fixed width format is used for exchanging tabular data between programs. It is often associated with legacy systems, but is also used for large files where performance is an issue (e.g. bioinformatics).

In fixed width format each column has a fixed width in characters. There is no column delimiter. Spaces are typically used as padding to make up the column width. The row delimiter is Line Feed, Carriage Return or Carriage Return+Line Feed. For example:

```
ID     Name          Payment    Country   Date
8904   John Black    12345.67   GB        08/20/2020
3999   Jane Brown    23456.78   US        08/20/2020
7489   Zadie Green   34567.89   DE        08/20/2020
```

Is input as:



| | ID | Name | Payment | Country | Date |
|---|---|---|---|---|---|
| 1 | 8904 | John Black | 12345.67 | GB | 08/20/2020 |
| 2 | 3999 | Jane Brown | 23456.78 | US | 08/20/2020 |
| 3 | 7489 | Zadie Green | 34567.89 | DE | 08/20/2020 |

Easy Data Transform will analyze the data and guess the column layout if you set **Columns** in the **Right** pane to **Automatic**. Or you can choose the column widths by setting **Columns** to **Manual**. Click the '...' button to edit the manual column widths.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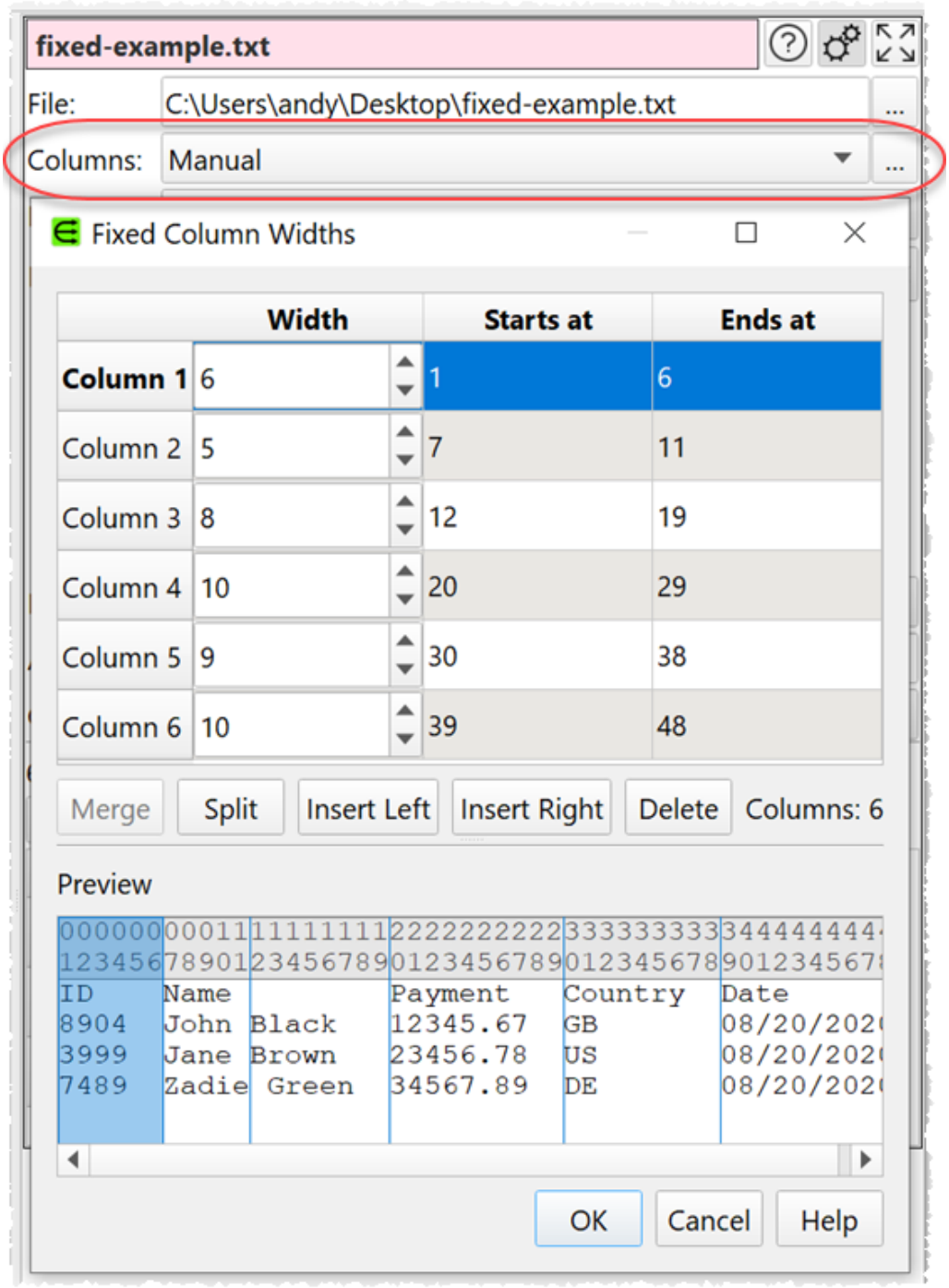


The current column boundaries are shown on the first few rows in the **Preview**. The horizontal offset of each character is shown in gray at the top. The currently selected columns are highlighted. Click on a column in the **Preview** to select it in the table, or vice versa.

You can change the column widths using the **Width** column of the table.


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Select 2 or more adjacent columns and click **Merge** to merge them into 1 column. Click then Shift+click in either the table or the preview to select multiple adjacent columns.

Select 1 column with a **Width** > 1 and click **Split** to split into 2 columns.

Select 1 or more adjacent columns and click **Insert Left** or **Insert Right** to add a new column with width 1 to the left or right of the selected columns.

Select 1 or more adjacent columns and click **Delete** delete the selected columns.

Click **OK** to save your changes and **Cancel** to discard them.

Unwanted columns and rows in the dataset can be removed after input using the Remove Cols and Filter transforms.

There is no specific fixed width file output type. But you can output fixed width files:

- Use the Extract transform to shorten any columns that are more than the desired length.
- Use the Pad transform to pad with spaces any columns that are less than the desired length.
- Use the Rename Cols transform to make columns headers the correct length.
- Output to plain text format.

See also:

- Video: How to convert fixed column width to CSV or Excel

### 2.5.5 JSON format

Easy Data Transform can input from and output to JSON format files. Default file extension ".json".

JSON (Javascript Object Notation) format is commonly used for exchanging data between programs.  JSON data is generally expected to be in UTF8 encoding without a Byte Order Mark (BOM).

For example:


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| | CategoryID | CategoryName | Description | In stock |
|---|---|---|---|---|
| 1 | 1 | Beverages | Soft drinks, coffees & teas | true |
| 2 | 2 | Condiments | Sweet and savory sauces | false |
| 3 | 3 | Confections | Candies and sweet breads | true |

Is equivalent to:

```
[
  {
    "CategoryID": 1,
    "CategoryName": "Beverages",
    "Description": "Soft drinks, coffees & teas",
    "In stock": true
  },
  {
    "CategoryID": 2,
    "CategoryName": "Condiments",
    "Description": "Sweet and savory sauces",
    "In stock": false
  },
  {
    "CategoryID": 3,
    "CategoryName": "Confections",
    "Description": "Candies and sweet breads",
    "In stock": true
  }
]
```

The Dot ('.') character is used in the column header to show nesting. For example:

| | name | carb | cholesterol | fiber | minerals.ca | minerals.fe | protein | sodium | vitamins.a | vitamins.c |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Avocado Dip | 2 | 5 | 0 | 0 | 0 | 1 | 210 | 0 | 0 |

Is equivalent to:

```
[
  {
    "name": "Avocado Dip",
    "carb": 2,
    "cholesterol": 5,
    "fiber": 0,
    "minerals": {
      "ca": 0,
      "fe": 0
    },
    "protein": 1,
    "sodium": 210,
```


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```
    "vitamins": {
      "a": 0,
      "c": 0
    }
  }
]
```

Any Dots in JSON names are converted to Hyphens ('-') on input.

JSON arrays can be input in either long or wide **Format**. For example:

```
[
   {
      "name": "1",
      "values": [ "a", "b" ]
   },
   {
      "name": "2",
      "values": [ "c", "d" ]
   }
]
```

Input as **Long (more rows):**

| | name | values |
|---|---|---|
| 1 | 1 | a |
| 2 | 1 | b |
| 3 | 2 | c |
| 4 | 2 | d |

Input as **Wide (more columns)**:

| | name | values.0 | values.1 |
|---|---|---|---|
| 1 | 1 | a | b |
| 2 | 2 | c | d |

If children of the top level object are named, then they are flattened slightly different to avoid creating thousands or millions of columns. For example:

```
{
      "record 1":{
           "value": 1
      },
```


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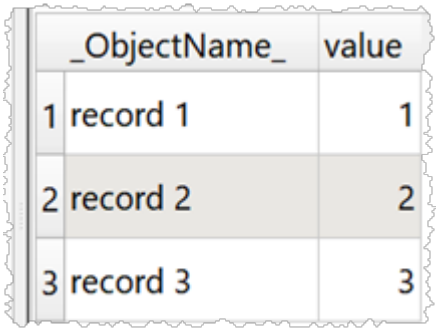
```
      "record 2":{
            "value": 2
      },
      "record 3":{
            "value": 3
      }
}
```

Is flattened into:



| | _ObjectName_ | value |
|---|---|---|
| 1 | record 1 | 1 |
| 2 | record 2 | 2 |
| 3 | record 3 | 3 |

An input JSON format file is expected to have either:

- a single top-level array or object; or
- a single JSON object on each line (see jsonlines.org).
- a record separator character followed by a single JSON object on each line (see RFC7464).

You can specify the JSON type for each columns when outputting to JSON using the **Value types** option.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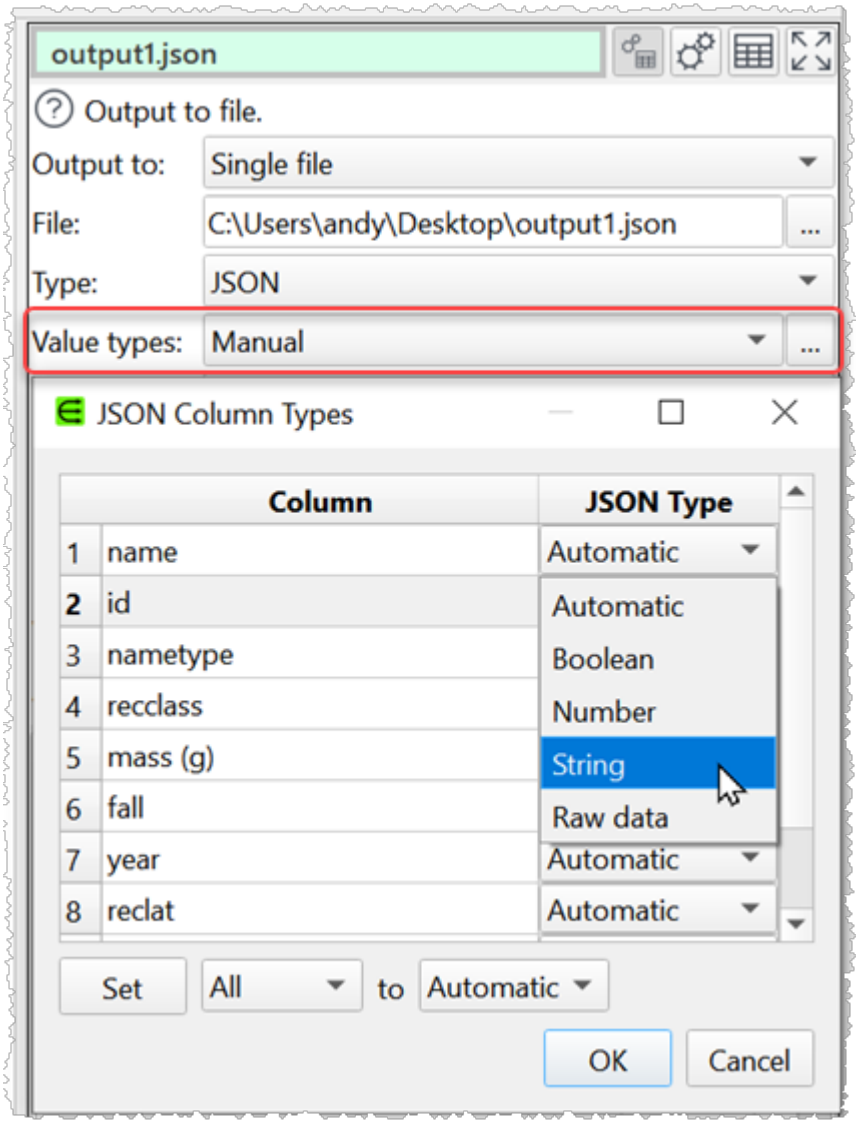


Note:

- The **Raw data** type is output without quotes or escaping and can be useful for data that is already valid JSON.
- The JSON number type does not support numbers with a additional leading 0, such as `0123` or `00.0`, or numbers containing a comma (regardless of locale). These should be output as JSON **String** type.
- Any values that do not match the type selected are output as a JSON null value.

See also:

- Video: How to convert CSV to JSON
- Video: How to convert Excel to JSON
- Video: How to convert JSON to CSV
- Video: How to convert JSON to Excel


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### 2.5.6 HTML format

Easy Data Transform can output to tables in HTML format files. Default file extension ".html".

HTML (HyperText Markup Language) format is commonly used for creating web pages. If you don't need the data to take up a whole page, you can just copy the `<table>` to `</table>` part of the output.

For example:

| | CategoryID | CategoryName | Description | In stock |
|---|---|---|---|---|
| 1 | 1 | Beverages | Soft drinks, coffees & teas | true |
| 2 | 2 | Condiments | Sweet and savory sauces | false |
| 3 | 3 | Confections | Candies and sweet breads | true |

Is output as:

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8"/>
    <title>C:\Users\andyb\Desktop\output.html</title>
    <style>table,td,th{border:1px solid black;text-
align:left;vertical-align:top;border-
spacing:0px;border-color:gray;font-family:Verdana,sans-
serif;}th{background-color:#E0E0E0;}td,th{padding:5px;}
</style>
  </head>
  <body>
    <table>
      <tbody>
        <tr>
          <th>CategoryID</th>
          <th>CategoryName</th>
          <th>Description</th>
          <th>In stock</th>
        </tr>
        <tr>
          <td>1</td>
          <td>Beverages</td>
          <td>Soft drinks, coffees &amp;amp; teas</td>
          <td>true</td>
        </tr>
        <tr>
          <td>2</td>
          <td>Condiments</td>
          <td>Sweet and savory sauces</td>
```


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```
          <td>false</td>
        </tr>
        <tr>
          <td>3</td>
          <td>Confections</td>
          <td>Candies and sweet breads</td>
          <td>true</td>
        </tr>
      </tbody>
    </table>
  </body>
</html>
```

Usually you will want to 'escape' special HTML characters in dataset values when output to HTML format. For example to convert < to `<`, so it can be correctly displayed in the HTML. However, if you wish to write 'raw' HTML, then you can uncheck **Escape special characters** in the **Right** pane. Note that you can also set **Change** to **To escaped HTML** to escape selected columns in the Decode transform.

### 2.5.7 Markdown format

Easy Data Transform can output to tables in Markdown format files. Default file extension ".md".

Markdown format is commonly used as a human-friendly markup language, which can be automatically translated to HTML.

For example:

| | CategoryID | CategoryName | Description | In stock |
|---|---|---|---|---|
| 1 | 1 | Beverages | Soft drinks, coffees & teas | true |
| 2 | 2 | Condiments | Sweet and savory sauces | false |
| 3 | 3 | Confections | Candies and sweet breads | true |

Is output as:

```
| CategoryID | CategoryName | Description
   | In stock |
|------------|--------------|-------------------------
---|----------|
| 1          | Beverages    | Soft drinks, coffees &
teas | true     |
| 2          | Condiments   | Sweet and savory sauces
   | false    |
| 3          | Confections  | Candies and sweet breads
   | true     |
```


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You can also use Markdown when you need a plain text version of your data, for example in a code comment.

Note that not all Markdown implementations support tables. If your implementation does not support tables, you may need to output to HTML instead.

See also:
- Video: How to convert CSV to Markdown
- Video: How to convert Excel to Markdown

### 2.5.8 Plain text format

Easy Data Transform can input from and output to plain text format files. Default file extension is ".log" for input and ".log" or ".txt" for output.

Plain text format is used for semi-structured data, such as computer generated log files.

When inputting plain text the dataset is read into a single column. The row delimiter is Line Feed, Carriage Return or Carriage Return+Line Feed.

For example:

```
03/22 08:51:01 INFO   :..settcpimage: Associate with TCP/IP image name = TCPCS
03/22 08:51:02 INFO   :..reg_process: registering process with the system
03/22 08:51:02 INFO   :..reg_process: attempt OS/390 registration
03/22 08:51:02 INFO   :..reg_process: return from registration rc=0
```

Is input in plain text format as:

| | 1 |
|---|---|
| 1 | 03/22 08:51:01 INFO :..settcpimage: Associate with TCP/IP image name = TCPCS |
| 2 | 03/22 08:51:02 INFO :..reg_process: registering process with the system |
| 3 | 03/22 08:51:02 INFO :..reg_process: attempt OS/390 registration |
| 4 | 03/22 08:51:02 INFO :..reg_process: return from registration rc=0 |

When outputting plain text:
- Each row ends with a Line Feed, Carriage Return or Carriage Return+Line Feed, as selected by the user.
- Typically plain text datasets only have 1 column. But if there is more than one column, the column values will be concatenated without a delimiter. If you want a delimiter use Concat Cols and Remove Cols to create a single column that contains the appropriate delimiters, or output as delimited text.
- Values are not escaped.


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## 2.5.9 TSV format

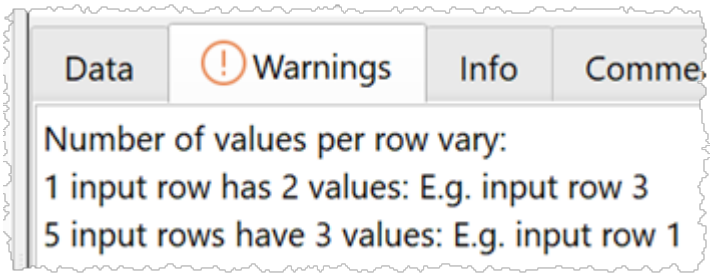
Easy Data Transform can input from and output to TSV format files. Default file extension ".tsv".

TSV (Tab Separated Value) format is commonly used for exchanging tabular data between programs.

TSV is a type of delimited text file format where values are separated by Tab characters and rows by Line Feed, Carriage Return or Carriage Return+Line Feed. Tabs and Carriage Return are not allowed within data values, so there is no need for quoting or escaping delimiters, as with CSV files. This means that TSV files are generally a bit more compact and faster to read and write than CSV files.

To input a TSV file you should set **Type** to **Delimited text** and **Delimiter** to **Tab (\t)** in the **Right** pane. You will usually also want to uncheck **ignore repeated delimiters** and set **Quoting** to **Automatic** (which is the same as **Unquoted** for Tab delimiters).

You will be warned when inputting a TSV format file that has a different number of values per row. This may be a sign that there are problems with the data.




To output a TSV file you should set **Delimiter** to **Tab (\t)**. You will usually also want to set **Quoting** to **Never** in the **Right** pane. If you have a Tab character or Carriage Return within a value, then Easy Data Transform will then convert it to a Space on output.

For example: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| | CategoryID | CategoryName | Description | In stock |
|---|---|---|---|---|
| 1 | 1 | Beverages | Soft drinks, coffees & teas | true |
| 2 | 2 | Condiments | Sweet and savory sauces | false |
| 3 | 3 | Confections | Candies and sweet breads | true |

Is output with **Delimiter** set to **Tab (\t)** and **Quoting** set to **Never** as:

```
CategoryID→CategoryName→Description→In stock
1→Beverages→Soft drinks, coffees & teas→true
2→Condiments→Sweet and savory sauces→false
3→Confections→Candies and sweet breads→true
```

See also:

- Video: How to convert Tab delimited to CSV
- Video: How to convert CSV to Tab delimited

## 2.5.10 vCard format

Easy Data Transform can input from and output to vCard format files. Default file extension ".vcf".

VCard format is commonly used as way of exchanging contact details between programs.

Note that you need to change the column header names to the values expected by vCard (using the Rename Cols transform). For example vCard expects the full name column to be named `FN`.

Choose an appropriate text encoding. You should probably uncheck **Byte Order Mark** if you are encoding in a UTF format, such as **UTF-8**.

For example:

| | N | FN | ORG | TEL;TYPE=WORK,VOICE | ADR;TYPE=WORK,PREF |
|---|---|---|---|---|---|
| 1 | Gump;Forrest;;Mr.; | Forrest Gump | Bubba Gump Shrimp Co. | (111) 555-1212 | 100 Waters Edge;Baytown; |

Is equivalent to:

```
BEGIN:VCARD
VERSION:3.0
N:Gump;Forrest;;Mr.;
FN:Forrest Gump
ORG:Bubba Gump Shrimp Co.
TEL;TYPE=WORK,VOICE:(111) 555-1212
```


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```
ADR;TYPE=WORK,PREF:100 Waters
Edge;Baytown;LA;30314;United States of America
END:VCARD
```

See also:

- Video: How to convert CSV to vCard

### 2.5.11 XML format

Easy Data Transform can input from and output to XML format files. Default file extension ".xml".

XML (Extensible Markup Language) format is commonly used for exchanging data between programs.

For example:

| | CategoryID | CategoryName | Description | In stock |
|---|---|---|---|---|
| 1 | 1 | Beverages | Soft drinks, coffees & teas | true |
| 2 | 2 | Condiments | Sweet and savory sauces | false |
| 3 | 3 | Confections | Candies and sweet breads | true |

Is equivalent to:

```
<?xml version="1.0" encoding="UTF-8"?>
<root>
  <record>
    <CategoryID>1</CategoryID>
    <CategoryName>Beverages</CategoryName>
    <Description>Soft drinks, coffees &amp;
teas</Description>
    <In-stock>true</In-stock>
  </record>
  <record>
    <CategoryID>2</CategoryID>
    <CategoryName>Condiments</CategoryName>
    <Description>Sweet and savory sauces</Description>
    <In-stock>false</In-stock>
  </record>
  <record>
    <CategoryID>3</CategoryID>
    <CategoryName>Confections</CategoryName>
    <Description>Candies and sweet breads</Description>
    <In-stock>true</In-stock>
  </record>
</root>
```


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The Dot ('.') character is used in the column header to show nesting. For example:

| | name | carb | cholesterol | fiber | minerals.ca | minerals.fe | protein | sodium | vitamins.a | vitamins.c |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Avocado Dip | 2 | 5 | 0 | 0 | 0 | 1 | 210 | 0 | 0 |

Is equivalent to:

```
<?xml version="1.0" encoding="UTF-8"?>
<root>
  <record>
    <name>Avocado Dip</name>
    <carb>2</carb>
    <cholesterol>5</cholesterol>
    <fiber>0</fiber>
    <protein>1</protein>
    <sodium>210</sodium>
    <minerals>
      <ca>0</ca>
      <fe>0</fe>
    </minerals>
    <vitamins>
      <a>0</a>
      <c>0</c>
    </vitamins>
  </record>
</root>
```

Note that the columns may be input in a different order to the nodes in the XML. You can use Reorder Cols or Stack transforms to change the ordering.

Any Dots in XML element names are converted to Hyphens ('-') on input.

The Underscore ('_') character is used at the start of a column header name to identify it as an XML attribute. For example:

| | _name | _carb | _cholesterol | _fiber | minerals.ca | minerals.fe | _protein | _sodium | vitamins.a | vitamins.c |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Avocado Dip | 2 | 5 | 0 | 0 | 0 | 1 | 210 | 0 | 0 |

Is equivalent to:

```
<?xml version="1.0" encoding="UTF-8"?>
<root>
  <record carb="2" cholesterol="5" fiber="0"
name="Avocado Dip" protein="1" sodium="210">
    <minerals>
      <ca>0</ca>
      <fe>0</fe>
    </minerals>
    <vitamins>
      <a>0</a>
```


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```
      <c>0</c>
    </vitamins>
  </record>
</root>
```

Repeated XML values can be input in either long or wide **Format**. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<ITEMS>
  <ITEM>
    <PARAM name="a" value="1"/>
    <PARAM name="b" value="2"/>
  </ITEM>
</ITEMS>
```

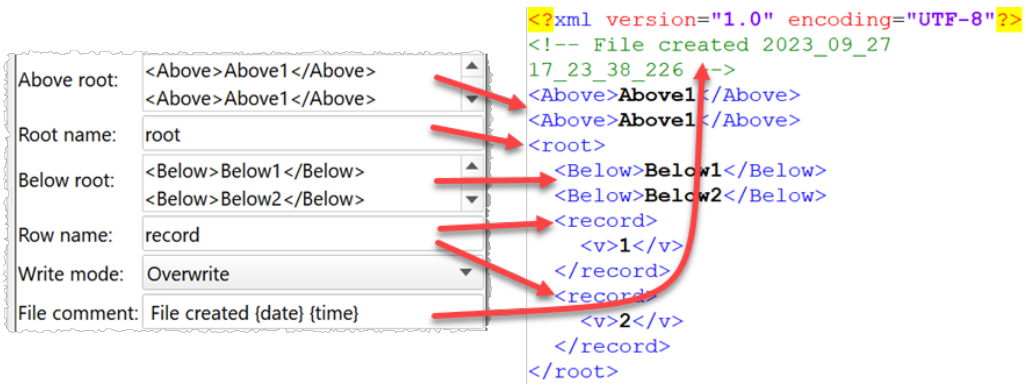
Input as **Long (more rows):**

| | PARAM._name | PARAM._value |
|---|---|---|
| 1 | b | 2 |
| 2 | a | 1 |

Input as **Wide (more columns)**:

| | PARAM._value | PARAM._name | PARAM._value.1 | PARAM._name.1 |
|---|---|---|---|---|
| 1 | 1 | a | 2 | b |

You can set the names for the root and record tags and add extra XML below the root:




Use '.' if you need nested tags: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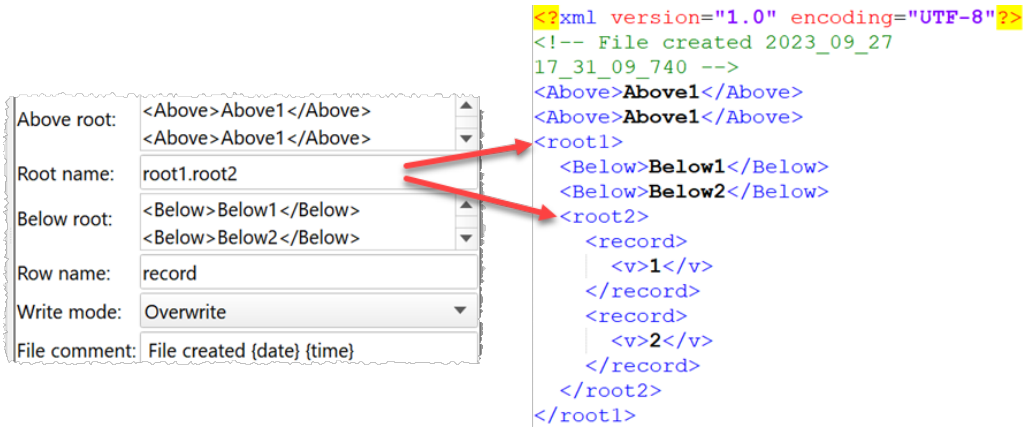
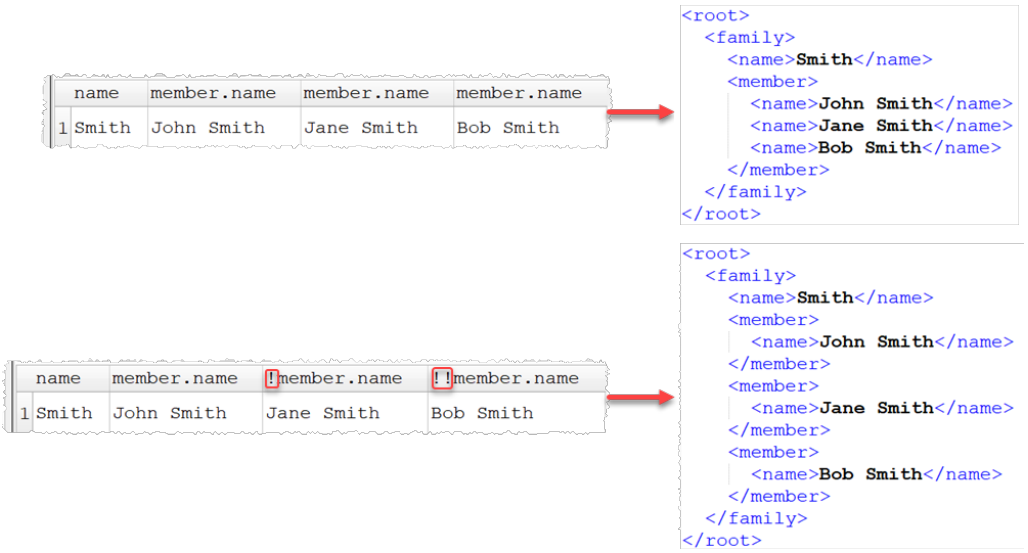



Exclamation marks at the start of column names are removed from name tags when output to XML. This can be useful when you want duplicate tag names with the same parent.




You are responsible for ensuring that the names of XML nodes and attributes are valid (e.g. start with a letter or underscore and do not contain spaces).

If you need really fine grained control over the XML output, you can:

- output the XML to a file
- read the file back in as plain text
- apply transforms
- write it back out as plain text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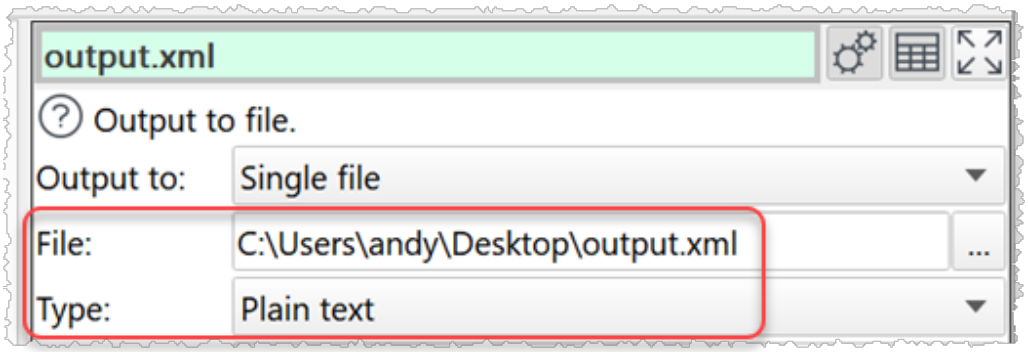


See also:

- Video: How to convert CSV to XML
- Video: How to convert Excel to XML
- Video: How to convert XML to CSV
- Video: How to convert XML to Excel
- Video: How to convert CAMT 053 XML to Excel or CSV

## 2.5.12 YAML format

Easy Data Transform can output to YAML format files. Default file extension ".yaml".

YAML (YAML Ain't Markup Language) format is commonly used for exchanging data between programs and for configuration files.

For example:

| | CategoryID | CategoryName | Description | In stock |
|---|---|---|---|---|
| 1 | 1 | Beverages | Soft drinks, coffees & teas | true |
| 2 | 2 | Condiments | Sweet and savory sauces | false |
| 3 | 3 | Confections | Candies and sweet breads | true |

Is output as:

```
---
-
  CategoryID: 1
  CategoryName: Beverages
  Description: Soft drinks, coffees & teas
  In stock: true
-
  CategoryID: 2
  CategoryName: Condiments
  Description: Sweet and savory sauces
  In stock: false
```


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```
-
  CategoryID: 3
  CategoryName: Confections
  Description: Candies and sweet breads
  In stock: true
```

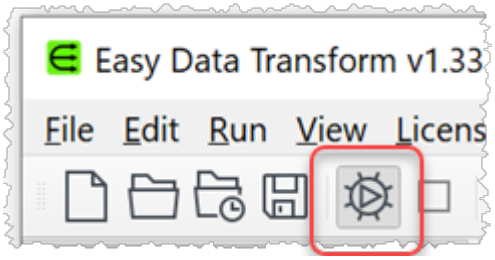
See also:

- Video: How to convert Excel to YAML

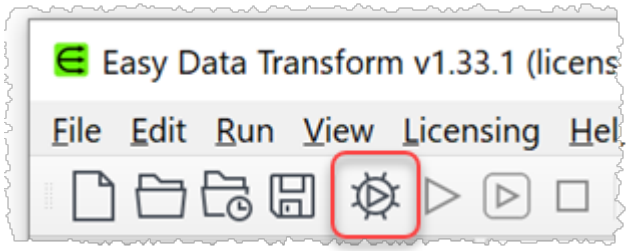
## 2.6 Processing

You can run processing of your data in one of two modes:

- Automatic mode: Processing is run automatically as soon as you have stopped making changes, for the amount of time specified in the Preferences window.




- Manual mode: You control when processing is run, on an item-by-item basis.




You can switch between modes by toggling **Run>Auto Run**, or the equivalent tool bar button.

Typically automatic mode is better for small to medium datasets, but manual mode may be a better choice for large datasets.

There are 3 options for running processing in manual mode:

- **Run>Run Unprocessed**: Run processing on any items that are not already processed.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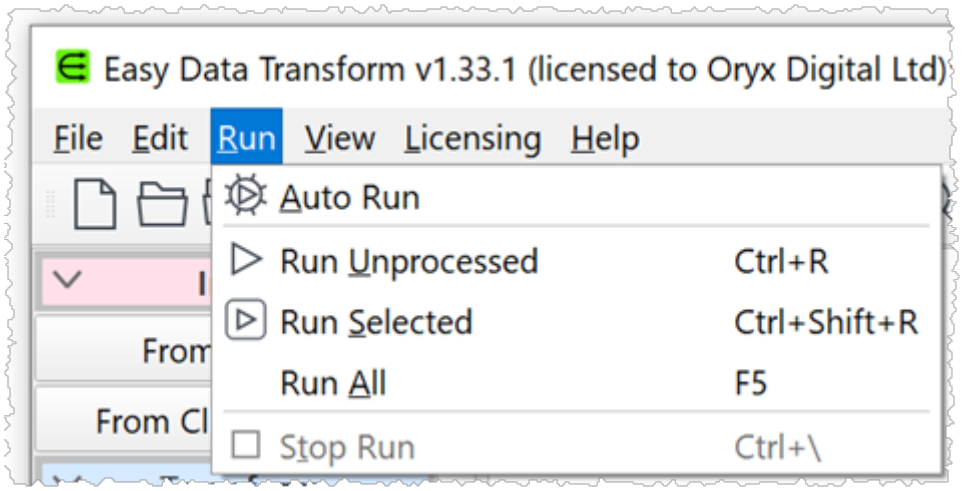
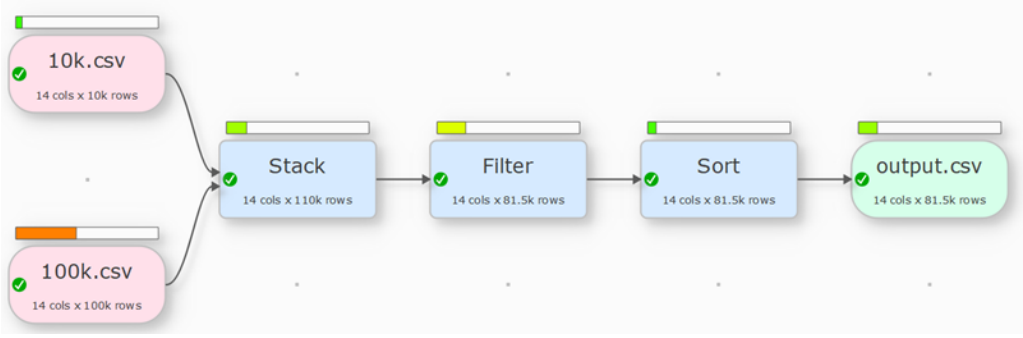
- **Run>Run Selected**: Run processing on one or more selected items, even if they are already processed. Any upstream items that need updating are also processed.
- **Run>Run All**: Run processing on all items, even if they are already processed. This is provided for completeness, but you should usually use one of the above 2 options, for efficiency.




You can also click the **Run** button in the **Right** pane, which is equivalent to **Run>Run Selected**. Note that **Run**, for a clipboard input, applies the options to data previously imported. If you want to re-import from the clipboard in automatic mode, then you have to click the **Import from clipboard** button.

Check **View>Timing Profile** to see where the processing time is being spent. The length of the colored bar is proportional to the fraction of total processing spent processing that item.




Or select **View>Item Summary...** and click on the **Processing** column header to sort by processing time,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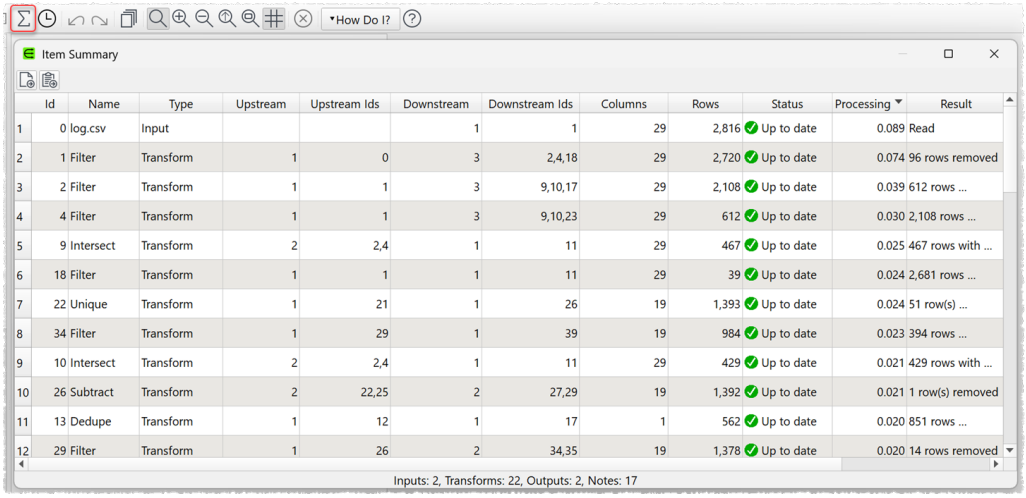



| | Id | Name | Type | Upstream | Upstream Ids | Downstream | Downstream Ids | Columns | Rows | Status | Processing | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | log.csv | Input | | | 1 | 1 | 29 | 2,816 | Up to date | 0.089 | Read |
| 2 | 1 | Filter | Transform | 1 | 0 | 3 | 2,4,18 | 29 | 2,720 | Up to date | 0.074 | 96 rows removed |
| 3 | 2 | Filter | Transform | 1 | 1 | 3 | 9,10,17 | 29 | 2,108 | Up to date | 0.039 | 612 rows ... |
| 4 | 4 | Filter | Transform | 1 | 1 | 3 | 9,10,23 | 29 | 612 | Up to date | 0.030 | 2,108 rows ... |
| 5 | 9 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 467 | Up to date | 0.025 | 467 rows with ... |
| 6 | 18 | Filter | Transform | 1 | 1 | 1 | 11 | 29 | 39 | Up to date | 0.024 | 2,681 rows ... |
| 7 | 22 | Unique | Transform | 1 | 21 | 1 | 26 | 19 | 1,393 | Up to date | 0.024 | 51 row(s) ... |
| 8 | 34 | Filter | Transform | 1 | 29 | 1 | 39 | 19 | 984 | Up to date | 0.023 | 394 rows ... |
| 9 | 10 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 429 | Up to date | 0.021 | 429 rows with ... |
| 10 | 26 | Subtract | Transform | 2 | 22,25 | 2 | 27,29 | 19 | 1,392 | Up to date | 0.021 | 1 row(s) removed |
| 11 | 13 | Dedupe | Transform | 1 | 12 | 1 | 17 | 1 | 562 | Up to date | 0.020 | 851 rows ... |
| 12 | 29 | Filter | Transform | 1 | 26 | 2 | 34,35 | 19 | 1,378 | Up to date | 0.020 | 14 rows removed |

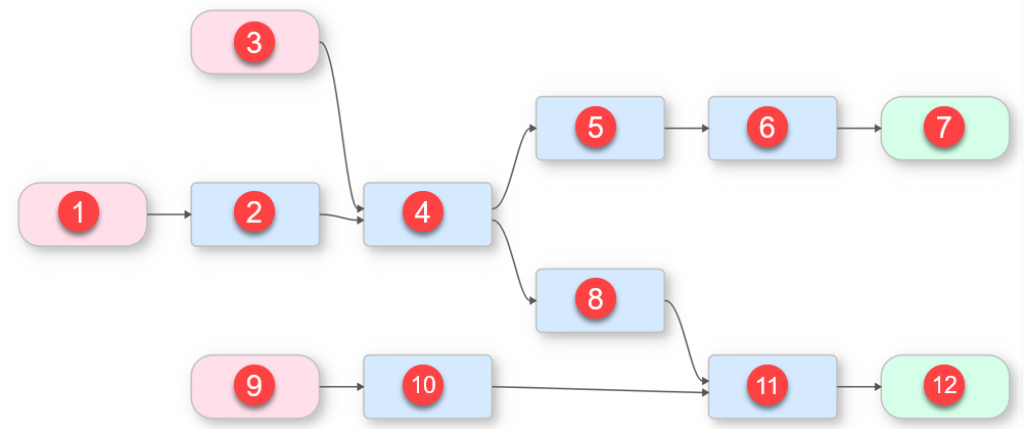
You can stop processing with **Run>Stop Run**, or the equivalent tool bar button. If you stop processing in automatic mode it will switch to manual mode.

When an item is processed, all it's upstream items will be processed first. You can only change the options for an item in the **Right** pane if all it's upstream inputs and transforms are processed.

The algorithm for processing items in sequence is:

```
While there are items that need processing:
      Find the unprocessed Input item that is further
left. If multiple Inputs have the same x position,
choose the topmost one.
      Process the input
      Recursively process it's children, depth-first,
starting with the top one in each branch. If multiple
children have the same y position, choose the leftmost
one.
```

For example:





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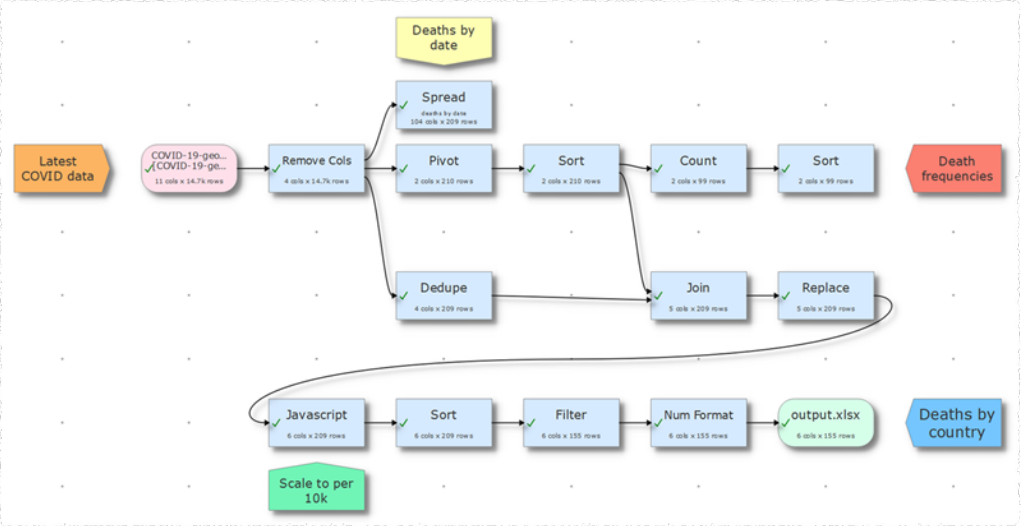
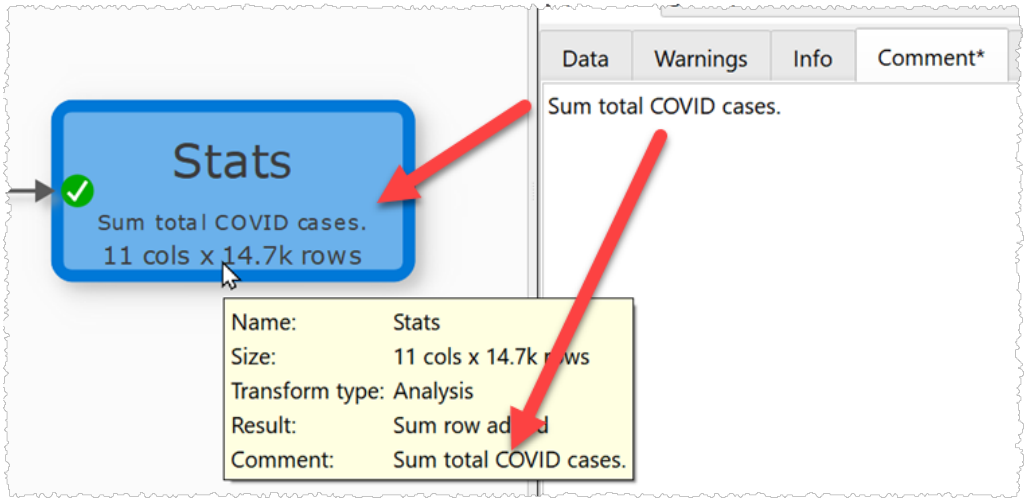
## 2.7 Comments

You can manage the complexity of large .transform files by adding comment text to:

- The **Comment** field of Note items. These are added to the **Center** pane by right clicking and selecting **Note** from the menu. You can also set an **Arrow** direction and a **Color**. If you right click on an existing item, the Note item will be placed pointing to that item, if there is space. The comment will be shown as a tooltip when you hover over the Note item.




- The **Comment** tab of Input, Transform or Output items. Check **View>Show Comments** to show these comments in the **Center** pane. The comment will be shown as a tooltip when you hover over the item.





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- In the **Notes** window that is displayed when you select **File>Notes...** from the main menu.

You can also visually group related items in the **Center** pane to show that they are related.

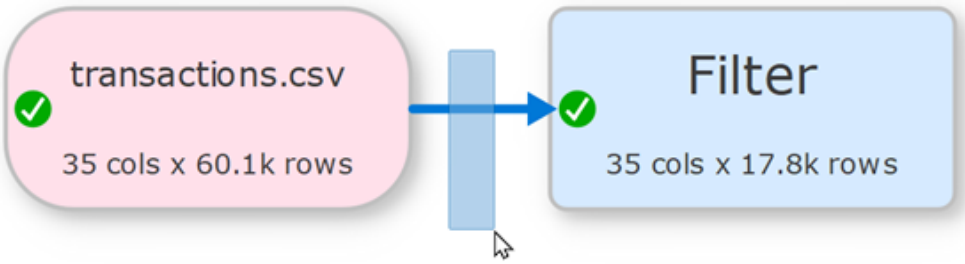
## 2.8 Connections

When you select an input or transform item and add a transform or output item, connections to the currently selected item(s) are added automatically.

### To select a connection

To select a connection either:

- Click on the connection; or
- Click and drag a box over any part of the connection. This may be easier than clicking the connection when you are zoomed back.




### To delete a connection

To delete a connection:

- Select the connection.
- Select **Edit>Delete** (or click the **Delete** tool bar button).

Easy Data Transform will try to remember columns when an item is disconnected and reconnected. But it is generally better not to disconnect an item, unless you have to.

- If you want to change an input file, do it by selecting the input and clicking on '...' in the **Right** pane, rather than disconnecting the input and connecting a new one.
- If you want to add a new transform between 2 already connected items, you can do it without disconnecting (see below).

### To add a transform to a connection

To add a transform between two already connected items:

- Select the connection.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- Choose the new transform from the **Left** pane or using the right click menu.

### To add a connection

To add a new connection between two existing items:

- Hover over the start item.
- Click the '**+**' that appears.
- Hover over the end item
- Click the '**+**' that appears.

Press the 'Esc' key or click away from an item to cancel adding the connection.

Note that the '**+**' will only appear if an additional connection is allowed. For example you can't:

- Create a loop.
- Connect more than once to an output.

## 2.9 Headers

If the first row of an input is a header (i.e. one that describes the columns below) check **has header** for that input in the **Right** pane.


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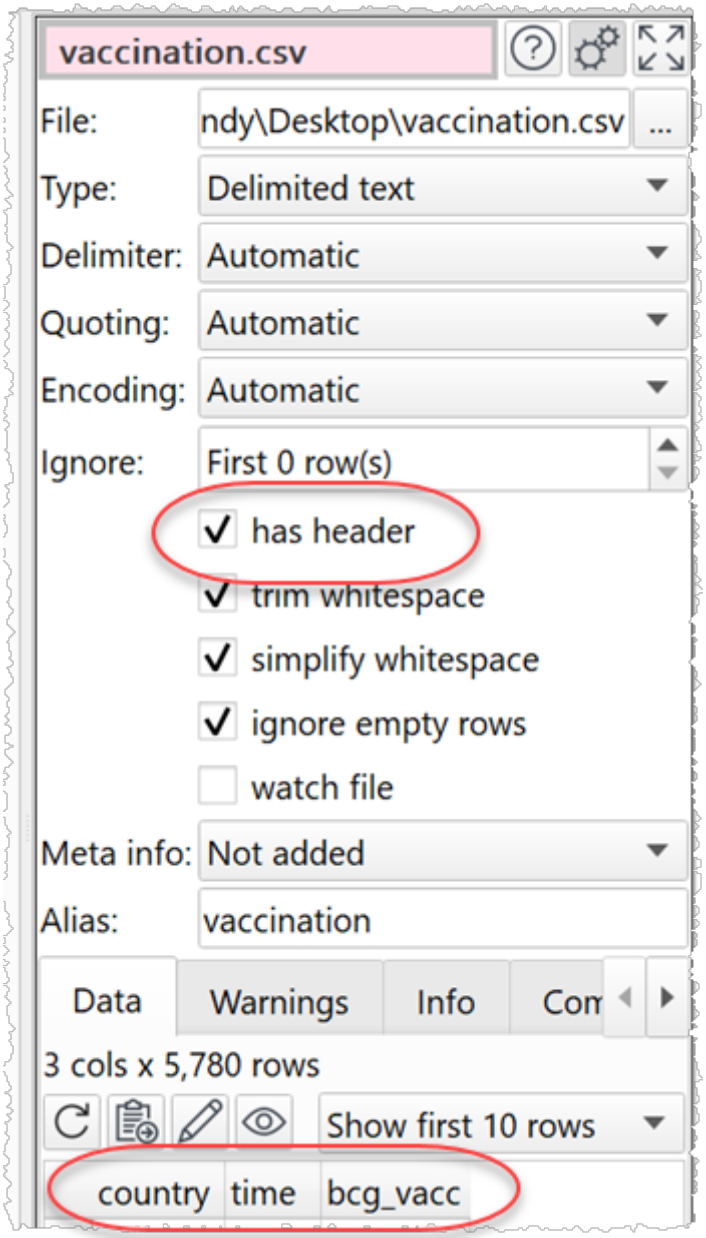


When you first read in a dataset Easy Data Transform will make a guess about whether the first row is a header (it will assume it is a header if it contains no dates or numbers).

If you have unwanted rows that appear before the header, you can remove them using the **Ignore** field.

You can move 1 or more dataset rows to the header using the Header transform.

See also:
- Compare 2 or more dataset headers
- Schemas


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## 2.10 Column types

Easy Data Transform does not require you to explicitly set column types. But different transforms might interpret a column as text, numeric or date, as appropriate. For example, **intelligent sort** in the Sort transform will infer whether a column is text, date or numeric from the values in the column, and sort it accordingly. This approach is very flexible and can save you a lot of time.

Note that you can explicitly set a column type when exporting to Excel or JSON files.

### 2.10.1 Text

Whitespace (such as Space and Tab characters) and case are always significant, unless stated otherwise.

You can remove leading and trailing whitespace by checking **trim whitespace** in the Input or using the Whitespace transform.

You can change the case using the Case transform.

You can concatenate and split columns of text using the Concat Cols and Split Col transforms.

Manipulate columns of text using the Chop, Extract , Insert, Pad, Replace and Substitute transforms.

Count the number of times each text value appears in a column using the Count transform.

Check text values are as expected in a column using the Verify transform.

Generate random text values from a selection using the Random transform.

### 2.10.2 Date

Set **Supported Date Formats** in the Preferences window according to how you want to interpret values as dates.

| Format | Meaning |
|---|---|
| `d` | The day as number without a leading zero (1 to 31) |
| `dd` | The day as number with a leading zero (01 to 31) |


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| Format | Meaning |
|---|---|
| ddd | The abbreviated localized day name (e.g. 'Mon' to 'Sun'). Uses the locale to localize the name. |
| dddd | The long localized day name (e.g. 'Monday' to 'Sunday'). Uses the locale to localize the name. |
| M | The month as number without a leading zero (1 to 12). |
| MM | The month as number with a leading zero (01 to 12) |
| MMM | The abbreviated localized month name (e.g. 'Jan' to 'Dec'). Uses the locale to localize the name. |
| MMMM | The long localized month name (e.g. 'January' to 'December'). Uses the locale to localize the name. |
| yy | The year as two digit number (00 to 99). |
| yyyy | The year as four digit number. If the year is negative, a minus sign is prepended in addition. |

For example:
- To support a date such as 31/1/2019 add a supported date format: d/M/yyyy
- To support a date such as 1-31-19 add a supported date format: M-d-yy

List the date formats in order of preference, with the most likely to be used first.

Dates with only two year digits, are treated as a date between 1900 and 1999. E.g. "31/1/19" is interpreted in d-M-yy format as 31st January 1919.

Add today date to a dataset using input file meta information or using the Stamp transform.


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Values that are in a recognized date format will be treated as dates in transforms such as: Calculate, Compare, Filter, If and Sort. Supporting large numbers of date formats will slow down these transforms.

Change the format of dates using the DateTime Format transform.

Do date calculations, such as calculating the number of days between 2 dates, using the Calculate or Javascript transform.

Convert between ISO standard datetimes and milliseconds since 1st Jan 1970 using the Calculate transform.

Convert an ISO standard datetimes (e.g. 2020-10-16T01:51) into separate date and time columns by using the Split Cols transform on the "T" delimiter.

Add missing dates in a sequence using Sequence.

Check date values are as expected in a column using the Verify transform.

Generate random dates using the Random transform.

Days of the week in `ddd` format in some of the more commonly used locales are:

| Day of week | English/ United Kingdom | English/ United States | French/ France | German/ Germany | Italian/Italy | Spanish /Spain |
|---|---|---|---|---|---|---|
| 1 | Sun | Sun | dim. | So. | dom | dom |
| 2 | Mon | Mon | lun. | Mo. | lun | lun |
| 3 | Tue | Tue | mar. | Di. | mar | mar |
| 4 | Wed | Wed | mer. | Mi. | mer | mié |
| 5 | Thu | Thu | jeu. | Do. | gio | jue |
| 6 | Fri | Fri | ven. | Fr. | ven | vie |
| 7 | Sat | Sat | sam. | Sa. | sab | sáb |

Days of the week in `dddd` format in some of the more commonly used locales are:


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| Day of week | English/ United Kingdom | English/ United States | French/ France | German/ Germany | Italian/Italy | Spanish /Spain |
|---|---|---|---|---|---|---|
| 1 | Sunday | Sunday | dimanche | Sonntag | domenica | domingo |
| 2 | Monday | Monday | lundi | Montag | lunedì | lunes |
| 3 | Tuesday | Tuesday | mardi | Dienstag | martedì | martes |
| 4 | Wednesday | Wednesday | mercredi | Mittwoch | mercoledì | miércoles |
| 5 | Thursday | Thursday | jeudi | Donnerstag | giovedì | jueves |
| 6 | Friday | Friday | vendredi | Freitag | venerdì | viernes |
| 7 | Saturday | Saturday | samedi | Samstag | sabato | sábado |

Months of the year in `MMM` format in some of the more commonly used locales are:

| Month of year | English/ United Kingdom | English/ United States | French/ France | German/ Germany | Italian/Italy | Spanish /Spain |
|---|---|---|---|---|---|---|
| 1 | Jan | Jan | janv. | Jan. | gen | ene |
| 2 | Feb | Feb | févr. | Feb. | feb | feb |
| 3 | Mar | Mar | mars | März | mar | mar |
| 4 | Apr | Apr | avr. | Apr. | apr | abr |
| 5 | May | May | mai | Mai | mag | may |
| 6 | Jun | Jun | juin | Juni | giu | jun |
| 7 | Jul | Jul | juil. | Juli | lug | jul |
| 8 | Aug | Aug | août | Aug. | ago | ago |
| 9 | Sept | Sep | sept. | Sept. | set | sept |
| 10 | Oct | Oct | oct. | Okt. | ott | oct |
| 11 | Nov | Nov | nov. | Nov. | nov | nov |
| 12 | Dec | Dec | déc. | Dez. | dic | dic |

Months of the year in `MMMM` format in some of the more commonly used locales are:


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| Month of year | English/ United Kingdom | English/ United States | French/ France | German/ Germany | Italian/Italy | Spanish /Spain |
|---|---|---|---|---|---|---|
| 1 | January | January | janvier | Januar | gennaio | enero |
| 2 | February | February | février | Februar | febbraio | febrero |
| 3 | March | March | mars | März | marzo | marzo |
| 4 | April | April | avril | April | aprile | abril |
| 5 | May | May | mai | Mai | maggio | mayo |
| 6 | June | June | juin | Juni | giugno | junio |
| 7 | July | July | juillet | Juli | luglio | julio |
| 8 | August | August | août | August | agosto | agosto |
| 9 | September | September | septembre | September | settembre | septiembre |
| 10 | October | October | octobre | Oktober | ottobre | octubre |
| 11 | November | November | novembre | November | novembre | noviembre |
| 12 | December | December | décembre | Dezember | dicembre | diciembre |

### 2.10.3 Numeric

Set the locale according to how you want to interpret values as numbers. For example:

- If locale is set to `English/United Kingdom` or `English/United States` then `123,456.7` is a number and `123.456,7` isn't
- If locale is set to `German/Germany` or `French/France` then `123.456,7` is a number and `123,456.7` isn't

An integer is a whole number. E.g. `1.0` or `1,0` (depending on your locale), `-1` and `1e3` are considered integers.

Numeric values are recognized in the approximate range -1 x $10^{308}$ to +1 x $10^{308}$.

Numeric calculations are accurate to approximately 16 digits of precision. This means that Easy Data Transform may consider `12345678901234567` and `12345678901234568` to be equal, for example using the = operator in a Filter transform.


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`NaN` means 'not a number'. It can be returned by some calculations, for example using **Calculate** to raise 1000 to the power 1000 will overflow numerically and return `NaN`.

Rounding artifacts can sometimes occur during calculations with real (floating point) numbers. This is because fractional values whose denominator is not a power of 2 (e.g. 0.1), cannot be exactly represented as floating point numbers of finite precision. It is not a bug.

Change the format of numbers (e.g. the number of decimal places or the decimal symbol) using the Num Format transform.

Change the base of integers (e.g. base 10 to base 16) using the Num Base transform.

Do numeric calculations, such as multiplying 2 columns, using the Calculate or Javascript transforms.

Add missing integers in a sequence using Sequence.

Check numeric values are as expected in a column using the Verify transform.

Generate random real or integer numbers using the Random transform.

### 2.10.4 Boolean

A boolean value can be `true` or `false`.

| Canonical value | Allowed values | Examples |
|---|---|---|
| `true` | `true` (case insensitive) or a non-zero numeric value | `true`<br>`TRUE`<br>`True`<br>`1`<br>`1.0`<br>`-1`<br>`0.1`<br>`999` |
| `false` | `false` (case insensitive) or a zero numeric value | `false`<br>`FALSE`<br>`False`<br>`0`<br>`0.0` |


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## 2.11 Locale

The locale language and country setting affect how numbers and dates are interpreted and displayed.

All newly created .transform files have the locale set by **Default Locale** in the Preferences window. The intial value of this is set from your operating system.

The current locale is shown in the status bar. You can change the locale of the current .transform file via **Edit>Locale...** or the **Locale** button in the status bar.

If you **File>Open** a .transform file with a different locale to the current locale, you will be warned, unless you disable this warning in **Preferences>warn on locale change**.

Example outputs using the DateTime Format transform with ISO date value `2001-05-21` and **Format to** set to `ddd MMMM d yyyy`:

| Locale to | Result |
|---|---|
| English/United States | Mon May 21 2001 |
| English/United Kingdom | Mon May 21 2001 |
| German/Germany | Mo. Mai 21 2001 |
| French/France | lun. mai 21 2001 |
| Spanish/Spain | lun. mayo 21 2001 |
| Italian/Italy | lun maggio 21 2001 |
| Portuguese/Portugal | segunda maio 21 2001 |
| Arabic/Egypt | الاثنين ٢١ مايو ٢٠٠١ |
| Chinese/China | 周一 五月 21 2001 |
| Japanese/Japan | 月 5月 21 2001 |

Example outputs using the Num Format transform with US/UK number value `1234.567`:


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| Locale to | Result |
|---|---|
| English/United States | 1,234.567 |
| English/United Kingdom | 1,234.567 |
| German/Germany | 1.234,567 |
| German/Switzerland | 1’234.567 |
| French/France | 1 234,567 |
| Spanish/Spain | 1.234,567 |
| Italian/Italy | 1.234,567 |
| Portuguese/Portugal | 1 234,567 |
| Arabic/Egypt | ١,٢٣٤,٥٦٧ |
| Chinese/China | 1,234.567 |
| Japanese/Japan | 1,234.567 |

## 2.12 Meta Information

You can add meta information to input data using the **Meta info** field in the **Right** pane when you select an input item.


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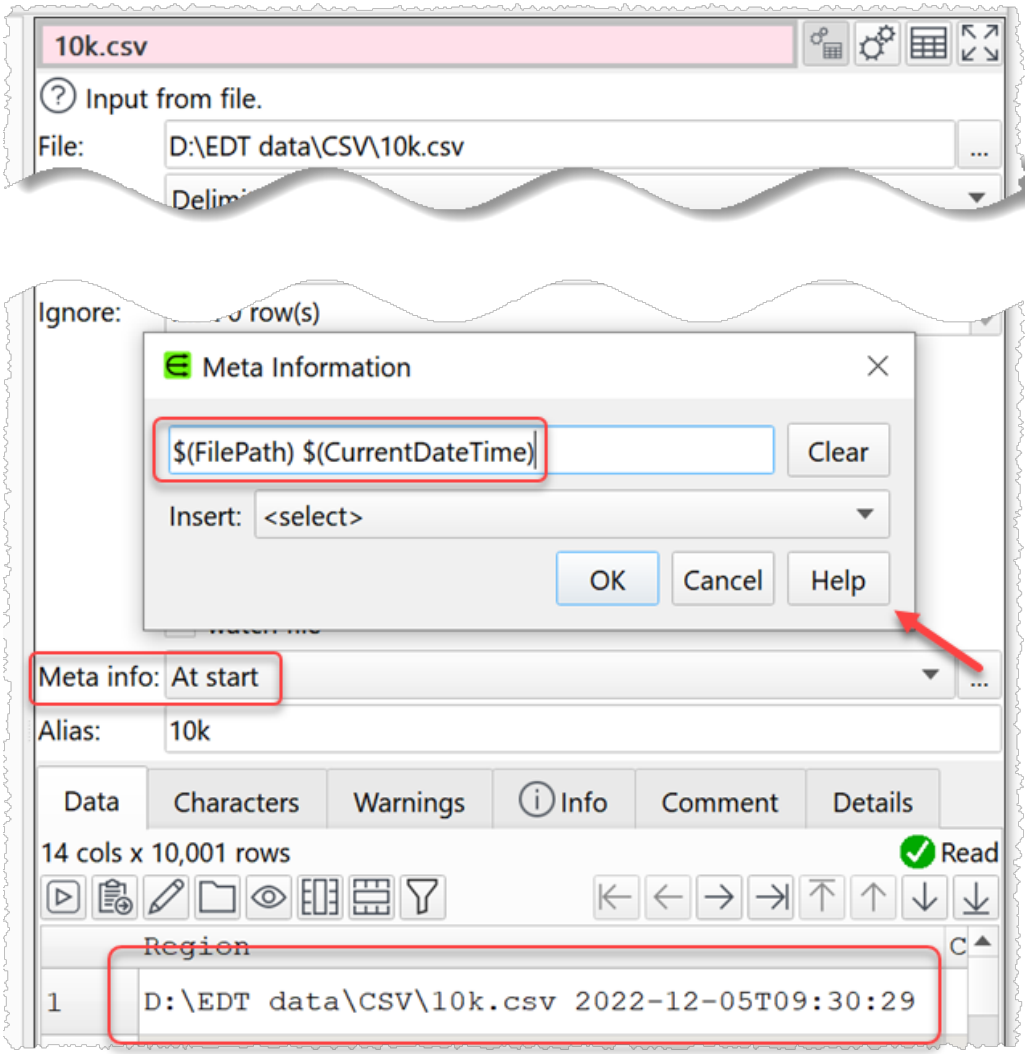


Set it to **At start**, **At end** or **Every row**, depending on where you want the meta information to appear. Then click on the ... button to edit which information you wish to show. The following placeholders are substituted by their actual values at the time of input.

| Meta Information | Description | Example |
|---|---|---|
| `$(ComputerName)` | The name of the computer. | `MyComputer` |
| `$(CurrentDate)` | The current date, in ISO format. | `2020-08-18` |
| `$(CurrentDateTime)` | The current datetime, in ISO format. | `2020-08-18T18:00:00` |
| `$(DataColumns)` | The number of columns in the dataset (not including meta data). | `10` |


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| Meta Information | Description | Example |
|---|---|---|
| `$(DataRows)` | The number of row in the dataset (not including meta data). | `10,000` |
| `$(DataValues)` | The number of columns x rows in the dataset (not including meta data). | `100,000` |
| `$(FileCreatedDate)` | The date the file was created, in ISO format. Only available for file input. | `2020-08-18` |
| `$(FileCreatedDateTime)` | The datetime the file was created, in ISO format. Only available for file input. | `2020-08-18T18:00:00` |
| `$(FileName)` | The name of the input file, including it's extension. Only available for file input. | `myfile.csv` |
| `$(FilePath)` | The full location (path) of the input file. Only available for file input. | `C:\users\andy\Documents\myfile.csv` |
| `$(FileSheetName)` | The name of the sheet. Only available for Excel file input. | `Sheet1` |
| `$(FileSizeBytes)` | The size of the file in bytes. Only available for file input. | `1,234,567` |
| `$(FileUpdatedDate)` | The date the file was last updated, in ISO format. Only available for file input. | `2020-08-18` |
| `$(FileUpdatedDateTime)` | The datetime the file was last updated, in ISO format. Only available for file input. | `2020-08-18T18:00:00` |


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| Meta Information | Description | Example |
|---|---|---|
| `$(UserName)` | The name of the user (from the USER or USERNAME environment variable). | `Andy` |

If **Meta info** is set to **Every row** you can set the new column name in **New column name**.

See also:
- Stamp

## 2.13 Schemas

The columns of an input can change over time:
- new columns added
- existing columns deleted
- column order changes

This is known as 'schema drift'. You can define a schema for each input, to manage this. Set **Use schema** to **Yes** and add the expected column names in the expected order (first column at the top, last column at the bottom). Click the **Import** button to import the columns from the current input.


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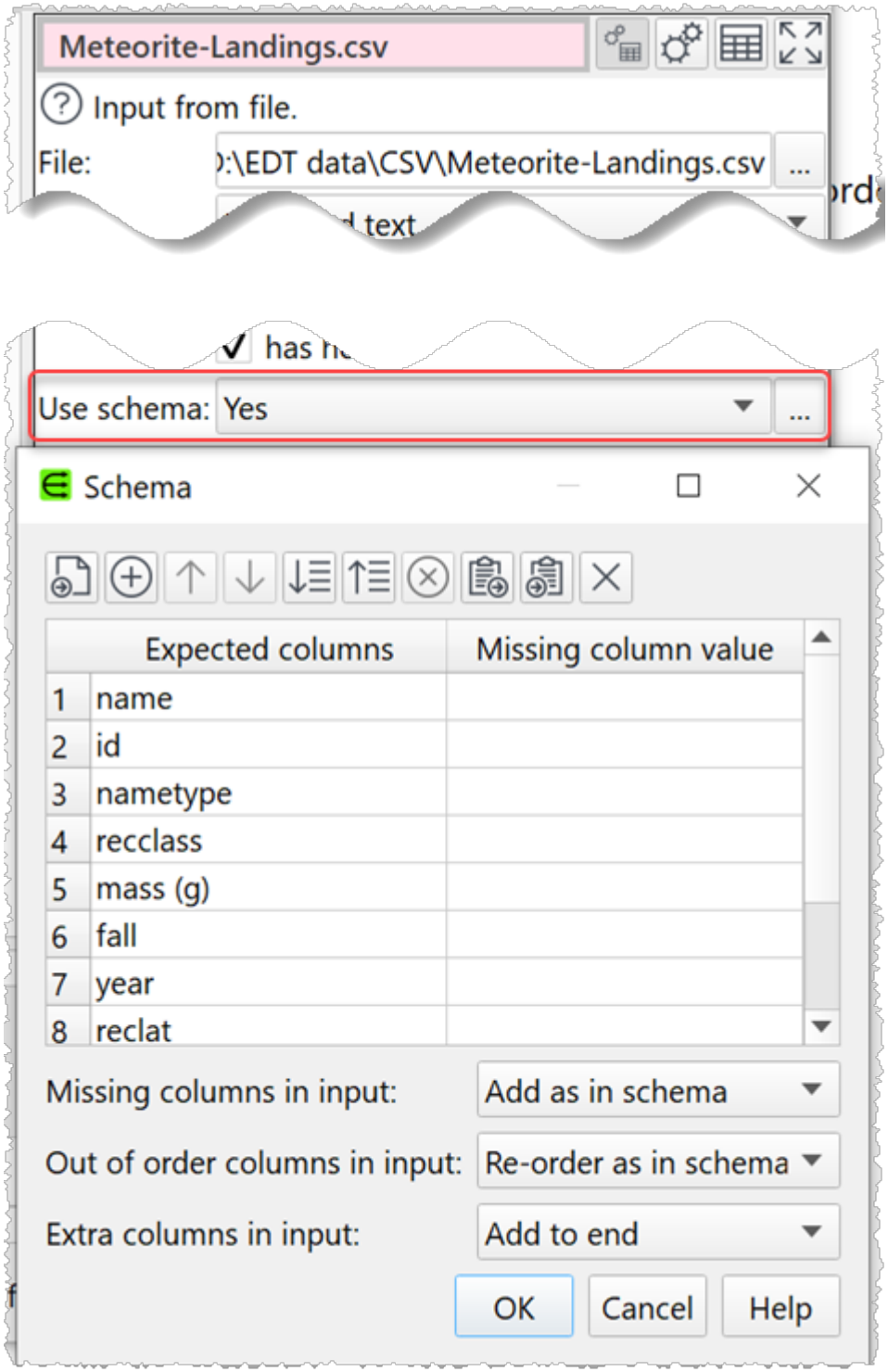


You can then choose what to do for:

- columns that are missing (in the schema, but not in the input):
  - add a column at the expected position in schema schema with all values set to **Missing column value**; or
  - stop with an error
- columns that are out of order (in a different column position in the schema):


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  - move column to the expected position in schema; or
  - stop with an error
- columns that are extra (in the input, but not in the schema):
  - add the extra column to the end; or
  - ignore the extra column; or
  - stop with an error

Matching between input column names and the schema is case sensitive and takes account of whitespace.

Any changes caused by the schema are output to the **Warnings** tab of the input and a summary of the changes are output to the **Info** tab.

For Excel inputs the **ignore hidden columns** option is applied before the schema.

The **ignore empty columns** option is applied after the schema.

Schemas work best when all columns have unique names.

See also:
- Video: How to handle schema drift

## 2.14 Verifying data

Real world datasets are often 'dirty', with invalid and missing values. You can check whether a dataset conforms to expected values (and remove rows or stop processing if it doesn't) using the Verify transform.

See also
- Video: How to verify data

## 2.15 Column variables

Transforms such as Filter, If, Insert, Javascript, Lookup, Replace, Slice and Substitute allow you to use the values in the same row using column variables. Column values can be referenced either:

- By column header name, e.g. `$(item cost)` for the 'item cost' column; or
- By column index, e.g. `$(1)` for the first column.


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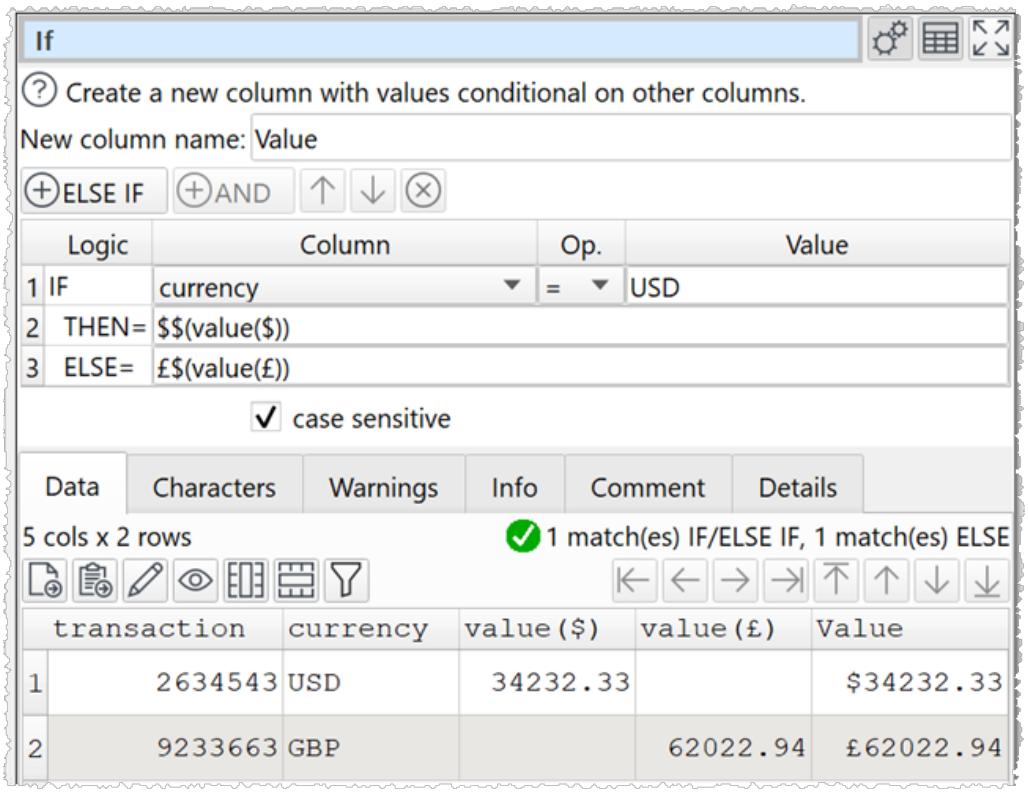
Notes:

- The column name is case sensitive. E.g. column 'A' is referenced by variable `$(A)` and column 'a' is referenced by variable `$(a)`.
- Whitespace at the start or end of the column name is ignored. E.g. column ' A ' is referenced by variable `$(A)`.
- Whitespace within the column variable is important. E.g. column 'AB' is not referenced by variables `$(A B)`, `$ (AB)` `$( AB)` or `$(AB )`.
- If multiple columns have the same name, the first column from the left with that name will be used.
- Reference by name takes priority over reference by index. For example, if there is a column named "1" then `$(1)` will refer to that rather than the first column.
- Column variables are replaced as text. For example if column 'A' has value '2' and column 'B' has value '3', then `$(A)*$(B)` evaluates as '2*3' (not '6').
- Column names can contain `$`, `(` and `)` characters. For example:




## 2.16 File name variables

You can dynamically change the name of an output file based on input file names using file name variables. For example, if the input file with alias `orders` has file name `orders_dec_2022.csv`, then setting the output filename to `output_{orders.fname}.csv` will write to `output_orders_dec_2022.csv`.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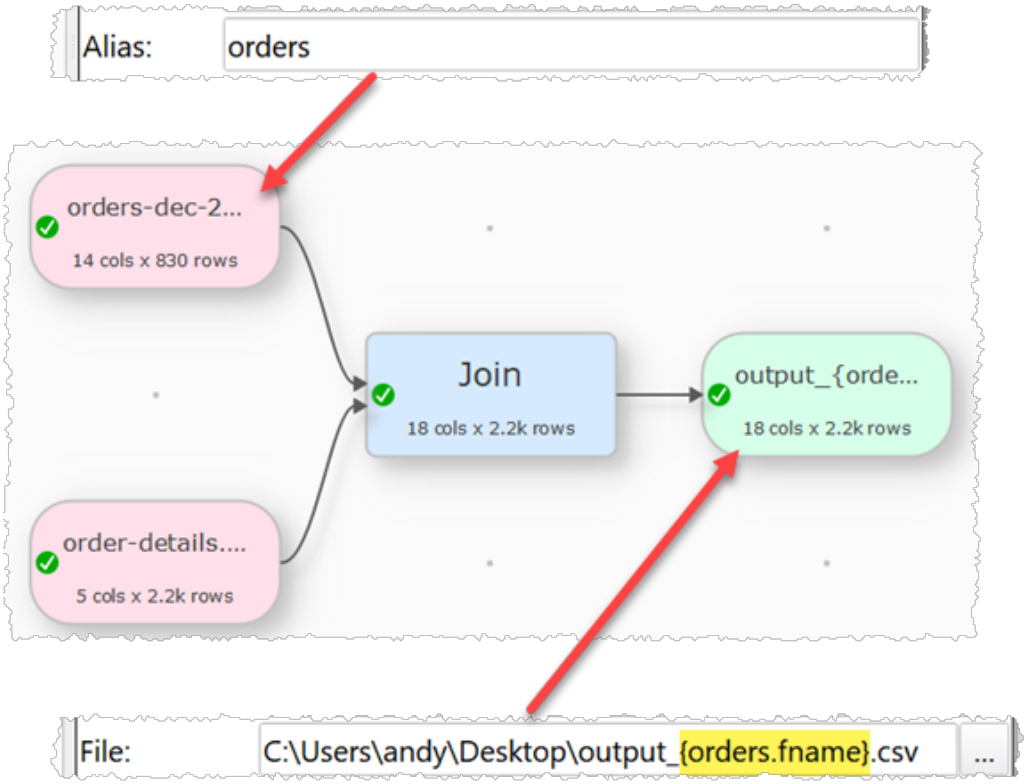


You can also include dates and times in your output file names.

| File name variable | Meaning | Example |
|---|---|---|
| `{<input alias>.fname}` | The name of the input file being processed with the corresponding alias. | If the input with alias `orders` is using file `C:\Users\andy\Documents\orders_2020.csv` then `{orders.fname}` is replaced with `orders_2020`. |
| `{<input alias>.ext}` | The extension of the input file being processed with the corresponding alias. Does not include the '.'. | If the input with alias `orders` is using file `C:\Users\andy\Documents\orders_2020.csv` then `{orders.ext}` is replaced with `csv`. |
| `{<input alias>.sheet}` | The sheet of the input file being processed with the corresponding alias (Excel only). | If the input with alias `orders` is using file `C:\Users\andy\Documents\orders_2020.xlsx` with sheet |


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| | | |
|---|---|---|
| | | `Sheet1` then `{orders.sheet}` is replaced with `Sheet1`. |
| `{<input alias>.folder}` | The folder (directory) of the input file being processed with the corresponding alias. Does not include the final `\`. | If the input with alias `orders` is using file `C:\Users\andy\Documents\orders_2020.csv` then `{orders.folder}` is replaced with `C:\Users\andy\Documents`. |
| `{<input alias>}` | The name of the input file (plus an underscore and the sheet name, if an Excel file) being processed with the corresponding alias. | If the input with alias `orders` is using file `C:\Users\andy\Documents\orders_2020.csv` then `{orders}` is replaced with value `orders_2020`.<br>If the input with alias `orders` is using file `C:\Users\andy\Documents\orders_2020.xlsx` with sheet `Sheet1` then `{orders}` is replaced with `orders_2020_Sheet1`. |
| `{date}` | Date processing was carried out in year_month_day format. | `2025_04_18` |
| `{time}` | Time processing was carried out in hours_minutes_seconds_milliseconds format. | `15_01_56_599` |
| `{datetime}` | Date/Time processing was carried out in year_month_day_hours_minutes_seconds_milliseconds format | `2025_04_18_15_01_56_599` |


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| | | |
|---|---|---|
| {day} | Current day of the month (2 digits). | 18 |
| {month} | Current month of the year (2 digits). | 04 |
| {year} | Current year (4 digits). | 2025 |
| {hour} | Current hour of the day (2 digits). | 15 |
| {minute} | Current minute of the hour (2 digits). | 01 |
| {second} | Current second of the minute (2 digits). | 56 |
| {computername} | The name of the computer. | MyComputer |
| {username} | The name of the user (from the USER or USERNAME environment variable). | Andy |
| {transformfname} | The file stem of the .transform file. Empty if not set. | If the .transform file path is C:\Users\andy\Documents\myfile.transform then {transformfname} is replaced with myfile. |
| {version} | The Easy Data Transform version number | v2_9_0 |

File name variables can be used for output file names set in the **Right** pane, in batch processing or through command line arguments.

## 2.17 Regular expressions

Regular expressions are a powerful way to match patterns in text (including text representation of dates and numbers). For example, you can use a regular expression in the Replace transform to swap first and last names:


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| | Match Type | Replace | With |
|---|---|---|---|
| 1 | Regex | (\w+)\s*(\w+) | \2, \1 |

Turns:

| | Full name |
|---|---|
| 1 | John Smith |
| 2 | Mary Brown |
| 3 | Jill Jones |

Into:

| | Full name |
|---|---|
| 1 | Smith, John |
| 2 | Brown, Mary |
| 3 | Jones, Jill |

Easy Data Transform allows the use of regular expressions in the Compare, Extract, Filter, If, Lookup, Replace, Slice, Split Col and Split Rows transforms. It is also available as part of the Javascript language in the Javascript transform.

Regular expressions are far too big a topic to cover here. However there are many detailed resources online, such as regex101.com, www.regular-expressions.info and regexr.com.

## 2.18 Fuzzy matching

Fuzzy matching allows you to match 2 values that are similar, but not identical. For example if you set fuzzy match closeness to 80%, then 2 values that are 80% the same or better are considered a match.

For example, doing a fuzzy match to this value:

```
100 avenue street, townsville, ohio
```

Gives:


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| Value | Fuzzy closeness |
|---|---|
| 100 avenue street, townsville, ohio | 100% |
| 100 avnue street, townsville, ohio | 98% |
| 100 avenue street townsville ohio | 95% |
| 100 avenue st., townsville, ohio | 89% |
| 100 avenue st, townsville | 72% |
| 100 av. st., citysville, texas | 52% |
| townsville, ohio | 46% |
| 742 evergreen terrace, springfield, oregon | 36% |

Fuzzy matching treats everything as text and takes account of whitespace. It can optionally take account of case.

Easy Data Transform supports the use of fuzzy matching in various transforms, including the Cluster, Dedupe , If, Filter and Lookup transforms.

Fuzzy matching is significantly slower than exact matching. The closeness score is based on Levenshtein distance.

See also:
- Match dirty data

## 2.19 Drilldown

If you check **allow drilldown** for a transform, double clicking a cell in the **Right** pane data table shows the rows in the upstream dataset that this cell/row was derived from. For example you can double click a cell in a pivot table to drilldown into the rows it was calculated from:


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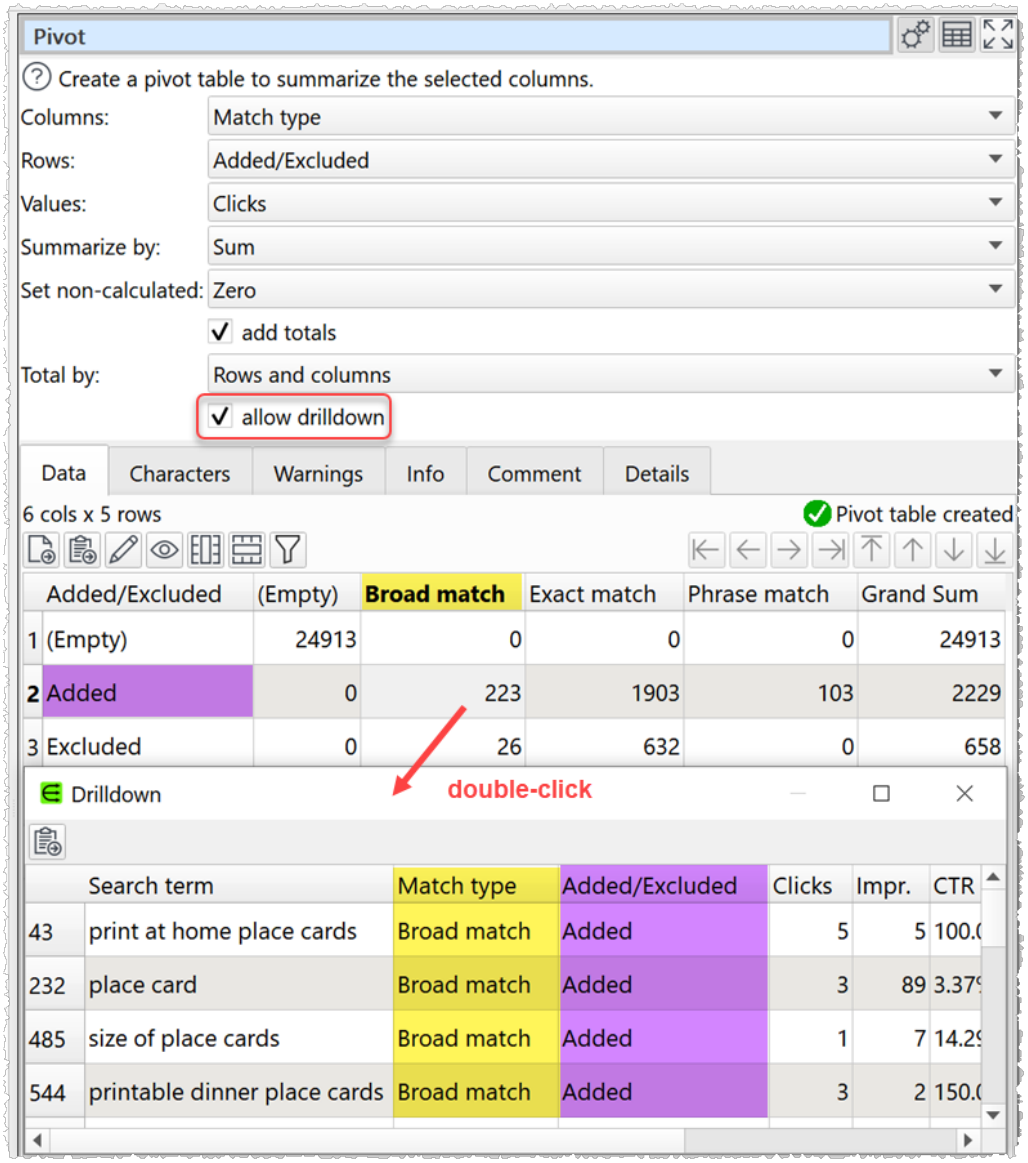


You can also select **Drilldown...** from the right click menu.

Easy Data Transform allows drilldown in the following transforms: Count, Dedupe, Ngram, Pivot and Unique.

Note that enabling drilldown slows down processing and requires more memory.

It is also possible to drilldown when profiling a dataset.

See also:
- Video: How to drilldown into data


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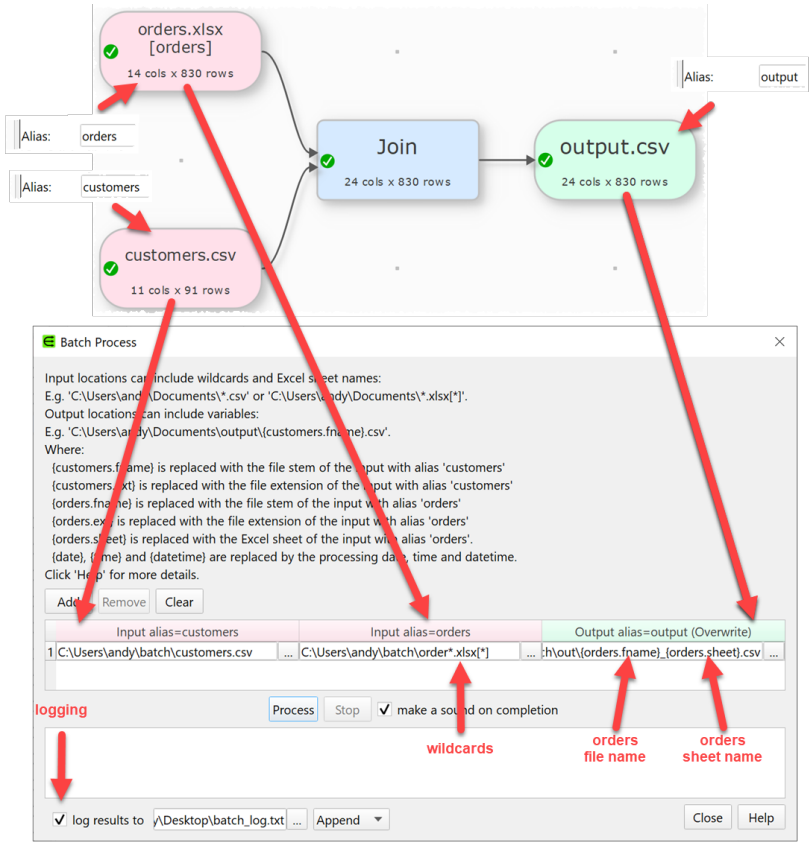
## 2.20 Batch processing

To apply the current .transform file to multiple input files/sheets select **File>Batch Process...** . The **Batch Process** window will appear with a column for each input item and a column for each output item. The **Alias** for each item is displayed in the column header.




Note:

- All input and output items must have an alias.
- An output item can't have the same alias as another output or input item.
- Disconnected input and output items are not shown.
- Output items with **Write mode**=Disabled are not shown.

Click **Add** to add a new processing row.

Click **Remove** to remove the selected processing row(s).

Click **Clear** to remove all processing rows.

Check **clear 'Append' outputs before first append** if you want to clear output files you are appending to before the first append.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Check **log results to** if you want to log the results to a text file. Set the file location and set the write mode to **Overwrite** or **Append**. You can use `{datetime}`, `{date}` and `{time}` in the file location.

In the input column(s) you can use * and ? wildcards for file name stems, file extensions and Excel sheet names. E.g.:

| Input | Description |
|---|---|
| `C:\Users\andy\Documents\*.csv` | All files with extension .csv in the Documents folder |
| `C:\Users\andy\Documents\d?.csv` | All the files with name 'd' plus a single character in the Documents folder |
| `C:\Users\andy\Documents\data.xlsx[*]` | All the sheets in data.xlsx in the Documents folder |
| `C:\Users\andy\Documents\*.xlsx[data*]` | All the sheets beginning with 'data' in all the .xslx files in the Documents folder |

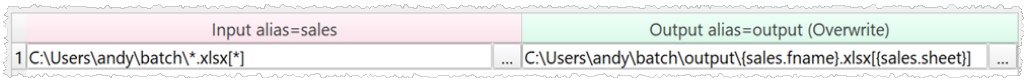
Note:

- If there is more than 1 input column on a row that specifies multiple files or sheets, then an output will be created for each possible permutation of input files/sheets in the row. E.g. 3 input files from column 1 x 4 sheets from column 2 = 12 outputs to process.
- Excel sheet names are not case sensitive.
- You cannot use wildcards for folder names.
- Batch processing will ignore files in sub-folders. Add them as extra rows.
- All the files input to an input item or output from an output item should be the same file type as the original.

In the output column(s) you can use the file name variables to dynamically change output file names based on input file names.

You can write to multiple sheets of an Excel file.

This example shows using a wildcard for the input file name and sheet and file name variables to set the output file name based on the input file with alias `sales`:





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But make sure to set the corresponding output **Write mode**=Overwrite/Sheet.

Click **Process** to start processing the rows.

Click **Stop** to stop processing the rows.

Check **make a sound on completion** if you want to play a sound when all processing is finished.

Click **Close** to close the window.

Note:
- Whether an output file is created, overwritten or appended to depends on the **Write mode** of the output item.
- We recommend you output to a different folder than the one the input files are in.

See also:
- Video: Batch processing
- Batch processing examples
- Command line arguments

## 2.21 Command line arguments

Easy Data Transform accepts the following command line arguments:

| Argument | Description |
|---|---|
| `<file name>` | The .transform file to open at start-up. |
| `-build` | Output the Easy Data Transform build time and date. |
| `-cli` | Close the application once any processing on the opened file is complete. |
| `-log <location>` | Appends the command line output to the file at `<location>`. `-cli` must also be set. |
| `-file <alias>=<location>` | Sets the input or output file with the given alias to the location (path) specified. Input Excel files should include the sheet name, e.g. `file.xlsx[sheet]`. Output Excel files may optionally include a sheet name. The file type should be the same as the original. |


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| Argument | Description |
|---|---|
| `-new_window` | Don't load the last opened .transform file, even if **open previous file at start-up** is checked in **Preferences**. |
| `-verbose` | Output additional information to the terminal. Useful for debugging problems. |
| `-version` | Output the Easy Data Transform version number. |

This allows you to run Easy Data Transform from the Windows Command Prompt or a .bat file. For example:

To run `C:\Users\andy\Documents\myfile 1.transform` with the output with alias `output1` output instead to `C:\Users\andy\Documents\data1.csv`:

```
"C:\Program
Files\EasyDataTransform\EasyDataTransform.exe" "C:
\Users\andy\Documents\myfile 1.transform" -file
"output1=C:\Users\andy\Documents\data1.csv" -cli -
verbose
```

To run `C:\Users\andy\Documents\myfile2.transform` with the input with alias `input1` input instead from sheet `sheet1` of `C:\Users\andy\Documents\data 2.xlsx`:

```
"C:\Program
Files\EasyDataTransform\EasyDataTransform.exe" "C:
\Users\andy\Documents\myfile2.transform" -file
"input1=C:\Users\andy\Documents\data 2.xlsx[sheet1]" -
cli -verbose
```

Use the forfiles command and wildcards to transform multiple files in a folder:

```
forfiles /p C:\Users\andy\Desktop\cli /m *.csv /c
"cmd /c C:
\progra~1\EasyDataTransform\EasyDataTransform.exe C:
\Users\andy\Desktop\cli\cli.transform -file cli-
in=@file -file cli-out=out-@fname.csv -cli -verbose"
```

Or with quoting in case of spaces:

```
forfiles /p C:\Users\andy\Desktop\cli /m *.csv /c
"cmd /c \"\"C:\program
files\EasyDataTransform\EasyDataTransform.exe\" \"C:
\Users\andy\Desktop\cli\cli.transform\" -file \"cli-
in=@file\" -file \"cli-out=out-@fname.csv\" -cli -
verbose\""
```


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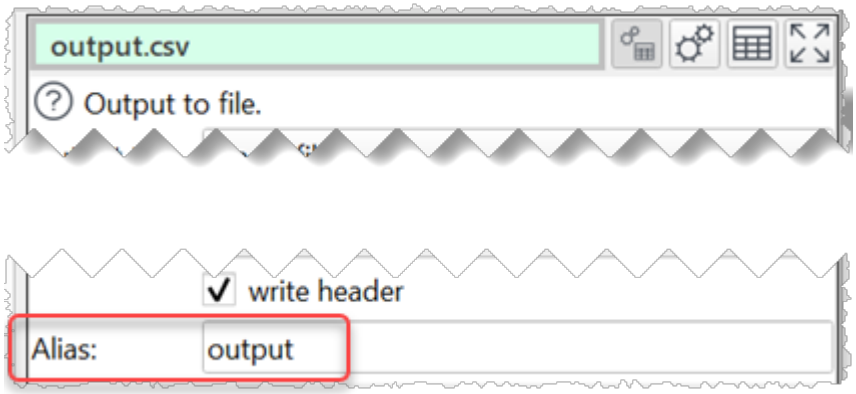
Use the `forfiles /s` option to recurse into sub-folders.

Use file name variables to dynamically change output file names based on input file names.

Put quotes (") around any arguments with spaces (as shown in the examples above).

Input and Output items are referenced by their **Alias** field value.




If you are using relative (rather than absolute) locations (paths) for input or output files, these will be relative to the folder the current working folder.

If you are using wildcards, then it is usually a good idea to output to a different folder to the one that you are inputting from.

Select **File>Command Line...** to show sample command line text which you can copy and modify. It will also warn you of potential issues.

To run on a schedule, call the command line interface (or a script file that calls the command line interface) from a scheduling program, such as Windows Task Scheduler.

See also:
- Batch processing
- Run jobs on a schedule

## 2.22 .transform files

.transforms file are stored in a simple XML format. So you can edit them with a standard text editor. However we recommend you make a copy first.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The results of transformations are not stored in the .transform file, and are recalculated whenever you **File>Open...** the file.

The contents of Input and Output files are not stored in the .transform file, only their locations (paths). These locations are stored as 'absolute' locations, so you can move the .transform file without changing the locations of the Input and Output files.

If you open a .transform file in a different location from that in which it was saved and it can't find Input and Output files at the expected absolute locations, it will look for them in the same location relative to the old .transform file. This allows you to easily move .transform files to different locations and computers if you keep the Input and Output files in the same relative location (e.g. in the same folder as the .transform file). This even works between Windows and Mac.

Example:

- `mytransform.transform` is in `C:\Users\andy\Documents\` on Windows processes Input file `MyData.csv` in sub-folder `MyData` (`C:\Users\andy\Documents\Data\MyData.csv`).
- `mytransform.transform` is moved to `/Users/Bob/Documents/EDT` on a Mac.
- When `mytransform.transform` is opened it will look for `MyData.csv` in `/Users/andy/Documents/Data`.
- If it can't find that it will look for `MyData.csv` in sub-folder `MyData` (`/Users/Bob/Documents/EDT/Data/MyData.csv`).

If you paste in data **From Clipboard** this is stored in the .transform file. We don't recommend you do this for large datasets as XML is not very efficient for storing large amounts of data.

## 2.23 Limits

Easy Data Transform has the following hard limits:

Maximum number of characters in a value (cell): 2^30 (1,073,741,824)
Maximum number of columns in a dataset: 2^28 (268,435,456)
Maximum number of rows in a dataset: 2^28 (268,435,456)

You will probably run out of memory before you get anywhere near the column or row limits.


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## 2.24 Memory usage

Easy Data Transform keeps all the data in memory for maximum performance. You can track the current memory usage in the **Status** bar.

Set **Maximum memory usage** in **Preferences** to the maximum amount of memory you want the Easy Data Transform process to use. If this is exceeded, you will be asked if you want to allocate more memory. It is generally not recommended to set this to more than the system RAM, otherwise Easy Data Transform will start using virtual memory (paging between RAM and disk), which is slow. The operating system can also crash or freeze if all the available virtual memory is used.

If **Optimize processing for** is set to **Minimum memory use** in **Preferences** then memory compression techniques are used to try to reduce the amount of memory required. This is generally recommended, as not using memory compression may use up all the RAM available and start using virtual memory to page between RAM and disk, which is likely to be a lot slower than the compression overhead.

## 2.25 Data security

As Easy Data Transform can potentially read or write any file on your computer, to which you have read/write permission, you need to be careful not to run .transform files of unknown provenance until you have checked them. Otherwise they could accidentally or maliciously read or write files that you don't wish to be accessed. To this end we recommend:

- Not setting **Opening a .transform with auto run** to **Leave auto run enabled** in **Preferences>General**, so that you can check any .transform files you aren't sure about, before running them.
- Setting **Block input from files with extensions** in **Preferences>Input Extensions** to any file extensions of any file types that Easy Data Transform shouldn't be reading from.
- Setting **Block output to files with extensions** in **Preferences>Output Extensions** to any file extensions of any file types that Easy Data Transform shouldn't be writing to.


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## 2.26 Portability

By default Easy Data Transform stores your preferences in the Windows registry. However you can store your preferences in an easydatatransform.ini file in the same folder as the Easy Data Transform .exe file. This means you can install Easy Data Transform on a device without admin access. It also allows you to store everything on a portable device, such as a USB memory stick. You can even move your portable device between Windows and Mac computers.

To use Easy Data Transform portably:

- Install Easy Data Transform into an appropriate folder on the portable device. Make sure you have write permission to the folder. We recommend you install from the zip file download, rather than the standard Windows installer.
- Start Easy Data Transform.
- Open the **Preferences** window.
- In the **General** tab set the **Store these preferences in** field to **portable .ini file**.
- Click **OK**.
- You may also wish to copy your .transform files to the portable device.

If you change the folder your portable version is installed in (e.g. you install a new version to a different folder) you should copy across your easydatatransform.ini file to the new folder.

If you move your portable device from one computer to another (e.g. Windows to Mac) the location (path) of files may change (e.g. from `D:\my_usb_key\my_transform.transform` to `/Volumes/my_usb_key/my_transform.transform`). Easy Data Transform will try to be intelligent about handling these changes of location by:

- storing recent .transform file locations as relative rather than absolute locations
- by treating relative .transform locations as relative to the Easy Data Transform .exe file.

It is possible to have Windows and Mac versions of Easy Data Transform on the same device sharing a single easydatatransform.ini file and common input, output and .transform files. Just make sure you install the Windows .exe and Mac .app into the same folder. We also recommend that they are the same version of Easy Data Transform.


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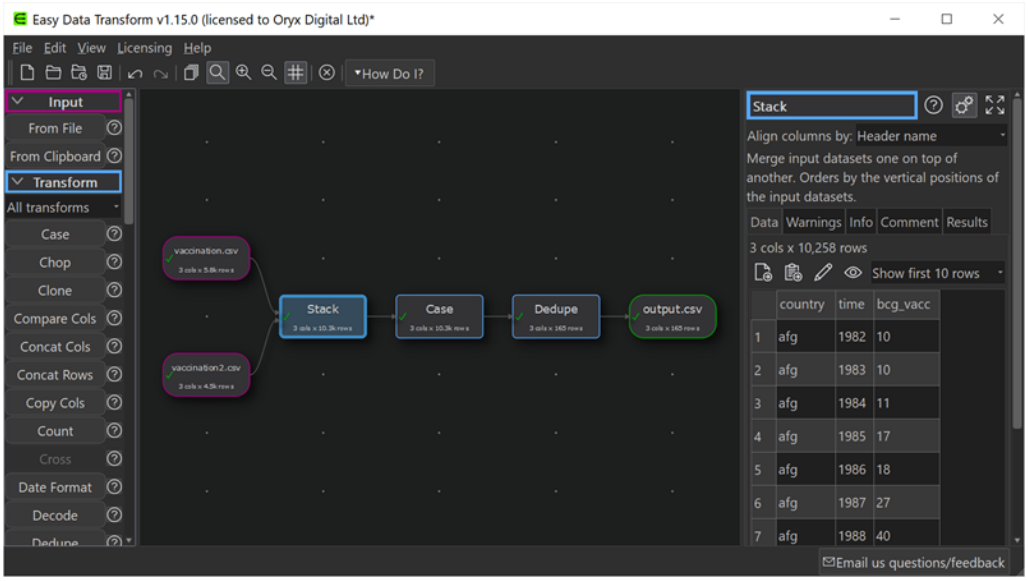
For the purposes of licensing, installing to a USB key, or other portable device, counts as one of your 3 allowed installs.

Note If you install Easy Data Transform Windows .exes or Mac .apps into 2 different folders and set them to use .ini files, they will each store their preferences in their own .ini file.

## 2.27 Dark mode

Select **View>Toggle UI Theme** (or the corresponding status bar button) to swap between light and dark user interface themes. You can also change the **Center** color scheme in the **Colors** tab of the **Preferences** window.




## 2.28 Keyboard shortcuts

Using keyboard shortcuts can improve your productivity. If you are using Easy Data Transform a lot we suggest you find the time to learn at least some of them. The following keyboard shortcuts are available for the Windows version of Easy Data Transform:

| Key | Shortcut | Action |
|---|---|---|
| A | `Ctrl+A` | Select all in **Center** pane. |
| B | `Ctrl+B` | Show the **Batch Process** window. |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| Key | Shortcut | Action |
|---|---|---|
| C | `Ctrl+C` | Copy selected data with header from the **Right** pane. |
| | `Ctrl+Shift+C` | Copy selected data without header from the **Right** pane. |
| D | `Ctrl+D` | Duplicate the selected branch in the **Center** pane. |
| | `Alt+D` | Compare the data of items selected in the **Center** pane. |
| F | `Ctrl+F` | Find items that match a search term in the **Center** pane. |
| H | `Ctrl+H` | Compare the headers of items selected in the **Center** pane. |
| I | `Alt+I` | Input From File. |
| | `Alt+Shift+I` | Input From Clipboard. |
| K | `Ctrl+K` | Search transforms by keyword. |
| L | `Ctrl+L` | Toggle the **Log** pane visibility on/off. |
| | `Ctrl+Alt+L` | Change the locale of the current .transform. |
| M | `Ctrl+M` | Toggle cursor magnification for **Center** pane on/off. |
| N | `Ctrl+N` | New .transform file. |
| O | `Ctrl+O` | Open .transform file. |
| | `Ctrl+Shift+O` | Show the **Open Recent** window. |
| | `Alt+O` | Output To File. |


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| Key | Shortcut | Action |
|---|---|---|
| R | `Ctrl+R` | Run unprocessed items [4]. |
| | `Ctrl+Shift+R` | Run selected items [4]. |
| S | `Ctrl+S` | Save .transform file. |
| T | `Ctrl+T` | Toggle two screen mode on/off |
| U | `Ctrl+U` | Toggle user interface between light and dark themes (if available). |
| Y | `Ctrl+Y` | Redo |
| Z | `Ctrl+Z` | Undo |
| Space | `Space` | Show the **Value** window for the current value in the **Right** pane. |
| Del | `Del` | Delete selected item(s) in **Center** pane. |
| . | `Ctrl+,` | Toggle the **Timing Profile** on/off. |
| ; | `Ctrl+;` | View the **Item Summary** window. |
| , | `Ctrl+,` | Show **Preferences** window. |
| = | `Ctrl+=` | Zoom **Center** pane so all items fit. |
| | `=` | Open or close the **Data Preview** window when hovering over an item in the **Center** pane. |
| + | `Ctrl++` | Zoom **Center** pane in. |
| - | `Ctrl+-` | Zoom **Center** pane out. |
| \ | `Ctrl+\` | Stop processing. |
| / | `Ctrl+/` | Zoom to selected items in the **Center** Pane. |


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| Key | Shortcut | Action |
|---|---|---|
| # | # | Open or close the **Data Preview** window when hovering over an item in the **Center** pane. |
| Left arrow | Ctrl+Left arrow | Move **Center** pane selection from item to highest[1] item that inputs to it. |
| | Alt+Left arrow | Move keyboard focus to **Center** pane. |
| Right arrow | Ctrl+Right arrow | Move **Center** pane selection from item to highest[1] item that it outputs to. |
| | Alt+Right arrow | Move keyboard focus to **Right** pane. |
| Up arrow | Ctrl+Up arrow | Move **Center** pane selection from item to highest[1] sibling[3]. |
| Down arrow | Ctrl+Down arrow | Move **Center** pane selection from item to lowest[2] sibling[3]. |
| 1...9 | Ctrl+1 ... Ctrl+9 | Select input item 1 to 9 (based on height in **Center** pane). |
| | Ctrl+Shift+1 ... Ctrl+Shift+9 | Select output item 1 to 9 (based on height in **Center** pane). |
| F1 | F1 | Show help. |
| F5 | F5 | (Re)process all. |
| F8 | F8 | Show options and data in the **Right** pane. |
| F9 | F9 | Show only options in the **Right** pane. |


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| Key | Shortcut | Action |
|---|---|---|
| F10 | `F10` | Show only data in the **Right** pane. |
| F11 | `F11` | Toggle setting **Right** pane item to fullscreen. Only works if 1 item in **Right** pane. |

[1] Highest=nearest the top of the **Center** pane.
[2] Lowest=nearest the bottom of the **Center** pane.
[3] Two items are considered siblings if they have inputs from the same item(s) or they both have no inputs.
[4] If **Run>Auto Run** is unchecked.

You can also use the keyboard to add transforms in the **Center** pane. Just select the item(s) you want to add the transform to and start typing the name. Only eligible transform that contain the typed letters will be displayed (spaces are ignored).

For example, to add the **Rename Cols** transform an existing Input item:
- select the input items
- type `ren`
- press the `Return` key

If you want to see a list of all the transform names, press the `Space` key before you start typing. You can use the `Del` or `Backspace` key to undo letters typed.

You can quickly change selection in the **Center** pane using arrow keys with the `Ctrl` key.


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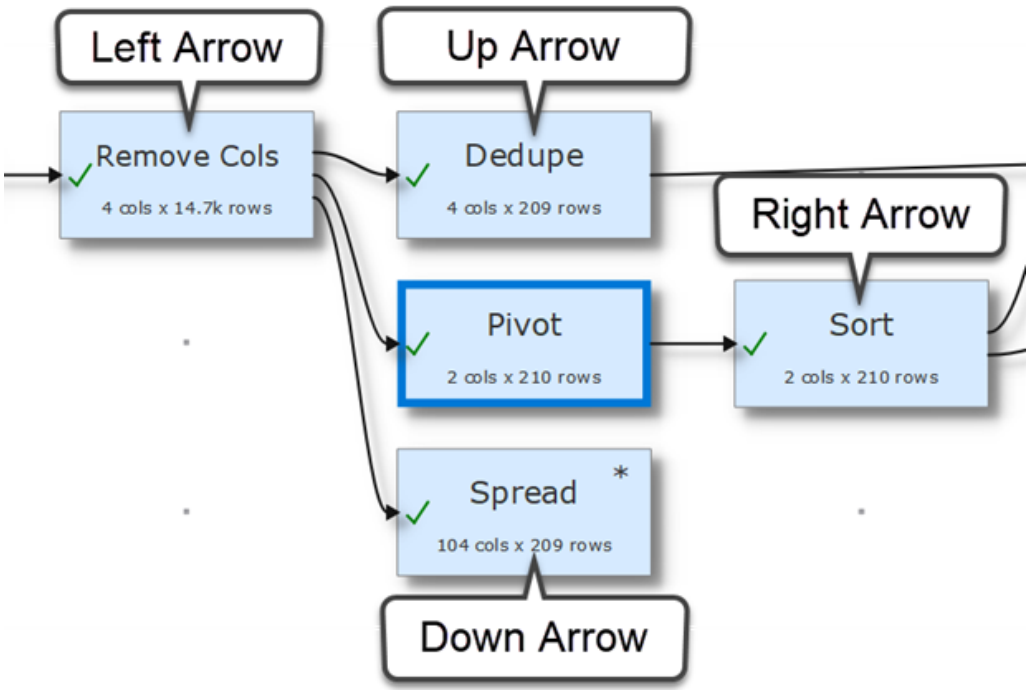


If you are zoomed in you can scroll the **Center** pane by pressing the `Shift` key and dragging the canvas.


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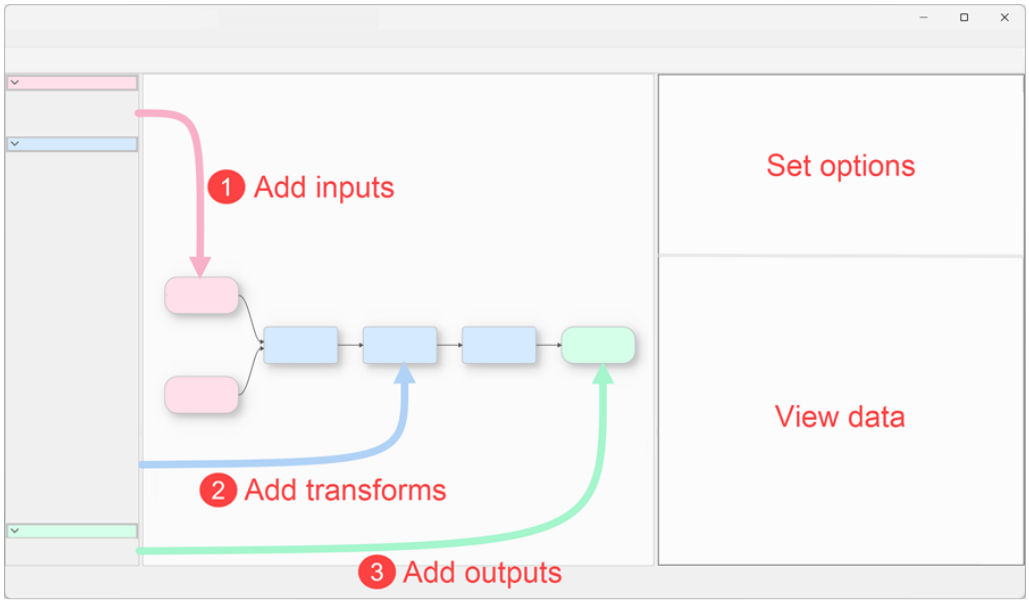
# How do I?

How to add a transform in Easy Data Transform.

# 3 How do I?

## 3.1 Add a Transform

You can chain transforms together to transform the input data into the desired form.




For example:

- Select one input or transform item and click the **Case** transform button to create a new dataset with the text case changed in 1 or more columns.
- Select two or more input or transform items and click the **Stack** transform button to create a new dataset, with the selected datasets stacked one on top of the other.

A transform item will be added to the **Center** pane.

Check **show advanced** in the **Left** pane to see all transforms available.

Once you have your data in the desired form you can output it.

See also:

- Adding a transform between existing items

## 3.2 Add an Input

You need to add data to Easy Data Transform before you can transform it.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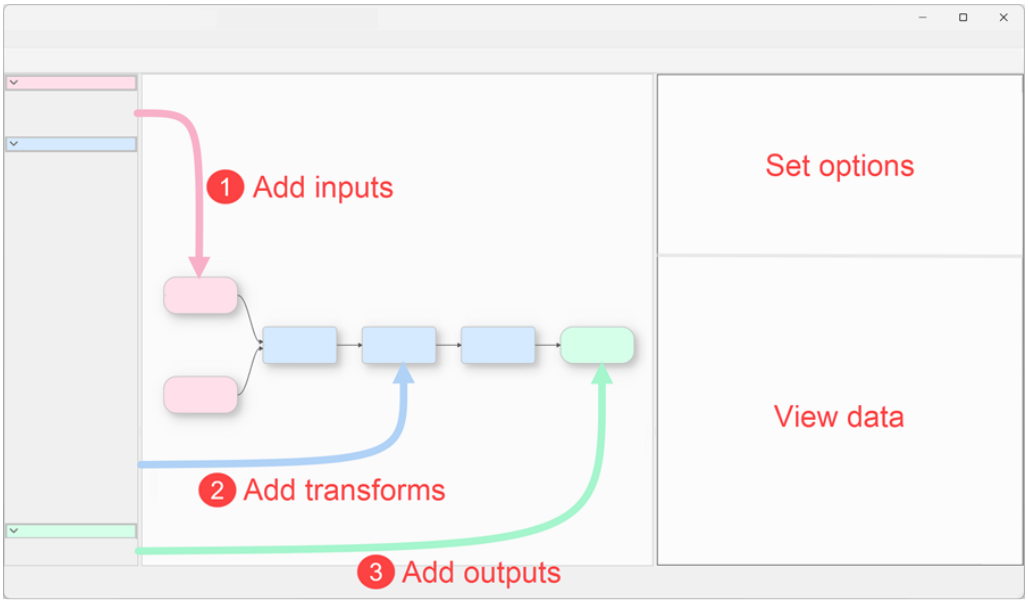


To add input from a file either:
- Drag the file onto the **Center** pane; or
- Click the **From File** button at the top of the **Left** Pane.

To add input from the clipboard:
- Click the **From Clipboard** button at the top of the **Left** Pane.

An input item will be added to the **Center** pane.

A wide range of file formats are supported.

Once you have added 1 or more inputs you can add transforms.

## 3.3 Add an Output

Once your data is in the desired form you can output it to a file.


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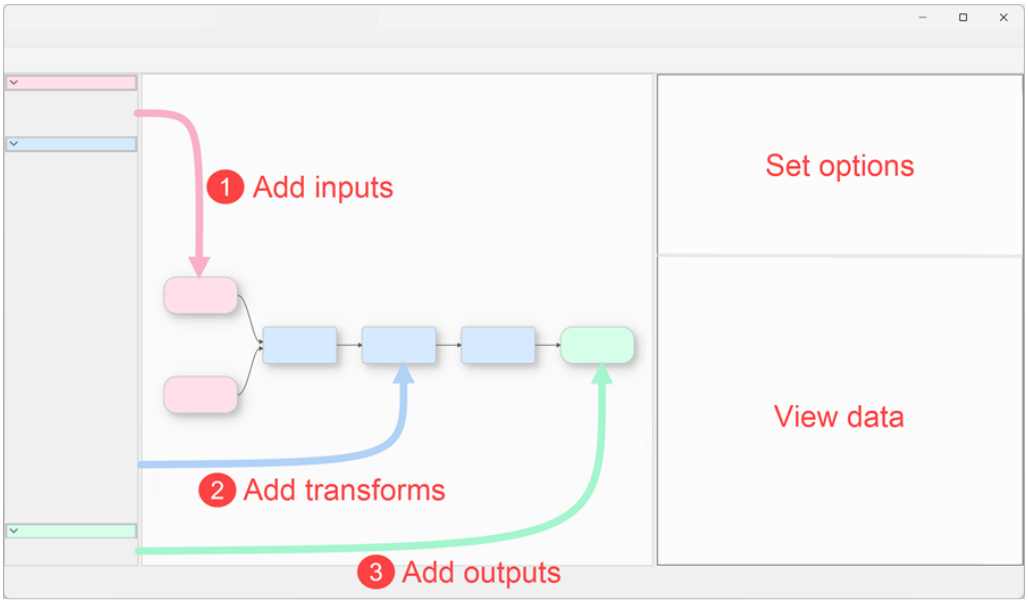


To create an output, select an input or transform item in the **Centre** pane and click the **To File** button at the bottom of the **Left** pane. You may need to scroll down to see it.

An output item will be added to the **Center** pane.

A wide range of file formats are supported.

## 3.4 Add a transform between existing items

To add a new transform between existing items (e.g. between 2 already connected transforms) see connections.

## 3.5 Add metadata to a dataset

You can add meta data to an input dataset by setting the **Meta info** field. See meta information for more information.


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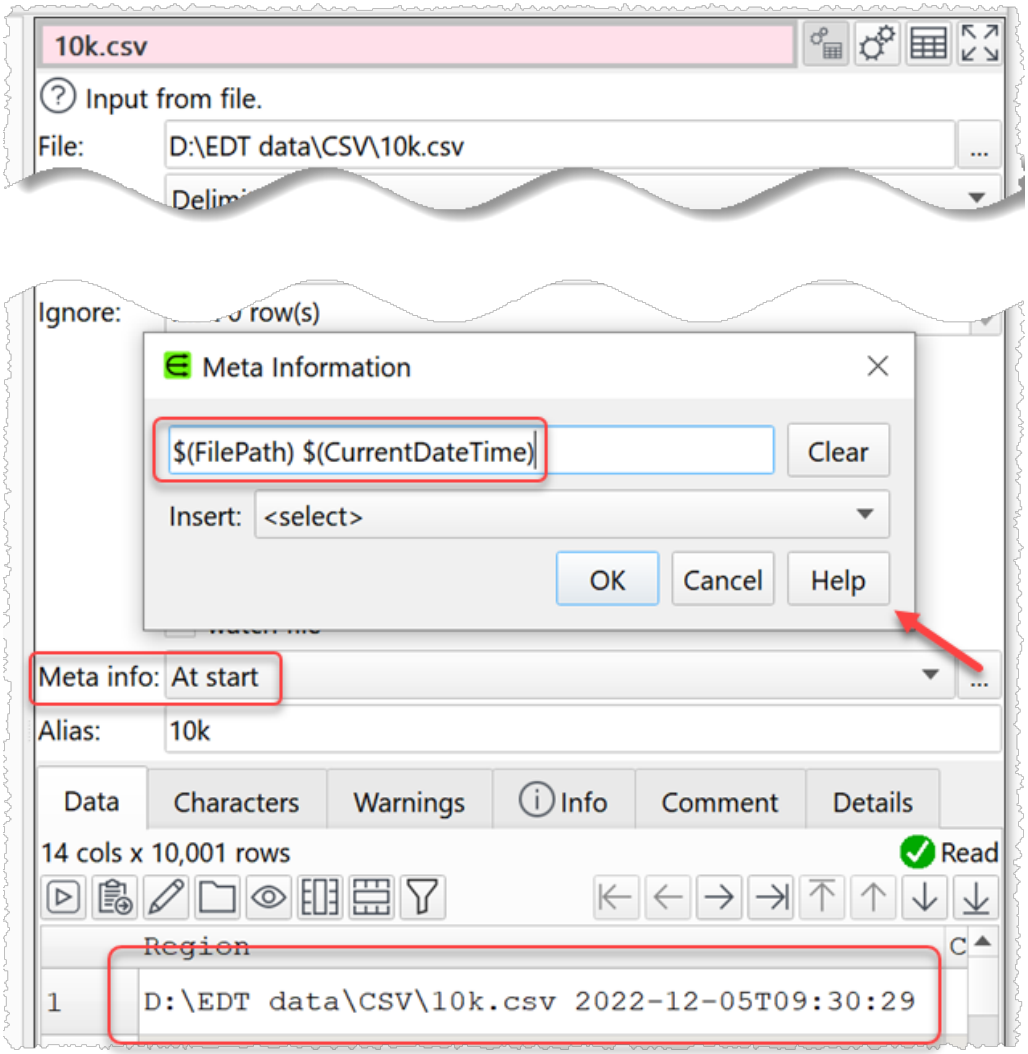


## 3.6 Add missing data values

You can add missing values (based on the average (mean), median or mode of non-empty values) using the **Impute** transform.

For example you can add missing ages for Titanic passengers based on the average age supplied for the other passengers:


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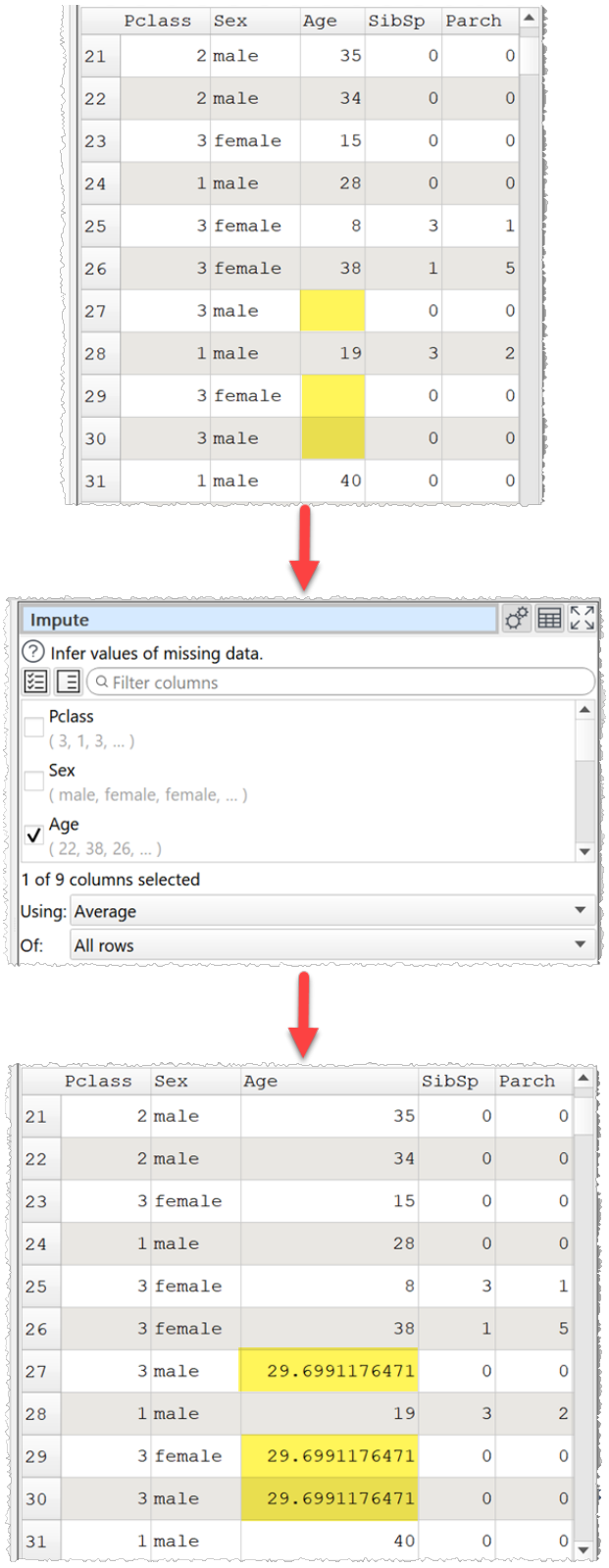

| | Pclass | Sex | Age | SibSp | Parch |
|---|---|---|---|---|---|
| 21 | 2 | male | 35 | 0 | 0 |
| 22 | 2 | male | 34 | 0 | 0 |
| 23 | 3 | female | 15 | 0 | 0 |
| 24 | 1 | male | 28 | 0 | 0 |
| 25 | 3 | female | 8 | 3 | 1 |
| 26 | 3 | female | 38 | 1 | 5 |
| 27 | 3 | male | | 0 | 0 |
| 28 | 1 | male | 19 | 3 | 2 |
| 29 | 3 | female | | 0 | 0 |
| 30 | 3 | male | | 0 | 0 |
| 31 | 1 | male | 40 | 0 | 0 |



| | Pclass | Sex | Age | SibSp | Parch |
|---|---|---|---|---|---|
| 21 | 2 | male | 35 | 0 | 0 |
| 22 | 2 | male | 34 | 0 | 0 |
| 23 | 3 | female | 15 | 0 | 0 |
| 24 | 1 | male | 28 | 0 | 0 |
| 25 | 3 | female | 8 | 3 | 1 |
| 26 | 3 | female | 38 | 1 | 5 |
| 27 | 3 | male | 29.6991176471 | 0 | 0 |
| 28 | 1 | male | 19 | 3 | 2 |
| 29 | 3 | female | 29.6991176471 | 0 | 0 |
| 30 | 3 | male | 29.6991176471 | 0 | 0 |
| 31 | 1 | male | 40 | 0 | 0 |

See the Impute transform documentation for more details.

See also:

- Video: How to impute missing data
- Replace empty values


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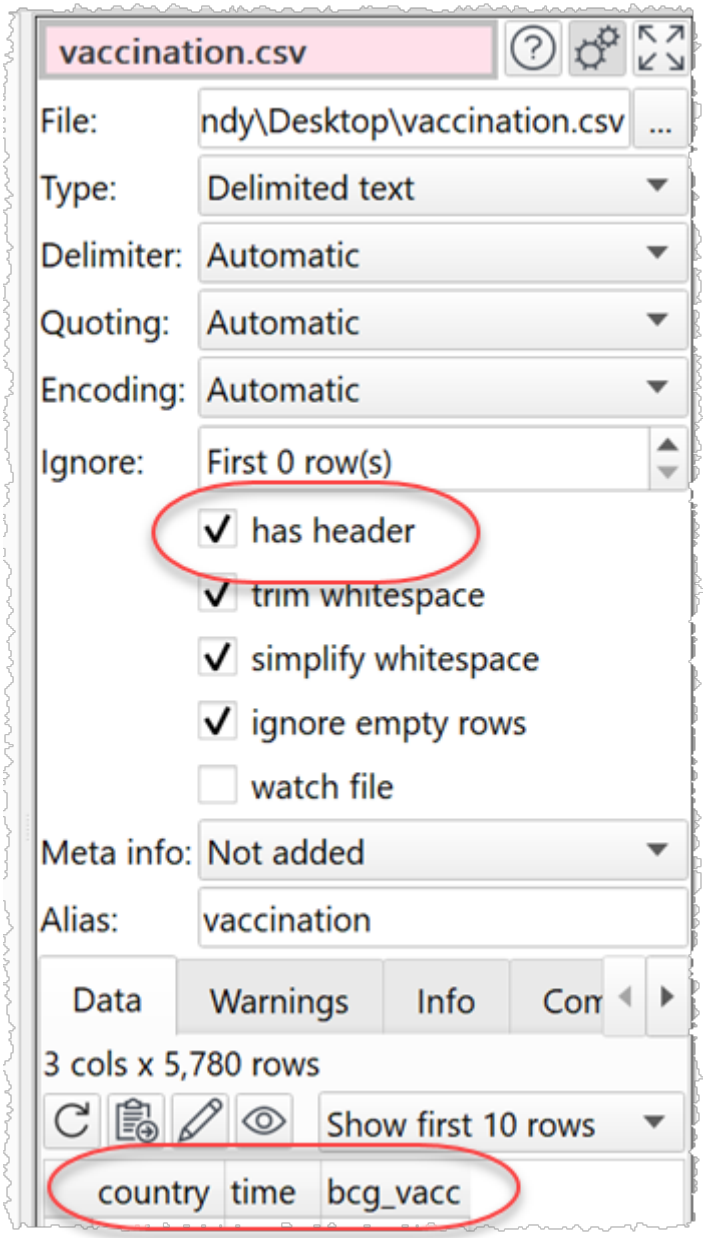
- Profile a dataset

## 3.7 Add or remove a header

To add or remove a header just check or uncheck the **has header** checkbox for the appropriate input item.




You can also make the first row of your dataset into a header using the Header transform.

## 3.8 Change a connection

To change a connection see connections.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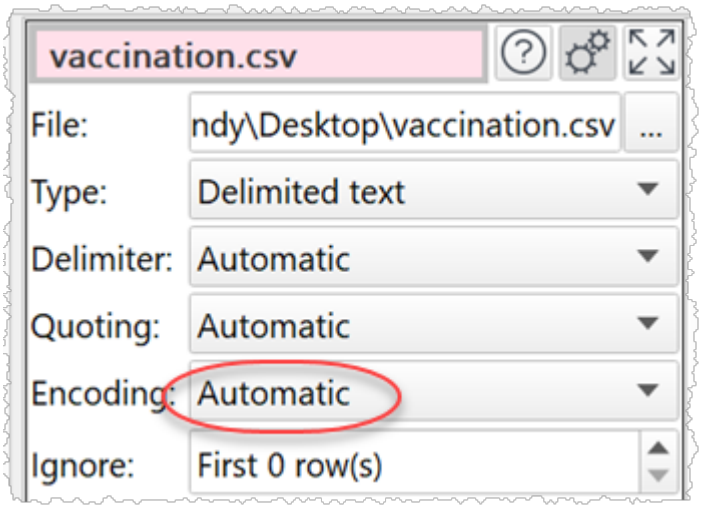
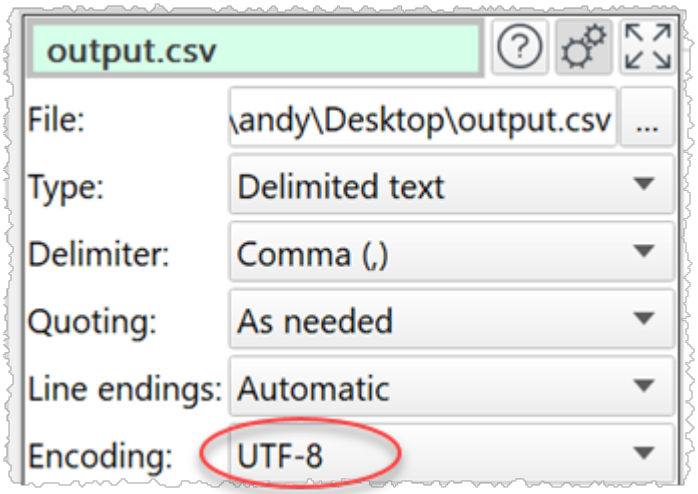
## 3.9 Change encoding

When Easy Data Transform inputs a text file (e.g. a CSV file) it will make a guess at the encoding. You can explicitly set the encoding by selecting an input item and changing **Encoding** from **Automatic** to one of the other encodings in the **Right** pane.




Similarly you can also set the encoding of a text file output by selecting the output item and changing **Encoding** in the **Right** pane.




See also:

- Video: How to change CSV file text encoding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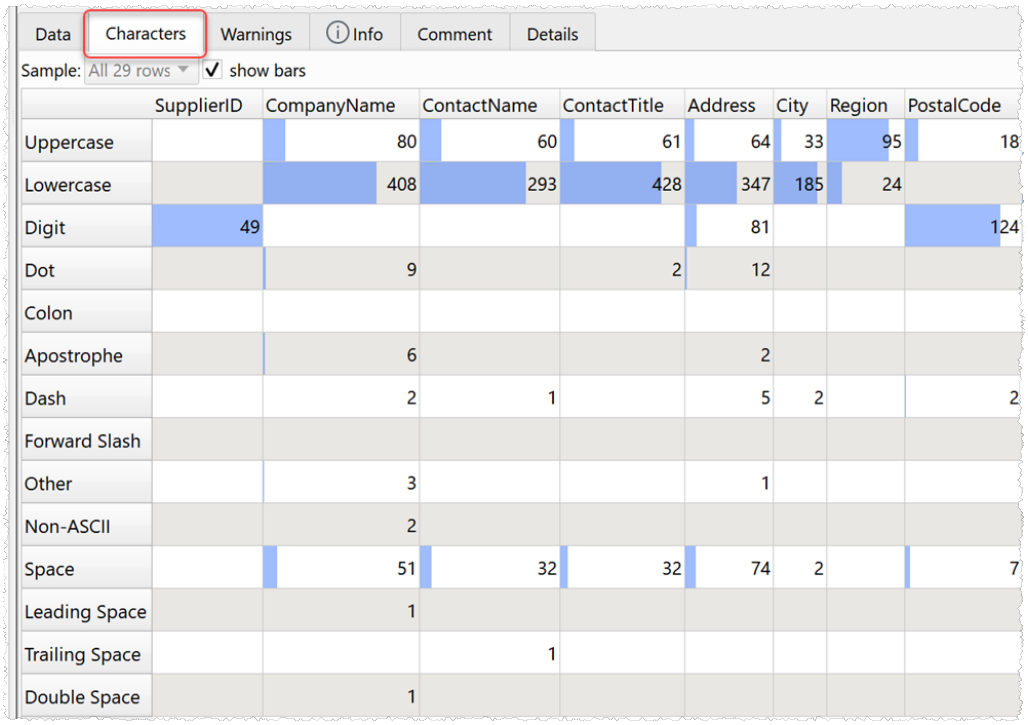
## 3.10 Clean a dataset

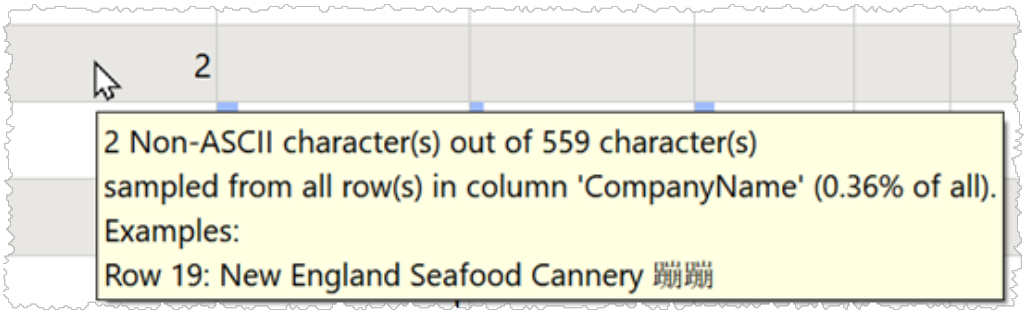
Data is often 'dirty' and needs to be cleaned up before further processing. You can quickly find unwanted characters by looking in the **Characters** tab of the **Right** pane to see what types of characters occur in which columns.




| | SupplierID | CompanyName | ContactName | ContactTitle | Address | City | Region | PostalCode |
|---|---|---|---|---|---|---|---|---|
| Uppercase | | 80 | 60 | 61 | 64 | 33 | 95 | 18 |
| Lowercase | | 408 | 293 | 428 | 347 | 185 | 24 | |
| Digit | 49 | | | | 81 | | | 124 |
| Dot | | 9 | | 2 | 12 | | | |
| Colon | | | | | | | | |
| Apostrophe | | 6 | | | 2 | | | |
| Dash | | 2 | 1 | | 5 | 2 | | 2 |
| Forward Slash | | | | | | | | |
| Other | | 3 | | | 1 | | | |
| Non-ASCII | | 2 | | | | | | |
| Space | | 51 | 32 | 32 | 74 | 2 | | 7 |
| Leading Space | | 1 | | | | | | |
| Trailing Space | | | 1 | | | | | |
| Double Space | | 1 | | | | | | |

Note that some of these categories are non-exclusive. For example: a Space might be counted as a Space, whitespace and a leading Space, and a symbol might also be a non-ASCII character.

Hover over a cell for more details.




You can turn the colored bars off.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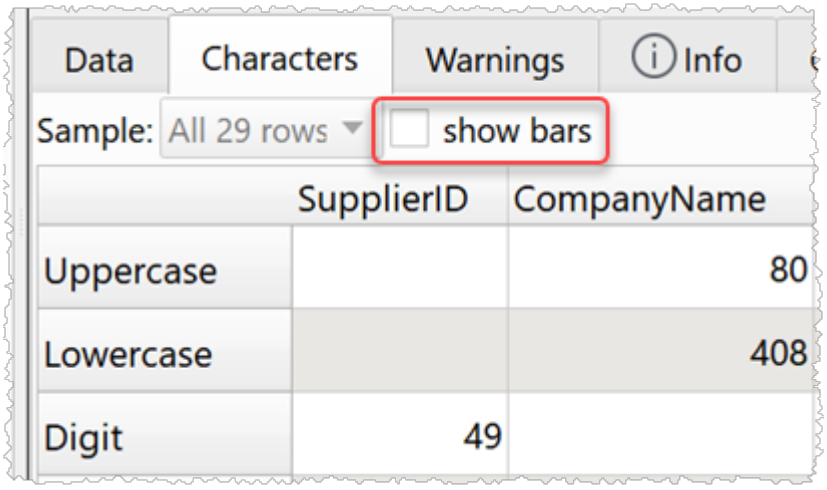
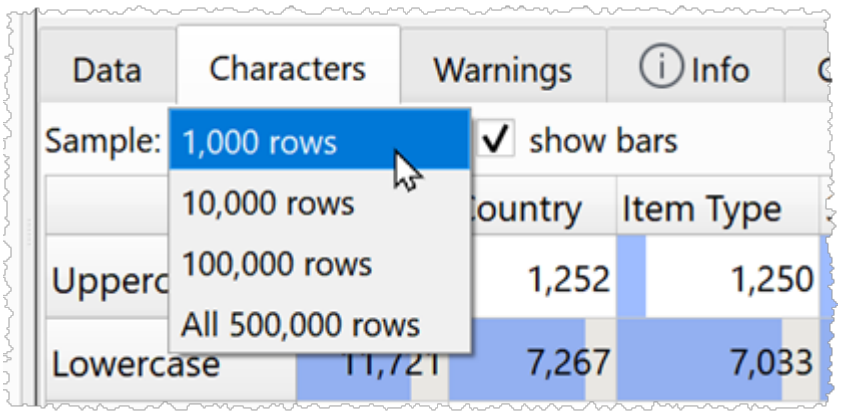



And you can restrict it to sampling only a subset of rows for improved speed in large datasets.




You can use the **Characters** tab in conjunction with the Replace and Whitespace transforms to quickly clean your data. **Replace** can easily remove non-ASCII, symbols etc by replacing them with nothing: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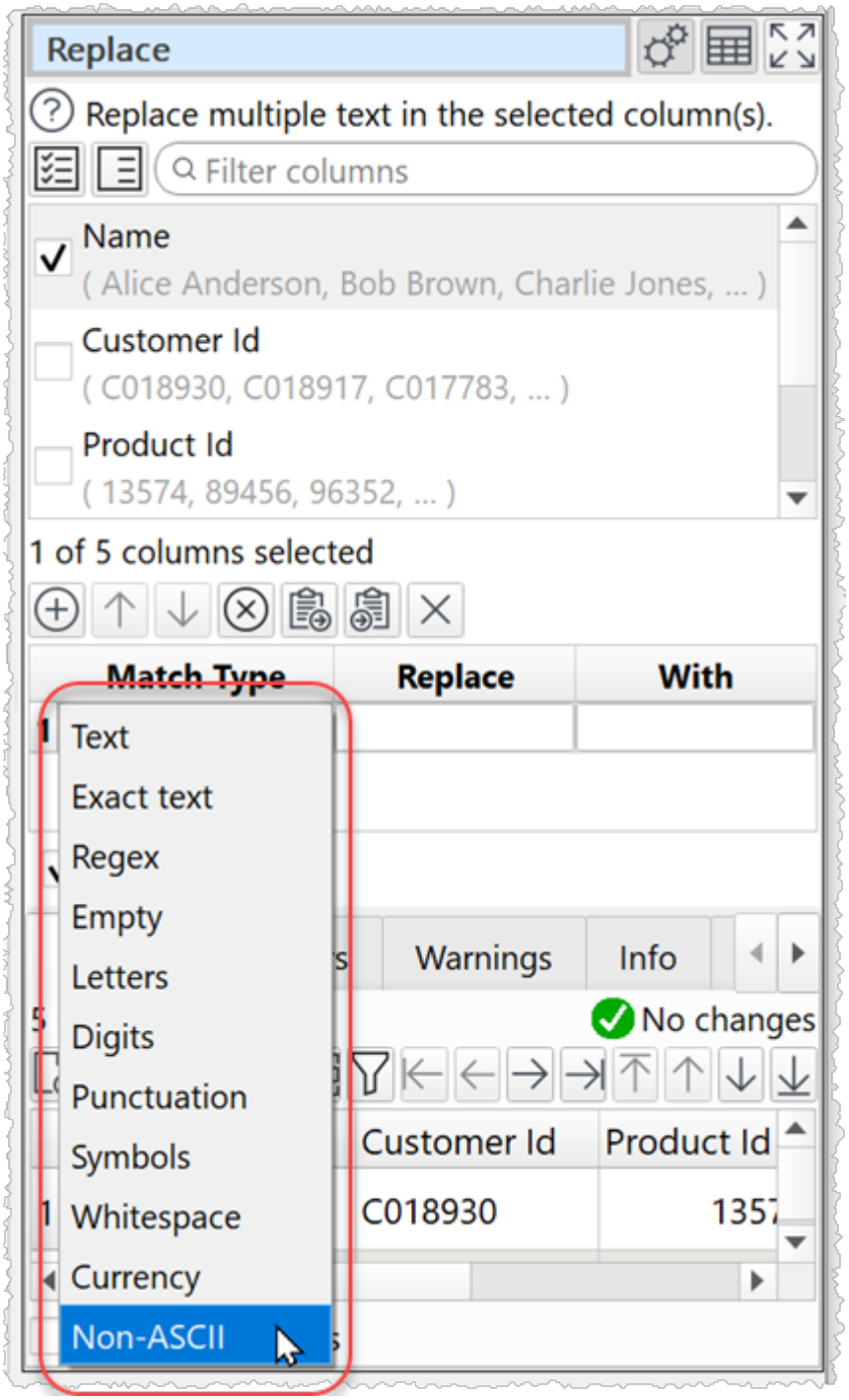


See also:

- Video: How to clean data
- Add missing data values
- Profile a dataset
- Match dirty data


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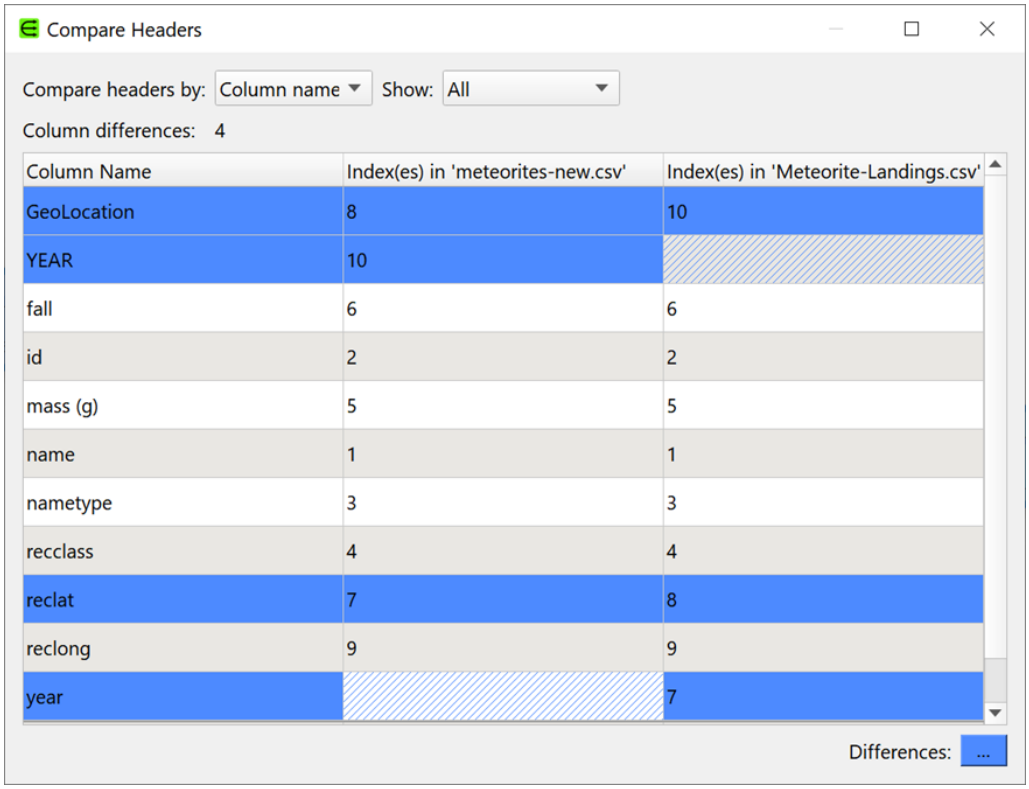
## 3.11 Compare datasets

### Comparing headers

To compare headers between 2 or more datasets:

- Select 2 or more items in the **Center** pane
- Select **View>Compare Headers...** , use the right click menu or `Ctrl+H`.




Notes:

- Set **Compare headers by** to compare by **Column name** or **Column index** (position).
- Comparing by **Column name** is sensitive to case and whitespace.
- Set **Show** to show **All**, **Only matches** or **Only differences**, depending on the rows you want displayed.
- Differences are shown colored. Missing headers are shown hatched.
- Click the color button to change the difference color.

### Comparing data visually

To compare the data in 2 datasets:

- Select 2 items in the **Center** pane
- Select **View>Compare Data...**, use the right click menu or `Alt+D`.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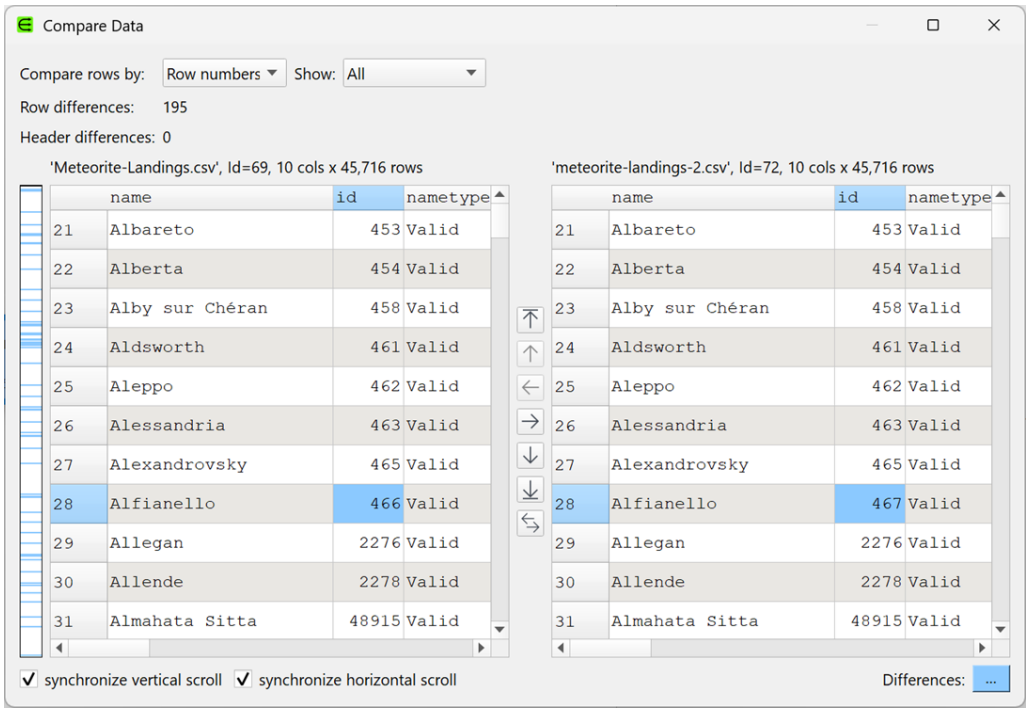


Notes:

- Set **Compare rows by** to:
  - **Row numbers** to see a row-by-row comparison of the 2 datasets.
  - **Key columns** to see a comparison by key values in each dataset.
    - Set the **Key column** for left and right datasets.
    - Check **Sort by key** to sort the keys in ascending order.
    - Check **case sensitive** to make the key comparison case sensitive.
- Set **Show** to:
  - **All** to show all rows.
  - **Only matches** to show only rows that are the same in both datasets.
  - **Only differences** to show only rows that are different in both datasets,
- Differences are shown colored. Missing rows are shown hatched.
- An overview of the differences by row are shown on the left when **Show** is set to **All**. You can click or drag this overview to navigate.
- Click **Top** to scroll to the top of both datasets.
- Click **Previous row difference** to go the previous row with a difference.
- Click **Previous difference** to go the previous cell with a difference.
- Click **Next difference** to go the next cell with a difference.
- Click **Next row difference** to go to the next row with a difference.
- Click **Bottom** to scroll to the bottom of both datasets.
- Click **Swap** to swap the left/right positions of the two datasets.
- Check **synchronize vertical scroll** to make vertical scrolling in one pane mirrored in the other pane.
- Check **synchronize horizontal scroll** to make horizontal scrolling in one pane mirrored in the other pane.
- Click **Differences** to change the color used to highlight differences.


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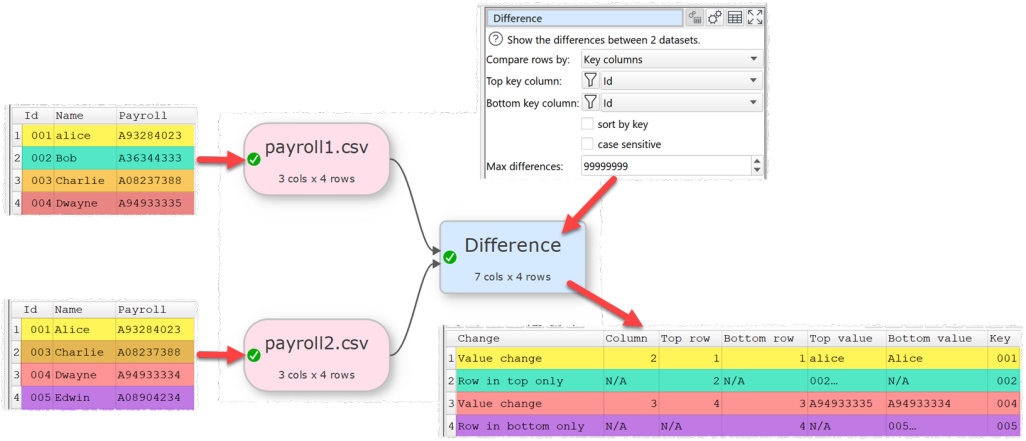
### Outputting a table of differences

You can use the Difference transform to create a new dataset with the differences of the 2 input datasets.




| | Id | Name | Payroll |
|---|---|---|---|
| 1 | 001 | alice | A93284023 |
| 2 | 002 | Bob | A36344333 |
| 3 | 003 | Charlie | A08237388 |
| 4 | 004 | Dwayne | A94933335 |

| | Id | Name | Payroll |
|---|---|---|---|
| 1 | 001 | Alice | A93284023 |
| 2 | 003 | Charlie | A08237388 |
| 3 | 004 | Dwayne | A94933334 |
| 4 | 005 | Edwin | A08904234 |

| | Change | Column | Top row | Bottom row | Top value | Bottom value | Key |
|---|---|---|---|---|---|---|---|
| 1 | Value change | 2 | 1 | 1 | alice | Alice | 001 |
| 2 | Row in top only | N/A | 2 | N/A | 002… | N/A | 002 |
| 3 | Value change | 3 | 4 | 3 | A94933335 | A94933334 | 004 |
| 4 | Row in bottom only | N/A | N/A | 4 | N/A | 005… | 005 |

See also:

- Video: How to compare Excel sheets
- See changes from a transform
- Match dirty data

## 3.12 Convert to percentages

You can convert to percentages using the Scale transform.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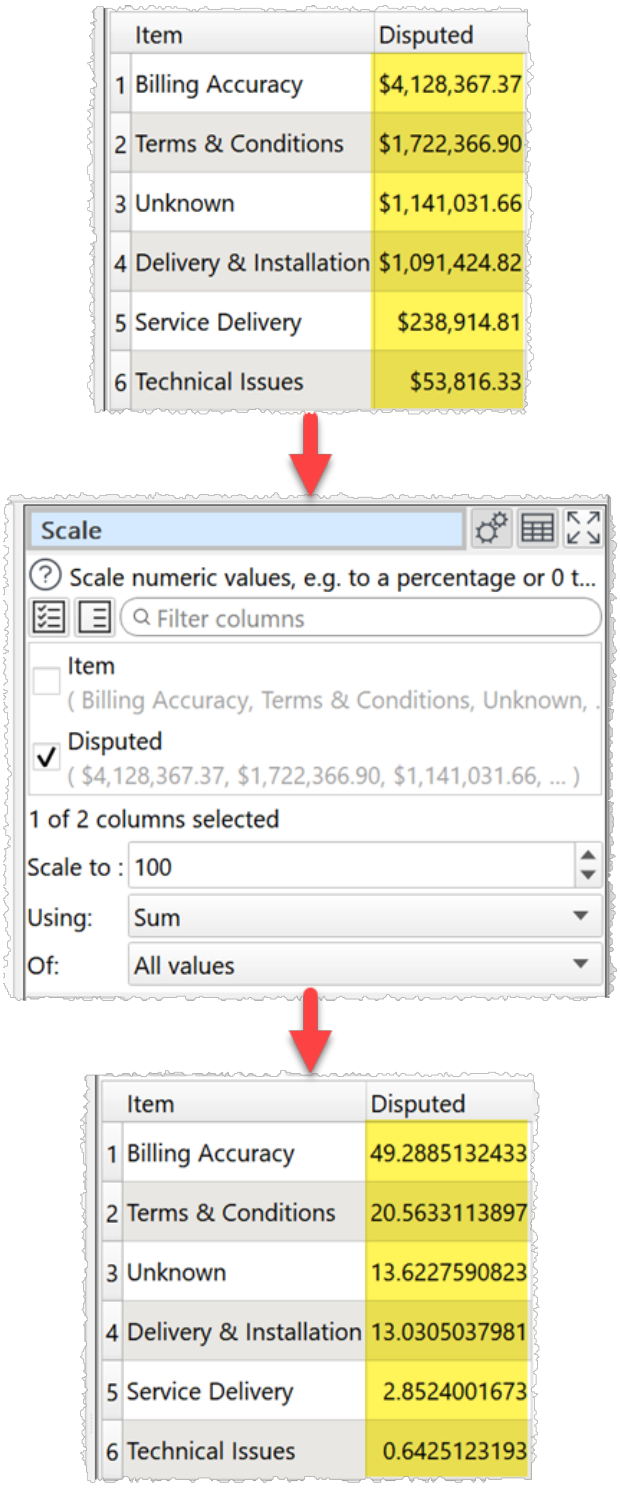


## 3.13 Dedupe a dataset

There are 2 transforms for removing duplicate rows from datasets:

- Dedupe removes duplicate rows, keeping only the first row in each group that it considers to be duplicates of each other.
- Unique creates a single aggregate row from each group that it considers to be duplicates of each other.


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Dedupe is simpler. Unique has more flexibility.

## Using Dedupe

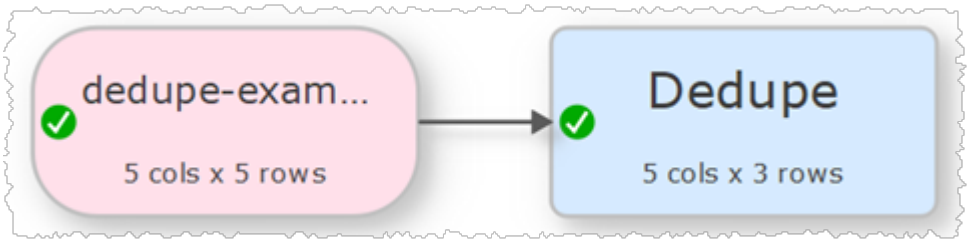
To keep only the first row with each **Customer Id** from this dataset:

| | Name | Customer Id | Product Id | Cost | Date |
|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 |
| 2 | Bob Brown | C018917 | 89456 | 10.55 | 01/10/2020 |
| 3 | Charlie Jones | C017783 | 96352 | 19.95 | 02/10/2020 |
| 4 | Robert Brown | C018917 | 98526 | 10.00 | 02/10/2020 |
| 5 | Charles Jones | C017783 | 28746 | 25.00 | 03/10/2020 |

To get this dataset:

| | Name | Customer Id | Product Id | Cost | Date |
|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 |
| 2 | Bob Brown | C018917 | 89456 | 10.55 | 01/10/2020 |
| 3 | Charlie Jones | C017783 | 96352 | 19.95 | 02/10/2020 |

Drag the dataset file onto the **Center** pane of Easy Data Transform. Then click the **Dedupe** transform in the **Left** pane.




Then check the **Customer Id** column in the **Right** pane.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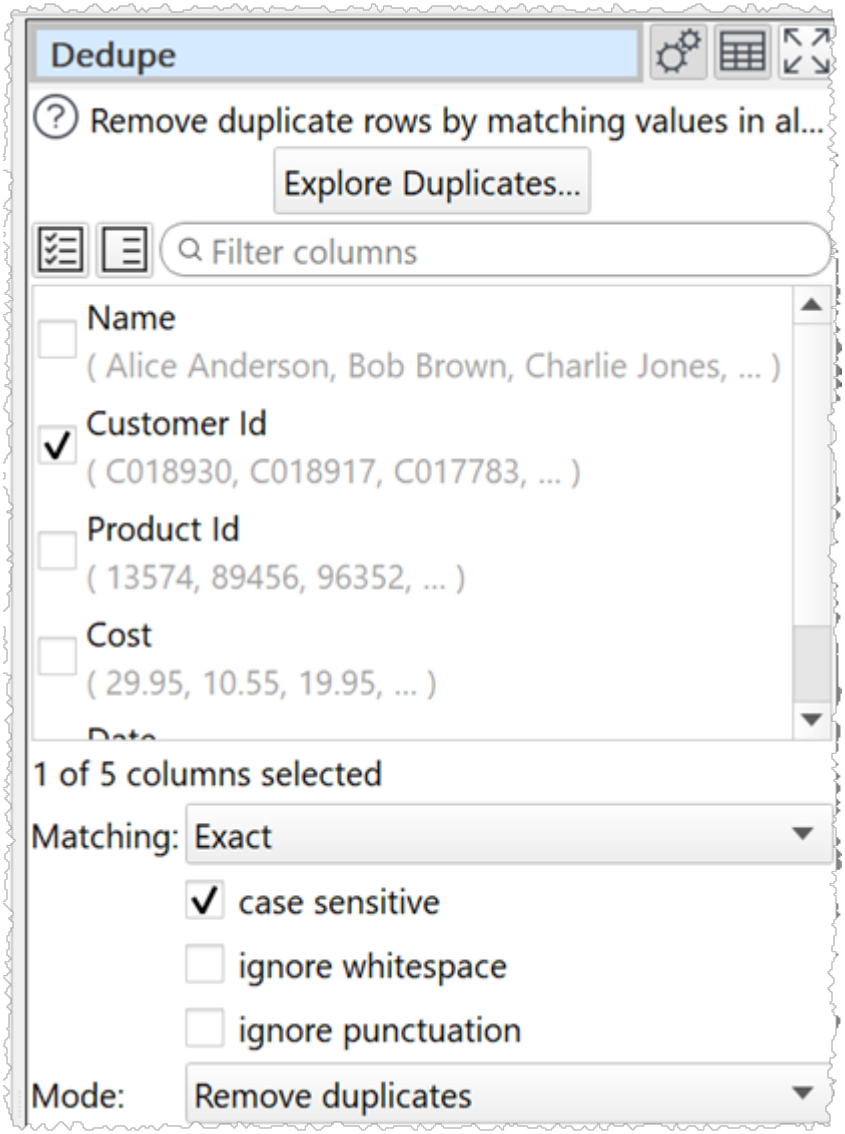


Only the first row with each **Customer Id** is kept. Use Sort if you want to change the order before the **Dedupe** transform.

If you only want to remove rows with the same **Customer Id** and **Product Id**, check both the **Customer Id** and **Product Id** columns.

If you want to use fuzzy matching to also remove rows that are similar, but not identical, set **Matching** to **Fuzzy**.

To see what rows will be removed and experiment with different options, click the **Explore Duplicates...** button.


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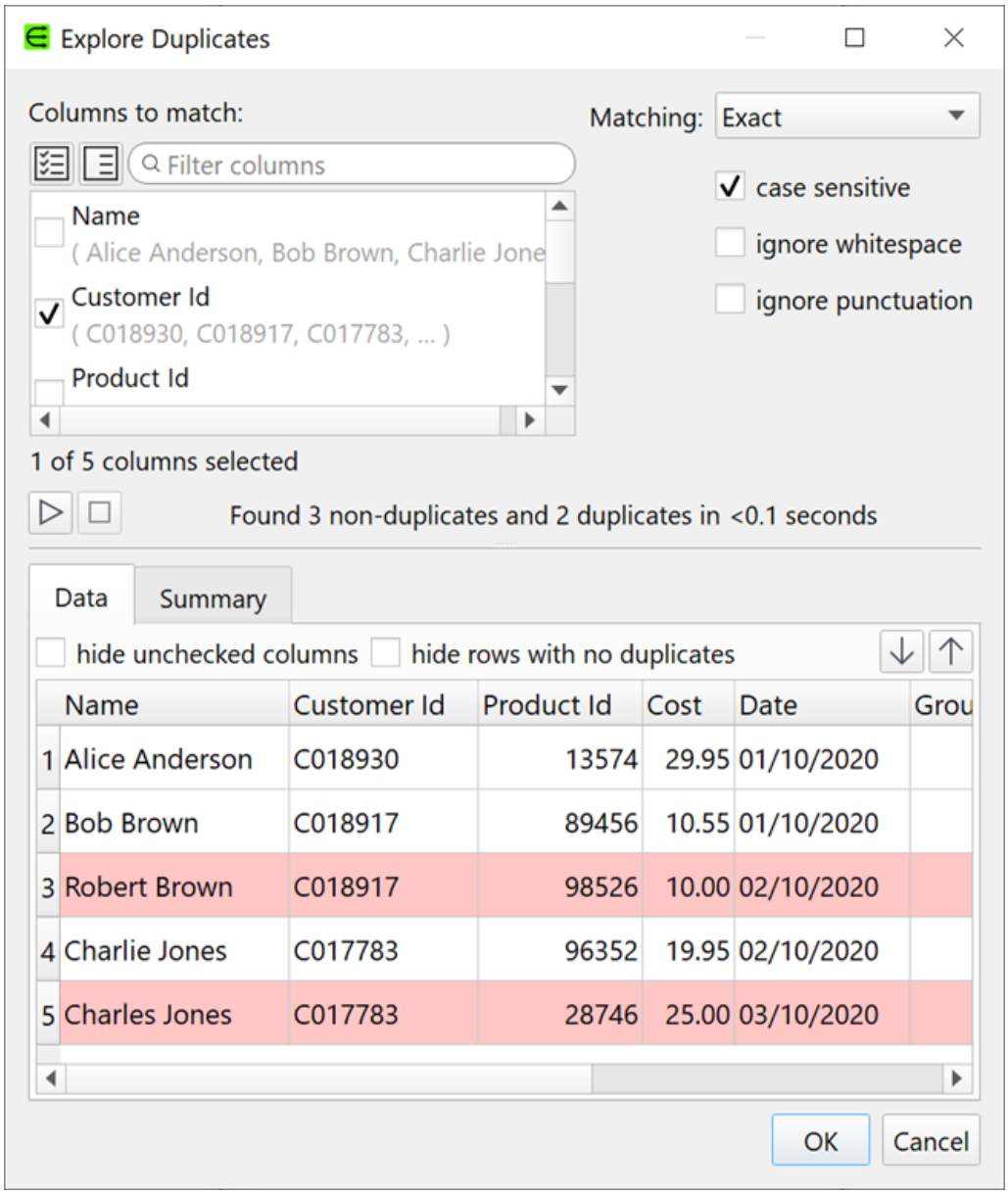


Note that **Dedupe** takes account of whitespace. So you might need a Whitespace transform before the **Dedupe** transform.

See also the Dedupe documentation.

## Using Unique

To aggregate all rows with the same **Customer Id**:


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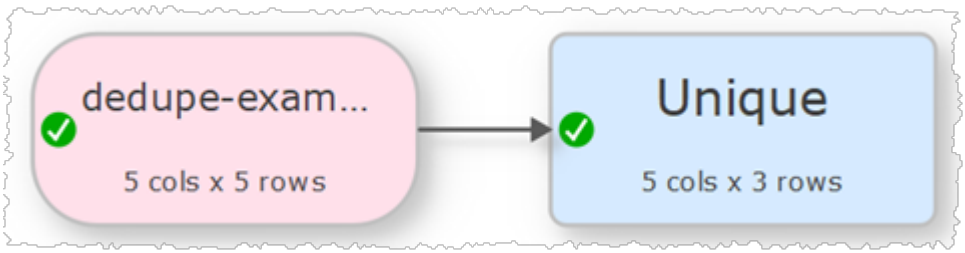
| | Name | Customer Id | Product Id | Cost | Date |
|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 |
| 2 | Bob Brown | C018917 | 89456 | 10.55 | 01/10/2020 |
| 3 | Charlie Jones | C017783 | 96352 | 19.95 | 02/10/2020 |
| 4 | Robert Brown | C018917 | 98526 | 10.00 | 02/10/2020 |
| 5 | Charles Jones | C017783 | 28746 | 25.00 | 03/10/2020 |

To get this dataset with:

- The first **Name** for that **Customer Id**
- A Comma separated list of **Product Ids** for that **Customer Id**
- The total **Cost** for that **Customer Id**
- The last **Date** for that **Customer Id**

| | Name | Customer Id | Product Id | Cost | Date |
|---|---|---|---|---|---|
| 1 | Alice Anderson | C018930 | 13574 | 29.95 | 01/10/2020 |
| 2 | Bob Brown | C018917 | 89456,98526 | 20.55 | 02/10/2020 |
| 3 | Charlie Jones | C017783 | 96352,28746 | 44.95 | 03/10/2020 |

Drag the dataset file onto the **Center** pane of Easy Data Transform. Then click the **Unique** transform in the **Left** pane (if you can't see **Unique**, then check **show advanced** is checked in the **Left** pane).




Then set the **Unique** options as shown below: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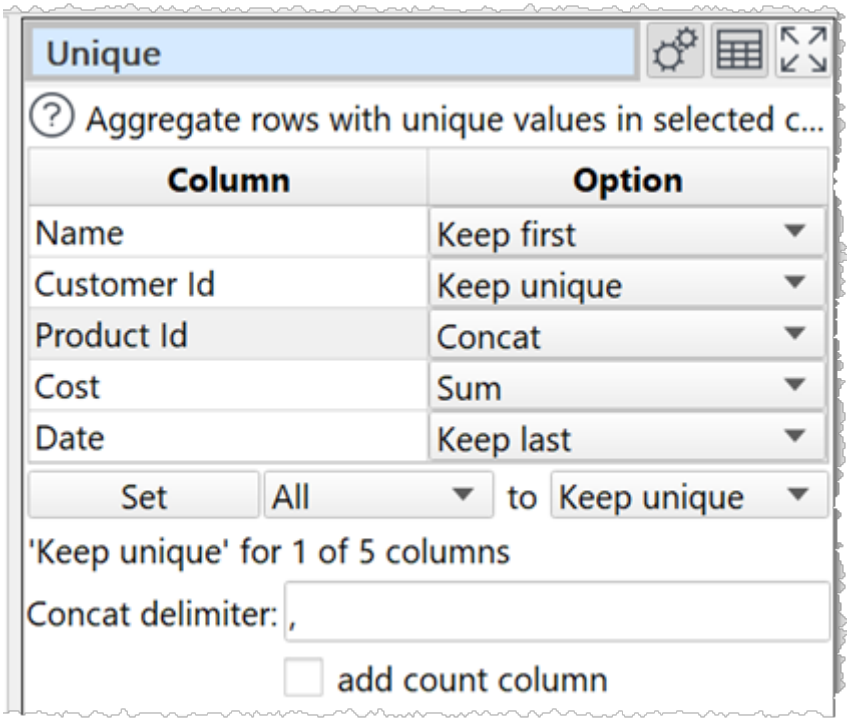


One aggregated row is created for each **Customer Id**. Use Sort if you want to change the order before the **Unique** transform.

If you only want to create a new aggregate row for rows with the same **Customer Id** and **Product Id**, set both the **Customer Id** and **Product Id** columns to **Keep unique**.

Note that **Unique** takes account of case and whitespace. So you might need a Case or Whitespace transform before the **Unique** transform.

See also the Unique documentation.

See also:
- Video: How to remove Excel duplicates
- Video: How to merge rows in Excel
- Video: How to clean, merge and scrub email lists

## 3.14 Duplicate a series of transforms

To duplicate multiple items in the **Center** pane (e.g. a sequence of transforms) right click on the first item and select **Duplicate Branch**.


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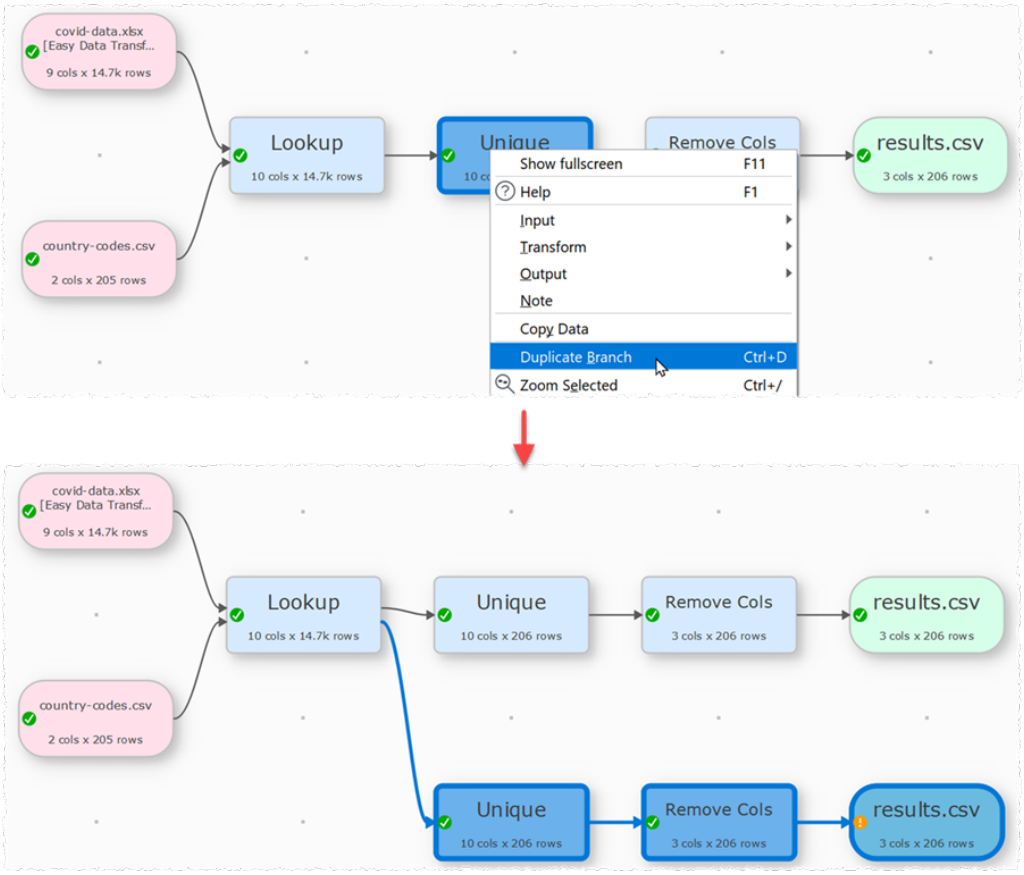


## 3.15 Find the difference between dates/datetimes

You can calculate the number off days difference between two dates using the Calculate transform. For example:


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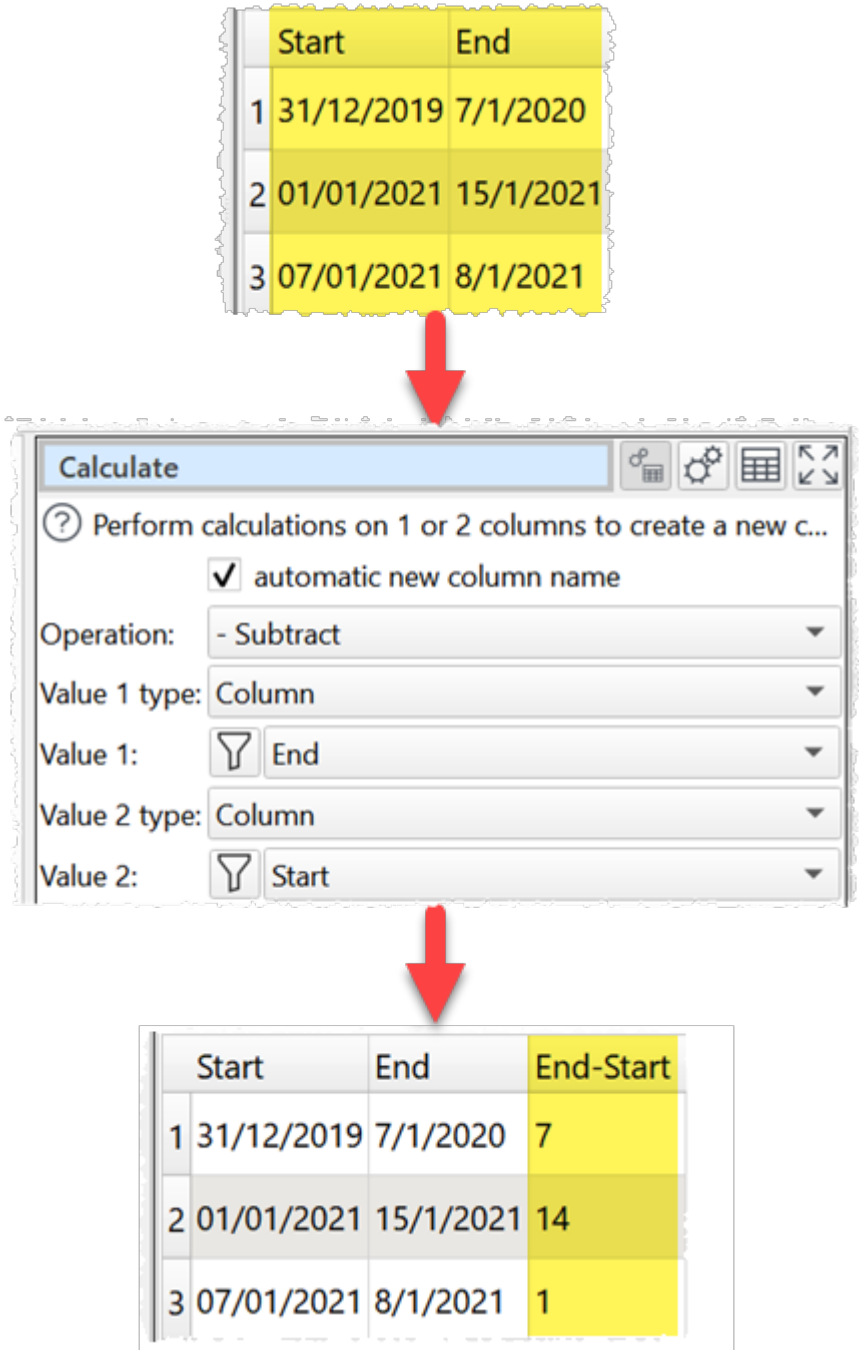


You can convert a datetime into a date using a transform such as Extract.

Alternatively, you can calculate the difference between two dates or datetimes using Date objects in the Javascript transform.

There are 4 ways to create a Javascript Date object:


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| Date format | Description |
|---|---|
| `new Date(year, month, day, hours, minutes, seconds, milliseconds)` | Specified date and time specified as numeric parameters (January is month 0!). |
| `new Date(text date)` | Date and time specified as text. |
| `new Date(milliseconds)` | Milliseconds after 1st January 1970. |
| `new Date()` | Current date and time. |

Notes:
- A text date should be in yyyy-MM-dd format.
- A Date object always includes a time. If no time is set, then the time is assumed to be midnight GMT.
- One and two digit years will be interpreted from 1900.

## Examples

To calculate the number of milliseconds between a date in the 'date' column and 31st Dec 2000:

```
return new Date( $(date) ) - new Date( "2000-12-31" );
```

Or:

```
return new Date( $(date) ) - new Date( 2000, 11, 31 );
```

To calculate the difference between datetimes in the 'start' and 'end' columns in hours:

```
return ( new Date( $(end) ) - new Date( $(start) ) ) /
( 60 * 60 * 1000 );
```

To calculate how many days ago 'date' occurred (rounded down):

```
return Math.floor( ( new Date() - new Date( $(date) ) )
/ ( 24 * 60 * 60 * 1000 ) );
```

For more information see the Javascript documentation.


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## 3.16 Handle column name/order changes in inputs

If you have a .transform file that you want to run multiple input files through (perhaps with a different input file each month, via the command line from a script, or as a batch process) you need to be aware of differences in column name and column order in the input files.

To change the file being used by an input, select the input item and change the file location in the **Right** pane (e,g, by clicking the '...' browse file button).

### Columns in the same order, but with different names

Easy Data Transform references columns in inputs by their position (e.g. 3rd column from the left) not their column name. So differences in column names (e.g. first column is called "id" in input 1 and "UniqueID" in input 2) are not generally an issue. But you need to be careful if you are using the Stack transform with **Align columns by** set to **Header name**, as this will reorder columns by name. If you want to always output the same column names, regardless of the input column names, you could use a Rename Cols transform to set the column names explicitly.

### Columns with the same names, but in a different order

Use a schema for the input.

### Columns with the same names, but with one or more columns missing

Use a schema for the input.

### Columns with the same names, but with one or more extra columns

Use a schema for the input.

### Columns with different names, in a different order

Easy Data Transform can't handle this automatically. But you can create a new .transform and use Reorder Cols and/or Rename Cols transforms to output to a new file with the correct column names/ordering. You can then input this to the original .transform.

## 3.17 Handle datasets with many columns

Easy Data Transform can help you to easily remove or rename columns in datasets with large numbers of columns.


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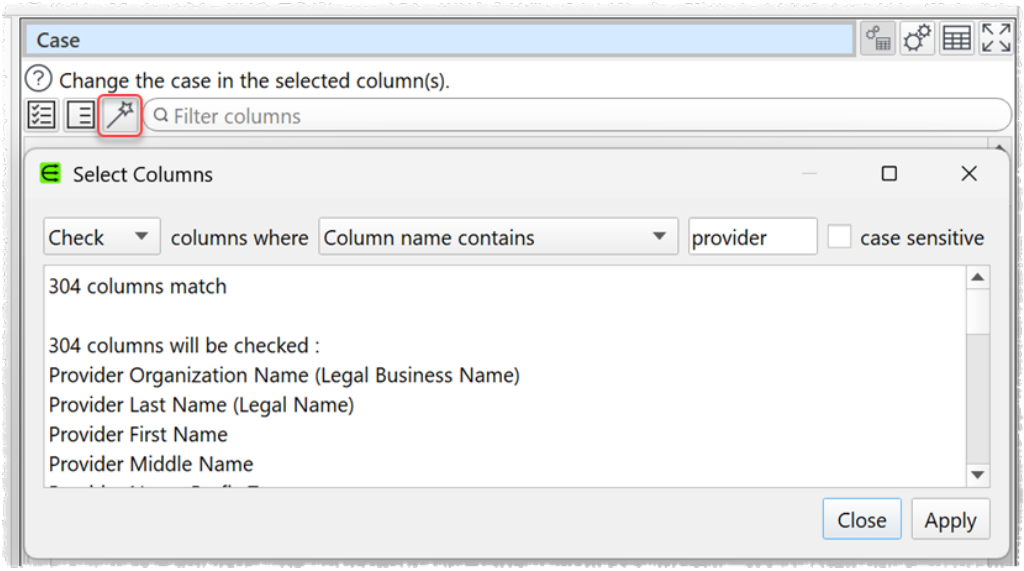
## Find columns by filtering

If there are large numbers of columns, you can quickly find the column you want by clicking the filter button and typing some characters from the column name.

## Check/uncheck multiple columns by criteria

If there are multiple columns, you can check or uncheck them by various criteria in the **Select Columns** window. For example it can check or uncheck all the empty columns.




## Remove multiple empty columns

If your dataset has a large number of empty columns you can remove them by checking **ignore empty columns** when you input it.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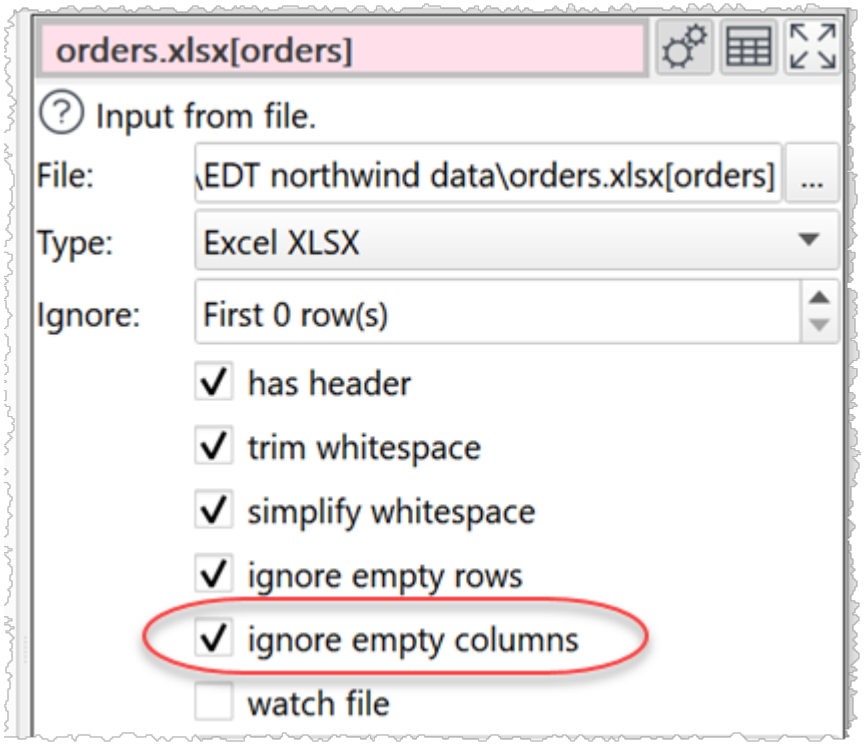


## Remove multiple columns

To quickly remove a large number of columns using the Remove Cols transform, you can filter by column names. For example, to remove the columns with names that contain "id":

- Add a **Remove Cols** transform.
- Type `id` into the filter field. All the columns whose names contain "id" should now be visible (not case sensitive).
- Click the **Unselect all** button.
- Click the **Clear** button.

All the columns whose names contain "id" should now be removed by the transform. You can repeat this process as often as needed.


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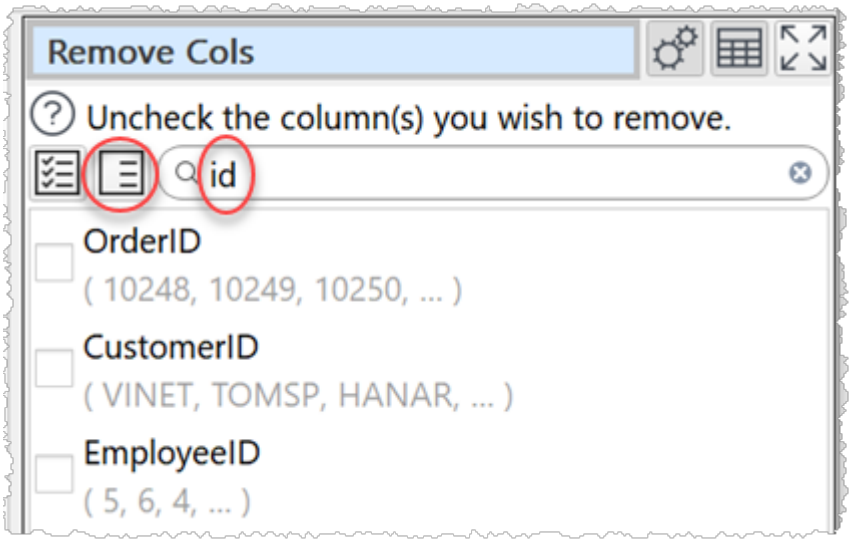
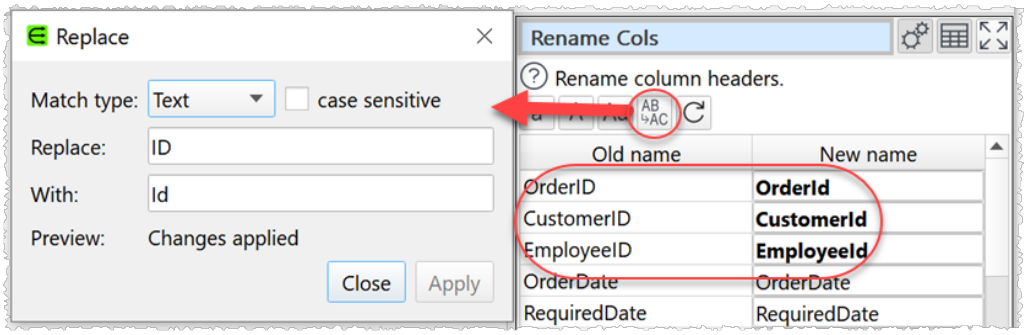



### Rename multiple columns

To quickly rename a large number of columns using the Rename Cols transform, use **Replace text**:

- Add a **Rename Cols** transform.
- Click the **Replace text** button.
- Enter the text you want to **Replace** and the text you want to replace it **With**. You can match as **Text**, **Exact text** or **Regex**, with **case sensitive** matching optional.
- Click **Apply** to make the change.
- Click **Close**.




See also:

- Handle large datasets

## 3.18 Handle large datasets

Large datasets (e.g. with millions of rows) can slow down processing. If slow processing is a problem you can:

- Add a sample transform straight after the input and set **Rows** to pass through only the first 100 or so rows. Once you have completed all your transforms you can then **Disable sampling** to pass through all rows.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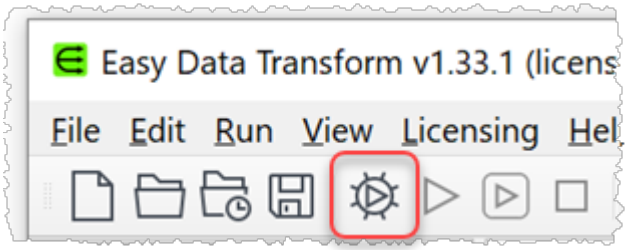
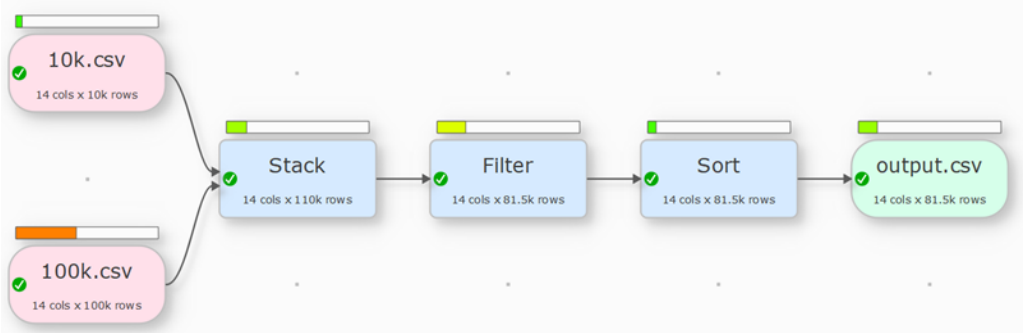
- Set **Maximum memory usage** to a higher value in the Preferences window, to ensure you don't run out of memory.
- Set **Optimize processing for** to **Minimum memory use** in the Preferences window, to reduce memory usage.
- Uncheck **Run>Auto Run** to give yourself full control over processing.




or

- Check **Run>Auto Run** and:
  - Set **Right pane processing delay** in the Preferences window to a longer time (say 5 seconds) to ensure that changes aren't processed until you have finished making the changes.
  - Set **Write mode** to **Disabled** in output files, until you are ready to write them.

You can check **View>Timing Profile** to see where the processing time is being spent.




Or select **View>Item Summary...** and click on the **Processing** column header to sort by processing time,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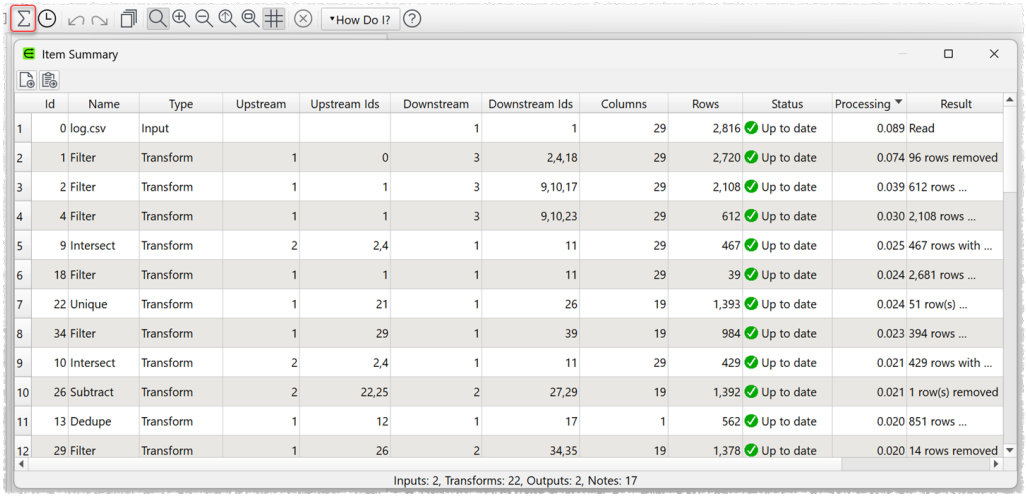


| | Id | Name | Type | Upstream | Upstream Ids | Downstream | Downstream Ids | Columns | Rows | Status | Processing | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | log.csv | Input | | | 1 | 1 | 29 | 2,816 | Up to date | 0.089 | Read |
| 2 | 1 | Filter | Transform | 1 | 0 | 3 | 2,4,18 | 29 | 2,720 | Up to date | 0.074 | 96 rows removed |
| 3 | 2 | Filter | Transform | 1 | 1 | 3 | 9,10,17 | 29 | 2,108 | Up to date | 0.039 | 612 rows ... |
| 4 | 4 | Filter | Transform | 1 | 1 | 3 | 9,10,23 | 29 | 612 | Up to date | 0.030 | 2,108 rows ... |
| 5 | 9 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 467 | Up to date | 0.025 | 467 rows with ... |
| 6 | 18 | Filter | Transform | 1 | 1 | 1 | 11 | 29 | 39 | Up to date | 0.024 | 2,681 rows ... |
| 7 | 22 | Unique | Transform | 1 | 21 | 1 | 26 | 19 | 1,393 | Up to date | 0.024 | 51 row(s) ... |
| 8 | 34 | Filter | Transform | 1 | 29 | 1 | 39 | 19 | 984 | Up to date | 0.023 | 394 rows ... |
| 9 | 10 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 429 | Up to date | 0.021 | 429 rows with ... |
| 10 | 26 | Subtract | Transform | 2 | 22,25 | 2 | 27,29 | 19 | 1,392 | Up to date | 0.021 | 1 row(s) removed |
| 11 | 13 | Dedupe | Transform | 1 | 12 | 1 | 17 | 1 | 562 | Up to date | 0.020 | 851 rows ... |
| 12 | 29 | Filter | Transform | 1 | 26 | 2 | 34,35 | 19 | 1,378 | Up to date | 0.020 | 14 rows removed |

See also:

- Handle datasets with many columns
- Manage a large number of Center pane items
- Processing

## 3.19 Input a fixed width format file

To input data from a fixed width file see fixed width format.

## 3.20 Manage a large number of Center pane items

Large .transform files can have 100+ Input, Transform, Output and Note items in the **Center** pane. There are various techniques you can use to keep this manageable:

- Place items in conceptual groups with space between. Use Note items to describe the purpose of the group.
- Try to avoid connections crossing items and other connections where possible.
- Set **Edit>Snap To Grid** on to make it easier to keep items neatly aligned.
- Select **View>Show Tool Tips>Detailed**, so that you can see detailed tooltips when hovering over an item.
- Add comments in item **Comment** tabs. You can see these in tooltips when you hover over the items. You can also select **View>Show Comments** to show them on items.
- Hover your mouse over an item in the **Center** pane to highlight the connections to and from it.


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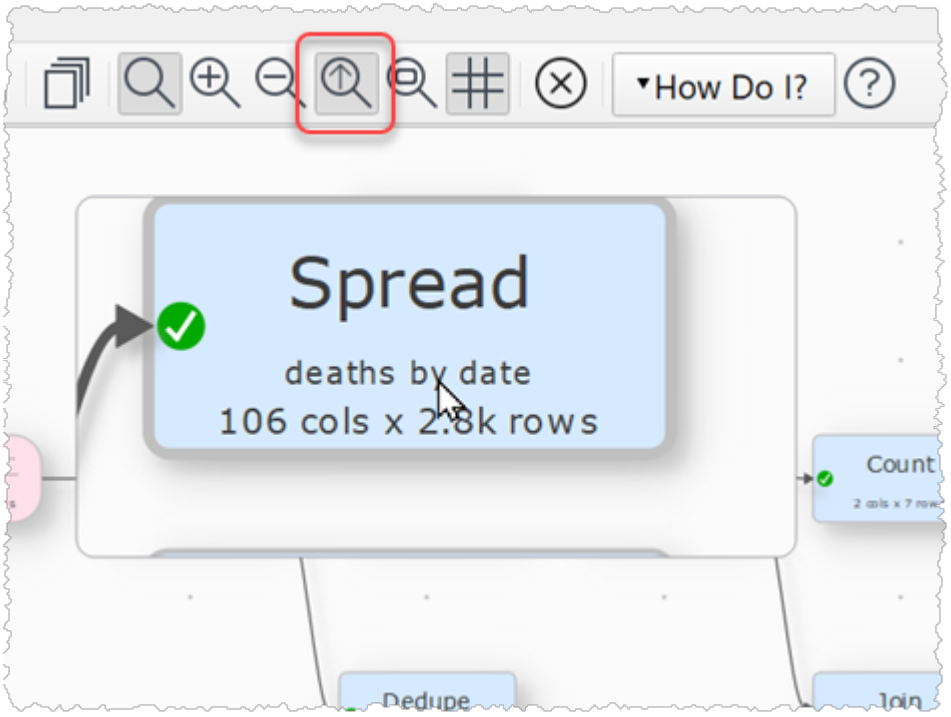
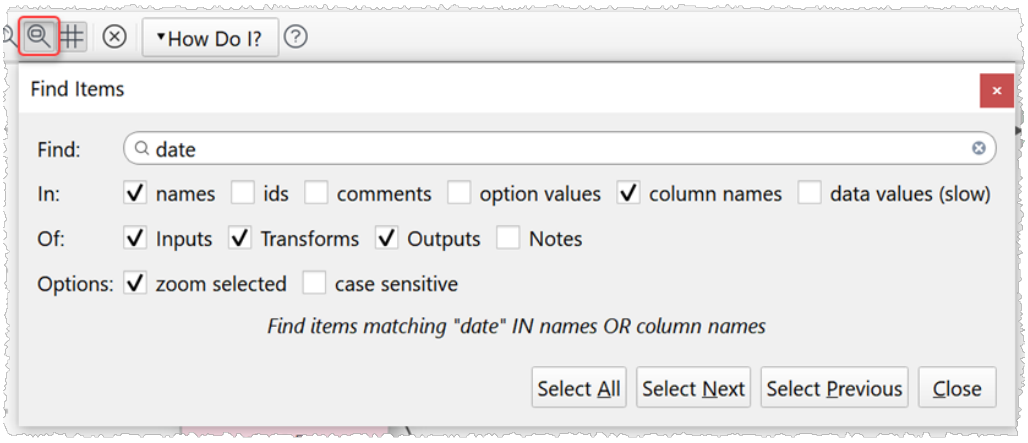
- Hover your mouse over a connection in the **Center** pane to highlight the items at either end.
- Hover your mouse over a transform button in the **Left** pane to highlight all buttons of that type.
- Select **View>Magnify Cursor** to magnify items while zoomed back.




- Select **View>Find Items** to select items in the **Center** pane that match one or more search terms.




- Get an overview of all the **Center** pane items in the **Item Summary** window by selecting **View>Item Summary...** .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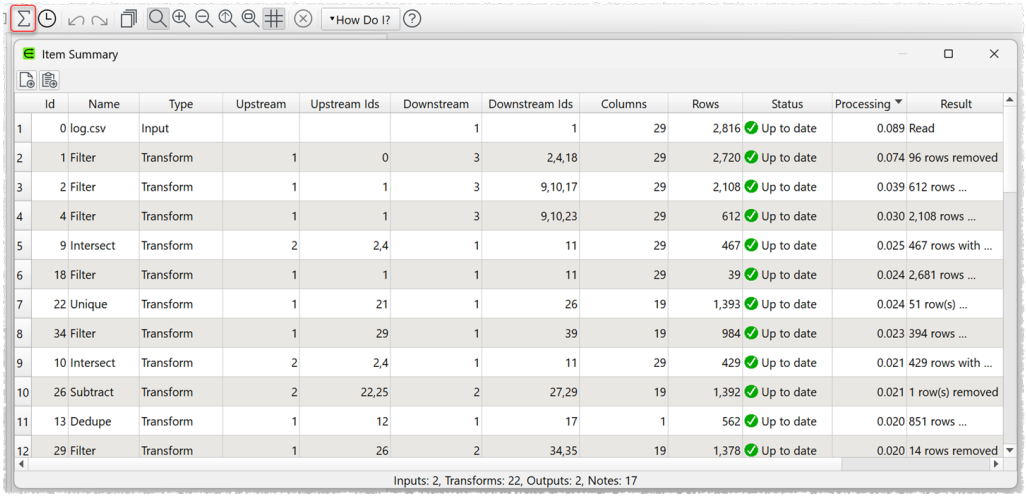


| | Id | Name | Type | Upstream | Upstream Ids | Downstream | Downstream Ids | Columns | Rows | Status | Processing | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | log.csv | Input | | | 1 | 1 | 29 | 2,816 | Up to date | 0.089 | Read |
| 2 | 1 | Filter | Transform | 1 | 0 | 3 | 2,4,18 | 29 | 2,720 | Up to date | 0.074 | 96 rows removed |
| 3 | 2 | Filter | Transform | 1 | 1 | 3 | 9,10,17 | 29 | 2,108 | Up to date | 0.039 | 612 rows ... |
| 4 | 4 | Filter | Transform | 1 | 1 | 3 | 9,10,23 | 29 | 612 | Up to date | 0.030 | 2,108 rows ... |
| 5 | 9 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 467 | Up to date | 0.025 | 467 rows with ... |
| 6 | 18 | Filter | Transform | 1 | 1 | 1 | 11 | 29 | 39 | Up to date | 0.024 | 2,681 rows ... |
| 7 | 22 | Unique | Transform | 1 | 21 | 1 | 26 | 19 | 1,393 | Up to date | 0.024 | 51 row(s) ... |
| 8 | 34 | Filter | Transform | 1 | 29 | 1 | 39 | 19 | 984 | Up to date | 0.023 | 394 rows ... |
| 9 | 10 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 429 | Up to date | 0.021 | 429 rows with ... |
| 10 | 26 | Subtract | Transform | 2 | 22,25 | 2 | 27,29 | 19 | 1,392 | Up to date | 0.021 | 1 row(s) removed |
| 11 | 13 | Dedupe | Transform | 1 | 12 | 1 | 17 | 1 | 562 | Up to date | 0.020 | 851 rows ... |
| 12 | 29 | Filter | Transform | 1 | 26 | 2 | 34,35 | 19 | 1,378 | Up to date | 0.020 | 14 rows removed |

- Configure the mouse wheel zoom and pan behavior using the **Zoom wheel behavior** field of the **General** tab in the Preferences window.
- Hold down the `Shift` key and drag on the **Center** pane to scroll left/right/up/down.

See also:
- Handle large datasets

## 3.21 Match dirty data

There is often a need to match real-world data that is 'dirty'. For example, you might want to match the company name in two datasets to perform a Lookup.

In the first dataset there are company names:

```
Smith Industries
Weyland-Yutani
ACME LTD
```

In the second dataset there are company names:

```
Smith Industries Ltd
Weyland-yutani,Inc.
Acme
```

You can try to match these using the fuzzy matching option in **Lookup**, but this is slow for big datasets and can result in false positives. So it is much better to try to clean/normalize the data as much as possible before matching.


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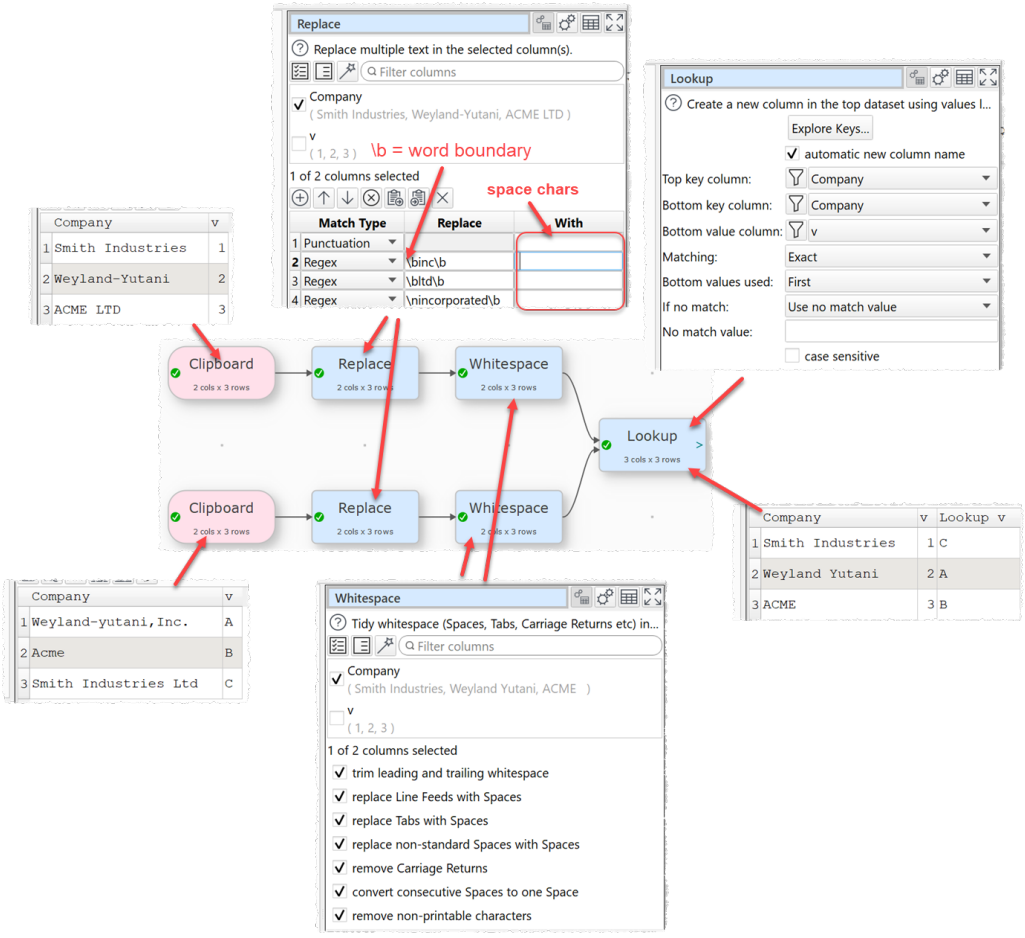
You can do this by using a Replace transform to replace any of the following with a space:

- punctuation characters
- 'inc', 'incorporated', 'ltd', 'limited' etc (use `\b` to denote a word boundary in a regex, so you only replace a whole word, not part of a word)

Then use a Whitespace transform to remove leading and trailing whitespace and convert consecutive spaces into a single space.

You can then do a **Lookup** with exact match and **case sensitive** unchecked:




If there are still issues (e.g. typos in company names) you could try setting **Matching** to **Fuzzy**.

Once you are happy with the match, you can add an output to write it to file.

See also:

- Fuzzy matching
- Clean a dataset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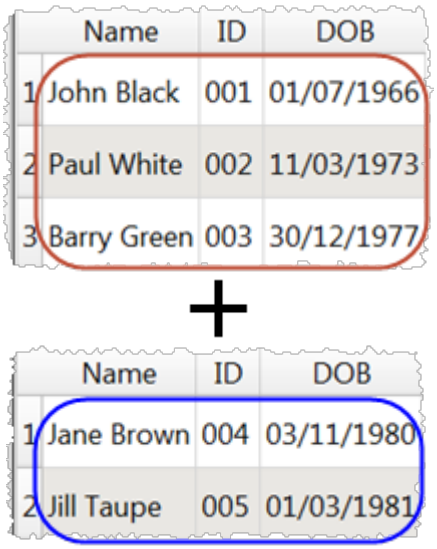
## 3.22 Merge datasets

Easy Data Transform has two main options for merging two datasets. Stack and Join.

### Stack datasets

If you want to merge the two datasets so they are one on top of another, use the Stack transform. For example, to Stack these two datasets:

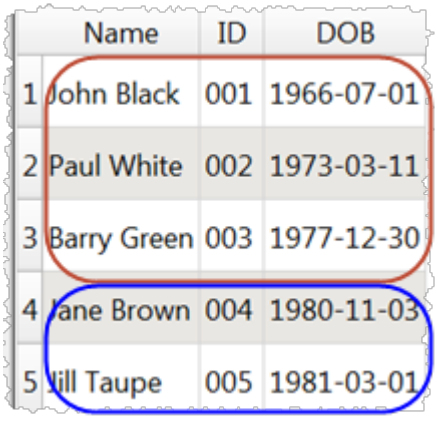


| | Name | ID | DOB |
|---|---|---|---|
| 1 | John Black | 001 | 01/07/1966 |
| 2 | Paul White | 002 | 11/03/1973 |
| 3 | Barry Green | 003 | 30/12/1977 |

+

| | Name | ID | DOB |
|---|---|---|---|
| 1 | Jane Brown | 004 | 03/11/1980 |
| 2 | Jill Taupe | 005 | 01/03/1981 |

To get this dataset:



| | Name | ID | DOB |
|---|---|---|---|
| 1 | John Black | 001 | 1966-07-01 |
| 2 | Paul White | 002 | 1973-03-11 |
| 3 | Barry Green | 003 | 1977-12-30 |
| 4 | Jane Brown | 004 | 1980-11-03 |
| 5 | Jill Taupe | 005 | 1981-03-01 |

- Drag the two dataset files onto the **Center** pane of Easy Data Transform.
- Select the two datasets using `Ctrl`+click.
- Click the **Stack** transform in the **Left** pane.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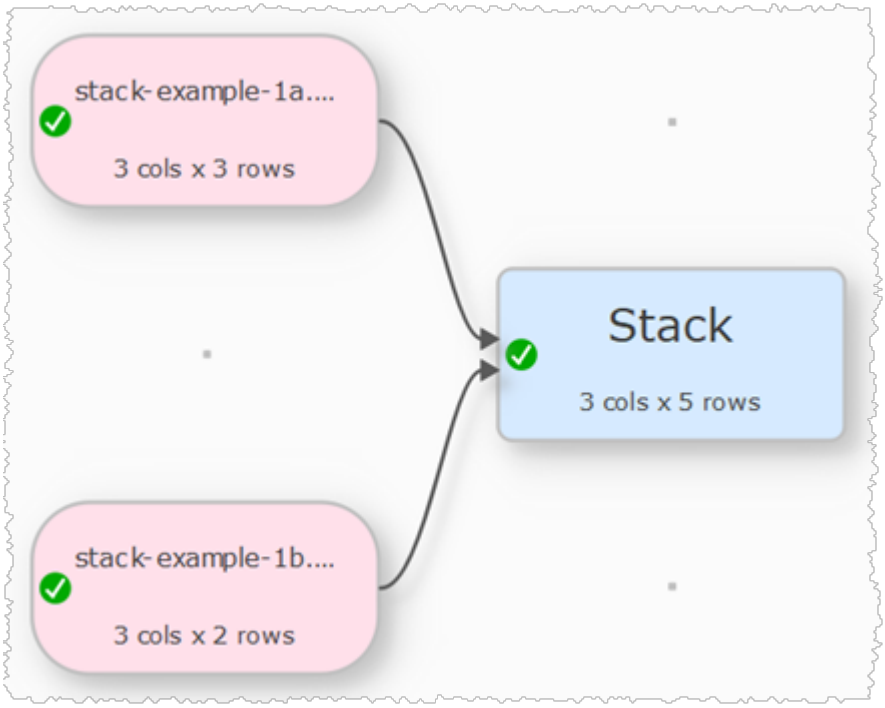


The datasets are now stacked in the vertical order that the datasets are shown on the screen. The top dataset is shown first. You can swap the vertical positions of the datasets to change the order in which they are stacked.

If you want to stack column n of the first dataset above column n of the second dataset, set **Align columns by** to **Column number**.

If you want to stack columns by common header names (even if they aren't in the same order), set **Align columns by** to **Header name**.

If you want to stack a large number of files you can do it by using batch processing to write to an output item with **Write Mode**=Append.

## Join datasets

If you want to merge the two datasets side-by-side using a common ('key') column, use the Join transform. For example, to Join these two datasets:


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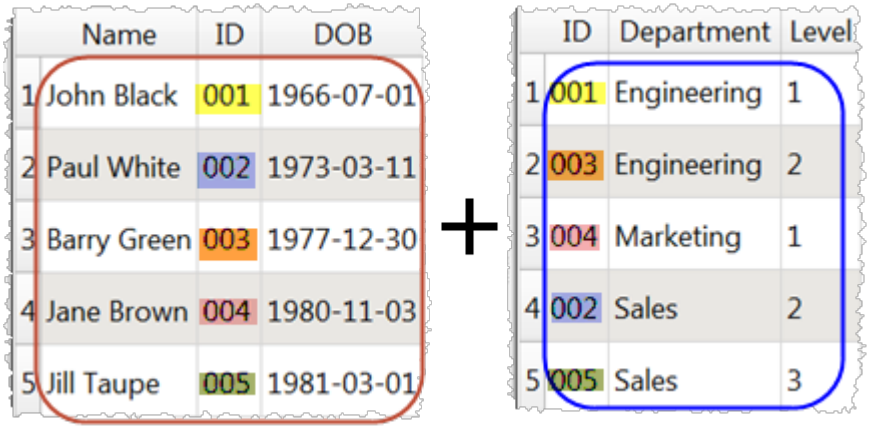

| | Name | ID | DOB |
|---|---|---|---|
| 1 | John Black | 001 | 1966-07-01 |
| 2 | Paul White | 002 | 1973-03-11 |
| 3 | Barry Green | 003 | 1977-12-30 |
| 4 | Jane Brown | 004 | 1980-11-03 |
| 5 | Jill Taupe | 005 | 1981-03-01 |

+

| | ID | Department | Level |
|---|---|---|---|
| 1 | 001 | Engineering | 1 |
| 2 | 003 | Engineering | 2 |
| 3 | 004 | Marketing | 1 |
| 4 | 002 | Sales | 2 |
| 5 | 005 | Sales | 3 |

By common ID value to get this dataset:

| | Name | ID | DOB | Department | Level |
|---|---|---|---|---|---|
| 1 | John Black | 001 | 1966-07-01 | Engineering | 1 |
| 2 | Paul White | 002 | 1973-03-11 | Sales | 2 |
| 3 | Barry Green | 003 | 1977-12-30 | Engineering | 2 |
| 4 | Jane Brown | 004 | 1980-11-03 | Marketing | 1 |
| 5 | Jill Taupe | 005 | 1981-03-01 | Sales | 3 |

- Drag the two dataset files onto the **Center** pane of Easy Data Transform.
- Select the two datasets using `Ctrl`+click.
- Click the **Join** transform in the **Left** pane.


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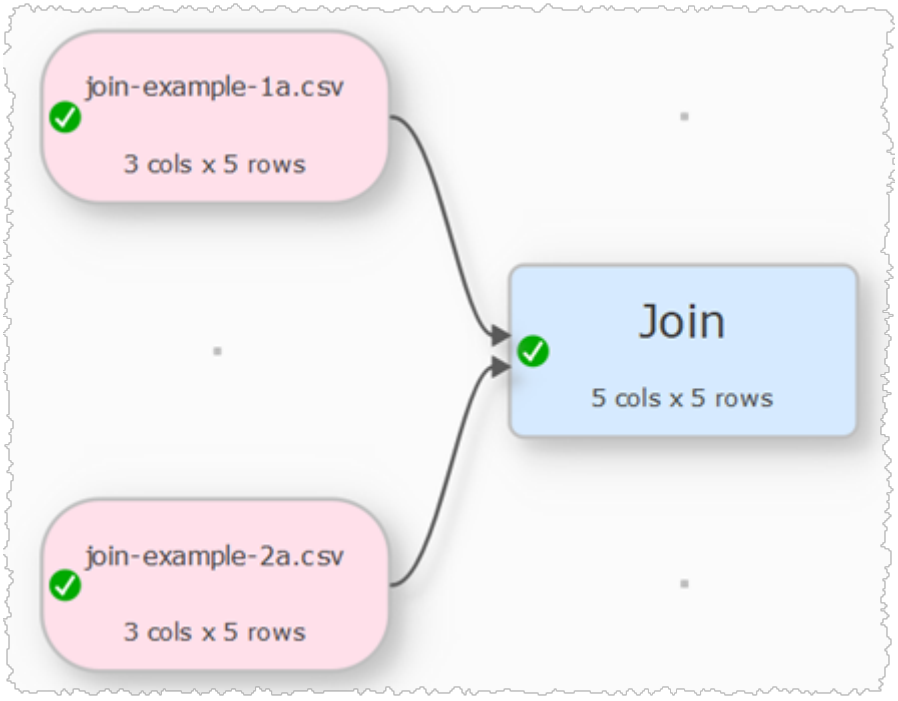
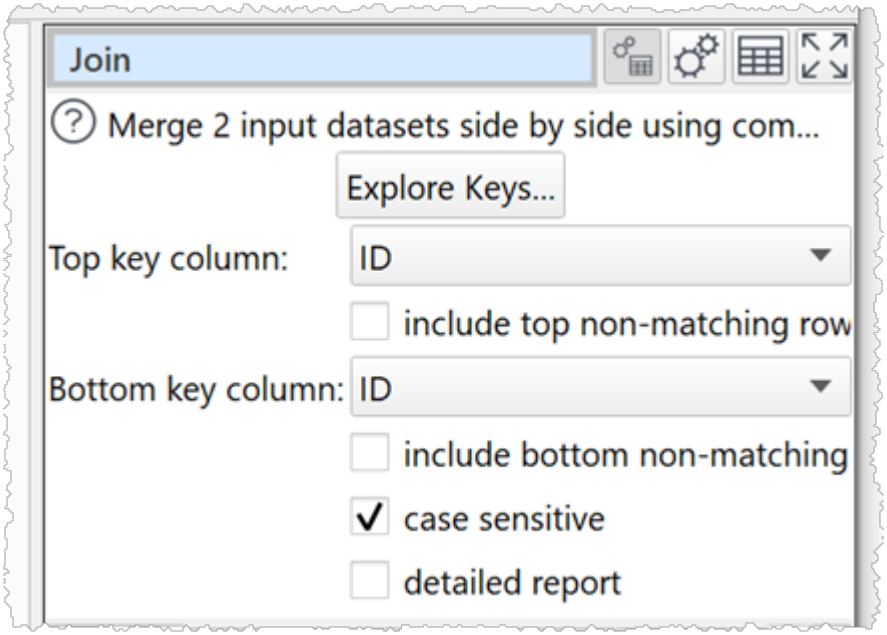



- Set both **Top key column** and **Bottom key column** to the common ('key') column.




The datasets are now joined side-by-side using the common column. The top dataset is shown on the left. You can swap the vertical positions of the datasets to change the order in which they are joined.

If you just want to join row N of one dataset to row N of another dataset, you set **By** to **Row** in the Join transform.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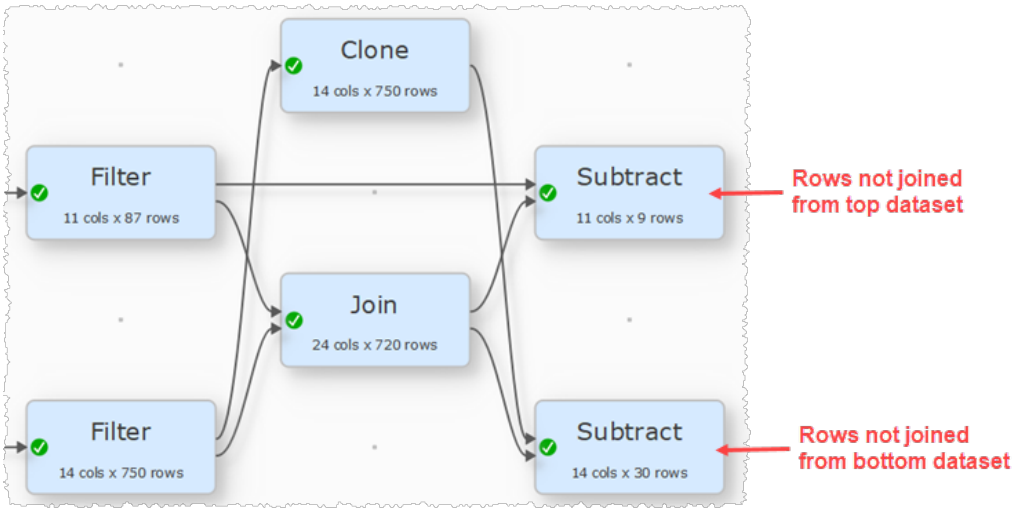
Set **include top non-matching rows** and **include bottom non-matching rows** depending on what you want to do with top and bottom dataset rows for which there are no matches.

Note that matching columns takes account of whitespace. So you might need to do Whitespace transform before the join.

If you only want one column from the second dataset you can use the Lookup transform.

If you want to find key values that are in one dataset but not the other (an 'anti-join') you can use the Subtract transform:




If you are merging numerical datasets you can also use an Interpolate transform.

See also:

- Video: How to join Excel files
- Video: How to clean, merge and scrub email lists

## 3.23 Move a .transform file

To move a .transform file to a different location on the same computer use **File>Save As...** or **Windows Explorer**. You either leave the Input files at the original location or move them to the same location relative to the .transform file (e.g. if they were in the same folder as the .transform file before, move them to the same folder as new .transform file).

To move a .transform file to a different computer, move the Input files to the same location relative to the .transform file (e.g. if they were in the same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folder as the .transform file before, move them to the same folder as new .transform file).

See also .transform files.

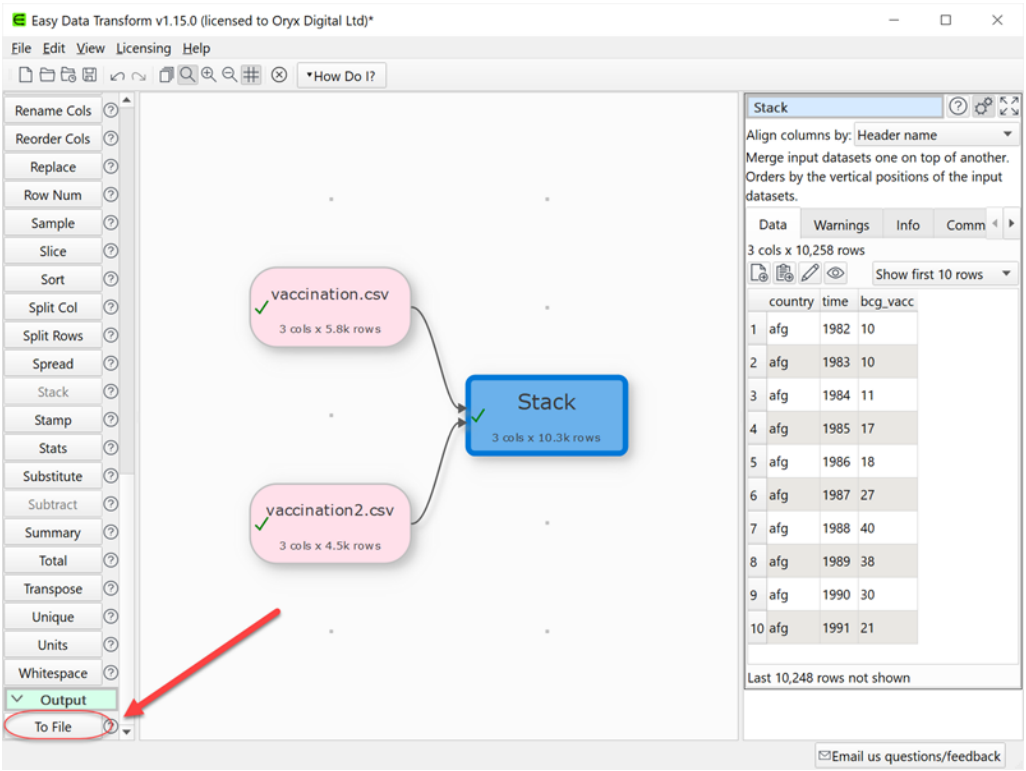
## 3.24 Open multiple main windows

To open an additional Easy Data Transform **Main** window, select **File>New Window**.

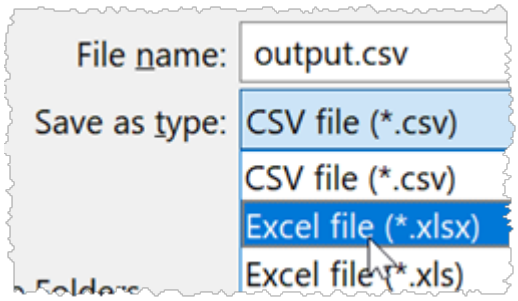
## 3.25 Output to Excel

To output results from a transform to an Excel .xlsx/.xls file:

- Select the transform item in the **Center** pane.
- Click **To File** at the bottom of the **Left** pane.




- Select ***.xlsx** or ***.xls** from the file type drop-down list that appears.





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You can't output style information directly to Excel. But you can copy the styling from another Excel sheet, including:

- column widths
- row heights
- column/row hidden status
- cell merging
- text orientation
- fonts


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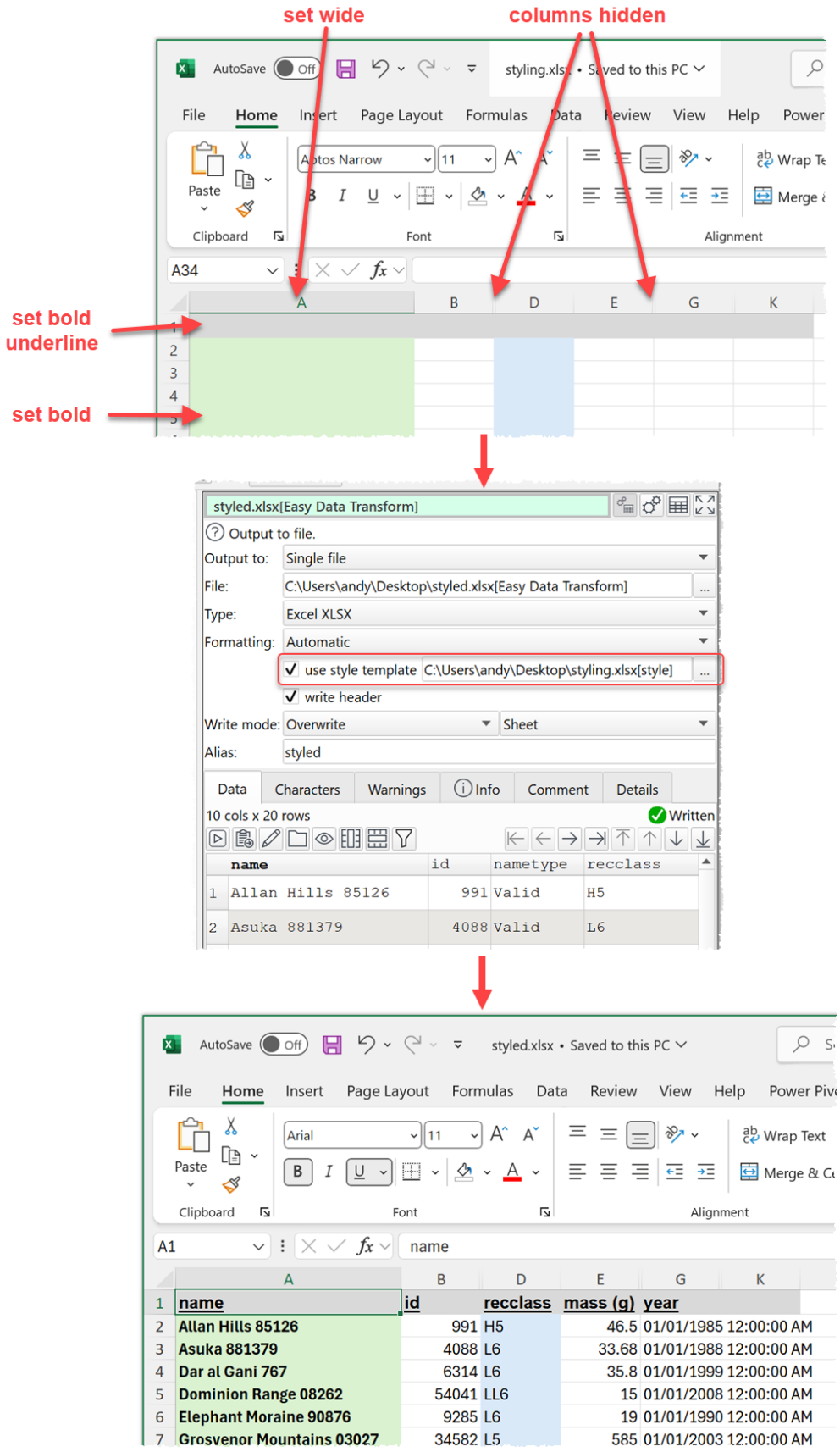



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You can use a relative location for the template file (relative to the *.transform* file):

Note that Excel .xlsx files are typically limited to 1,048,576 rows and 16,384 columns.

See also:

- Excel format
- Write to multiple sheets of an Excel file
- Video: How to convert fixed column width to CSV or Excel
- Video: How to convert JSON to Excel
- Video: How to convert XML to Excel

## 3.26 Output nested JSON or XML

You can use the Dot ('.') character in the column header to show nesting. For example:

| | name | carb | cholesterol | fiber | minerals.ca | minerals.fe | protein | sodium | vitamins.a | vitamins.c |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Avocado Dip | 2 | 5 | 0 | 0 | 0 | 1 | 210 | 0 | 0 |

Is output to JSON as:

```
[
  {
    "name": "Avocado Dip",
    "carb": "2",
    "cholesterol": "5",
    "fiber": "0",
    "minerals": {
      "ca": "0",
      "fe": "0"
    },
    "protein": "1",
    "sodium": "210",
    "vitamins": {
      "a": "0",
      "c": "0"
    }
  }
]
```

And to XML as:

```
<?xml version="1.0" encoding="UTF-8"?>
<root>
  <record>
    <name>Avocado Dip</name>
```


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```
    <carb>2</carb>
    <cholesterol>5</cholesterol>
    <fiber>0</fiber>
    <protein>1</protein>
    <sodium>210</sodium>
    <minerals>
      <ca>0</ca>
      <fe>0</fe>
    </minerals>
    <vitamins>
      <a>0</a>
      <c>0</c>
    </vitamins>
  </record>
</root>
```

For more details see:

- JSON format
- XML format

See also:

- Video: How to convert CSV to XML
- Video: How to convert CSV to JSON

## 3.27 Perform the same transforms on many files

You can perform the same set of transforms on multiple inputs in one operation using batch processing or command line arguments.

### Example 1

To convert a folder full of .json files to .csv files:

1. Select **File>New** to create a new .transform file.
2. Drag one of the .json files onto the **Center pane**. Ensure the options (encoding etc) are correct in the **Right** pane.
3. Click on the **To File** button at the bottom of the **Left** pane and set the location of a .json file to create. Ensure the options (encoding etc) are correct in the **Right** pane.


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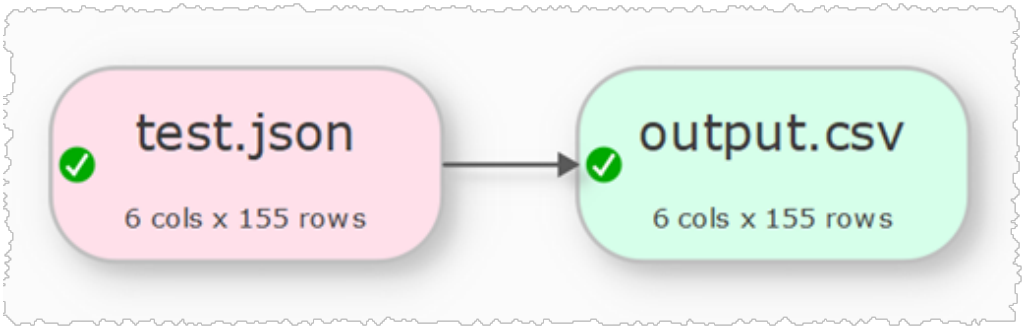
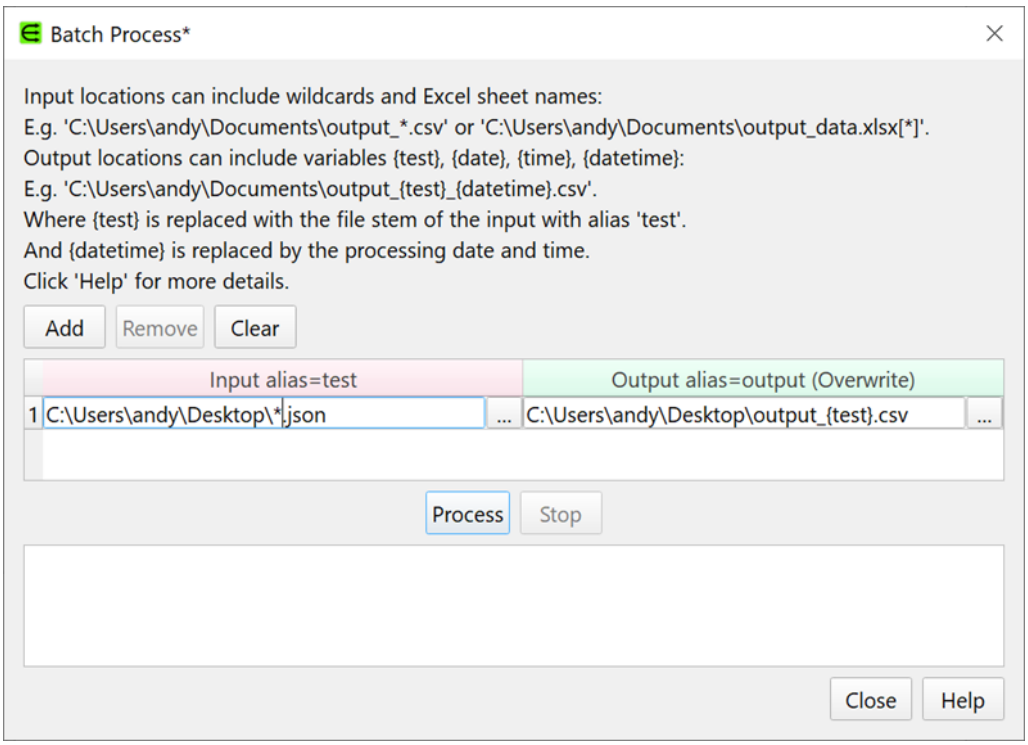



4. Select **File>Batch Process**.
5. In the **Batch Process** window change the `.json` file name to `*.json`, so that all the `.json` files in that folder will be processed.




6. Press the **Process** button. A `.csv` file will now be created for each `.json` file in the folder. In the example above the `{test}` file name variable will be replaced by the file name of the input file with alias `test` (if you just output to `output.csv` then you would be continually overwriting the same file).
7. Select **File>Save** to save your .transform for future use.

If you want to process input files from another folder then click **Add** to add a new row and change the input folder.

## Example 2

To merge multiple .csv files into a single .csv file: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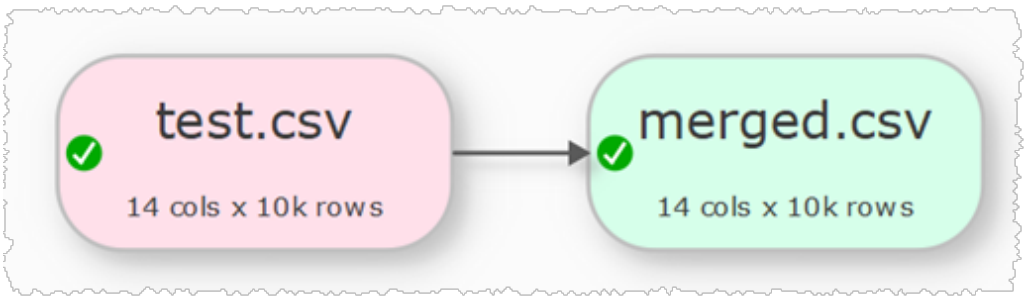
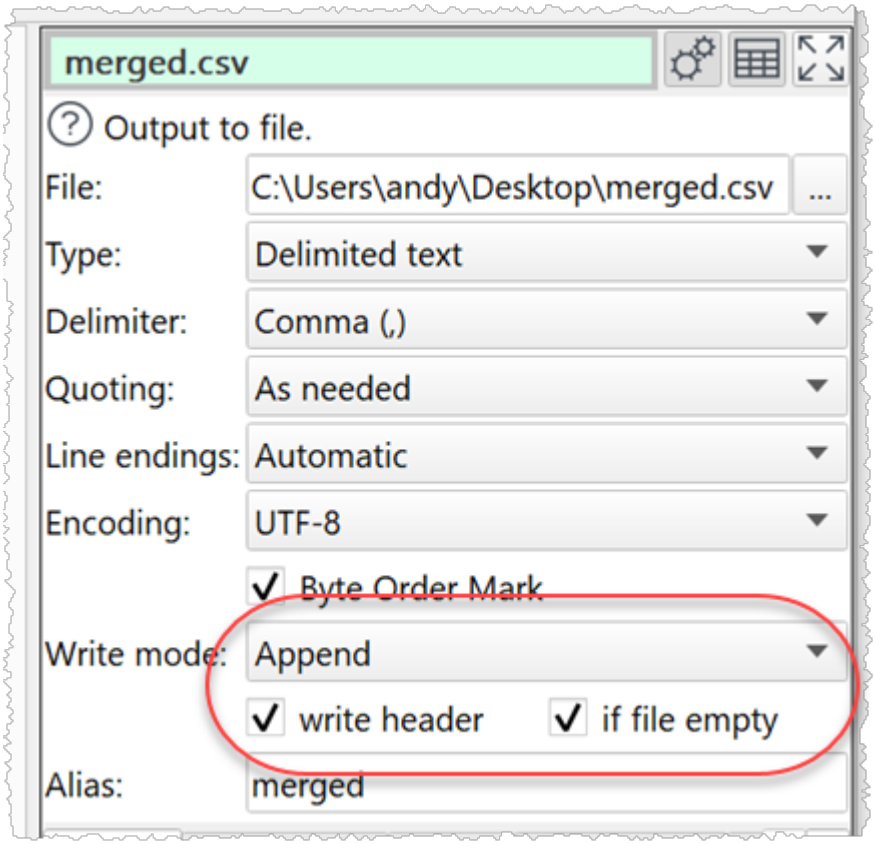
8. Select **File>New** to create a new .transform file.
9. Drag one of the .csv files onto the **Center pane**. Ensure the options (encoding etc) are correct in the **Right** pane.
10. Click on the **To File** button at the bottom of the **Left** pane and set the location of a `merged.csv` file to create, in a different folder to the input .csv files. Ensure the options (encoding etc) are correct.




4. In the **Right** pane set **Write Mode** to **Append** and check **write header** and **if empty**. This ensures that only one header will be written, rather than one for every input file.




5. Select **File>Batch Process**.
6. In the **Batch Process** window: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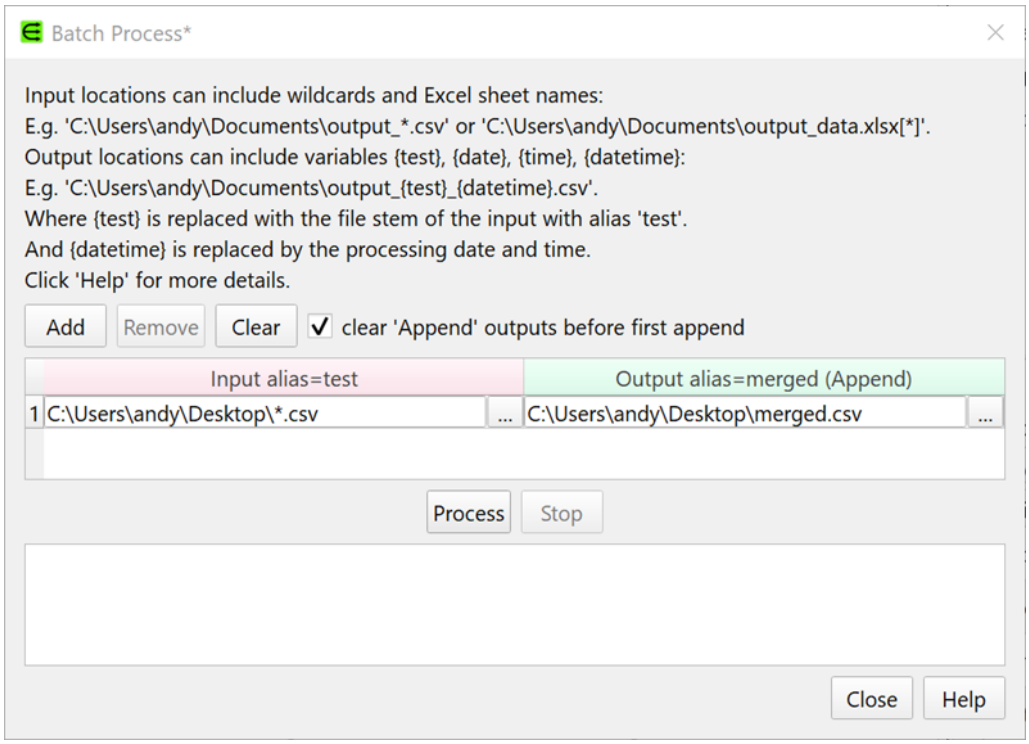
- change the input .csv file name to `*.csv`, so that all the `.csv` files in that folder will be processed.
- Check **clear 'Append' outputs before first append** so that any existing data in the output file is cleared before Easy Data Transform start appending to it.




7. Press the **Process** button. A single `merged.csv` file will now be created that contains a concatenation of all the other `.csv` files.
8. Select **File>Save** to save your .transform for future use.

If the headers are different orders in different .csv files, then you can Stack by header name in your .transform to get a consistent column order before outputting.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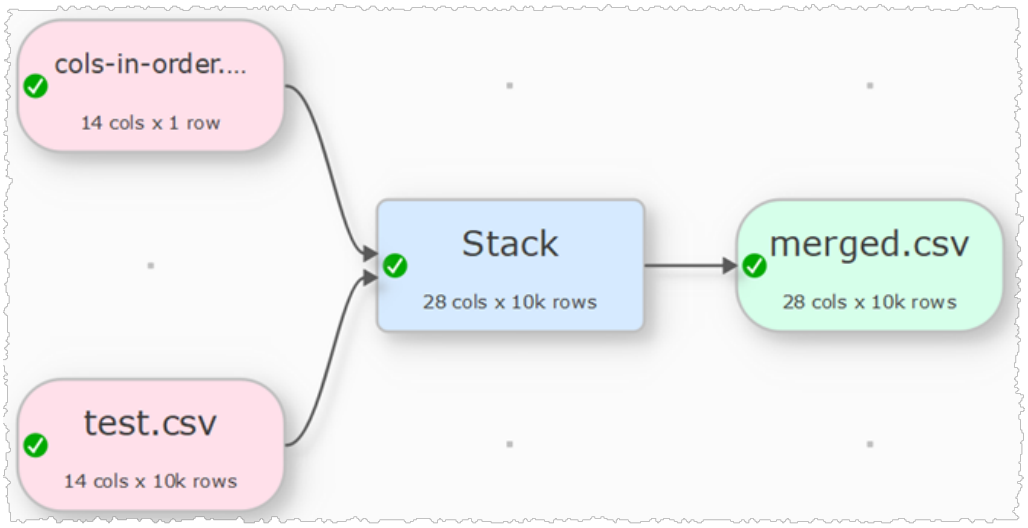


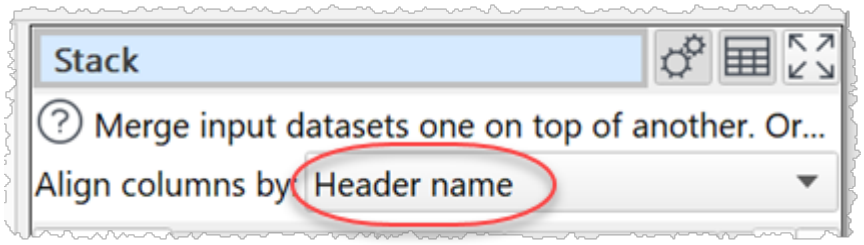


See also:

- Video: Batch processing

## 3.28 Profile a dataset

In the **Right** pane you can double click on a column header or click the corresponding button to show a profile of the data in each column. For example the different data types (text, numeric etc) and the frequencies of different values. Potential discrepancies (such as missing values) are highlighted in red.

You can hover over some table cells to see example values. You can double click these cells to drilldown to see the dataset rows with these values.

You can use profiling in conjunction with Filter, Remove Cols and Replace transforms to remove unwanted rows, columns or values; and with the Impute transform to add missing values.


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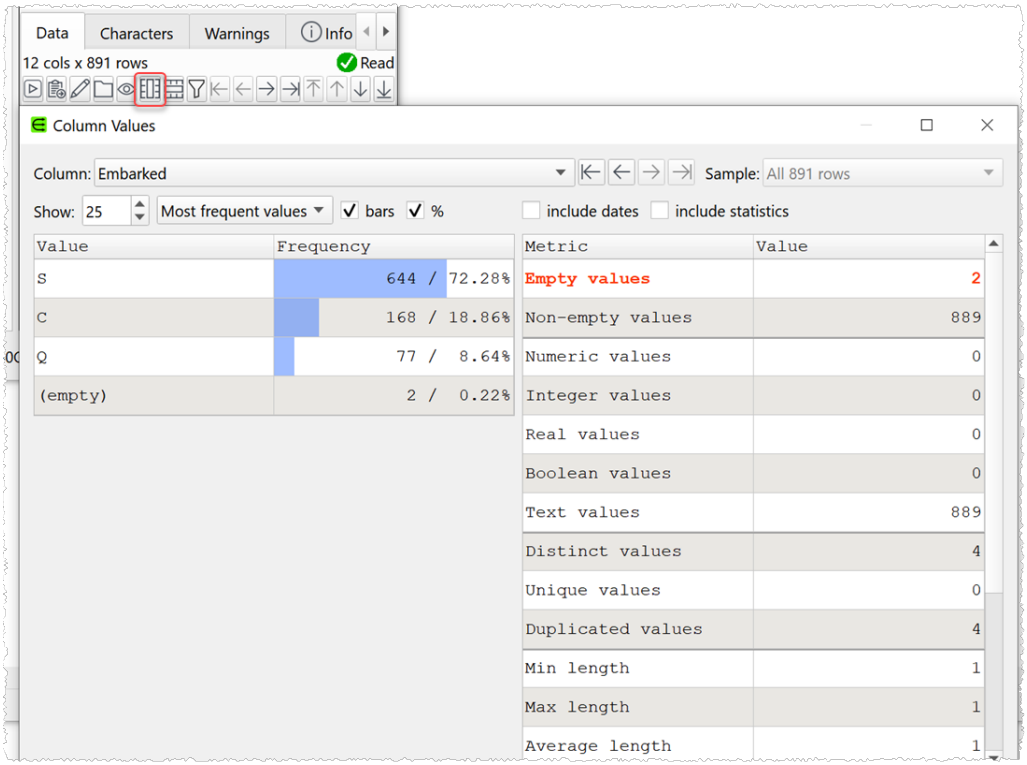


For large datasets you might want to set **Sample** to less than the full dataset for speed. You can also leave **include dates** and **include statistics** unchecked for speed (**include dates** checks against every date format listed in **Preferences**).

See also:

- Video: How to profile data
- Summary
- Add missing data values
- Clean a dataset

## 3.29 Replace empty values

You can replace empty values using the Replace transform.


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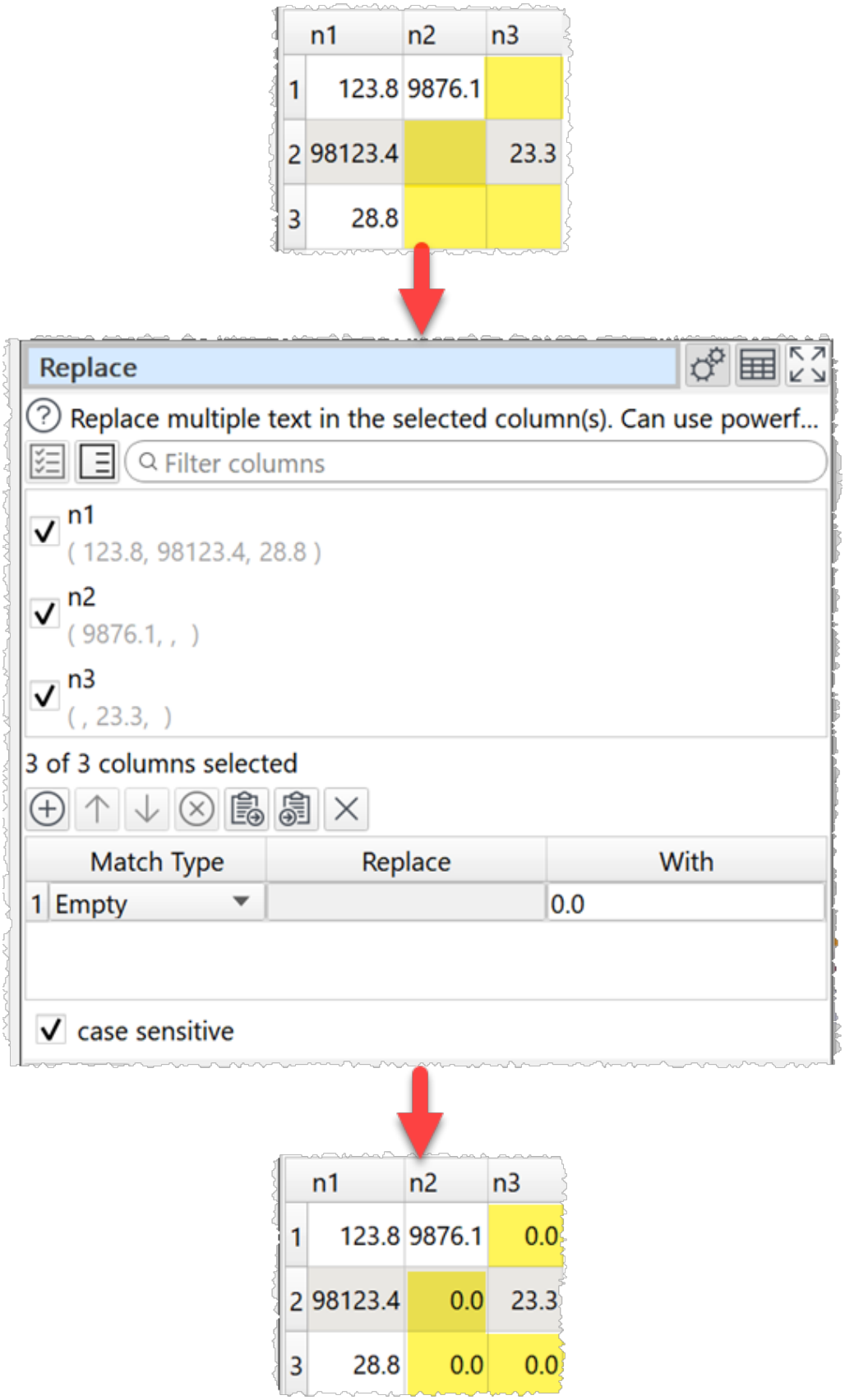


See also:

- Add missing data values


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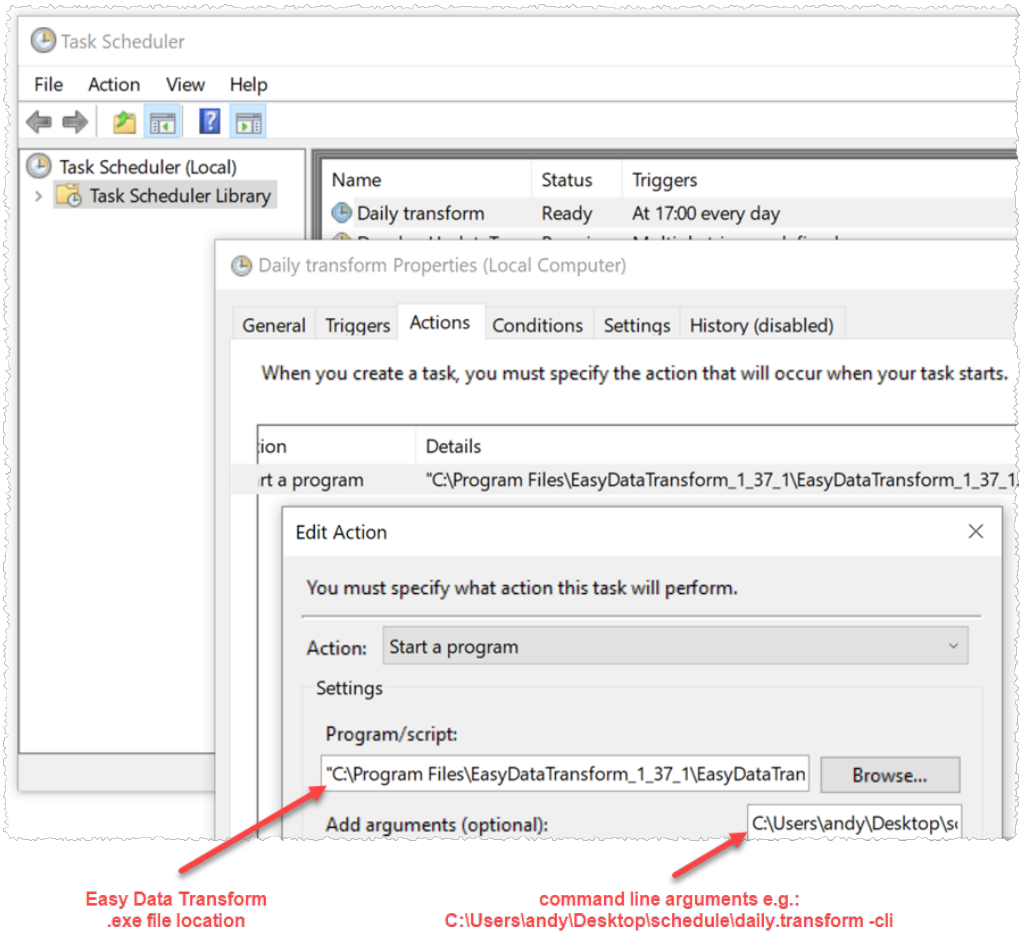
## 3.30 Run jobs on a schedule

Easy Data Transform doesn't currently have it's own scheduler. However you can run jobs on a schedule (e.g. at 5pm every day) by using pretty much any scheduler to call the Easy Data Transform command line interface:

1. Create the .transform file that details the transformations you want to carry out.
2. Call Easy Data Transform command line interface (or a script that calls the command line interface) from your scheduler.

You can use Task Scheduler, which is part of Windows. Or you can use any number of third party scheduler applications .




You can change the input and output file names through the command line interface. Add `-cli` to close Easy Data Transform after the job is finished.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Some schedulers will also allow you to call Easy Data Transform on an event, e.g. when a file is added to or updated in a particular folder.

## 3.31 Scrape web data

You can scrape data from a web browser by selecting it and dragging into the **Center** pane of Easy Data Transform (or copying and clicking **From Clipboard**).


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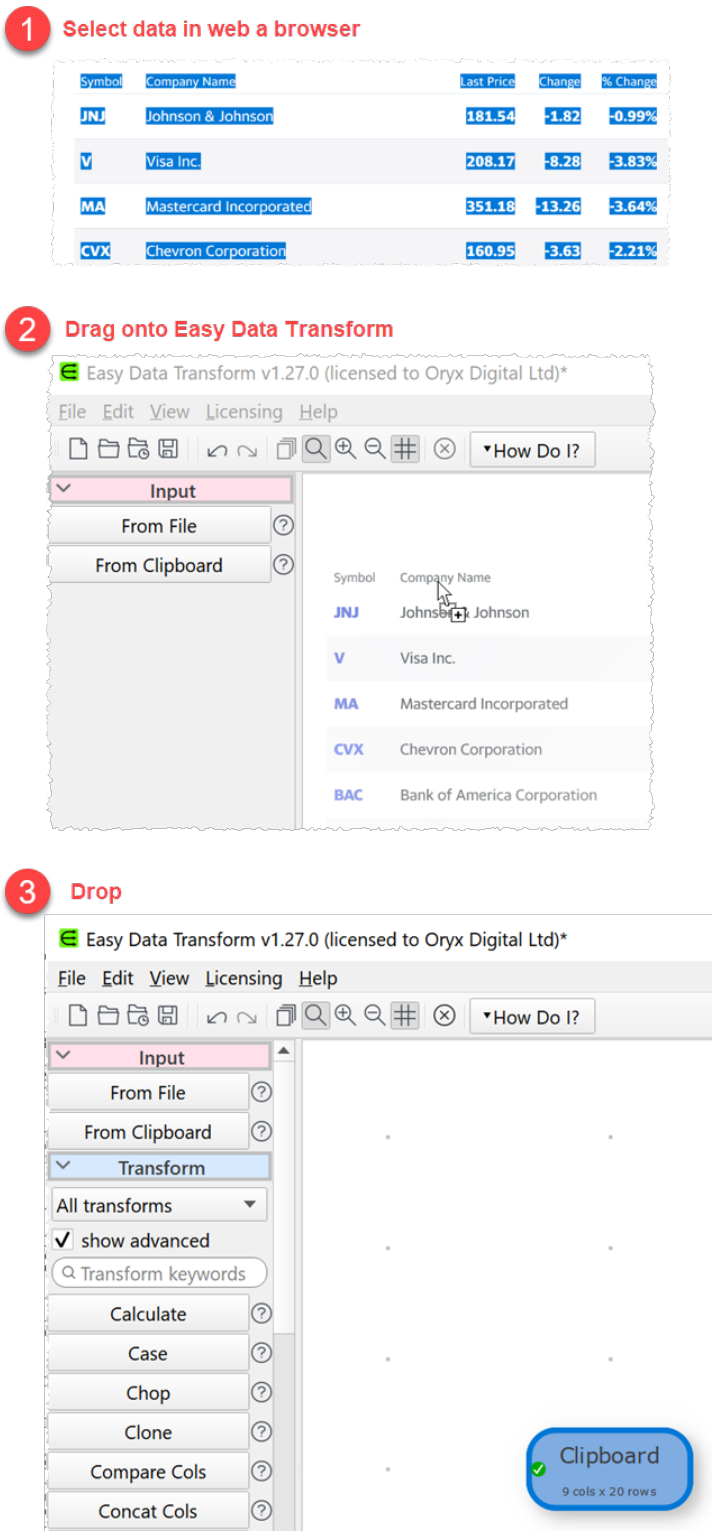


See also:

- Video: How to scrape web data

## 3.32 See changes from a transform

The following transforms allow you to highlight changes made by the transform:


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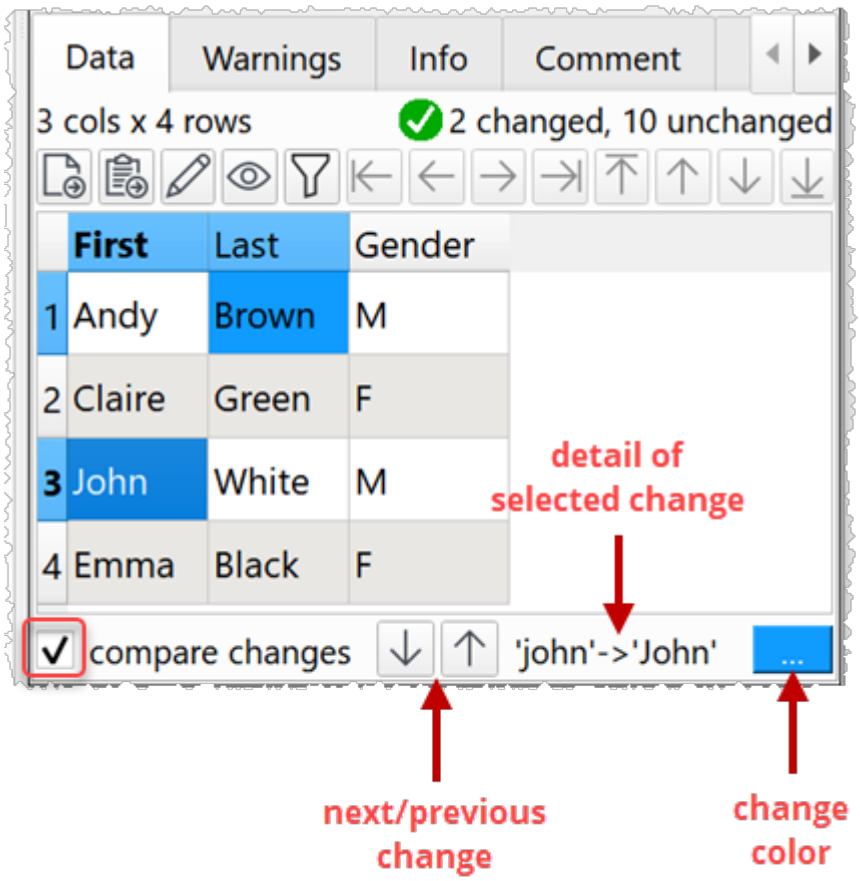
- Case
- Chop
- DateTime Format
- Decode
- Extract
- Fill
- Hash
- Impute
- Insert
- Number Format
- Offset
- Pad
- Replace
- Scale
- Unfill
- Units
- Whitespace

Check the **compare changes** checkbox below the data table to highlight changes made by the transform.




Click on or hover over a cell to see details of each change.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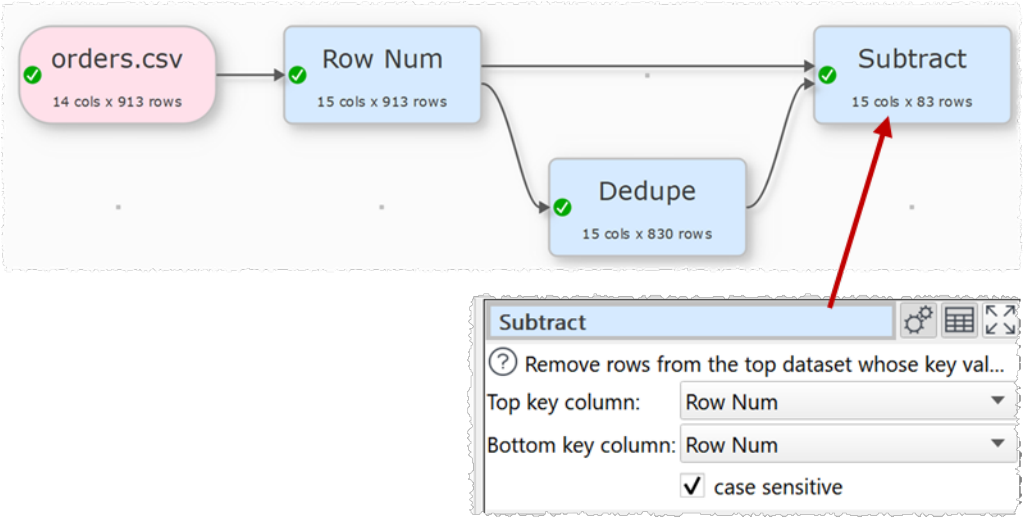
Click on the up and down arrows to move between changes. Changes hidden by dataset filtering are skipped.

If you want to see rows that were removed by a transform such as Dedupe, Unique or Filter, you can do that using Subtract. The dataset needs to have a column of unique key values to use in the **Subtract**. If it doesn't have one, then add one first using Row Num.




You can also compare headers or data between datasets.

## 3.33 Set output file name from input file

To set an output file name based on the name of one or more input files, see File name variables.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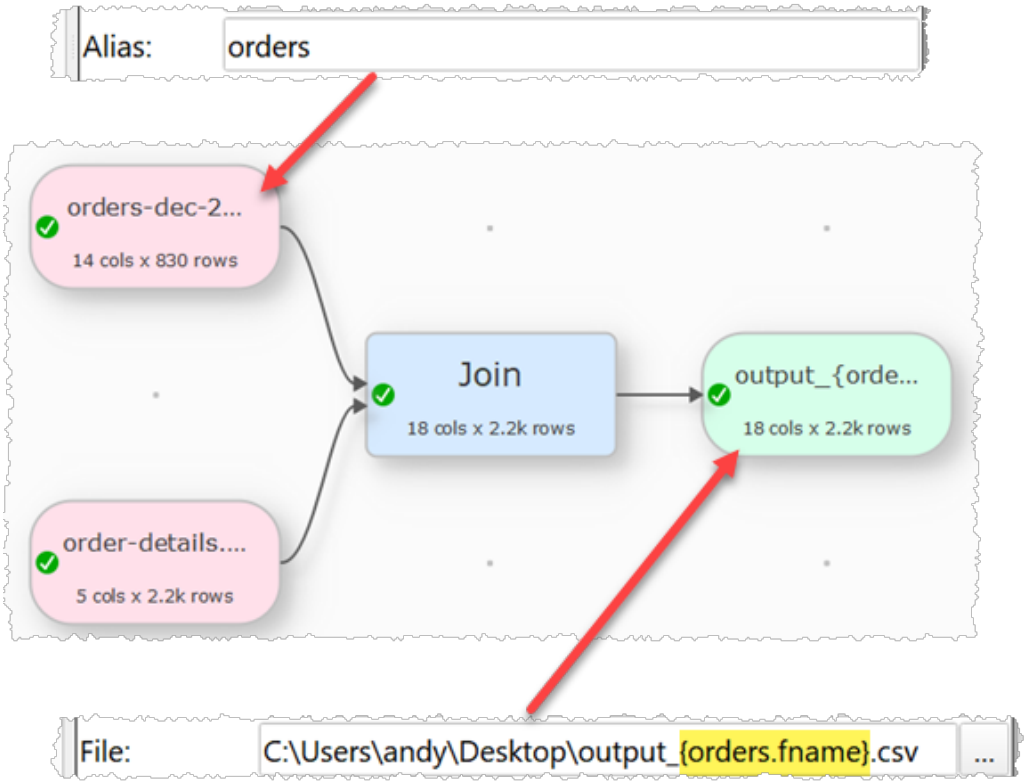
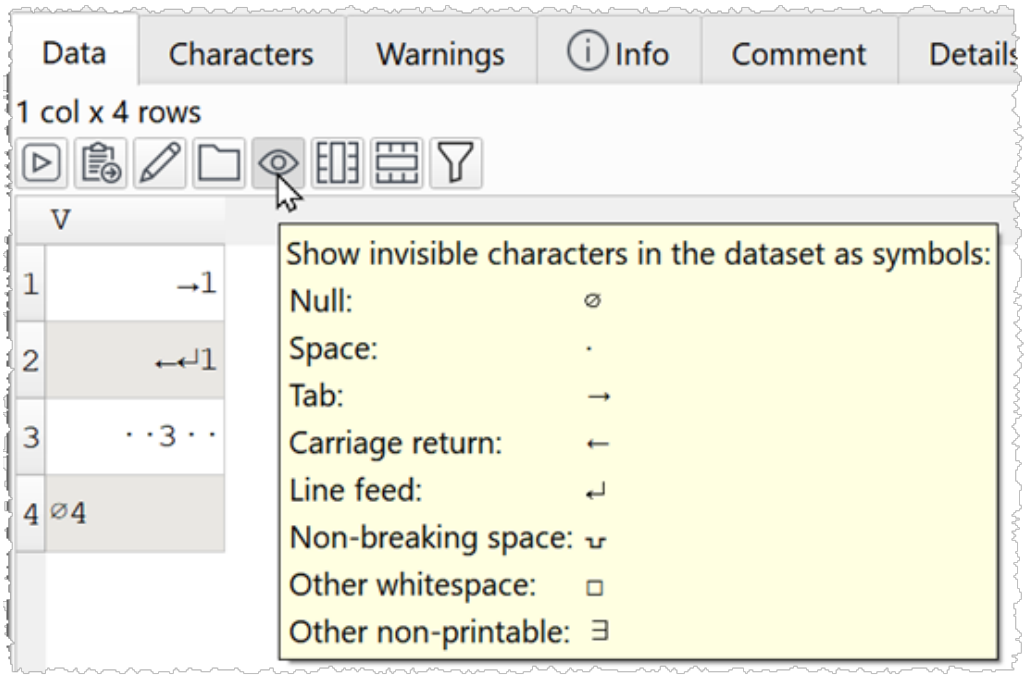



## 3.34 Show whitespace and invisible characters

Click the eye icon in the **Right** pane to show whitespace and other invisible characters in the data.





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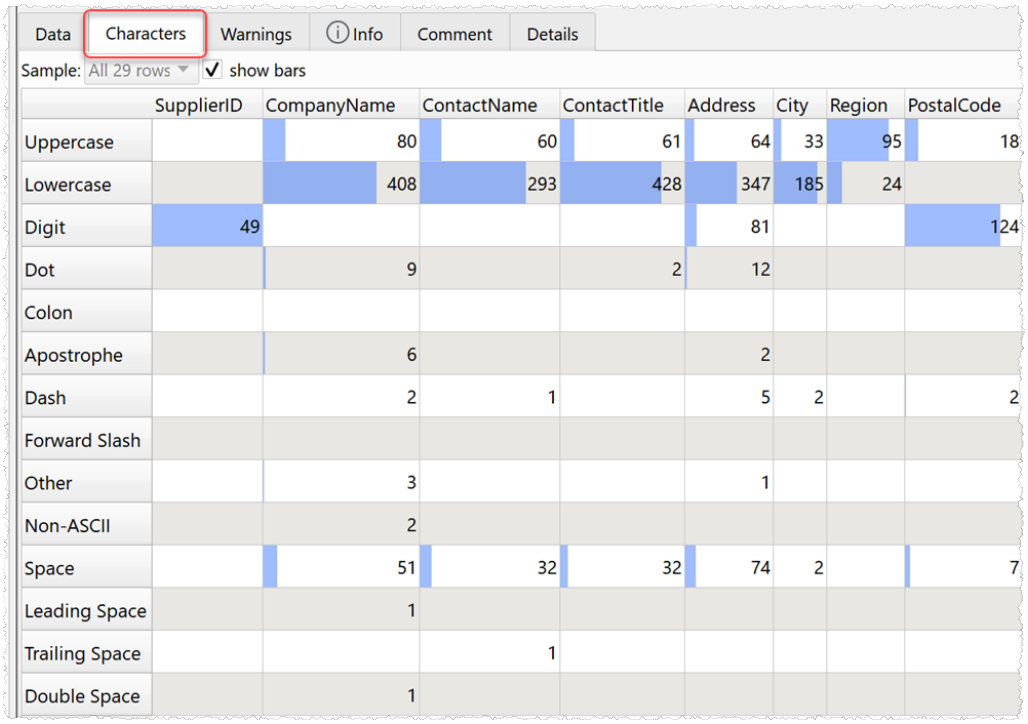
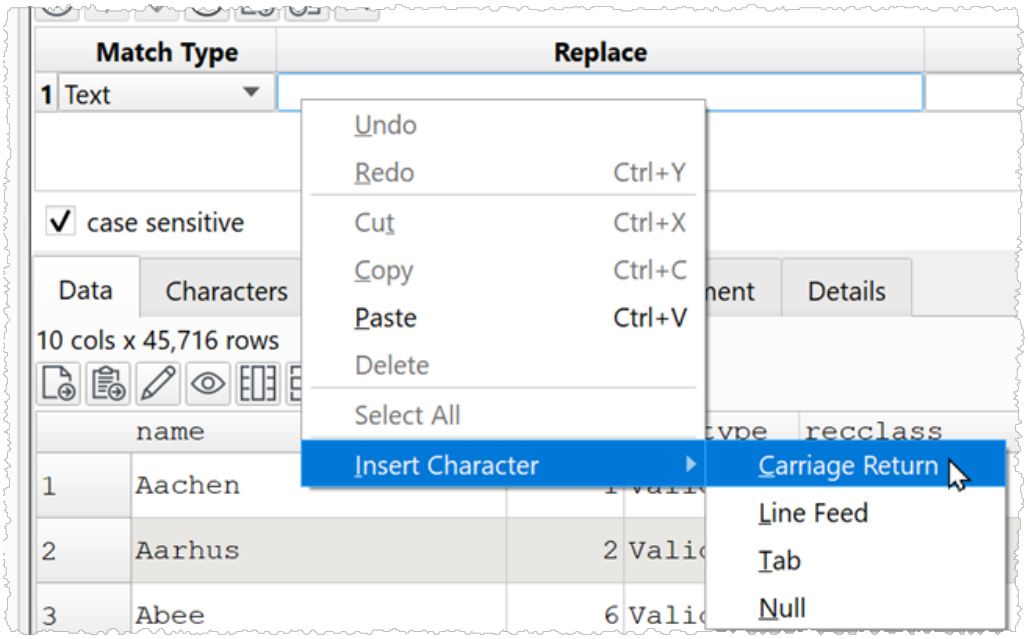
The number of whitespace and invisible characters is also totaled by column in the **Characters** tab.




| | SupplierID | CompanyName | ContactName | ContactTitle | Address | City | Region | PostalCode |
|---|---|---|---|---|---|---|---|---|
| Uppercase | | 80 | 60 | 61 | 64 | 33 | 95 | 18 |
| Lowercase | | 408 | 293 | 428 | 347 | 185 | 24 | |
| Digit | 49 | | | | 81 | | | 124 |
| Dot | | 9 | | 2 | 12 | | | |
| Colon | | | | | | | | |
| Apostrophe | | 6 | | | 2 | | | |
| Dash | | 2 | 1 | | 5 | 2 | | 2 |
| Forward Slash | | | | | | | | |
| Other | | 3 | | | 1 | | | |
| Non-ASCII | | 2 | | | | | | |
| Space | | 51 | 32 | 32 | 74 | 2 | | 7 |
| Leading Space | | 1 | | | | | | |
| Trailing Space | | | 1 | | | | | |
| Double Space | | 1 | | | | | | |

To add or replace Null, Tab, Carriage Return or Line Feed characters you can use the right click menu:





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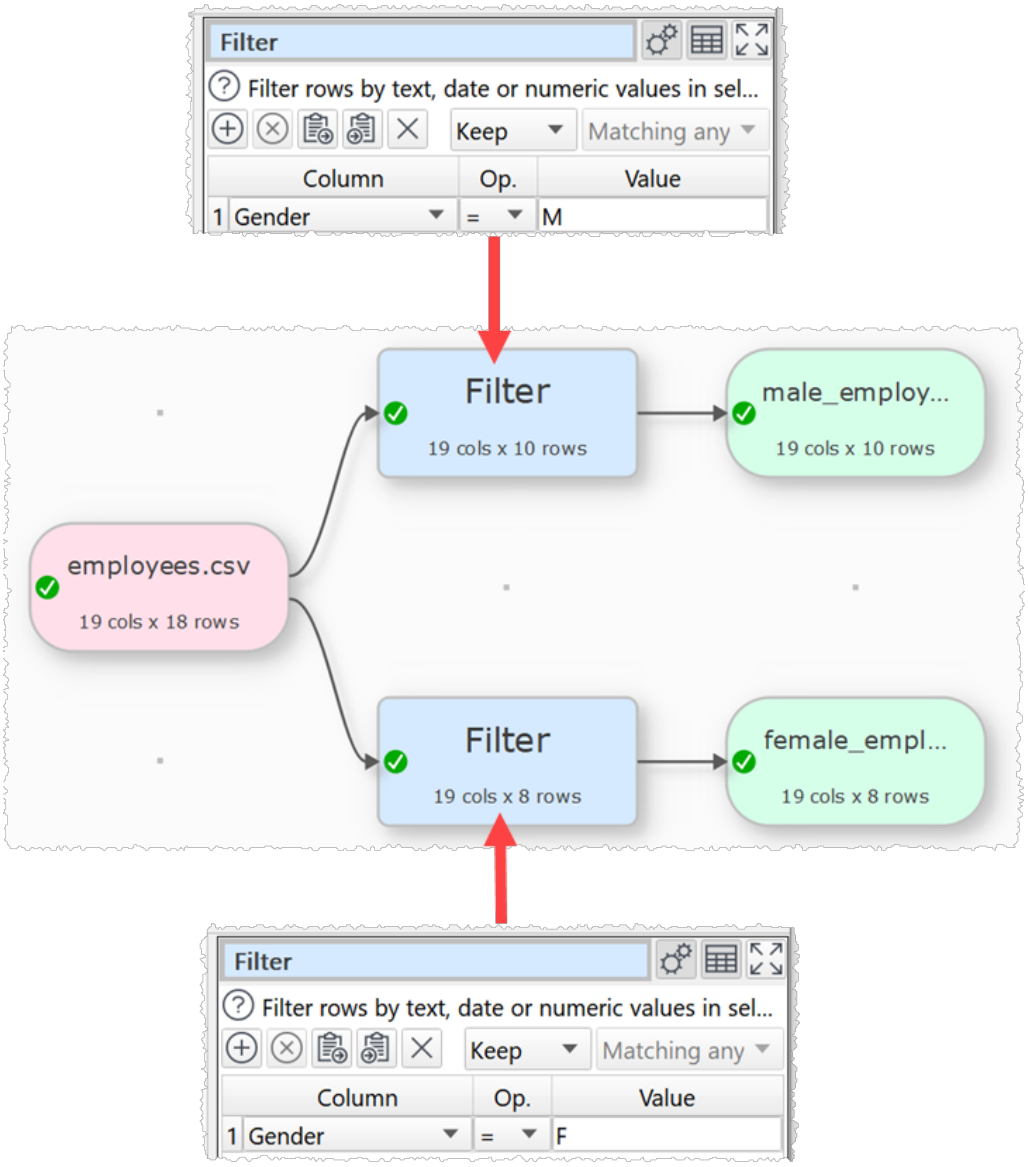
## 3.35 Split a dataset into multiple files

Easy Data Transform supports splitting datasets into multiple files in 2 different ways.

### Example 1: Simple splitting

To split a dataset according to whether the `Gender` column contains `M` or `F`, use a pair of Filter transforms.




### Example 2: Split according to row values

To split a dataset according to `Region` column values: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- Use transforms (such as Substitute) to create a column with the file location you want to output to, based on the `Region` column. The location can be an absolute location (e.g. `c:\users\andy\output.csv`) or a location relative to the .transform file location (e.g. `results\output.csv`). Folders output to must already exist. Empty or invalid values are ignored. This column is not output (use the **Copy Cols** transform if you want it to be).
- Create an output with **Output to** set to **Multiple files** and the **Files column** selected.
- Set **Confirm files** checked to be prompted before writing (recommended).


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## Example 3: Split by size

To split a dataset into files of 1000 rows each:


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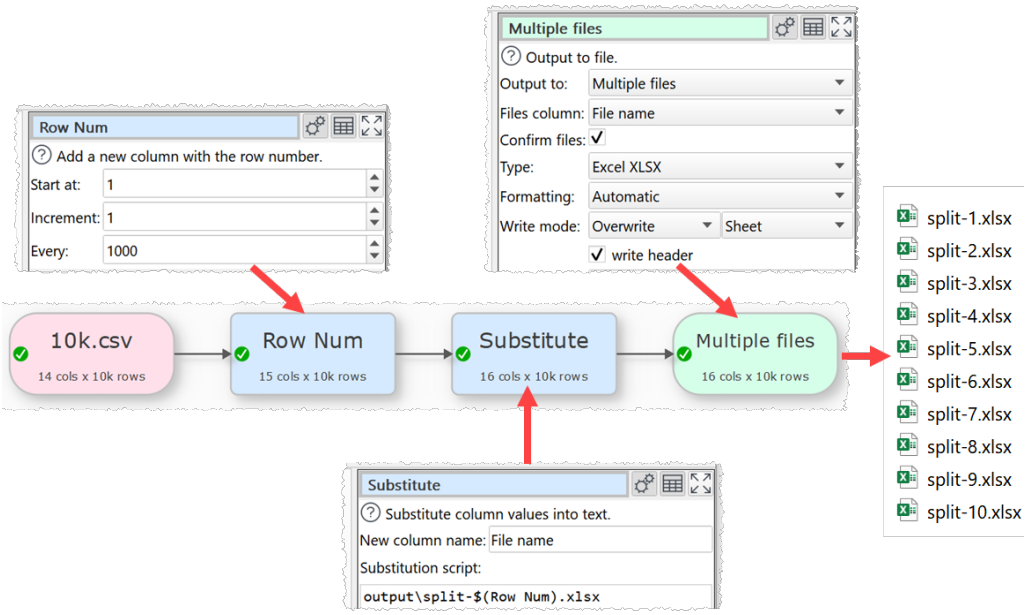
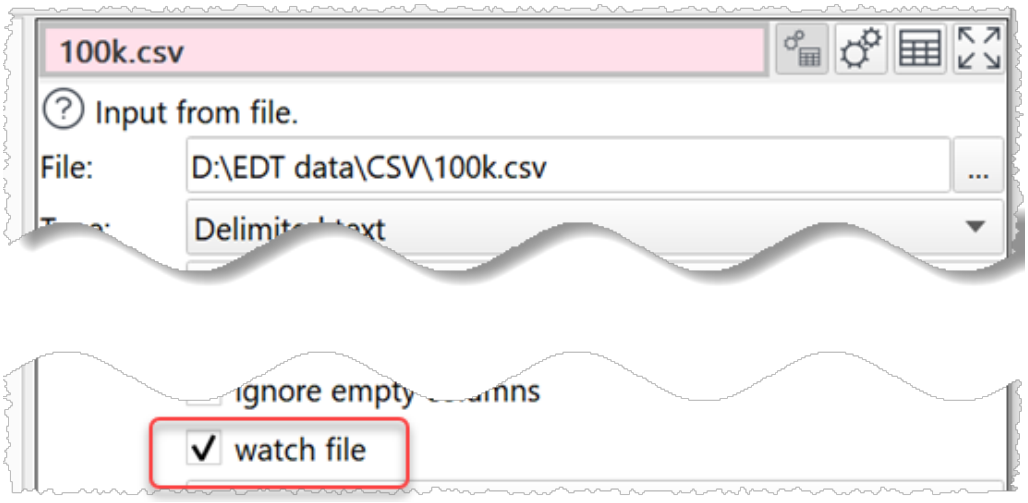



See also:

- Video: How to split CSV into multiple files

## 3.36 Trigger an update when an input changes

Check **watch file** in the **Right** pane for an input file if you want to set it to 'Needs update' whenever the input file changes (which will trigger processing if **Run>Auto Run** is checked).




Note:

- If you are also outputting to this file in the same .transform you are inputting it, it may cause the .transform to run forever.
- The update may not be triggered if the file is deleted and replaced with a new file with the same name.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## 3.37 Use Easy Data Transform from a USB key

See Portability.

## 3.38 Use multiple keys for Join/Lookup/Intersect/Subtract

You can Join, Lookup, Intersect or Subtract on more than one key column by creating a composite or compound[1] key column, using Concat Cols.

For example, if you want to Join this table using both **Catalog** and **Part** as key columns:

| | OrderId | Catalog | Part |
|---|---|---|---|
| 1 | 83478 | ACME | 89383 |

To this table to this table using both **SupplierCatalog** and **PartId** as key columns:

| | SupplierCatalog | PartId | Cost | Description |
|---|---|---|---|---|
| 1 | ACME | 89383 | 13.00 | Spanner |

So that rows are joined only when catalog and part ids both match, then you need to create a new composite/compound key column for each dataset using **Concat Cols**:


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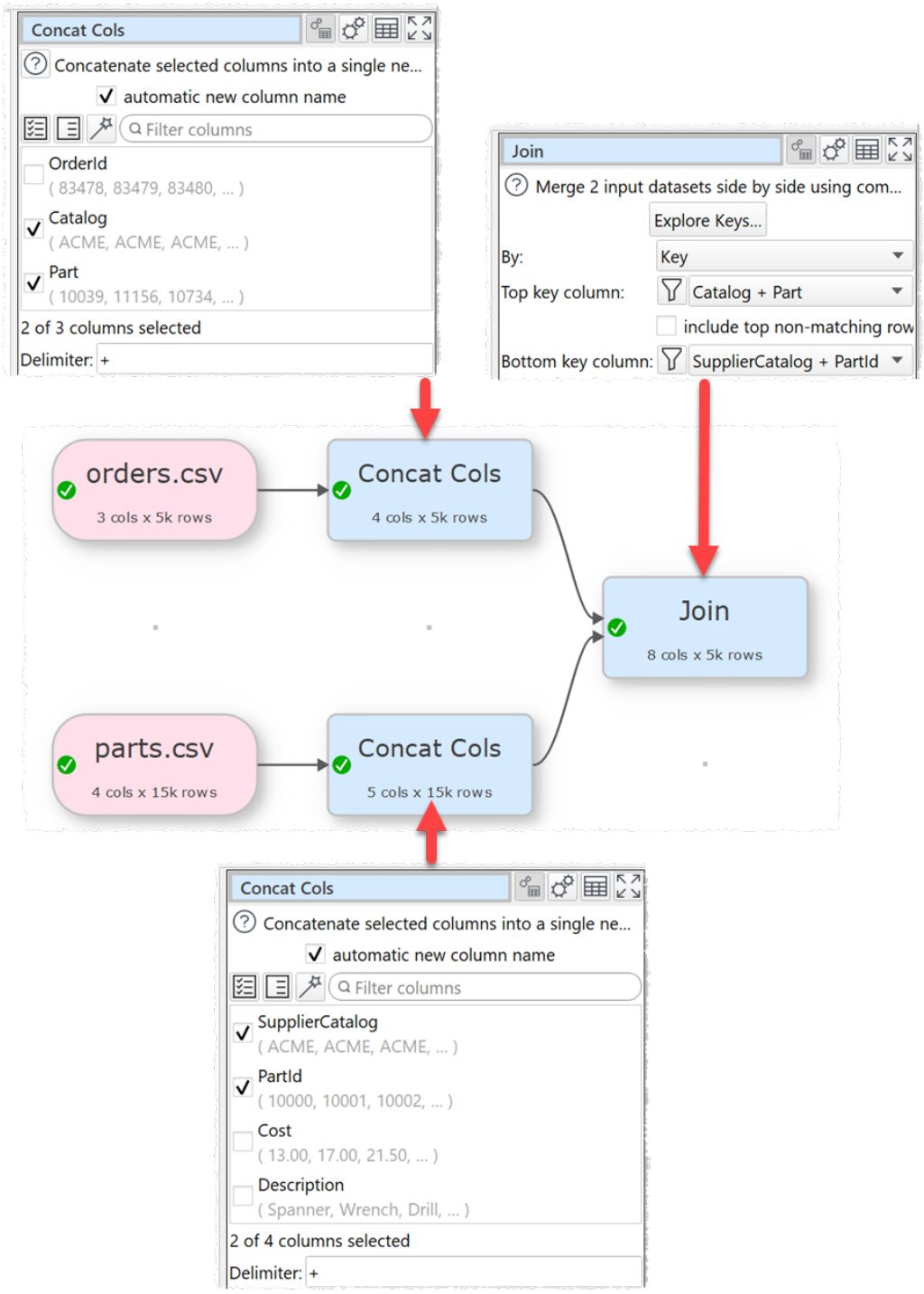


Use a delimiter in **Concat Cols**, otherwise concatenating AB with CD will produce the same key as concatenating A with BCD. Use a delimiter that is unlikely to occur in either key.

You may need to use Copy Cols or Rename Cols to get the key columns in the same order in each dataset, before **Concat Cols**.

[1] A compound key is a composite key where each element is a unique key in it's own right.


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## 3.39 Verify data values

You can check that a dataset has the expected values using the Verify transform.

## 3.40 Visualize data

Currently Easy Data Transform does not support charting beyond data profiling. However it can easily integrate with other tools that do. For example. by outputting a CSV for import into the visualization tool, or copying and pasting via system clipboard.

For example, you can copy and paste data direct from Easy Data Transform to rawgraphs.io:

| | countriesAndTerritories | deaths per 10k |
|---|---|---|
| 1 | Ecuador | 0.18 |
| 2 | United_Kingdom | 0.09 |
| 3 | Italy | 0.08 |
| 4 | Spain | 0.06 |
| 5 | Netherlands | 0.05 |


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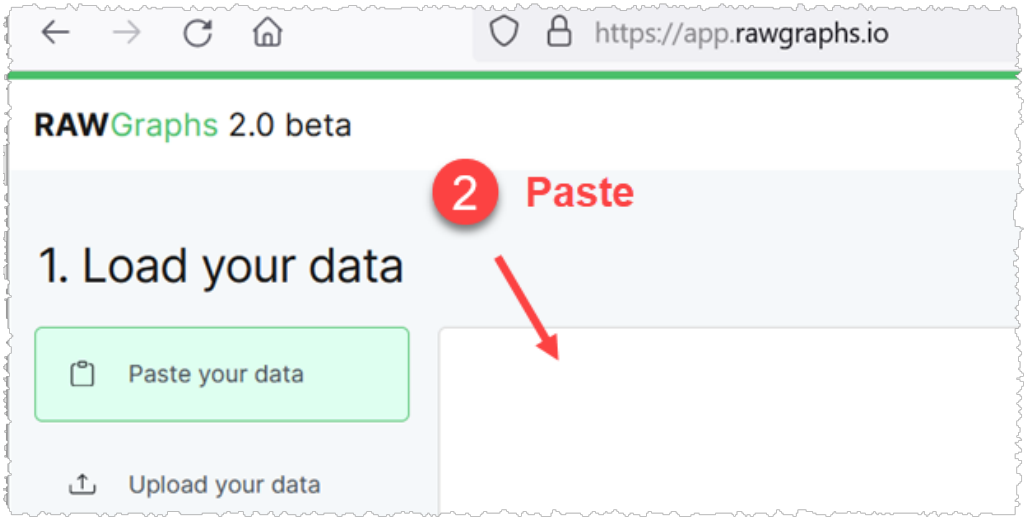


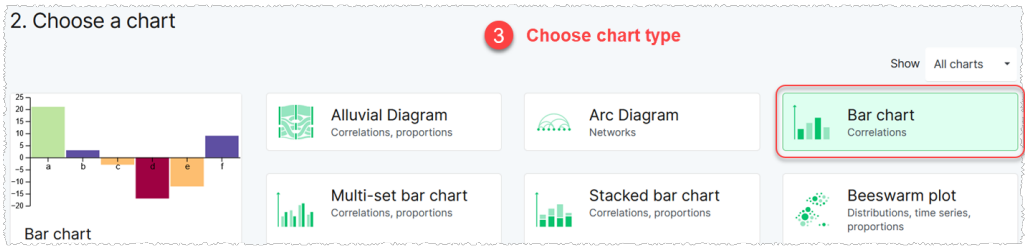


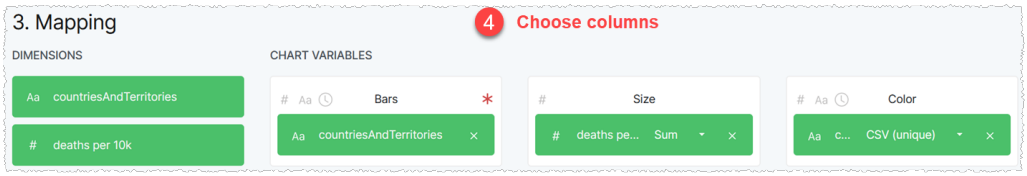


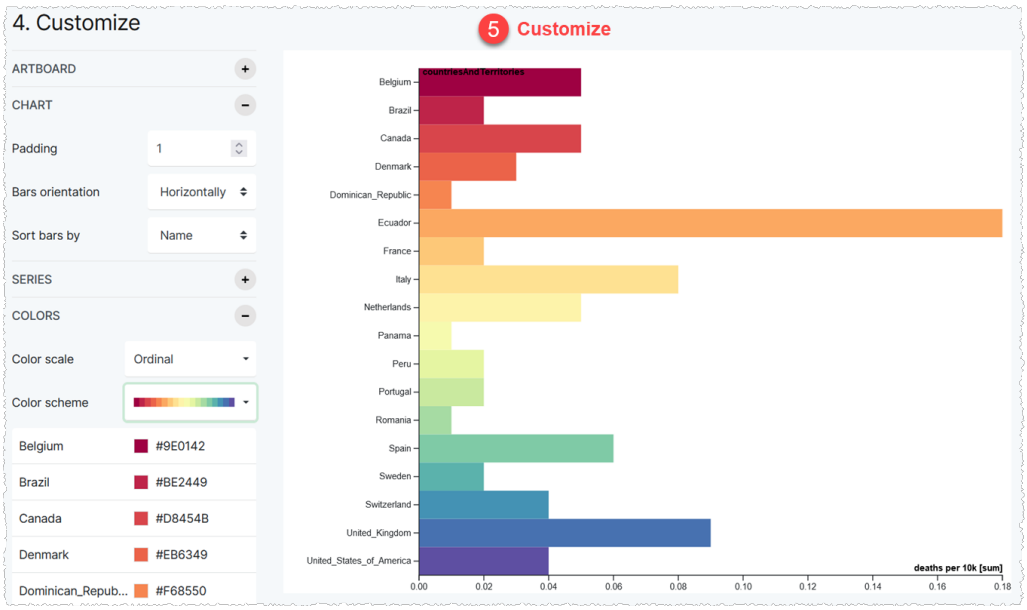



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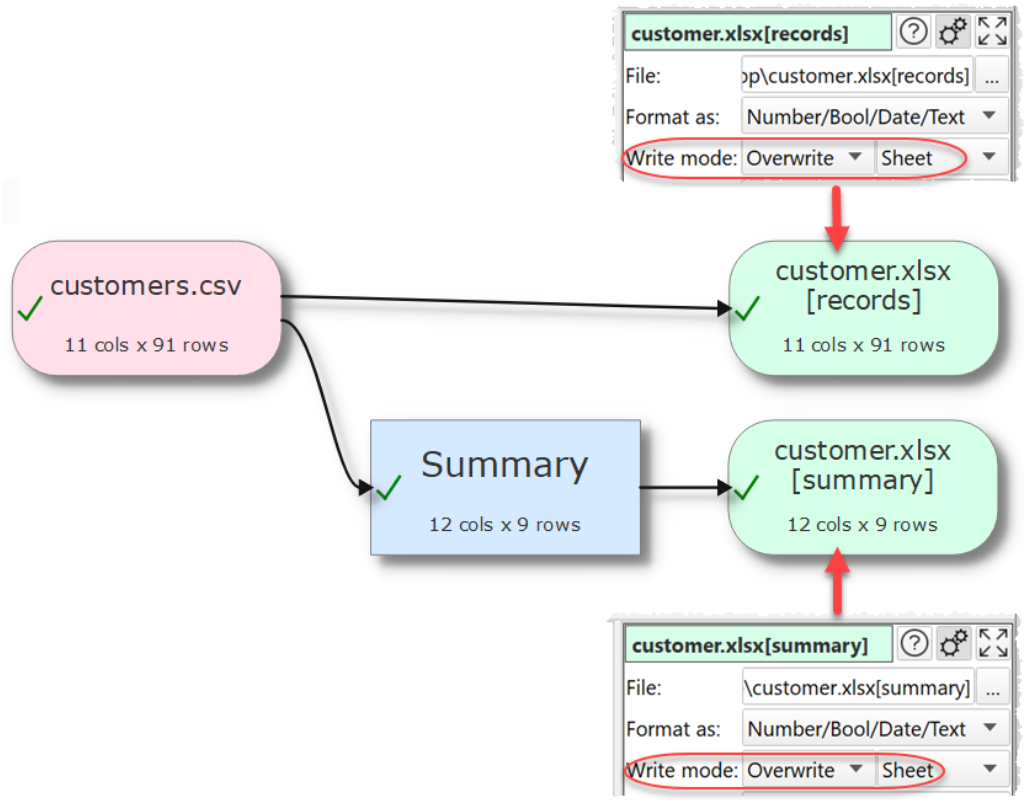
See also:

- Video: How to visualize data with rawgraphs.io

## 3.41 Write to multiple sheets of an Excel file

To write to multiple sheets (tabs) of the same Excel file you need to set the **Write mode** of each output item to **Overwrite/Sheet** (to clear the sheet first) or **Append** (to add to existing sheet data).




If you set the **Write mode** to **Overwrite/File** for an item then the write will remove existing sheets.

See also:

- Excel format
- Output to Excel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# Expert tips

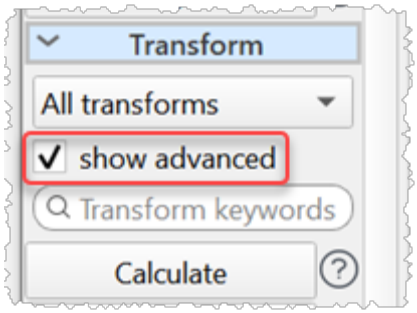
Easy Data Transform expert tips.

# 4 Expert tips

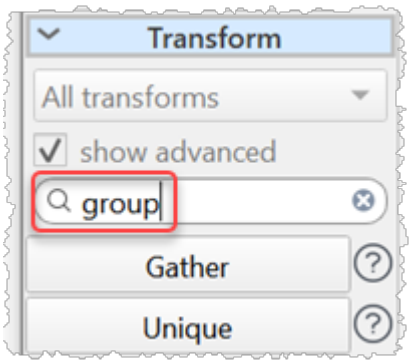
## 4.1 Expert tips

Here are some tips to help you be more productive with Easy Data Transform.

1. Check the **show advanced** checkbox in the **Left** pane to see all available transforms.

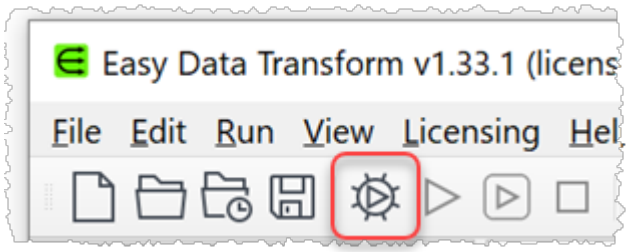



2. Type a keyword in the transform keywords field to quickly find the right transform.




3. Add a transform by clicking an existing **Center** pane item and typing the first few letters of the transform name.

4. Uncheck **Run>Auto Run** to take full control of when items are processed.





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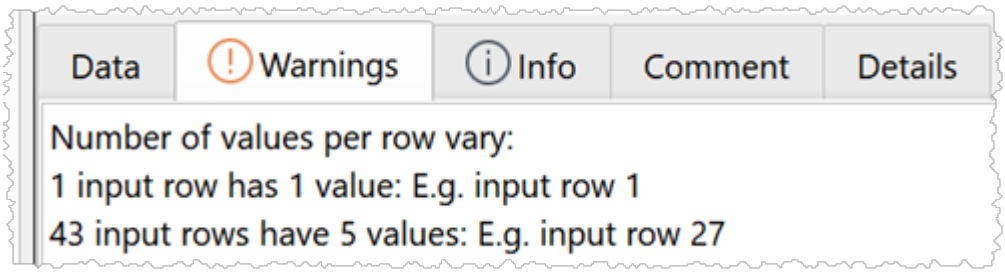
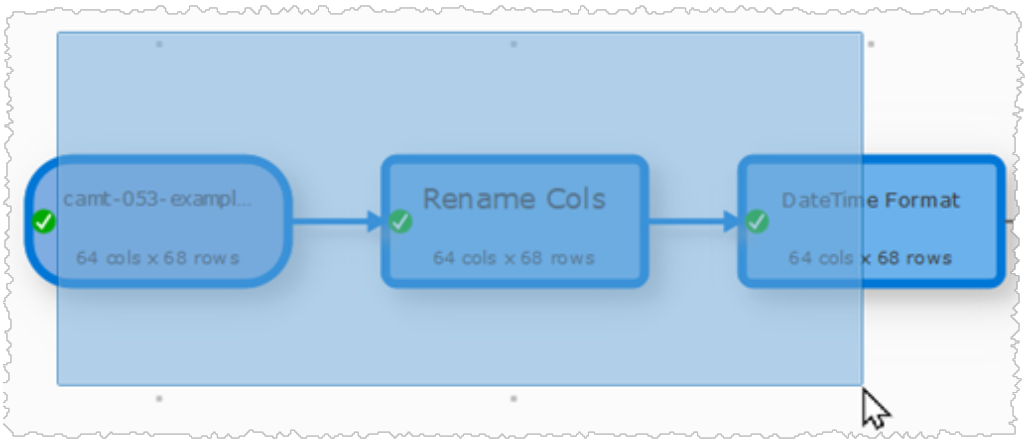
5. Hold down the `Shift` key and drag on the **Center** pane to scroll left/right/up/down.

6. Use Note items to remind yourself how a complex .transform works.

7. Look in the **Warnings** and **Info** tabs in the **Right** pane to troubleshoot potential issues.




8. Select multiple items in the **Center** pane by left clicking with the mouse and dragging a box over the items you want to select.




9. Add a transform to an existing connection, rather than disconnecting and reconnecting existing transforms.

10. Improve performance for large datasets by adding a **Sample** transform straight after the input of a large dataset and set **Rows** to pass through only the first 100 or so rows. Once you have completed all your transforms you can then **Disable sampling** to pass through all rows.

11. Double click on an item in the **Center** pane to show it fullscreen. `Escape` to close the window.

12. Use a schema to handle column changes in an input.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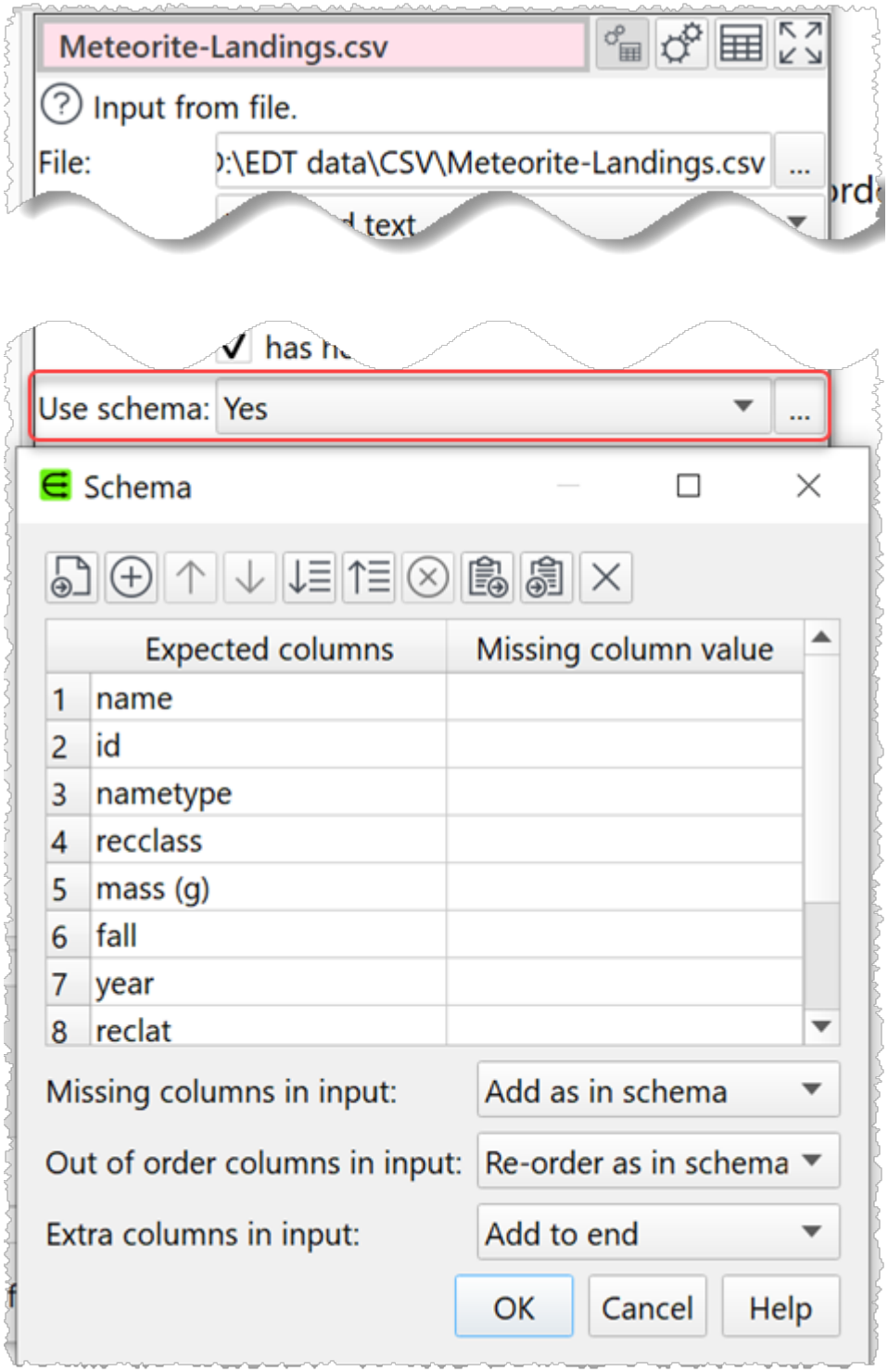


13. Check **View>Timing Profile** to see where the processing time is being spent.


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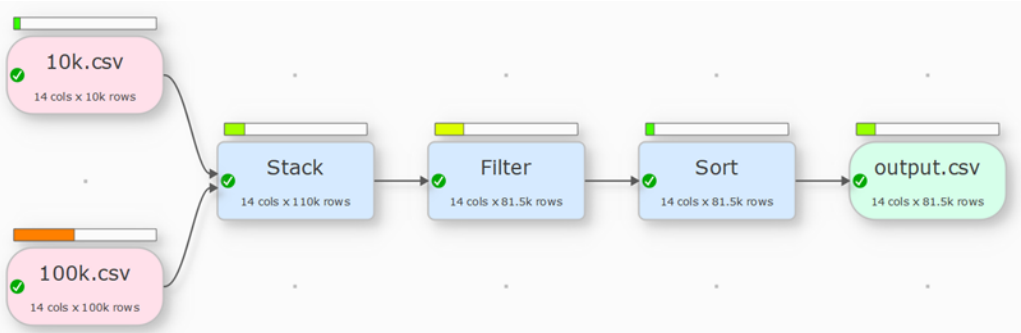
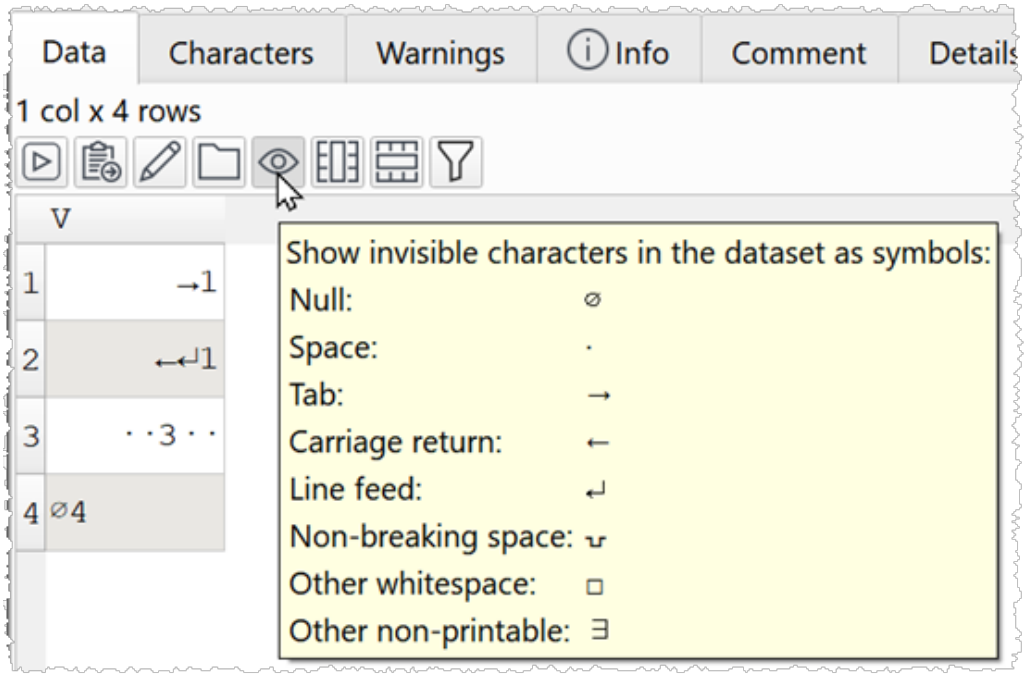



14. Click the eye icon in the **Right** pane to show whitespace and invisible characters in the data.




15. Check **compare changes** in the **Right** pane to see changes from a transform (selected transforms only).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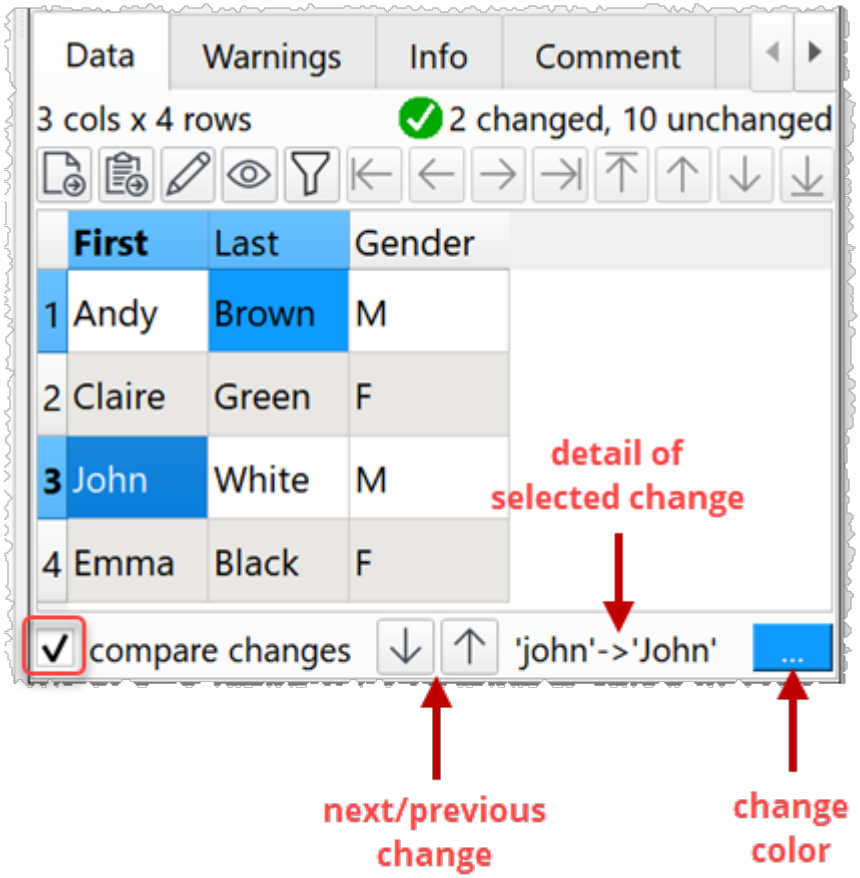


16. Select a column and click the column values icon in the **Right** pane to show the frequency of values in that column. Potential issues are shown in red.


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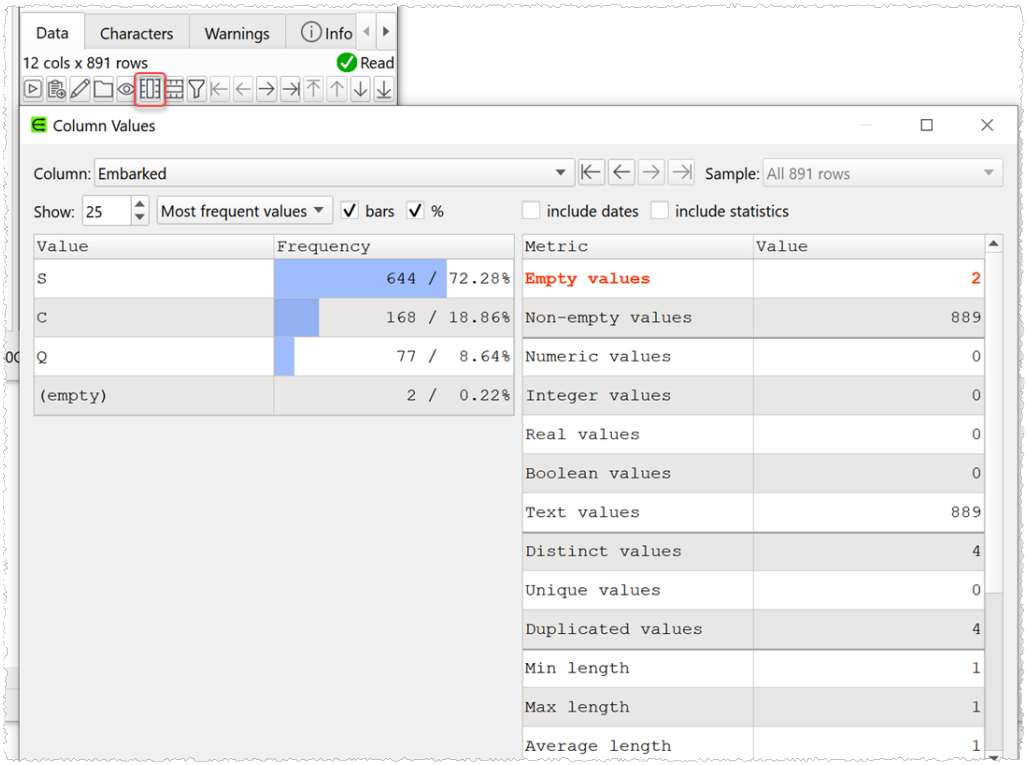
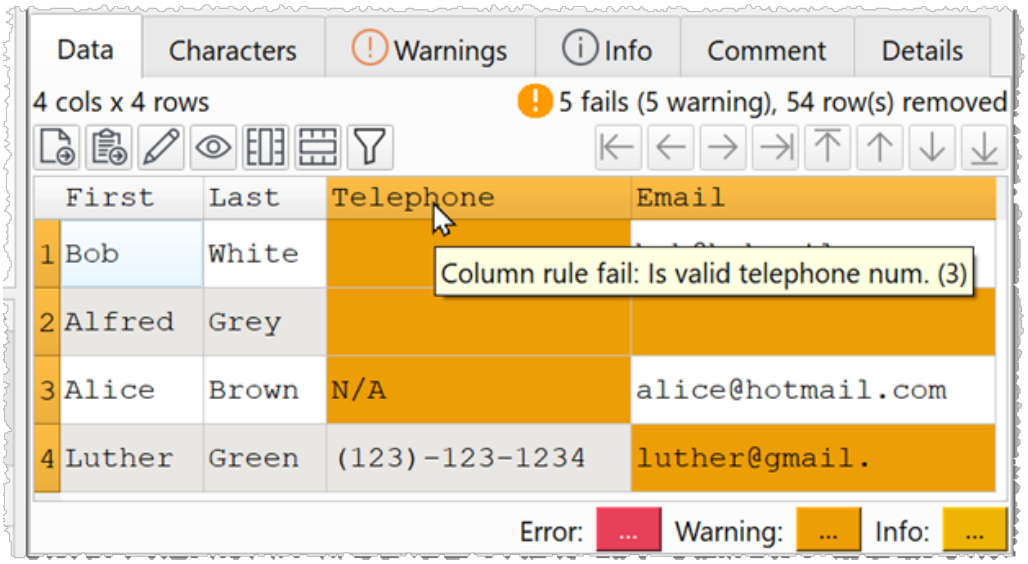



17. Check that the values in a dataset conform to your expectations using a Verify transform.




18. Enable drilldown to double click on a cell and see how the information was derived (selected transforms only).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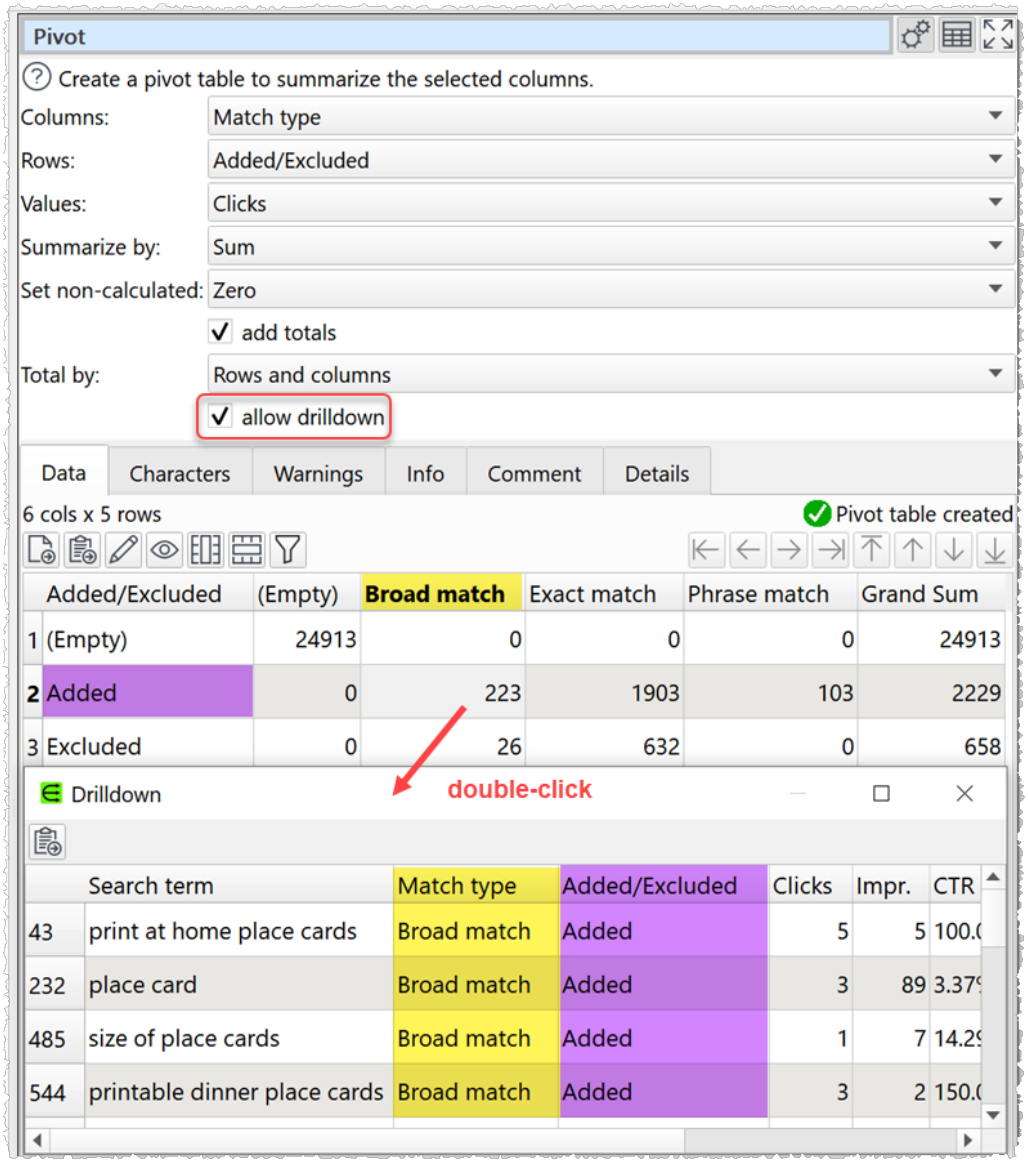


19. Filter data in the **Right** pane. This does not change the underlying data.

20. Display the value currently selected in the data table in a separate window by pressing the `Space` key or selecting **Show Value...** from the right click menu. This is useful for inspecting values that are too wide to be displayed in the data table.


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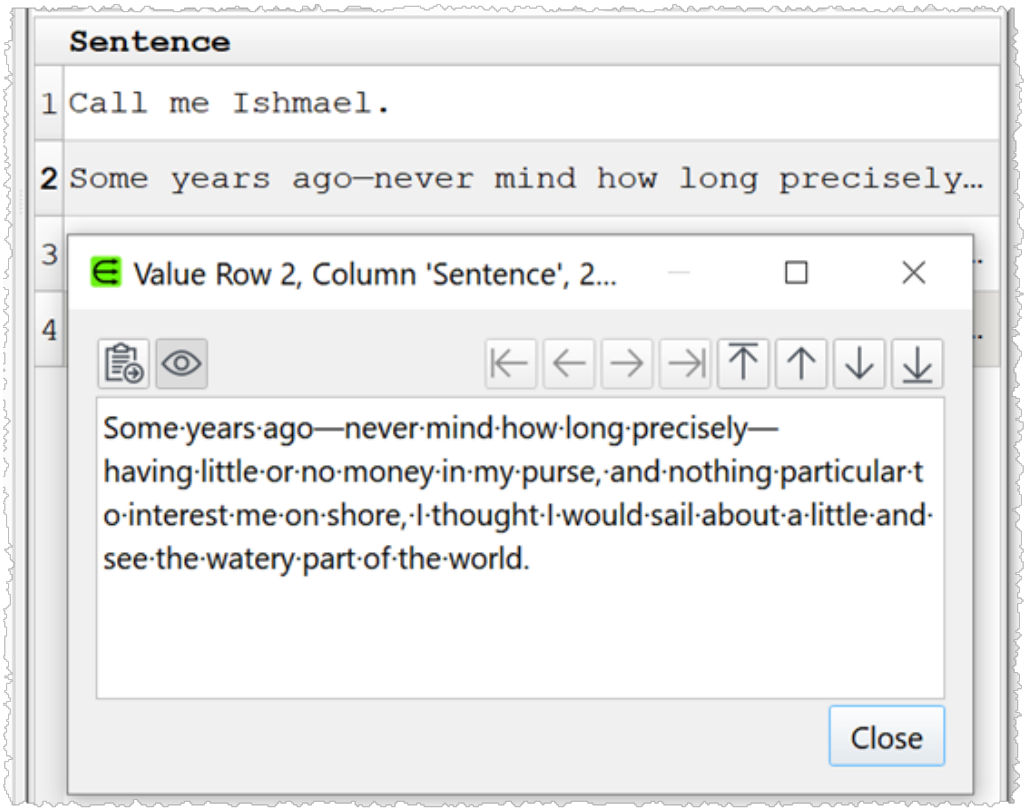


21. If you need several similar branches of transforms you can create one branch and duplicate it.


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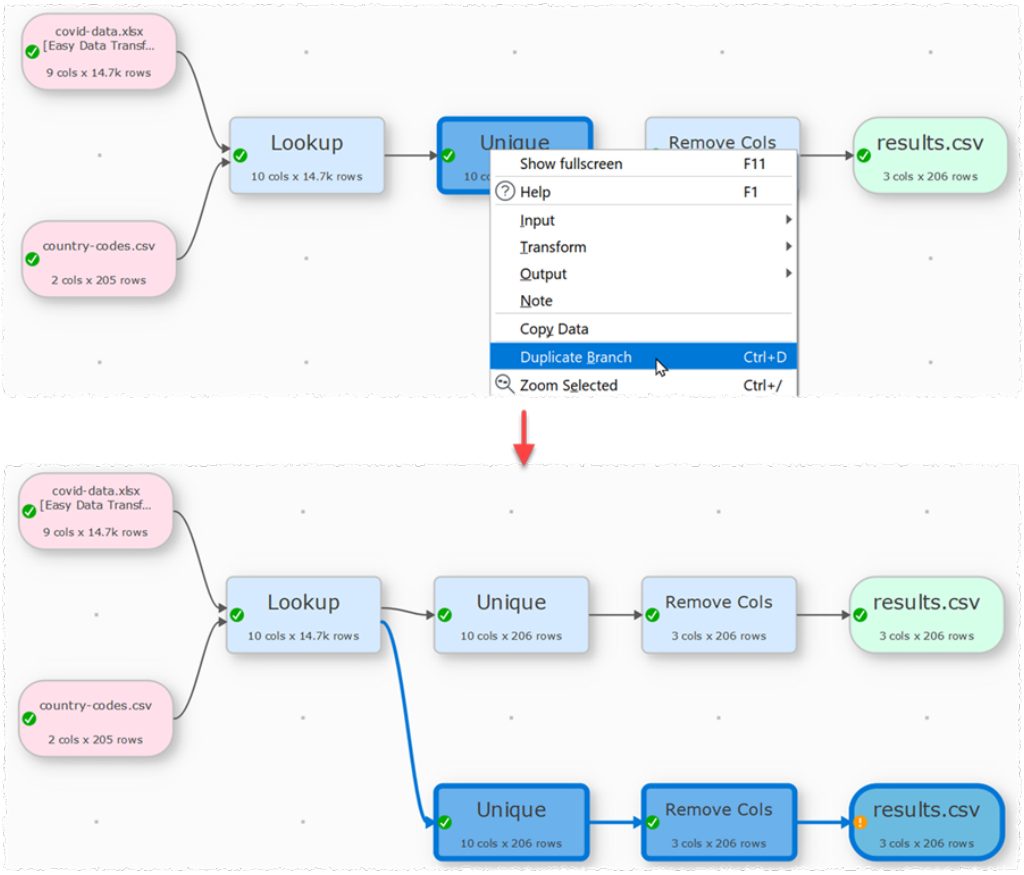


22. If you have 2 or more monitors connected to your computer select **View>Two Screen Mode** to show the **Right** pane on your second monitor.

23. Use batch processing with wildcards (e.g. *.csv) to process a folder full of input files in one operation.

24. Use command line arguments to run .transform files from a batch or script file.

25. Use file name variables to set the name of an output file based on the name of an input file, date created etc.


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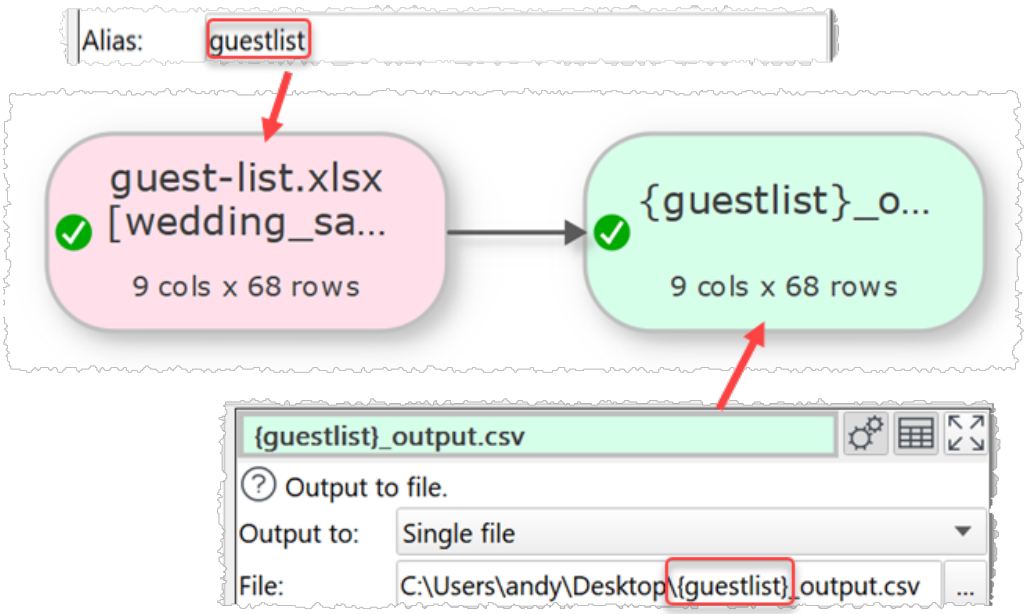
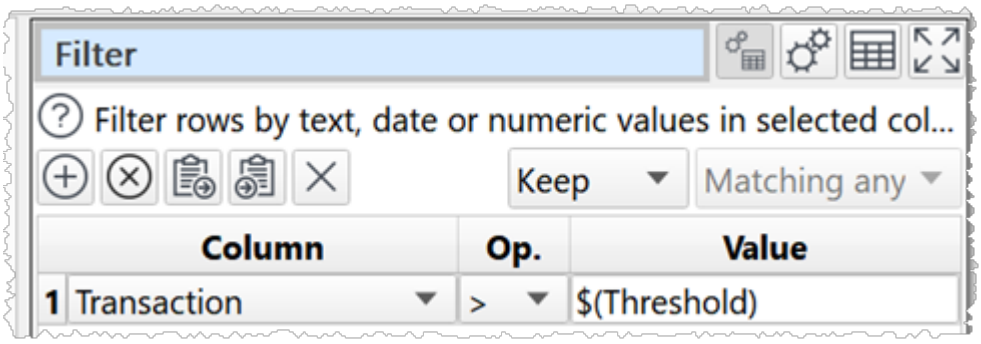



26. Use column variables when you want to use values from columns in transforms such as **If** and **Filter**.




27. Compare the headers of 2+ datasets by selecting the items in the **Center** pane and selecting **View>Compare Headers...** .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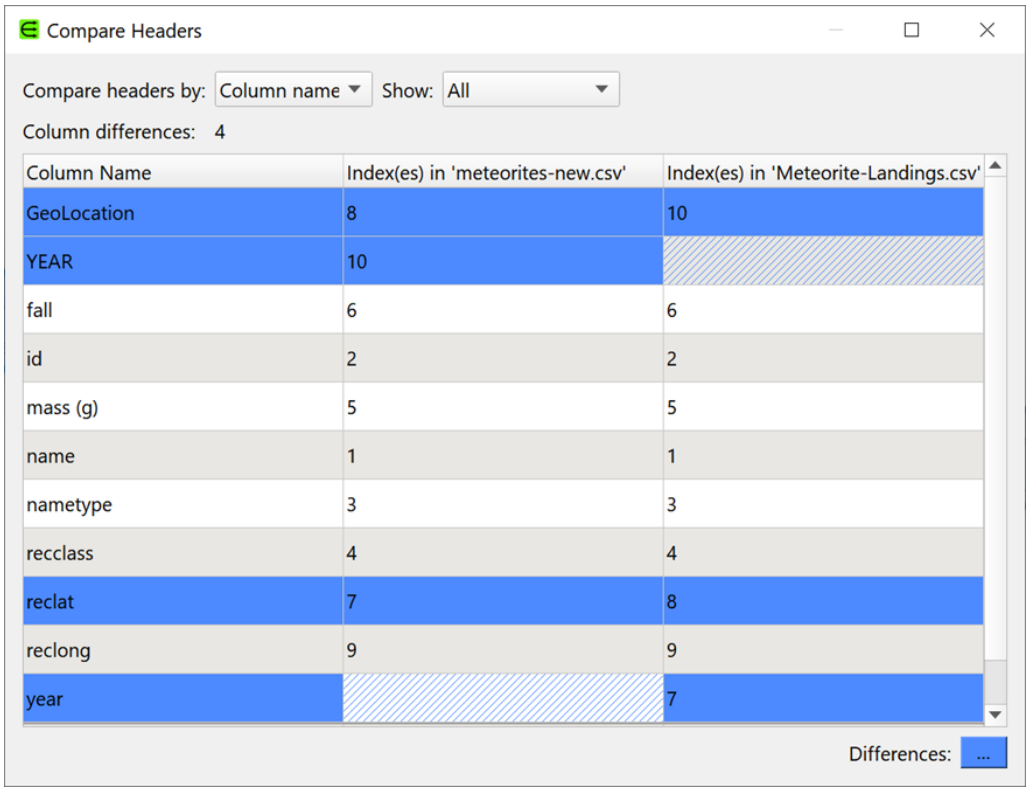
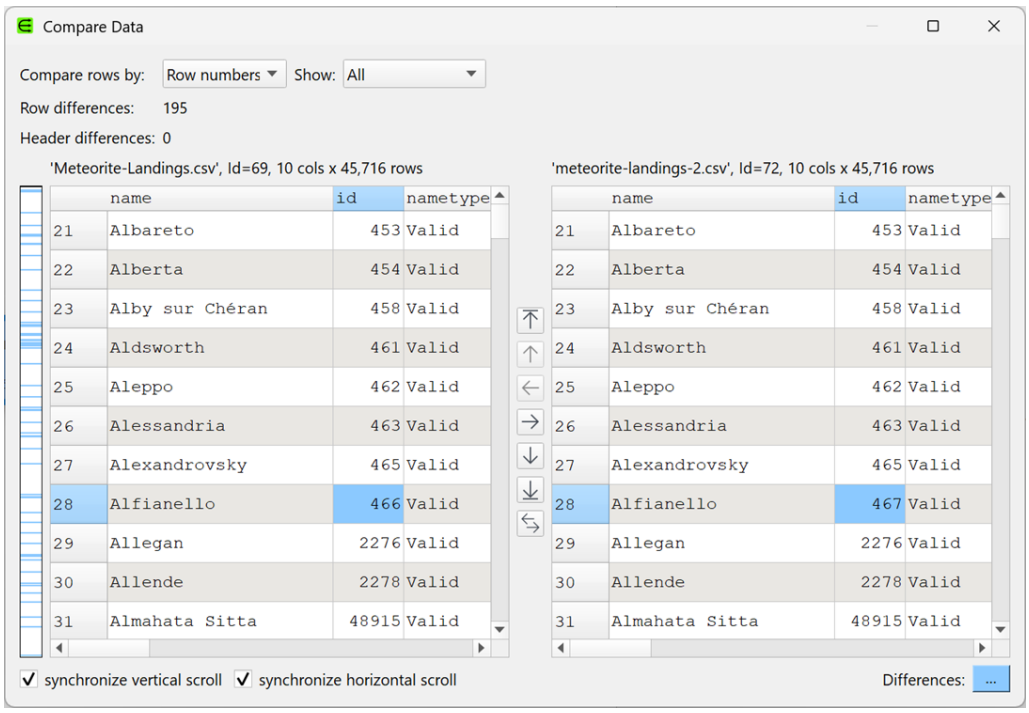



28. Compare the data values of 2 datasets by selecting the items in the **Center** pane and selecting **View>Compare Data...** .




29. Click on a status icon in the status bar to select and zoom in on all items with that status.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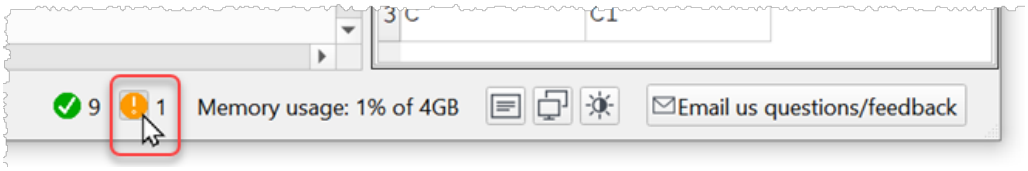
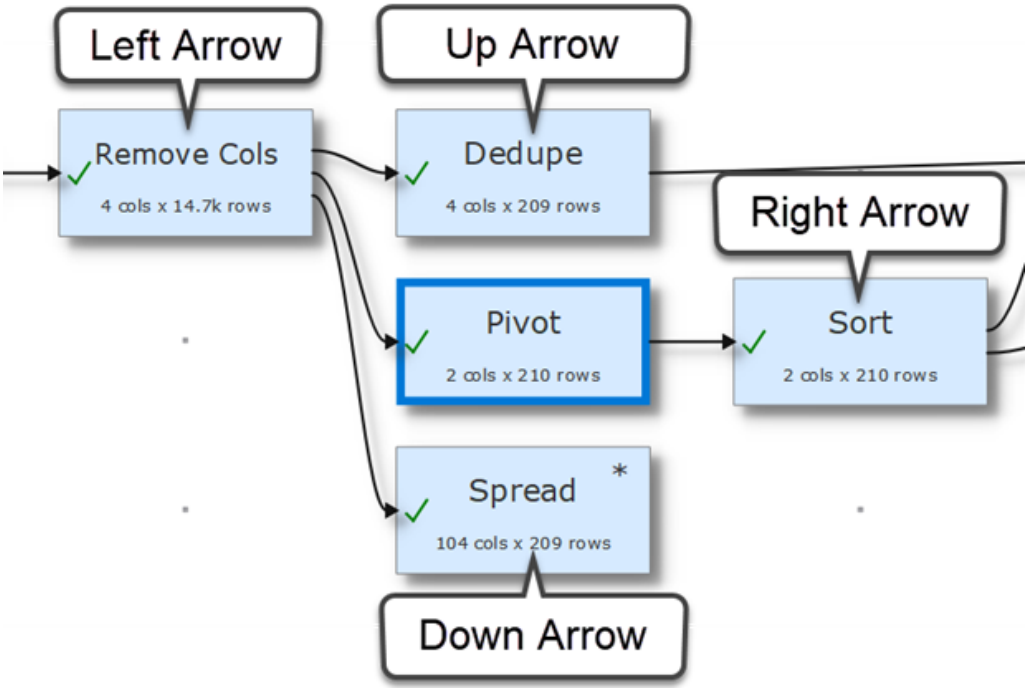
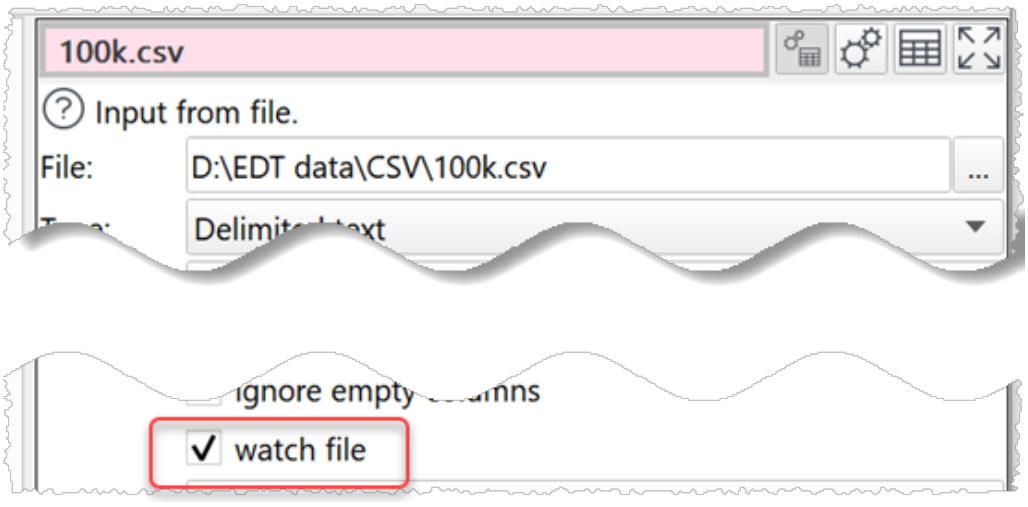



30. Use keyboard shortcuts. For example, you can quickly change selection in the **Center** pane using arrow keys with the `Ctrl` key.




31. Check **watch file** in the **Right** pane for an input file if you want to trigger processing (**Run>Auto Run** checked) or set it to 'Needs update' (**Run>Auto Run** unchecked) whenever it changes.





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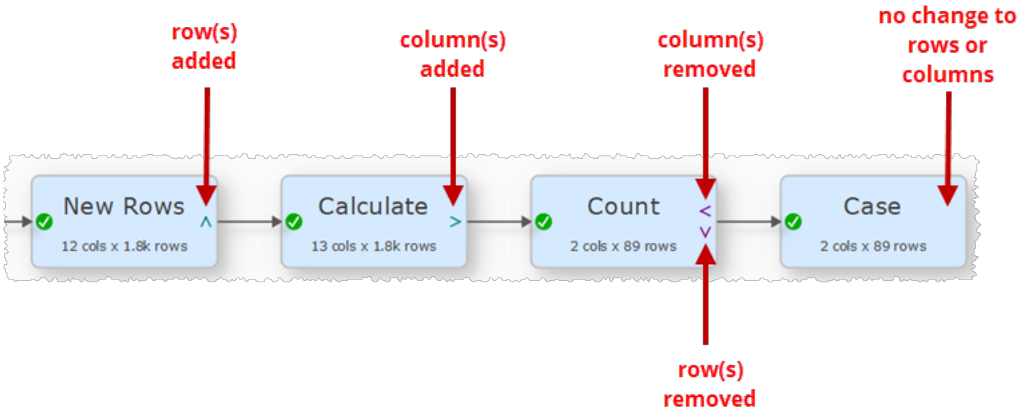
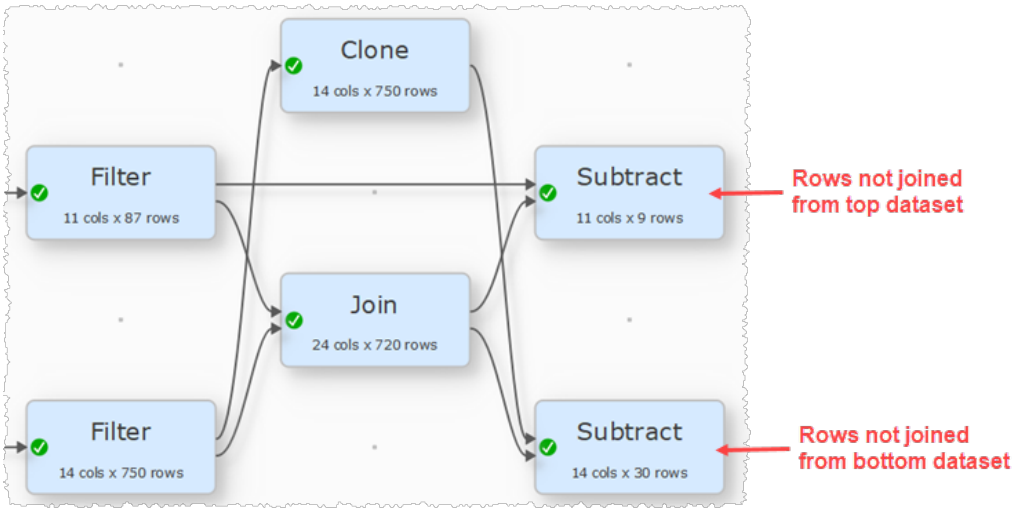
32. Check **View>Show Row/Col Changes** to show changes in the number of rows and columns in the **Center** pane.




33. Use the Subtract transform to perform an 'anti-join'.




34. Deploy Easy Data Transform as a portable application so you can run it from a USB key or install it on computers where you have limited access rights.

35. Find items matching one or more search terms in the **Center** pane using **View>Find Items**.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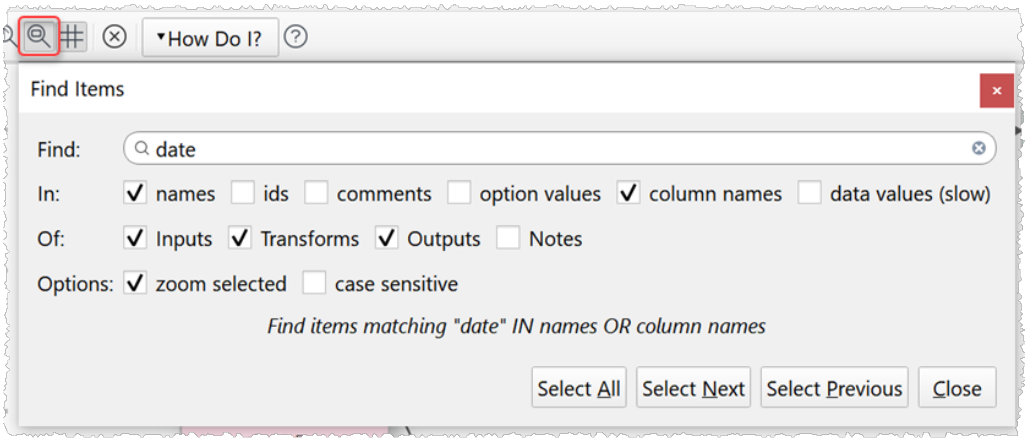
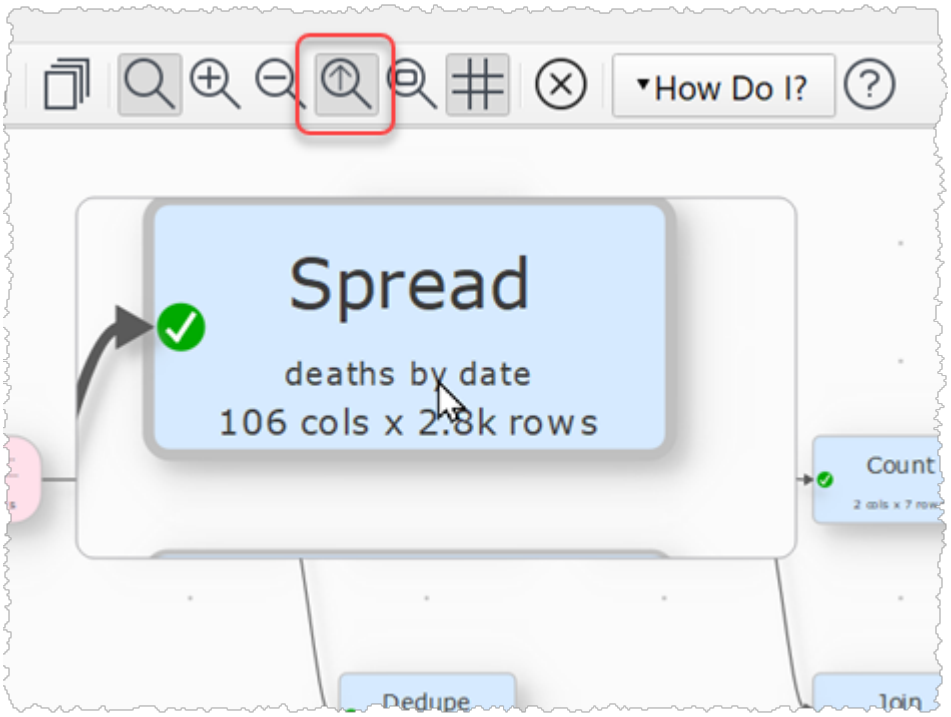



36. Magnify under the cursor in the **Center** pane using **View>Magnify Cursor**.




37. Use the right click menu to add Carriage Return, Line Feed, Tab or Null characters into a text option for a transform.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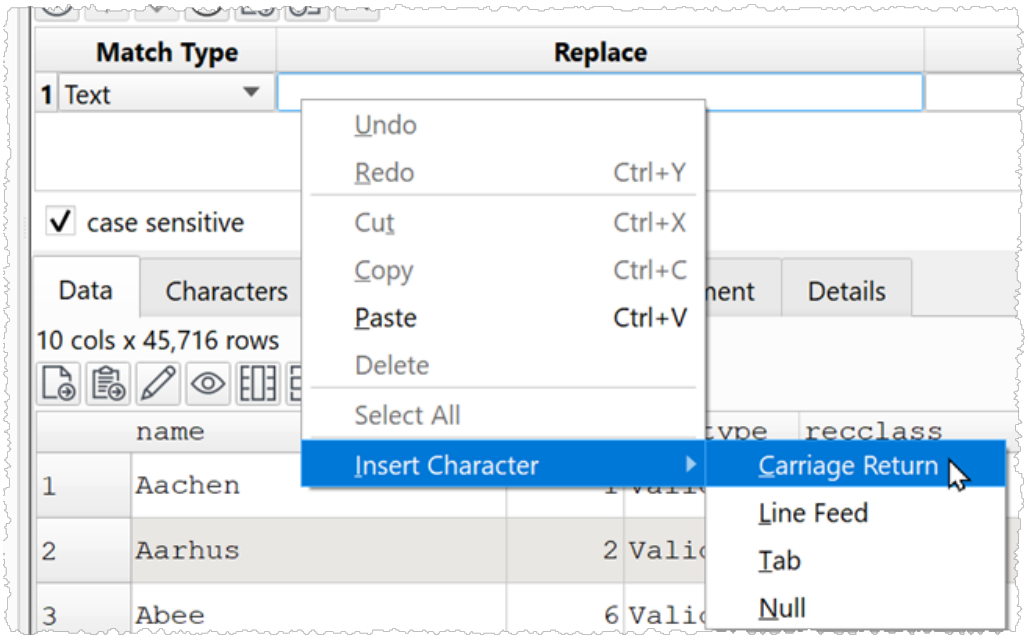


38. Use fuzzy matching to match text values that aren't identical.

39. Experiment with changing **Optimize processing for** from **Minimum memory use** to **Maximum speed** in **Preferences** to see if that improves performance. It may be slower or it may use up all your memory.

40. Hover over an item in the **Center** pane and press the # key to show the **Data Preview** window.

You can press the # key again to close the window. If the# key is not convenient, you can use = instead.

41. Change the **Center** pane color scheme in the **Colors** tab of the **Preferences** window.


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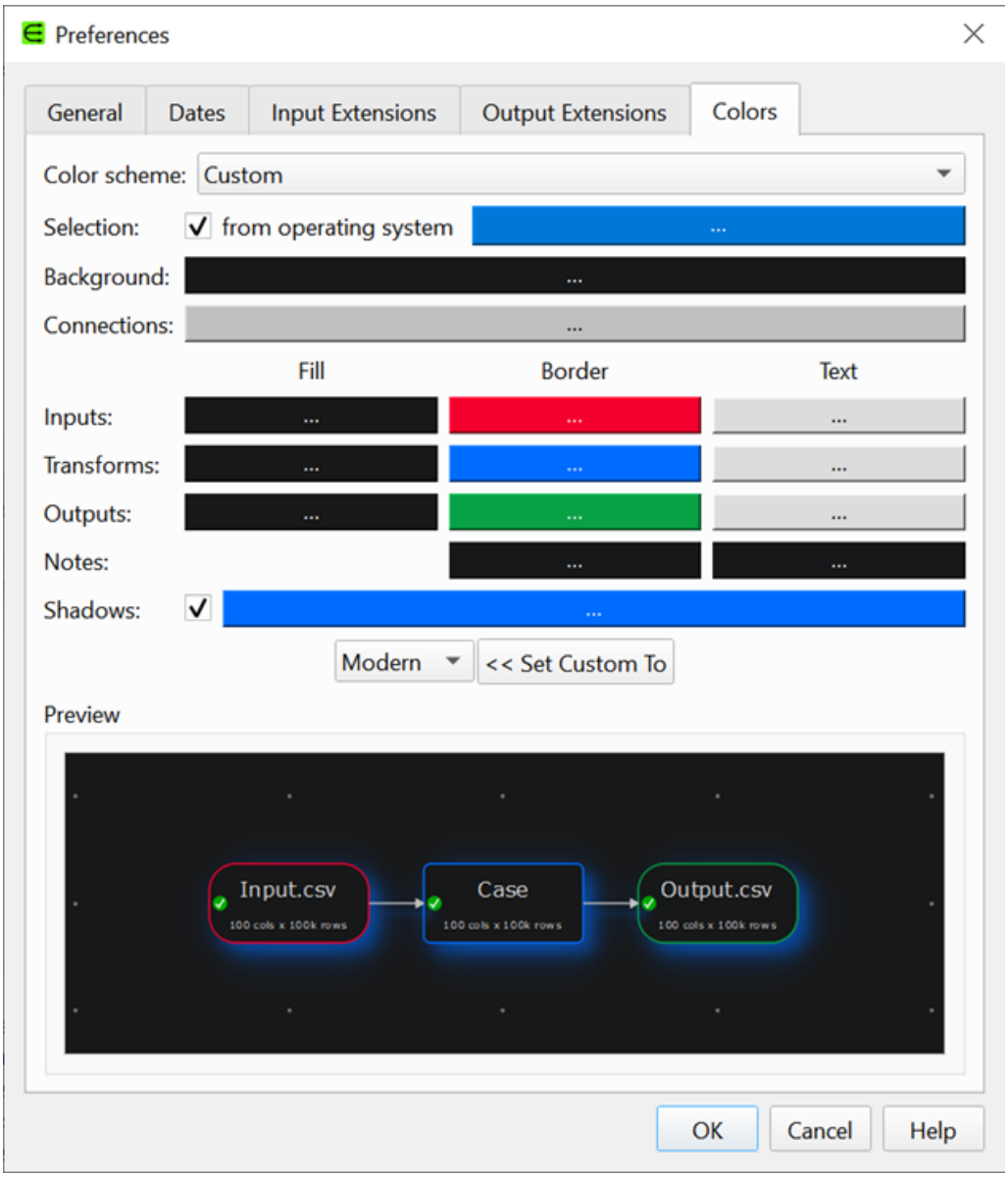


42. Select **View>Toggle UI Theme** to swap between light and dark user interface themes.


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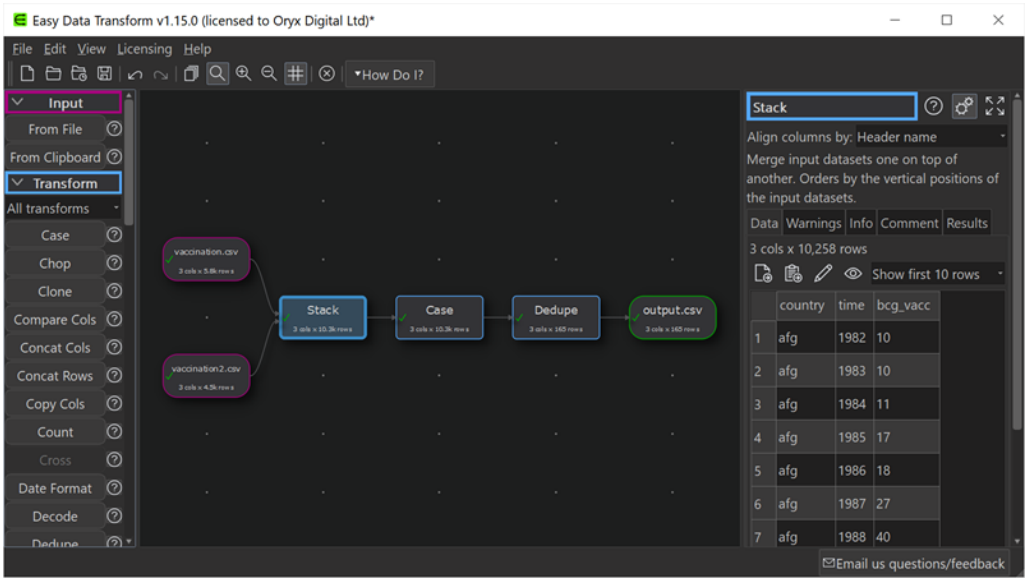
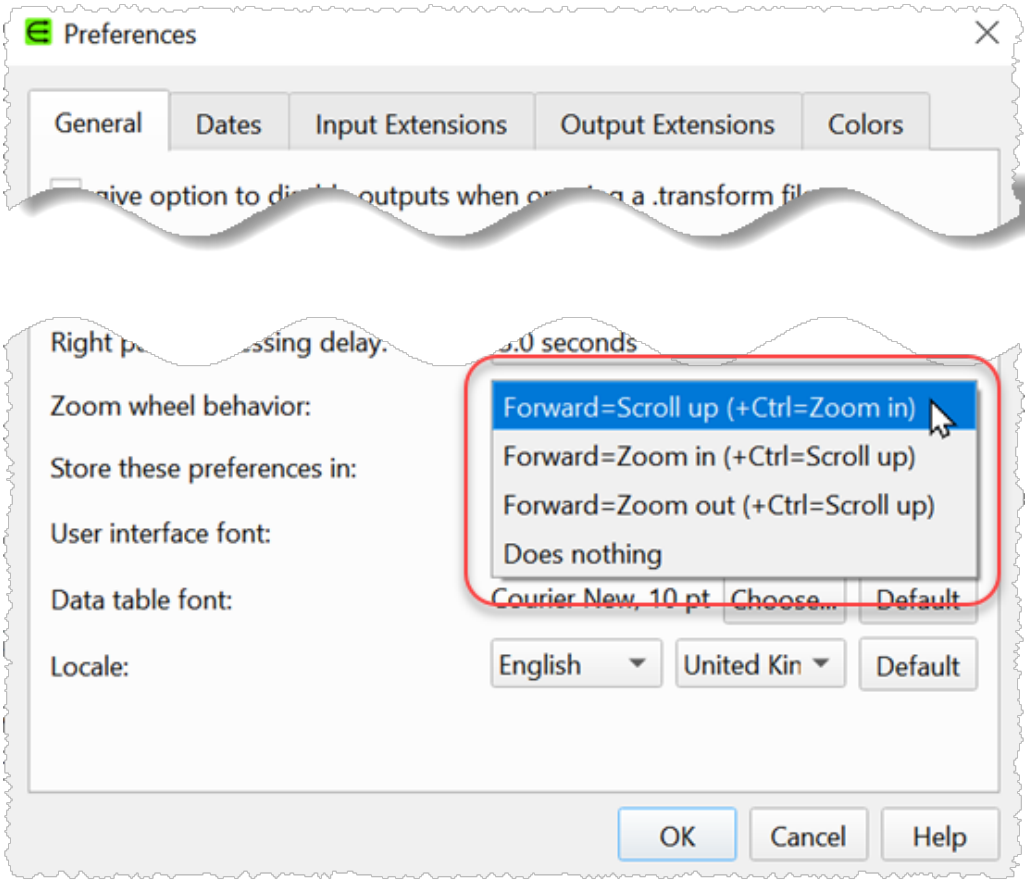



43. Select **File>New Window** to open a new **Main** window.

44. Set the **Center** pane mouse wheel behavior in the **Preferences** window.




45. Hold down the `Ctrl` key when adding a new transform or output item to add it to the bottom left or the current canvas. Otherwise, it will be added to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the right of the currently selected item(s). This works when inserting by clicking a button in the **Left** pane, typing a transform name or adding from the right click menu.

46. When outputting Excel, check **use style template** to copy the styling across from another Excel spreadsheet.


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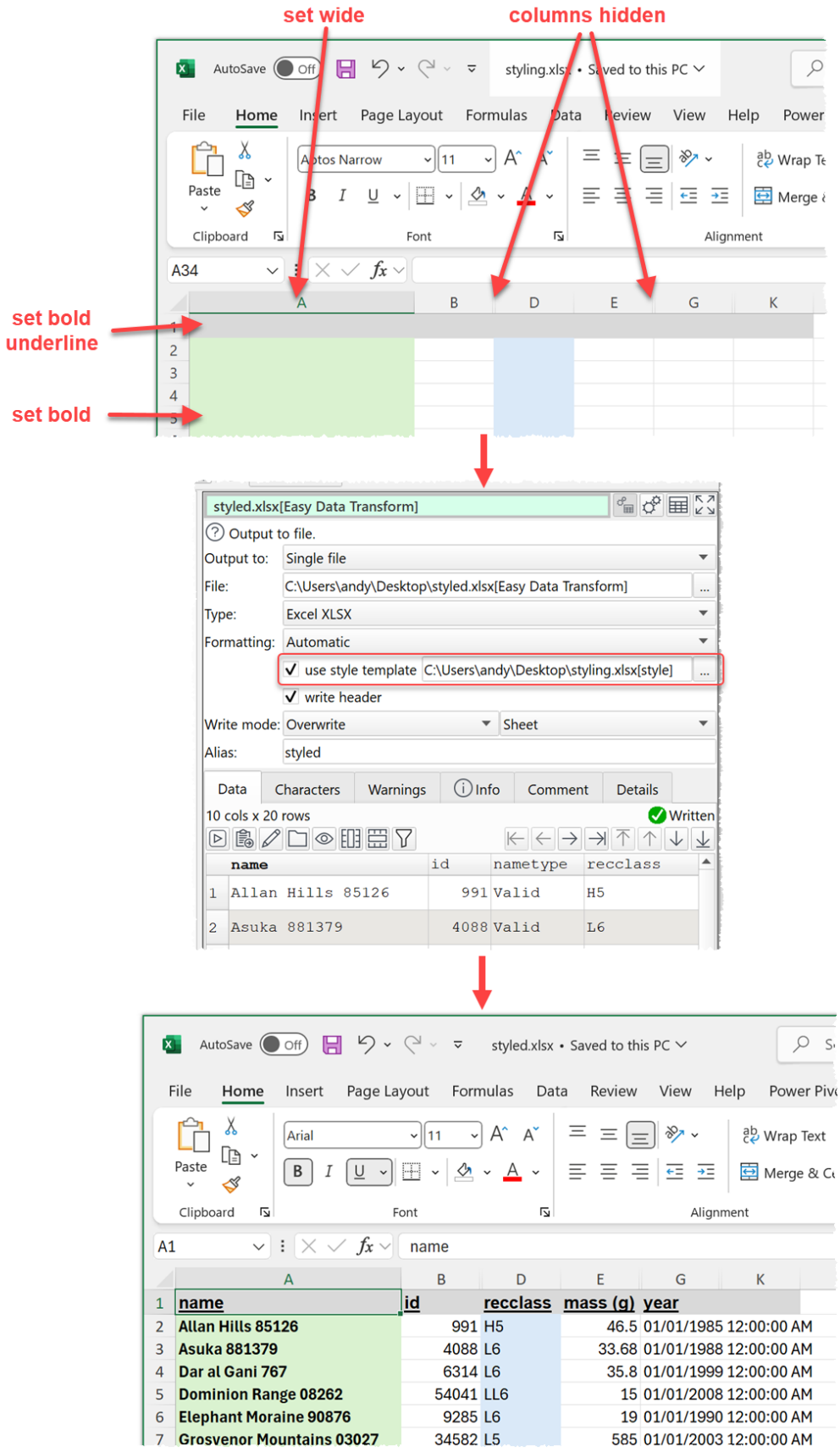



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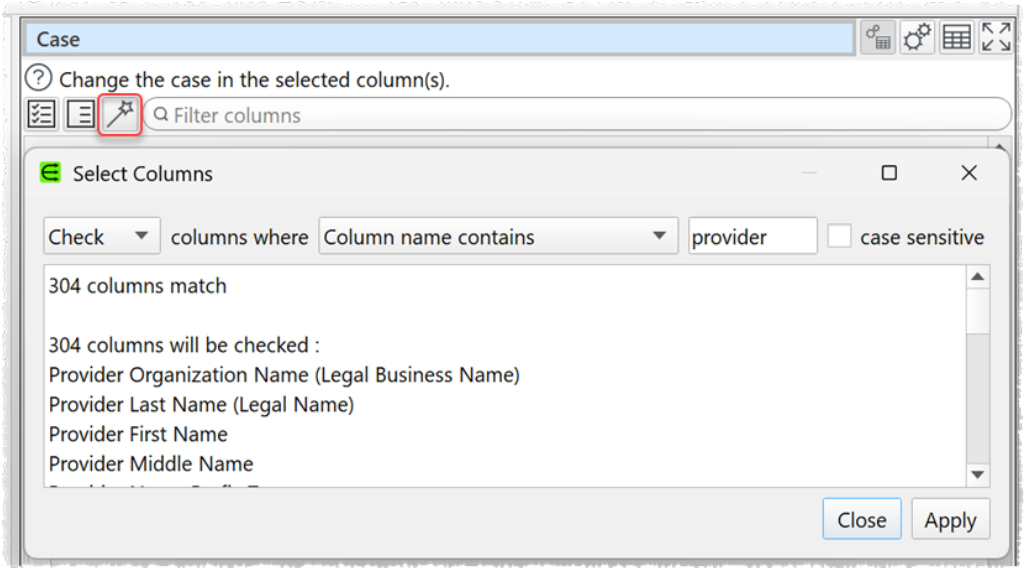
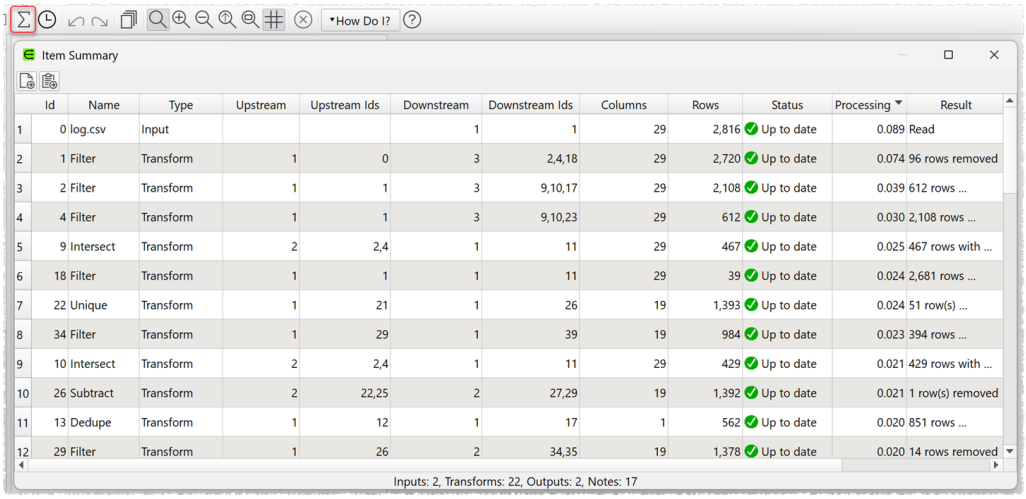
47. Quickly select a column by pressing the filter button and typing a few characters of the name.

48. Quickly check/uncheck multiple columns using the **Select Columns** window.




49. Select **View>Item Summary...** to see summary data on all the **Center** pane items. Click a header to sort. However over a row to highlight the corresponding item in the **Center** pane. Double click a row to select the corresponding item in the **Center** pane.




| | Id | Name | Type | Upstream | Upstream Ids | Downstream | Downstream Ids | Columns | Rows | Status | Processing | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | log.csv | Input | | | 1 | 1 | 29 | 2,816 | Up to date | 0.089 | Read |
| 2 | 1 | Filter | Transform | 1 | 0 | 3 | 2,4,18 | 29 | 2,720 | Up to date | 0.074 | 96 rows removed |
| 3 | 2 | Filter | Transform | 1 | 1 | 3 | 9,10,17 | 29 | 2,108 | Up to date | 0.039 | 612 rows ... |
| 4 | 4 | Filter | Transform | 1 | 1 | 3 | 9,10,23 | 29 | 612 | Up to date | 0.030 | 2,108 rows ... |
| 5 | 9 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 467 | Up to date | 0.025 | 467 rows with ... |
| 6 | 18 | Filter | Transform | 1 | 1 | 1 | 11 | 29 | 39 | Up to date | 0.024 | 2,681 rows ... |
| 7 | 22 | Unique | Transform | 1 | 21 | 1 | 26 | 19 | 1,393 | Up to date | 0.024 | 51 row(s) ... |
| 8 | 34 | Filter | Transform | 1 | 29 | 1 | 39 | 19 | 984 | Up to date | 0.023 | 394 rows ... |
| 9 | 10 | Intersect | Transform | 2 | 2,4 | 1 | 11 | 29 | 429 | Up to date | 0.021 | 429 rows with ... |
| 10 | 26 | Subtract | Transform | 2 | 22,25 | 2 | 27,29 | 19 | 1,392 | Up to date | 0.021 | 1 row(s) removed |
| 11 | 13 | Dedupe | Transform | 1 | 12 | 1 | 17 | 1 | 562 | Up to date | 0.020 | 851 rows ... |
| 12 | 29 | Filter | Transform | 1 | 26 | 2 | 34,35 | 19 | 1,378 | Up to date | 0.020 | 14 rows removed |

Note that you can click the **Export** or **Copy** buttons to export the summary to a file or the clipboard. You can then add the summary as an Input item in Easy Data Transform, for transformation or analysis!

50. Change focus between the **Center** and **Right** panes using `Alt+Left` and `Alt+Right`.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51. Check **gray Left pane buttons when not available** in the **General** tab of the **Preferences** window for **Left** pane buttons to be disabled until the appropriate items in the **Center** pane are selected.

52. Check **move Note items with associated items** in the **General** tab of the **Preferences** window if you want Note items to be automatically moved when you drag other items that the notes are adjacent to and pointing at.


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# Support

The Easy Data Transform forum.

# 5 Support

## 5.1 Forum

There is a discussion forum online at forum.easydatatransform.com. You can use this to ask questions, share what you are doing and keep up to date with news.

## 5.2 Contact support

If you have any questions or suggestions, please post a question on forum.easydatatransform.com or email us at support@easydatatransform.com.

## 5.3 Report a bug

Please report any bugs you find to support@easydatatransform.com Please include:

- your operating system (e.g. Windows 11)
- the version of Easy Data Transform (from **Help>About**)
- a step-by-step description of how we can reproduce the problem
- your .transform file and input data files (where appropriate)
- a screen capture or video can often be helpful

The step-by-step description is particularly important - if we can't reproduce your problem, then we probably won't be able to fix it.

We treat all data sent to us as confidential, unless you tell us otherwise. If your data is particularly sensitive, it might be enough to send us just the first few rows with sensitive values changed. Please keep the same column structure though.

## 5.4 Request an enhancement

We are always very interested to hear your suggestions on how the software can be improved. Please post a feature suggestion on our forum.easydatatransform.com or email us at support@easydatatransform.com.


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