1. Input Data tool

- To add multiple files / wildcard match in a folder
- (Examples) *.csv Sales_20*.csv Sales_20??.csv
- An output data tool can be converted to input data tool
- An input data tool can be converted to (1) macro input (2) dynamic input
- No delimited \0
- Delimiters may be specified for some file types
- Assigns data types that auto-calculated to the smallest datatypes

2. Data type

- Int 16 --- -255 to +255
- WString – only ASCII characters
- V_WString – accepts any character & only amount of storage needed

3. Output data tool

- Change the entire file path
- Change file/Table name
- Prepend prefix to file/table name
- Append suffix to file/table name

4. Append Field Tool

- The data types of the fields can be changes
- Fields can be renamed
- Add prefix to fieldnames

5. Results Window

- Displays 1 MB of data for each anchor
- 1000 bytes of string data
- Search / Sort / Filter results
- Revert to original dataset
- Click (¶) to show whitespaces

6. Data Cleaning tool

- Replace Nulls with “Blank” or ”0”
- Replace unwanted characters (Whitespace, tabs, line, All, letters, numbers, punctuation)
- Modify case (Upper, lower, title)

7. Select tool

- Select, deselect & reorder columns
- Modify data type & size
- Rename a column or add a description
- Remove columns from the dataset

8. Filter Tool

- Expressions created in the tool can be saved and then accessed in other tools
- The number of records that are input into a filter tool equal the output of the combined record from the T and F anchors
- The operators displayed in the drop-down list in the basic filter change based on the data type of the chosen field

9. Formula Tool

- \- Saved expressions can be found in the Folder Button
- \- Can update values
- \- Multiple formulas can be updated
- \- Select data type and size of the column
- \- Format dates
- \- Apply conditional statements
- \- Find Min & Max values
- \- Cleanse string data

10. Summarize tool

- \- Concatenate String Values/fields
- \- Group by fields
- \- It is data type dependent
- \- It is case sensitive

11. Find Replace Tool

- - Several items in a single record can be replaced
- - Fields can be appended or replaced.

12. Union tool

- - Auto Config by name
- - Auto config by position/field order
- - Manually config
- - Accepts multiple inputs, based on either field name or position record and creates a stacked output table.

13. Join Tool

- - Two incoming data streams to be connected horizontally

14. Cross Tab

- - Visual data columns onto a horizontal axis
- - Summarizing the data/aggregation of values
- - Group data by values
- - Need at least 2 columns

15. Transpose Tool

- - Horizontal to Vertical
- - Key Columns and Data column
- - All of the selected fields selected as ‘Data Fields’ will have their values stacked into a single column called “Value”, while the names of each corresponding variable will be stored alongside in a column called “Name”.

16. Tool Container

- - Disable to prevent tools inside from running
- - Group tools in a container to isolate a section or process in a workflow
- - Modify container contents – right-click expand container & delete container only

- - Disable the container
- - Configure the container

17. Workflow Optimisation

- - Remove unnecessary fields (select tool)
- - Limit amount of data (sample tool)
- - Eliminate browse tools
- - Browse to a data file from a spatial tool
- - Balance file size in the distance tool
- - Manage targets and inputs in the spatial match
- - Ensure local temporary directory space

18. Workflow Group

- - A collection of workflows that are saved together and can be opened as one file

19. Workflow Dependencies

- - A connection from one workflow to another workflow so that changes to one can also update the other

20. Annotations

- - Annotations can appear above or below the tool as canvas
- - Annotations can be customized with the user-specified text

21. Comment Tool

- **In the Text field, enter the text to appear in the comment box, or double-click the comment box on the canvas and enter text directly into the box.**
- **Specify the Shape, Font, Text Color, Background Color, and Text Alignment.**
- **Select a Background Image for the text box. You can select .png, .gif, .bmp, or .jpg image files.**

Other Options

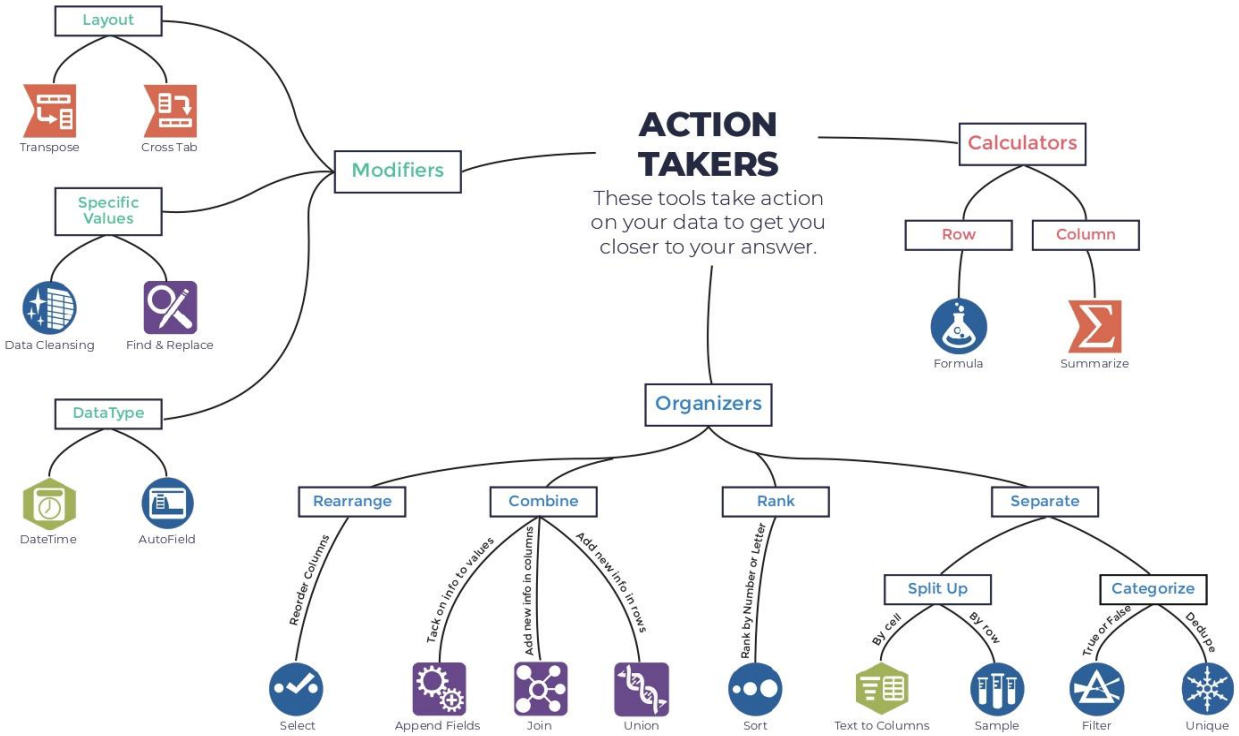
- To re-size the comment box, point to a side or corner and drag to the desired size.
- To change the visibility of the comment box in relation to other tools on the canvas, right-click the tool and select Bring to Front or Send to Back. For more information on tool options, visit Build Workflows.
-

CHOOSING THE RIGHT TOOL

Hover or click the icons for more info.

ENABLERS

Tools that help you when using other tools.



ACTIONS YOU MAY WANT TO TAKE...	TOOLS THAT CAN DO THAT IN DESIGNER
Change Datatype	Select Formula Autofield
Row to Column	Transpose
Column to row	Cross Tab
Split one cell into multiple cells	Text to Column Formula
Combine lists by adding rows	Union
Combine lists by adding columns	Join Find & Replace Append Fields
Group Information	Union Find & Replace Summarize
Rank Data	Sort Summarize
Get rid of columns	Select
Get rid of empty values	Formula Filter
Get rid of rows	Formula Filter Sample
Get rid of puncutation or whitespace	Data Cleansing
Perform a calculation	Summarize Formula
Work with dates	DateTime Formula
Find a value (unique, min, max)	Summarize Unique Find & Replace
Identify records with a unique ID	Record ID
Replace a value	Find & Replace Formula
Input Data	Input Data
Rename Fields	Select
Reorder Fields	Select
View Results	Browse
Ouput Results	Output Data

FUNCTIONS

When using functions in Designer, keep in mind that datatype is very important. The table on the right shows the function category and an X indicates that functions in that category are compatible with that column's corresponding datatype. This is not an exhaustive list. Rather, use this table to match your data's type and find a category that is compatible with that datatype to ensure the function will work. Note that you may need to change your data's datatype if you wish to use it with a particular function.

	String	Numeric	DateTime	Boolean	Spatial
Conditional	X	X	X	X	X
Conversion	X	X			
DateTime	X		X		
File	X				
Finance		X			
Math		X			
Math: Bitwise		X			
Min/Max		X			
Operators	X	X	X	X	X
Spatial		X			X
Specialized	X	X	X	X	X
String	X				
Test	X	X	X	X	X

TERMINOLOGY

Blend - merging data from different sources into one dataset, such as data from different spreadsheets, databases, or other sources into one complete dataset.

Concatenate - joining one or more text strings together.

Datatype - an attribute of data which lets the computer know how to interpret that value. There are 5 main datatypes in Designer (string, numeric, DateTime, Boolean, Spatial). Datatypes can be changed for particular values.

Delimiter - a sequence of one or more characters that creates a boundary between values. Common delimiters include commas, pipes, and quotes.

Filter - filtering separates your data into two streams: True containing the data met your criteria, and False containing the data that did not meet your criteria.

Flag - flagging data is a technique used to categorize data. This is usually accomplished with a conditional statement which checks values against a set of criteria and creates a corresponding flag in another column.

Parse - parsing separates values based on delimiters. Examples include: separating keywords from phrases, separating numbers from letters, or area codes from phone numbers.

Sort - ranking items in ascending or descending order.

Type	Description	Example
String	Fixed Length Latin-1 String. The length should be at least as large as the longest string you want to be contained in the field, or values are truncated. Limited to 8192 Latin-1 characters.	Any string whose length does not vary much from value to value, and only contains simple Latin-1 characters.
WString	Wide String accepts any character (Unicode.) Limited to 8192 characters.	Any string whose length does not vary much from value to value and contains any character.

V_String	Variable Length. The length of the field adjusts to accommodate the entire string within the field.	Any string whose length varies from value to value, and only contains simple Latin-1 characters.
V_WString	Variable Length Wide String. The length of the field adjusts to accommodate the entire string within the field and will accept any character.	Any string whose length varies from value to value and contains any character.

Numeric Data

There are several different numeric data types including integers, decimals, floats, and doubles. With the exception of the Fixed Decimal type, numeric data types are not adjustable in length.

Type	Description	Example
Byte	A unit of data that is 8 binary digits (bits) long. A byte field is a positive whole number that falls within the range 0 thru 255, or 2^8	0, 1, 2, 3....253, 254, 255
Int16	A numeric value without a decimal equal to 2 bytes, or $-(2^{15})$ to $(2^{15})-1$	–32,768 to 32,767
Int32	A numeric value without a decimal equal	–2,147,483,648 to 2,147,483,647

	to 4 bytes, or -(2^{31}) to (2^{31})-1	
Int64	A numeric value without a decimal equal to 8 bytes, or -(2^{63}) to (2^{63})-1	–9,223,372,036,854,775,808 to 9,223,372,036,854,775,807

Fixed Decimal	**A numeric value with a decimal.**	**A value of 1234.567 with a length of 7.2 results in 1234.57**
	The length (precision) of a fixed decimal is equal to the width of the integer (left side of decimal) plus the decimal point plus the width of the scale (right side of decimal). If a number is negative, the negative sign is also included in the length.	**A value of 1234.567 with a length of 7.3 results in a field conversion error and Null output, as the value does not fit within the specified precision.**
		A value of 1234.567 with a length of 6.1 results in 1234.6
		A value of 1234.567 with a length of 8.3 results in 1234.567
	Alteryx defaults a Fixed Decimal to 19.6. The maximum precision is 50, inclusive of the decimal point and negative sign (if applicable).	**A value of -1234.567 with a length of 8.3 results in a field conversion error and Null output, as the value does not fit within the specified precision.**
		A value of 1234.567 with a length of 11.6 results in 1234.567000
	A Fixed Decimal is the only numeric data type with an adjustable length.	**A value of 12222222222222222222222222222222222.00000**

	when converted to Double results in 1.22222222222222e+34
Be careful when using Fixed Decimal in the Formula tool and when converting Fixed Decimal to Float or Double. In Formula, Fixed Decimal is implicitly converted into Double. The maximum precision for the Double data type is 15 digits and for Float 7 digits. If you are converting Fixed Decimal, you need to expect to lose all the data that couldn't fit into the type you are converting to.	**A value of 1.983274187638715245 when converted to Double results in 1.98327418763872**

Float	**A standard single-precision floating-point value. It uses 4 bytes, and can represent values from +/- 3.4 x 10^{-38} to 3.4 x 10^{38} with 7 digits of precision.** **A float uses a decimal that can be placed in any position and is mainly used to save memory in large arrays of floating-point numbers.**	**+/- 3.4 x 10^{-38} to 3.4 x 10^{38} with 7 digits precision**
Double	**A standard double-precision floating-point value. It uses 8 bytes and can represent values from +/- 1.7 x 10^{-308} to 1.7 x 10^{308} with 15 digits precision.**	**+/- 1.7 x 10^{-308} to 1.7 x 10^{308} with 15 digits**

	A double uses a decimal that can be placed in any position. A double uses twice as many bits as a float and is generally used as the default data type for decimal values.

DateTime Data

Type	Description	Example

Date	**A 10 character String in "yyyy-mm-dd" format.**	**December 2, 2005 = 2005-12-02**
Time	**An 8 character String in "hh:mm:ss" format.**	**2:47 and 53 seconds a.m. = 02:47:53**
		2:47 and 53 seconds p.m. = 14:47:53
DateTime	**A 19 character String in "yyyy-mm-dd hh:mm:ss" format.**	**2005-12-02 14:47:53**

Date, Time, and DateTime data types can be treated as strings when using functions in a tool with an expression editor. Refer to the Date/Time Data table above for descriptions and examples.

Boolean Data

Type	Description	Example
Bool	An expression with only two possible values: True or False.	The words 'True' and 'False' display in the results where 'False' = 0 and 'True' = non-zero.

Spatial Objects

Type	Description	Example

SpatialObj	The spatial object associated with a data record. A table can contain multiple spatial object fields.	A spatial object can consist of a point, line, polyline, or polygon.

TOOLS:

Select Tool:

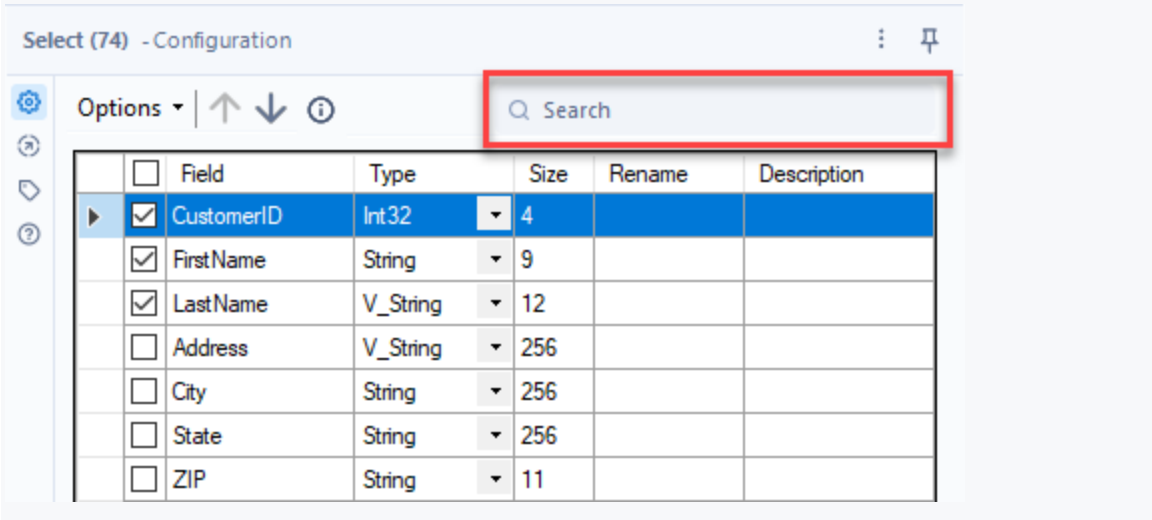
Configure the Tool

Use the table in the Configuration window to modify the incoming data stream. Each row in the table represents a column (field) in your data. The Field column in the table identifies the name of each column in the data and auto-sizes to fit column names without cutting off any text (up to 40 characters).

Search Fields

Before you start updating your fields (columns), you might want to limit your list so that you can perform updates on only a subset of the fields. This is also really helpful if your dataset contains many fields.

To do this, you can use the Search box at the top of the Configuration window. Enter a keyword and the Select tool searches the Field, Rename, and Description columns to return matches. *The search is not case-sensitive.*



You can then perform various actions (like select, deselect, rename, etc.) on only the fields that were returned via your search. Think of the Search box as a way to filter your list of fields so that you can update only a subset of your data columns.

To view your entire list of fields again, use the "x" icon to clear out the Search box.

After you perform a search, only a subset of your data fields (columns) display. Note that depending on what action you chose in the Options menu...

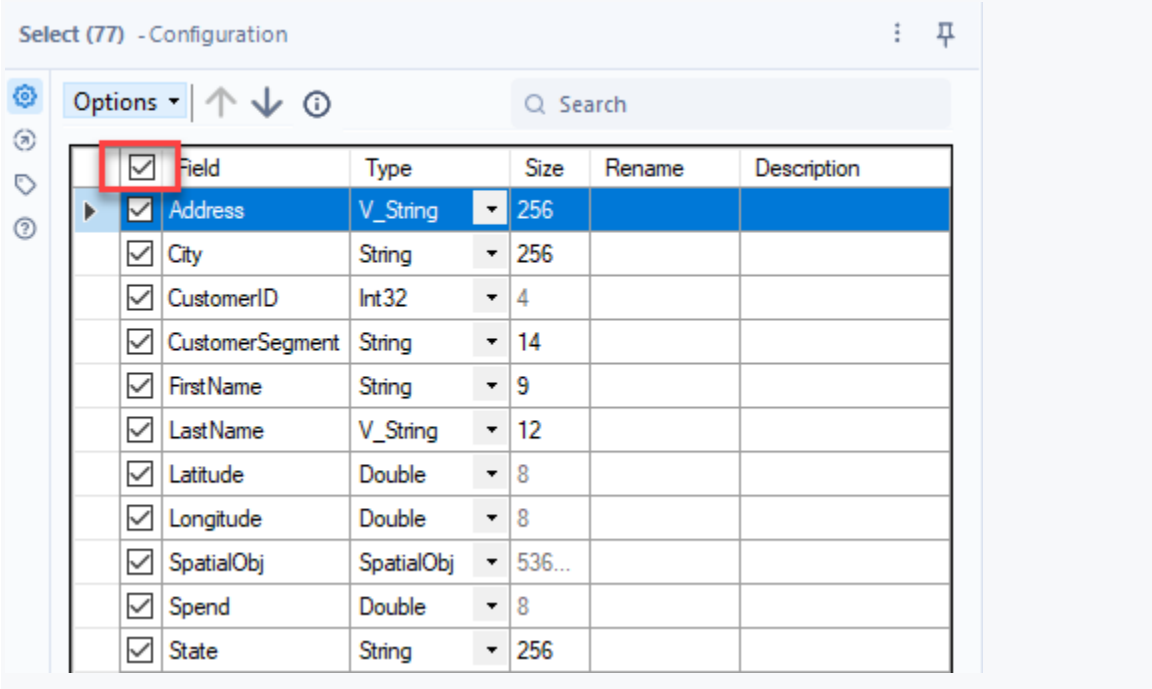
- Some actions might apply to only fields shown.
- Some actions might apply to all fields, regardless of which ones are shown
- Some actions might only apply to the specific fields that are selected (highlighted) in the list of fields.

Because of this, please use caution when you perform actions on a subset of fields and double-check the results to make sure they are what you're expecting.

Select, Deselect, Sort, and Reorder Columns

Select and Deselect Fields/Columns

To include a column in the dataset, check the box to the left of the column name. Uncheck the box to exclude the column. You can also use the select and deselect all check box at the top of the table to quickly select and deselect all visible fields.



Sort Columns

To sort the columns of data based on the column name...

- Click on the column name to sort in ascending order.
- Click on the column name a second time to sort in descending order.

Sort Method

Depending on the language of your Designer instance, a different default sort order might be used. Consult the Localization User Settings to read more about the default Sort Method.

Reorder Columns

To reorder the columns of data...

- Select to highlight a row, or select and drag to highlight multiple rows.
- Use the Move Up or Move Down arrows, or right-click and drag, to move the rows to a new location.

The Unknown column is selected by default. It allows new columns in the data. Move the column to the location where you want a new column to be.

Modify Data Type and Size

Data Type

Use the Type dropdown to change the data type of a column in your dataset.

Data Size

To change the supported length (characters for string and numeric fixed decimal types) or measurement (bytes for other numeric types) of data in a column, select Size and enter a number. Size varies by data type and you can edit it for fixed decimal numeric types and all string types.

Use the [data type]: Forced option to ensure a column always contains the expected data type. This is helpful when you create macros.

Rename a Column or Add a Description

- To change the name of a column, select the Rename field and enter the new name.
- To add a description, select the Description field and enter a description.

View More Options

After you select or highlight rows (columns of data) in the table, select the Options dropdown above the table to view more configuration options:

- Save/Load: Save Field Configuration as a YXFT file. The Alteryx Field Type File is a text file that can be used in other workflows using the Load Field Names or Load Field Names & Types options.

- **Select: Select or deselect all or highlight columns. Options include Select All and Deselect All.**
- **Change Field Type of Highlighted Fields: Change the data type of all highlighted columns at once.**
- **Sort: Sort the column order in ascending or descending order. Options include Sort on Original Field Name, Sort on New Field Name, and Sort on Field Type, or Revert to Incoming Field Order. Depending on the language of your Designer instance, a different default sort order might be used. Consult the Localization User Settings to read more about the default Sort Method.**
- **Move: Move highlighted columns to the top or bottom of the list.**
- **Add Prefix to Field Names: Add a prefix to the selected or highlighted column name.**
- **Add Suffix to Field Names: Add a suffix to the selected or highlighted column name.**
- **Remove Prefix or Suffix: Remove the prefix or suffix from the selected or highlighted column name.**
- **Clear All Renames: Remove the new name for all columns.**
- **Clear Highlighted Renames: Remove the new name for all highlighted columns.**
- **Revert All to Original Type & Size: Undo all changes to type and size in all columns and use the original values.**
- **Revert Highlighted to Original Type & Size: Undo changes to type and size in the selected or highlighted columns and use the original values.**
- **Forget All Missing Fields: Remove all columns that are no longer included in the data.**
- **Forget Highlighted Missing Fields: Remove all highlighted columns that are no longer included in the data.**
- **Deselect Duplicate Fields: Deselect the second column when duplicate column names exist. This option is only available with multiple inputs.**
- **Use commas as decimal separators: For string and numeric data type conversions only, select this option to use commas as decimal separators instead of periods. For example:**
    - **1776,45 read as a String data type and converted to a Double outputs 1776.45 with this option selected.**
    - **1776.45 read as a Double data type and converted to a String outputs 1776,45 with this option selected.**

APPEND FIELD TOOL:

Use Append Fields to append the fields of one small input (Source) to every record of another larger input (Target). The result is a Cartesian join. In a Cartesian join, every row from one table is joined to every row of another table. For example, if table A has 100 rows, and table B has 1,000 rows, the Cartesian join of these two tables results in 100,000 rows.

Connect Inputs

The Append Fields tool accepts 2 inputs:

- **T anchor (Target): The larger data stream that records are appended to.**
- **S anchor (Source): The smaller data stream that provides the records that are added to the Target stream.**

For example, Target (T) input contains 16 records with 5 data fields, and Source (S) contains 5 records with 3 fields. The output generated from the Append Fields contains 80 records with 8 fields.

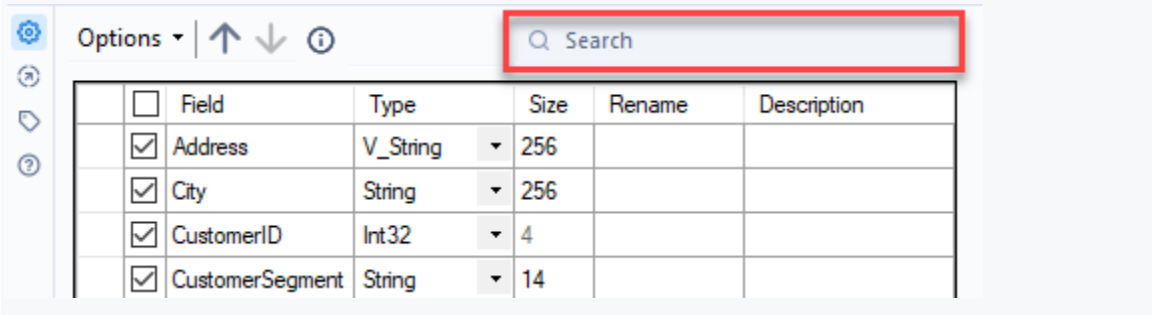
Configure the Tool

Use the table in the Configuration window to modify the incoming data stream. Each row in the table represents a column in your data. The Field column in the table identifies the name of each column in the data and auto-sizes to fit column (field) names without cutting off any text (up to 40 characters).

Search Fields

Before you start updating your fields (columns), you might want to limit your list so that you can perform updates on only a subset of the fields. This is also really helpful if your dataset contains many fields.

To do this, you can use the Search box at the top of the Configuration window. Enter a keyword and the Append Fields tool searches the Field, Rename, and Description columns to return matches. *The search is not case-sensitive.*



You can then perform various actions (like select, deselect, rename, etc.) on only the fields that were returned via your search. Think of the Search box as a way to filter your list of fields so that you can update only a subset of your data columns.

To view your entire list of fields again, use the "x" icon to clear out the Search box.

After you perform a search, only a subset of your data fields (columns) display. Please note that depending on what action you chose in the Options menu...

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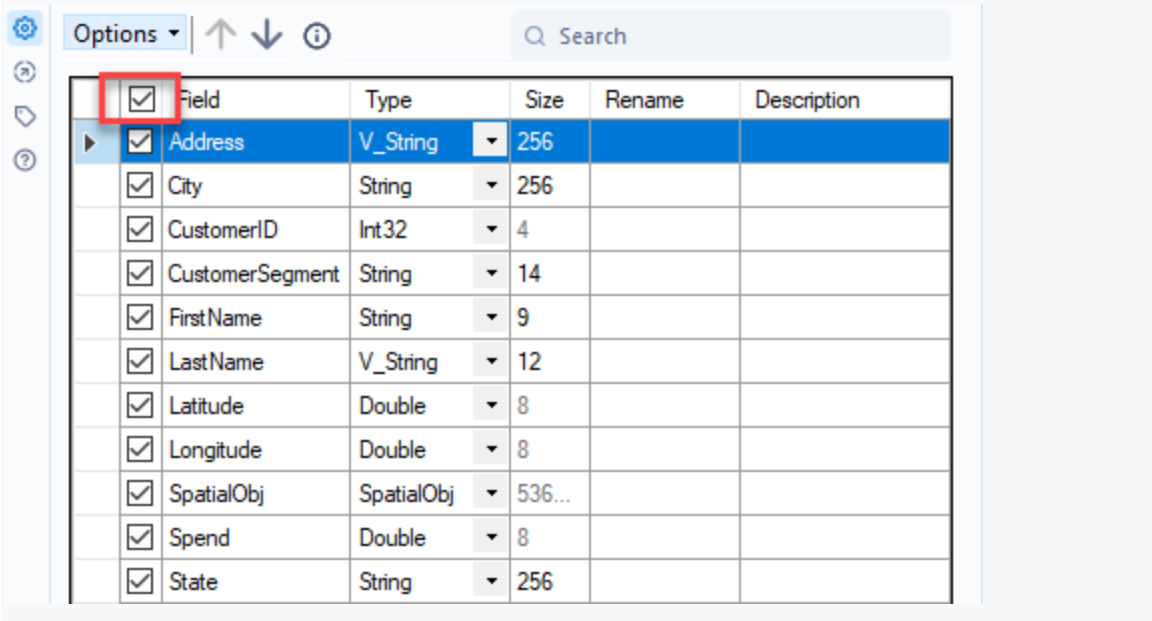
Because of this, please use caution when you perform actions on a subset of fields and double-check the results to make sure they are what you're expecting.

Select, Deselect, Sort, and Reorder Columns

Select and Deselect Fields/Columns

To include a column in the dataset, check the check box to the left of the column name. Uncheck the check box to exclude the column. You can also use the select and deselect all check box at the top of the table to quickly select and deselect all visible fields.



Sort Columns

To sort the columns of data based on the column name...

- **Click on the column name to sort in ascending order.**
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Sort Method

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Reorder Columns

To reorder the columns of data...

- **Select to highlight a row, or select and drag to highlight multiple rows.**
- **Use the Move Up or Move Down arrows, or right-click and drag, to move the rows to a new location.**

The Unknown column is selected by default. It allows new columns in the data. Move the column to the location where you want a new column to be.

Modify Data Type and Size

Data Type

Use the Type dropdown to change the data type of a column in your dataset.

Data Size

To change the supported length (characters for string and numeric fixed decimal types) or measurement (bytes for other numeric types) of data in a column, select Size and enter a number. Size varies by data type and you can edit it for fixed decimal numeric types and all string types.

Use the [data type]: Forced option to ensure a column always contains the expected data type. This is helpful when creating macros.

Rename a Column or Add a Description

- To change the name of a column, select the Rename field and enter the new name.
- To add a description, select the Description field and enter a description.

View More Options

After you select or highlight rows (columns of data) in the table, select the Options dropdown above the table to view more configuration options:

- Save/Load: Save Field Configuration as a .yxft file. The Alteryx Field Type File is a text file that can be used in other workflows using the Load Field Names or Load Field Names & Types options.
- Select: Select or deselect all or highlight columns. Options include Select All and Deselect All.
- Change Field Type of Highlighted Fields: Change the data type of all highlighted columns at once.
- Sort: Sort the column order in ascending or descending order. Options include Sort on Original Field Name, Sort on New Field Name, and Sort on Field Type, or Revert to Incoming Field Order. Depending on the language of

your Designer instance, a different default sort order might be used. Consult the Localization User Settings to read more about the default Sort Method.

- Move: Move highlighted columns to the top or bottom of the list.
- Add Prefix to Field Names: Add a prefix to the selected or highlighted column name.
- Add Suffix to Field Names: Add a suffix to the selected or highlighted column name.
- Remove Prefix or Suffix: Remove the prefix or suffix from the selected or highlighted column name.
- Clear All Renames: Remove the new name for all columns.
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- Forget All Missing Fields: Remove all columns that are no longer included in the data.
- Forget Highlighted Missing Fields: Remove all highlighted columns that are no longer included in the data.
- Deselect Duplicate Fields: Deselect the second column when duplicate column names exist. This option is only available with multiple inputs.

Warn/Error on Too Many Records Being Generated

Since the Append Fields tool performs a Cartesian join, you can unintentionally produce an excessive amount of records. You can configure warnings or errors to be reported to ensure that too many records are not produced.

- Allow All Appends: All records will be appended to all records with no error or warning.
- Warn on appends of more than 16 Records: If more than 16 records are in the Source file (S input) a warning is reported and the workflow continues processing.
- Error on appends of more than 16 Records: If more than 16 records are in the Source file (S input) an error is reported and the workflow stops processing.

JOIN TOOL:

Use Join to combine 2 inputs based on common fields between the 2 tables. You can also Join 2 data streams based on record position.

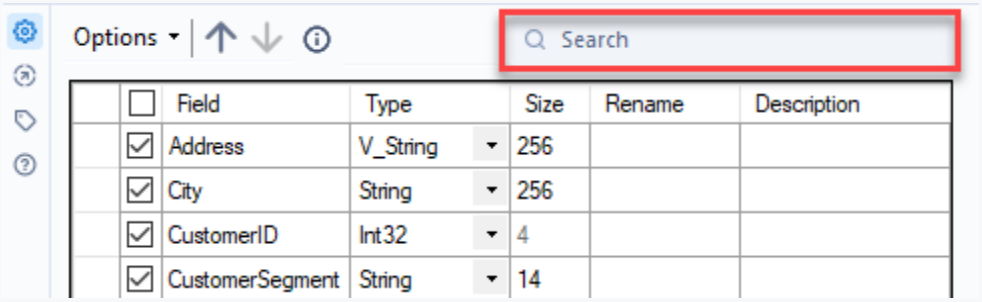
Configure the Tool

1. Select how to perform the Join. The 2 options are: by record position or by a specific field (column).
    - Join by Record Position: Select this option when the two tables to be joined have the same field structure, and the data will be joined by its position within the two tables.
    - Join by Specific Field: Select this option when the two tables have one or more fields in common (like an ID) and the data will be joined together. You can choose to Join based on multiple fields. Each Join should be a separate row in the grid.
2. **Potential Error Message**
   The Join tool restricts what field types can be joined together. The error messages might result stating Joins on Double or Float are not recommended due to a rounding error that might occur.
    - String fields can only be joined to other string fields.
    - Numeric fields can only be joined to other numeric fields.
    - Boolean fields can only be joined to other boolean fields.
    - DateTime field types can only be joined to their exact type.
    - Spatial fields cannot be joined, use the **Spatial Match tool** instead.
    - Blob fields cannot be joined to any other type.
3. Each Input (Left and Right) has a dropdown list where you can select fields (columns). Select the join field for each input. Alteryx Designer automatically selects a join field from an input if the same field name was already selected from a different input. If you need multiple join fields, you can configure an additional row of join fields.
    - Select the dropdown to choose an additional join field, per input.
    - To delete a join field, select a number on the left-hand side and select the Delete button.
4. Use the table in the Configuration window to modify the incoming data stream. Each row in the table represents a column in your data. The Field column in the table identifies the name of each column in the data and auto-sizes to fit column (field) names without cutting off any text (up to 40 characters).

Search Fields

Before you start updating your fields (columns), you might want to limit your list so that you can perform updates on only a subset of the fields. This is also really helpful if your dataset contains many fields.

To do this, you can use the Search box at the top of the Configuration window. Enter a keyword and the Join tool searches the Field, Rename, and Description columns to return matches. *The search is not case-sensitive.*



You can then perform various actions (like select, deselect, rename, etc.) on only the fields that were returned via your search. Think of the Search box as a way to filter your list of fields so that you can update only a subset of your data columns.

To view your entire list of fields again, use the "x" icon to clear out the Search box.

After you perform a search, only a subset of your data fields (columns) display. Please note that depending on what action you chose in the Options menu...

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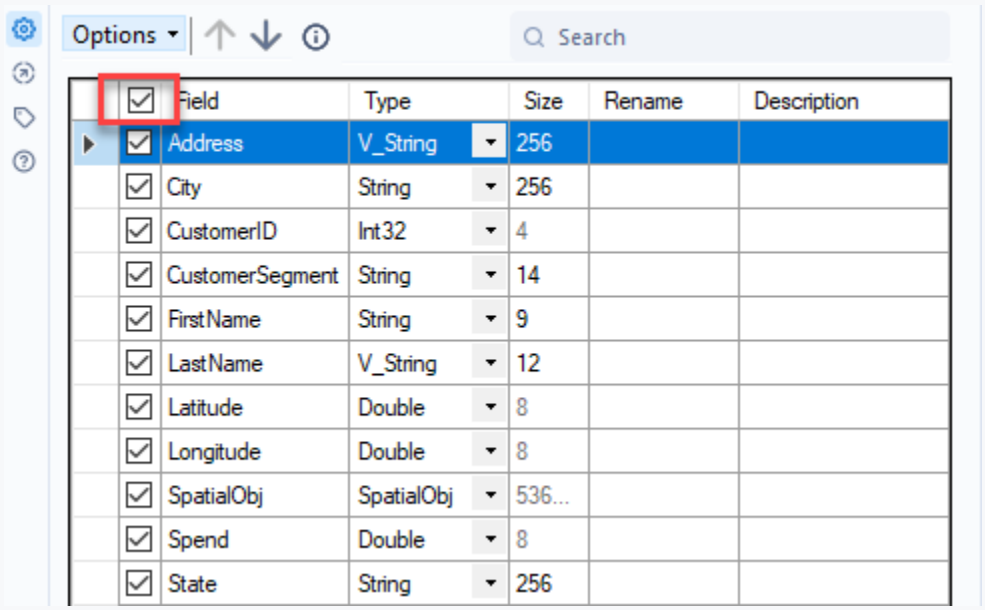
Select, Deselect, Sort, and Reorder Columns

Select and Deselect Fields/Columns

To include a column in the dataset, check the check box to the left of the column name. Uncheck the check box to exclude the column. You can also use the select and deselect all check box at the top of the table to quickly select and deselect all visible fields.



Sort Columns

To sort the columns of data based on the column name...

- Click on the column name to sort in ascending order.
- Click on the column name a second time to sort in descending order.

Sort Method

Depending on the language of your Designer instance, a different default sort order might be used. Consult the **Localization User Settings** to read more about the default Sort Method.

Reorder Columns

To reorder the columns of data...

- Select to highlight a row, or select and drag to highlight multiple rows.
- Use the Move Up or Move Down arrows, or right-click and drag, to move the rows to a new location.

The Unknown column is selected by default. It allows new columns in the data. Move the column to the location where you want a new column to be.

Modify Data Type and Size

Data Type

Use the Type dropdown to change the data type of a column in your dataset.

Data Size

To change the supported length (characters for string and numeric fixed decimal types) or measurement (bytes for other numeric types) of data in a column, select Size and enter a number. Size varies by **data type** and you can edit it for fixed decimal numeric types and all string types.

Use the [data type]: Forced option to ensure a column always contains the expected data type. This is helpful when creating **macros**.

Rename a Column or Add a Description

- To change the name of a column, select the Rename field and enter the new name.
- To add a description, select the Description field and enter a description.

View More Options

After you select or highlight rows (columns of data) in the table, select the Options dropdown above the table to view more configuration options:

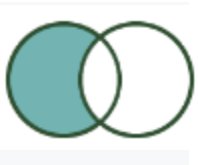
- Save/Load: Save Field Configuration as a .yxft file. The Alteryx Field Type File is a text file that can be used in other workflows using the Load Field Names or Load Field Names & Types options.
- Select: Select or deselect all or highlight columns. Options include Select All and Deselect All.

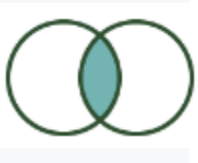
- Change Field Type of Highlighted Fields: Change the data type of all highlighted columns at once.
- Sort: Sort the column order in ascending or descending order. Options include Sort on Original Field Name, Sort on New Field Name, and Sort on Field Type, or Revert to Incoming Field Order. Depending on the language of your Designer instance, a different default sort order might be used. Consult the **Localization User Settings** to read more about the default Sort Method.
- Move: Move highlighted columns to the top or bottom of the list.
- Add Prefix to Field Names: Add a prefix to the selected or highlighted column name.
- Add Suffix to Field Names: Add a suffix to the selected or highlighted column name.
- Remove Prefix or Suffix: Remove the prefix or suffix from the selected or highlighted column name.
- Clear All Renames: Remove the new name for all columns.
- Clear Highlighted Renames: Remove the new name for all highlighted columns.
- Revert All to Original Type & Size: Undo all changes to type and size in all columns and use the original values.
- Revert Highlighted to Original Type & Size: Undo changes to type and size in the selected or highlighted columns and use the original values.
- Forget All Missing Fields: Remove all columns that are no longer included in the data.
- Forget Highlighted Missing Fields: Remove all highlighted columns that are no longer included in the data.
- Deselect Duplicate Fields: Deselect the second column when duplicate column names exist. This option is only available with multiple inputs.

View the Output

The 3 outputs that result from the join are...

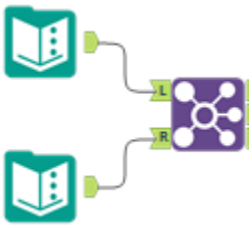
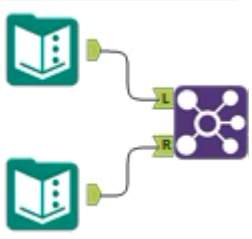
L anchor	Contains records from the L input that didn't join to records from the R input.



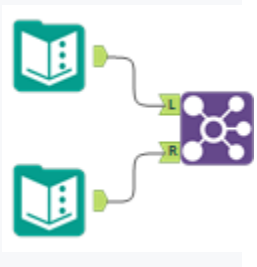
J anchor	Contains records that joined from the L input to the records in the R input.	
R anchor	Contains records from the R input that didn't join to records from the L input.	

Additional Types of Joins

Reference this table to use the Join tool to execute different types of joins.

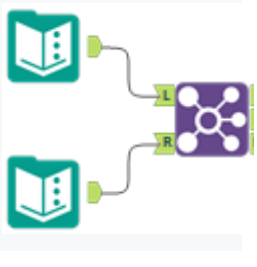
Inner Join: Contains records that joined from the L input to records in the R input.		 The J output of the Join tool contains the result of an Inner Join.
Left Unjoined: Contains records from the L input that didn't join to records from the R input.		 The L output of the Join tool contains the result of a Left Unjoined.

Right Unjoined: Contains records from the R input that didn't join to records from the L input.



The R output of the Join tool contains the result of a Right Unjoined.

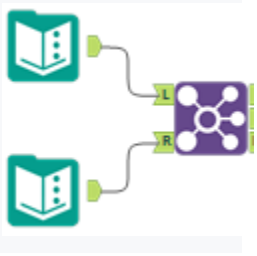
Left Outer Join: All records from the L input, including the records that joined with the R input.



To do a Left Outer Join, connect the J and L outputs of the Join tool to the Union tool.

Connect the J output first to establish the combined table schema.

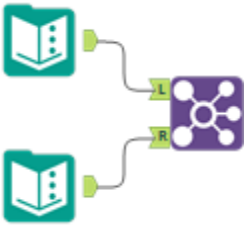
Right Outer Join: All records from the R input including the records that joined with the L input.



To do a Right Outer Join, connect the J and R outputs of the Join tool to the Union tool.

Connect the J output first to establish the combined table schema.

Full Outer Join: All of the records from both L and R inputs.



To do a Full Outer Join, connect the J, L, and R outputs of the Join tool to the Union tool.

Connect the J output first to establish the combined table schema.

JOIN MULTIPLE TOOL:

Use Join Multiple to combine 2 or more inputs based on a commonality between the input tables. By default, the tool outputs a full outer join. Visit Join Tool for more information.

Configure the Tool

1. **Select how to perform the Join.**
    - **Join by Record Position: Select this option when the input tables to be joined have the same field structure, and the data is joined by its position within the 2 tables.**
    - **Join by Specific Fields: Select this option when the input tables have one or more fields in common (like an ID) and the data is joined based on the shared field.**
        - **Select the field to join on for each input via the provided dropdowns. Designer automatically selects the join field for an input if the same field name is already selected for another input.**
        - **If you want multiple join fields, you can configure an additional row of join fields. Select the dropdown to choose an additional join field per input.**

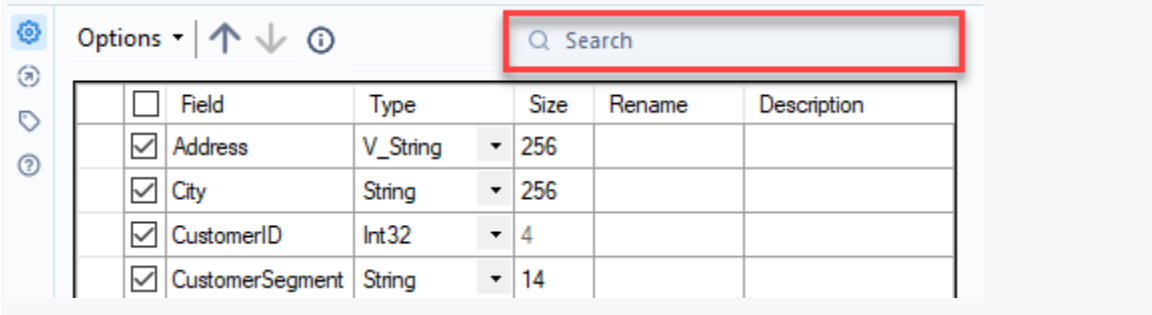
- To delete a join field, select the field to remove and select the delete button (minus icon) on the right.
- Cartesian Joins: Choose how you want to handle Cartesian joins. Cartesian joins occur when every row of one table is joined to every row of another table. For example, if table A has 100 rows and is joined with table B, which has 1,000 rows, a Cartesian join results in 100,000 rows. These joins are CPU intensive.
    - Allow All multidimensional Joins: The multidimensional join will occur with no error or warning reported.
    - Warn on multidimensional joins of more than 16 Records: A warning is reported in the Results window that a multidimensional join has occurred.
    - Error on multidimensional joins of more than 16 Records: An error is reported in the Results window that a multidimensional join has occurred and downstream processing stops.

2. Only Output Records that Join from All Inputs: Select this box to only allow records that meet all Join criteria to be passed. When unselected, all records are returned including NULL field values where records did not meet Join criteria.
3. Use the table in the Configuration window to modify the incoming data stream. Each row in the table represents a column in your data. The Field column in the table identifies the name of each column in the data and auto-sizes to fit column (field) names without cutting off any text (up to 40 characters).

Search Fields

Before you start updating your fields (columns), you might want to limit your list so that you can perform updates on only a subset of the fields. This is also really beneficial if your dataset contains many fields.

To do this, you can use the Search box at the top of the Configuration window. Enter a keyword and the Join Multiple tool searches the Field, Rename, and Description columns to return matches. *The search is not case-sensitive.*



You can then perform various actions (like select, deselect, rename, etc.) on only the fields that were returned via your search. Think of the Search box as a way to filter your list of fields so that you can update only a subset of your data columns.

To view your entire list of fields again, use the "x" icon to clear out the Search box.

After you perform a search, only a subset of your data fields (columns) display. Please note that depending on what action you chose in the Options menu...

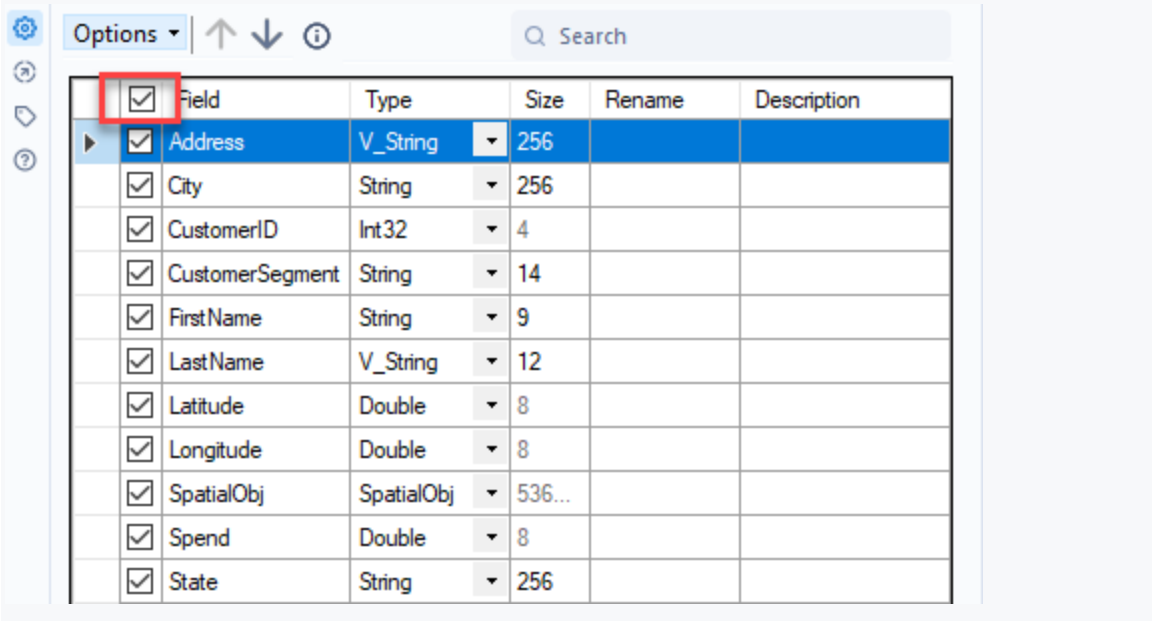
- Some actions might apply to only fields shown.
- Some actions might apply to all fields, regardless of which ones are shown
- Some actions might only apply to the specific fields that are selected (highlighted) in the list of fields.

Because of this, please use caution when you perform actions on a subset of fields and double-check the results to make sure they are what you're expecting.

Select, Deselect, Sort, and Reorder Columns

Select and Deselect Fields/Columns

To include a column in the dataset, check the check box to the left of the column name. Uncheck the check box to exclude the column. You can also use the select and deselect all check box at the top of the table to quickly select and deselect all visible fields.



Sort Columns

To sort the columns of data based on the column name...

- **Click on the column name to sort in ascending order.**
- **Click on the column name a second time to sort in descending order.**

Sort Method

Depending on the language of your Designer instance, a different default sort order might be used. Consult the Localization User Settings to read more about the default Sort Method.

Reorder Columns

To reorder the columns of data...

- **Select to highlight a row, or select and drag to highlight multiple rows.**
- **Use the Move Up or Move Down arrows, or right-click and drag, to move the rows to a new location.**

The Unknown column is selected by default. It allows new columns in the data. Move the column to the location where you want a new column to be.

Modify Data Type and Size

Data Type

Use the Type dropdown to change the data type of a column in your dataset.

Data Size

To change the supported length (characters for string and numeric fixed decimal types) or measurement (bytes for other numeric types) of data in a column, select Size and enter a number. Size varies by data type and you can edit it for fixed decimal numeric types and all string types.

Use the [data type]: Forced option to ensure a column always contains the expected data type. This is helpful when creating macros.

Rename a Column or Add a Description

- To change the name of a column, select the Rename field and enter the new name.
- To add a description, select the Description field and enter a description.

View More Options

After you select or highlight rows (columns of data) in the table, select the Options dropdown above the table to view more configuration options:

- Save/Load: Save Field Configuration as a .yxft file. The Alteryx Field Type File is a text file that can be used in other workflows using the Load Field Names or Load Field Names & Types options.
- Select: Select or deselect all or highlight columns. Options include Select All and Deselect All.
- Change Field Type of Highlighted Fields: Change the data type of all highlighted columns at once.
- Sort: Sort the column order in ascending or descending order. Options include Sort on Original Field Name, Sort on New Field Name, and Sort on Field Type, or Revert to Incoming Field Order. Depending on the language of

your Designer instance, a different default sort order might be used. Consult the Localization User Settings to read more about the default Sort Method.

- Move: Move highlighted columns to the top or bottom of the list.
- Add Prefix to Field Names: Add a prefix to the selected or highlighted column name.
- Add Suffix to Field Names: Add a suffix to the selected or highlighted column name.
- Remove Prefix or Suffix: Remove the prefix or suffix from the selected or highlighted column name.
- Clear All Renames: Remove the new name for all columns.
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- Revert Highlighted to Original Type & Size: Undo changes to type and size in the selected or highlighted columns and use the original values.
- Forget All Missing Fields: Remove all columns that are no longer included in the data.
- Forget Highlighted Missing Fields: Remove all highlighted columns that are no longer included in the data.
- Deselect Duplicate Fields: Deselect the second column when duplicate column names exist. This option is only available with multiple inputs.

FIND NEAREST TOOL:

Use Find Nearest to identify the shortest distance between spatial objects in one file and the objects in a second file.

There are many use cases for this tool. For example, use the tool to find the closest store locations to consumers in the customer file (both point files), identify the

closest cell towers (point files) to LATAs (polygon files), or select congressional districts (polygon files) within 50 miles of a major thoroughfare (line file).

A Universe input connection into this tool is optional, as this file can be specified with an input path. If you are using DriveTime, visit Guzzler Drivetime Methodology for more information.

Configure the Tool

Inputs

The Find Nearest Point tool accepts 2 spatial inputs: Target (T Input) and Universe.

Select the Spatial Object Field to use for the Targets (T Input). Any object type can be chosen for the Target, but if it is not a point-type object, the centroid is used for analysis.

Specify the Universe object.

- Use Records from U Input: Select the Spatial Object field from the data going into the tool.
- Use Records from File or Database: When reading in spatial objects from a data source, make sure the data source that is being brought in has already been sorted on the spatial object. Ensure no connection is going into the U input.
    - To specify the input data source, either enter the file path location of the input or browse to the data source's location.
    - Select the Spatial Object Field from the input data source to calculate the nearest distance.

How Many Nearest Points to Find

How many nearest points to find?: Specify how many nearest Universe objects to find for each Target. The default is 1. The Find Nearest tool can return more records than selected in the “How many nearest points to find?” field if there are multiple records in Universe the same distance from the Target object.

Maximum Distance

Set the Maximum Distance and units of measure these objects can be from the Target. If Drive time is to be calculated, the user can specify the dataset they wish to use to calculate this figure. If only one dataset is installed, you will not have the option to select another dataset. You can specify the default dataset from User Settings. Go to Options > User Settings > Edit User Settings and select the Dataset Defaults tab.

Choose whether or not to Ignore 0 Distance Matches. When checked, a point never matches to itself. If you are expecting the same number of input records as output records, ensure you do not have any duplicates in your data stream.

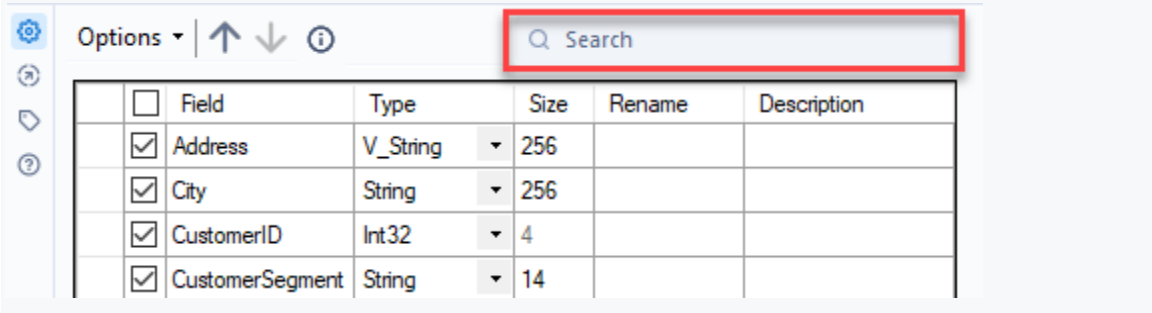
Modify Incoming Data Stream

Use the table in the Configuration window to modify the incoming data stream. Each row in the table represents a column in your data. The Field column in the table identifies the name of each column in the data and auto-sizes to fit column (field) names without cutting off any text (up to 40 characters).

Search Fields

Before you start updating your fields (columns), you might want to limit your list so that you can perform updates on only a subset of the fields. This is also really beneficial if your dataset contains many fields.

To do this, you can use the Search box at the top of the Configuration window. Enter a keyword and the Find Nearest tool searches the Field, Rename, and Description columns to return matches. *The search is not case-sensitive.*



You can then perform various actions (like select, deselect, rename, etc.) on only the fields that were returned via your search. Think of the Search box as a way to filter your list of fields so that you can update only a subset of your data columns.

To view your entire list of fields again, use the "x" icon to clear out the Search box.

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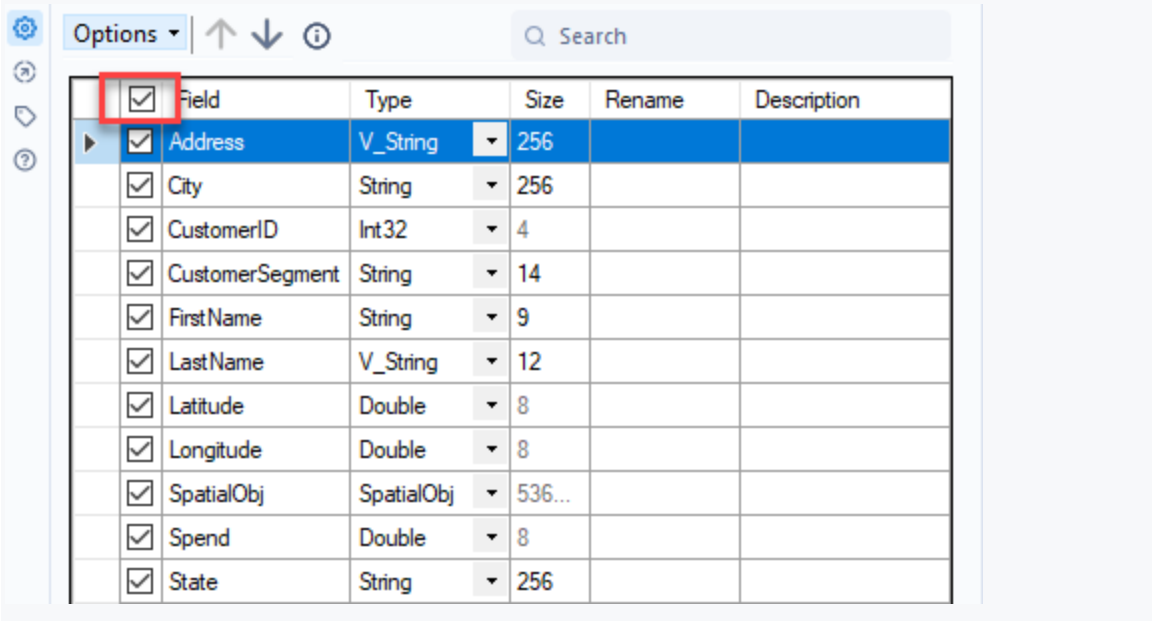

Sort Columns

To sort the columns of data based on the column name...

- **Click on the column name to sort in ascending order.**
- **Click on the column name a second time to sort in descending order.**

Sort Method

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Reorder Columns

To reorder the columns of data...

- **Select to highlight a row, or select and drag to highlight multiple rows.**
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Modify Data Type and Size

Data Type

Use the Type dropdown to change the data type of a column in your dataset.

Data Size

To change the supported length (characters for string and numeric fixed decimal types) or measurement (bytes for other numeric types) of data in a column, select Size and enter a number. Size varies by data type and you can edit it for fixed decimal numeric types and all string types.

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After you select or highlight rows (columns of data) in the table, select the Options dropdown above the table to view more configuration options:

- Save/Load: Save Field Configuration as a .yxft file. The Alteryx Field Type File is a text file that can be used in other workflows using the Load Field Names or Load Field Names & Types options.
- Select: Select or deselect all or highlight columns. Options include Select All and Deselect All.
- Change Field Type of Highlighted Fields: Change the data type of all highlighted columns at once.
- Sort: Sort the column order in ascending or descending order. Options include Sort on Original Field Name, Sort on New Field Name, and Sort on Field Type, or Revert to Incoming Field Order. Depending on the language of

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- Move: Move highlighted columns to the top or bottom of the list.
- Add Prefix to Field Names: Add a prefix to the selected or highlighted column name.
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- Remove Prefix or Suffix: Remove the prefix or suffix from the selected or highlighted column name.
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- Clear Highlighted Renames: Remove the new name for all highlighted columns.
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- Forget All Missing Fields: Remove all columns that are no longer included in the data.
- Forget Highlighted Missing Fields: Remove all highlighted columns that are no longer included in the data.
- Deselect Duplicate Fields: Deselect the second column when duplicate column names exist. This option is only available with multiple inputs.

SPATIAL MATCH TOOL:

Use Spatial Match to establish the spatial relationship (contains, intersects, touches, etc.) between two sets of spatial objects. The tool accepts a set of spatial objects from the Target Input and a set of spatial objects from the Universe Input. At least one input stream should contain Polygon type spatial objects.

For more information on the Spatial Match tool, visit Spatial Match Behavior.

Connect Inputs

A Universe (U) input connection into this tool is optional (this file can be specified via an input path), as indicated by the white input connection arrow.

For each record from the Target's data stream, the Spatial Match tool analyzes the spatial object's extents and attempts to find a record in the Universe's data stream whose spatial object's extents intersect with that of the Target's. If a matching record is found in the Universe Input, it is sent through the Matched output, and joined to the Target record. If no matching Universe Input record is found, the Target record is sent through the Unmatched output.

Configure the Tool

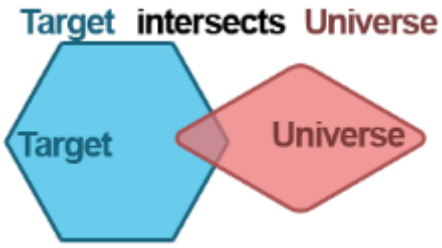
The Spatial Match tool accepts 2 spatial inputs.

1. Select the Targets (T Input) Spatial object. When working with polygons on both sides, the physically larger polygons should be on the Targets side. When working with polygons and points, the polygon should be on the Targets side.
2. Specify the Universe object:
    - Use Records from U Input: Select the Spatial Object field from the data going into the tool.
    - Use Records from File or Database: When reading in spatial objects from a data source, make sure the data source that is being brought in has already been sorted on the spatial object. Ensure no connection is going to the U input.
        - To specify the input data source, either enter the file path location of the input or select Browse to navigate to the data source's location.
        - Select the Spatial Object field from the input data source to match against. The physically smaller objects should be on the Universe side. Specifying a .yxdb file for direct import is a more efficient vehicle for running a Spatial Match. In fact, it is good practice to convert any static polygon file (such as basic geographies: States, Counties, etc.) to a pre-sorted .yxdb file. Visit Troubleshooting/FAQ.

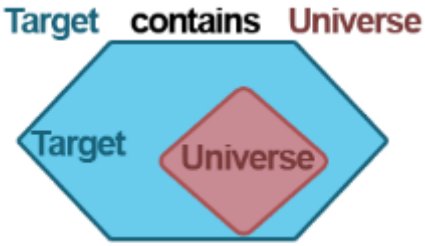
          Calgary Spatial Matches

          If specifying a Calgary (cydb) file, be aware that the Calgary spatial index uses 5 decimal places of accuracy for compression and speed. The .yxdb spatial index uses 6 decimal places. This adds an addition round-off error of up to a maximum of 1.8 feet to Calgary indexes. In other words, it is possible that a point can be 1.8 feet inside of a polygon and be found as outside in Calgary.

3. **Specify the type of Spatial Match to calculate:**
    - **Where Target Intersects Universe: Matches records where both sets of objects have any area in common.**

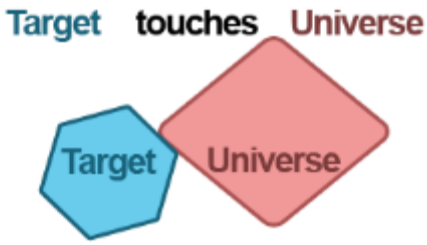


    - **Where Target Contains Universe: Matches records where Target objects contain Universe objects in their entirety.**

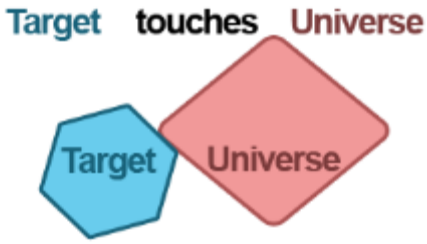


    - **Where Target Is Within Universe: Matches records where Target objects are entirely within Universe objects.**

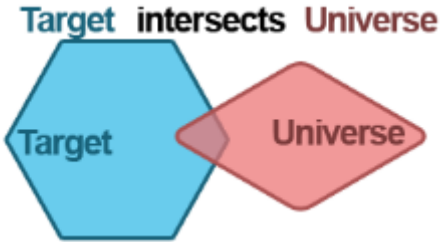
    - **Where Target Touches Universe: Matches records where Target objects touches the outside boundary of Universe objects. To qualify as touching, neither object can occupy any of the same interior space.**



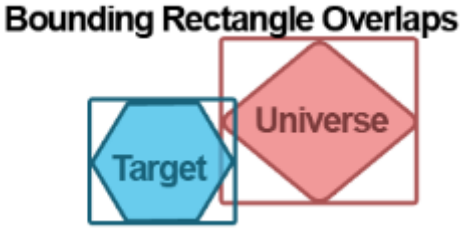
- **Where Target Touches or Intersects Universe: Matches records where Target objects either share interior space with Universe objects, or touch the boundary of Universe objects.**



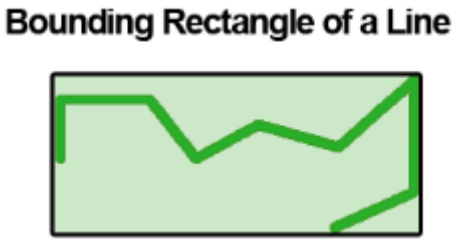
or



- **Bounding Rectangle Overlaps: Matches records where the bounding rectangles of Target objects and Universe objects share interior space.**



- **Custom DE-9IM Relation: Users must be familiar with DE-9IM relations to enter the custom value.**
  When bringing Line type objects into the Spatial Match, matching is based on the bounding rectangle only.



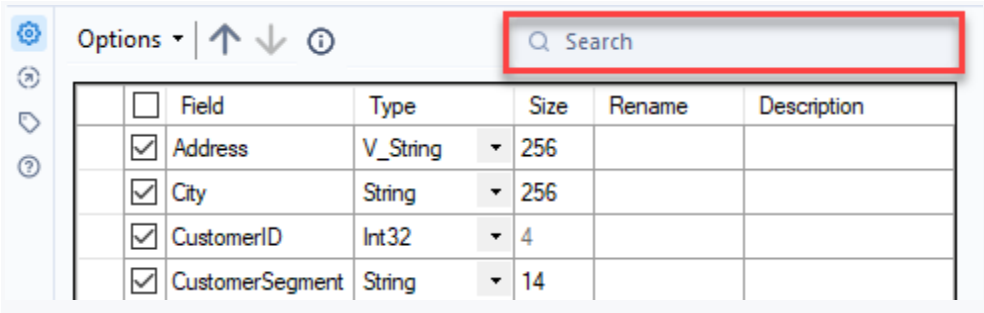
4. **Output Intersection Object (Intersects Only): When checked, the intersection polygon will be included in downstream tools. This option is only relevant when matching polygon to polygon.**

Use the table in the Configuration window to modify the incoming data stream. Each row in the table represents a column in your data. The Field column in the table identifies the name of each column in the data and auto-sizes to fit column (field) names without cutting off any text (up to 40 characters).

Search Fields

Before you start updating your fields (columns), you might want to limit your list so that you can perform updates on only a subset of the fields. This is also really beneficial if your dataset contains many fields.

To do this, you can use the Search box at the top of the Configuration window. Enter a keyword and the Spatial Match tool searches the Field, Rename, and Description columns to return matches. *The search is not case-sensitive.*



You can then perform various actions (like select, deselect, rename, etc.) on only the fields that were returned via your search. Think of the Search box as a way to filter your list of fields so that you can update only a subset of your data columns.

To view your entire list of fields again, use the "x" icon to clear out the Search box.

After you perform a search, only a subset of your data fields (columns) display. Please note that depending on what action you chose in the Options menu...

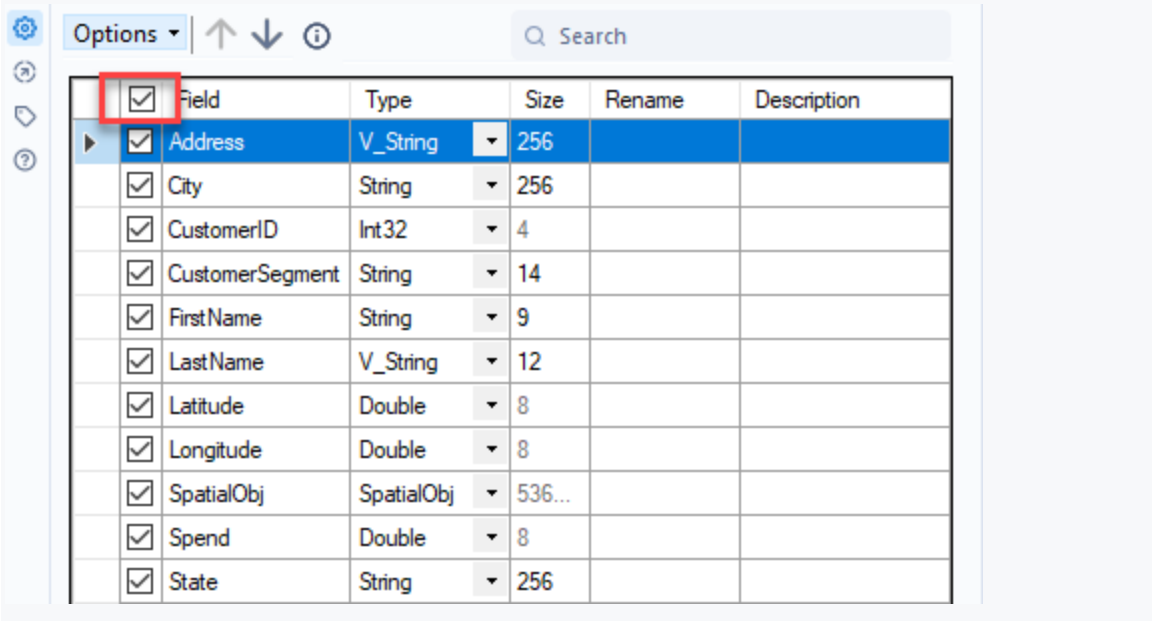
- **Some actions might apply to only fields shown.**
- **Some actions might apply to all fields, regardless of which ones are shown**
- **Some actions might only apply to the specific fields that are selected (highlighted) in the list of fields.**

Because of this, please use caution when you perform actions on a subset of fields and double-check the results to make sure they are what you're expecting.

Select, Deselect, Sort, and Reorder Columns

Select and Deselect Fields/Columns

To include a column in the dataset, check the check box to the left of the column name. Uncheck the check box to exclude the column. You can also use the select and deselect all check box at the top of the table to quickly select and deselect all visible fields.



Sort Columns

To sort the columns of data based on the column name...

- **Click on the column name to sort in ascending order.**
- **Click on the column name a second time to sort in descending order.**

Sort Method

Depending on the language of your Designer instance, a different default sort order might be used. Consult the Localization User Settings to read more about the default Sort Method.

Reorder Columns

To reorder the columns of data...

- **Select to highlight a row, or select and drag to highlight multiple rows.**
- **Use the Move Up or Move Down arrows, or right-click and drag, to move the rows to a new location.**

The Unknown column is selected by default. It allows new columns in the data. Move the column to the location where you want a new column to be.

Modify Data Type and Size

Data Type

Use the Type dropdown to change the data type of a column in your dataset.

Data Size

To change the supported length (characters for string and numeric fixed decimal types) or measurement (bytes for other numeric types) of data in a column, select Size and enter a number. Size varies by data type and you can edit it for fixed decimal numeric types and all string types.

Use the [data type]: Forced option to ensure a column always contains the expected data type. This is helpful when creating macros.

Rename a Column or Add a Description

- To change the name of a column, select the Rename field and enter the new name.
- To add a description, select the Description field and enter a description.

View More Options

After you select or highlight rows (columns of data) in the table, select the Options dropdown above the table to view more configuration options:

- Save/Load: Save Field Configuration as a .yxft file. The Alteryx Field Type File is a text file that can be used in other workflows using the Load Field Names or Load Field Names & Types options.
- Select: Select or deselect all or highlight columns. Options include Select All and Deselect All.
- Change Field Type of Highlighted Fields: Change the data type of all highlighted columns at once.
- Sort: Sort the column order in ascending or descending order. Options include Sort on Original Field Name, Sort on New Field Name, and Sort on Field Type, or Revert to Incoming Field Order. Depending on the language of

your Designer instance, a different default sort order might be used. Consult the Localization User Settings to read more about the default Sort Method.

- Move: Move highlighted columns to the top or bottom of the list.
- Add Prefix to Field Names: Add a prefix to the selected or highlighted column name.
- Add Suffix to Field Names: Add a suffix to the selected or highlighted column name.
- Remove Prefix or Suffix: Remove the prefix or suffix from the selected or highlighted column name.
- Clear All Renames: Remove the new name for all columns.
- Clear Highlighted Renames: Remove the new name for all highlighted columns.
- Revert All to Original Type & Size: Undo all changes to type and size in all columns and use the original values.
- Revert Highlighted to Original Type & Size: Undo changes to type and size in the selected or highlighted columns and use the original values.
- Forget All Missing Fields: Remove all columns that are no longer included in the data.
- Forget Highlighted Missing Fields: Remove all highlighted columns that are no longer included in the data.
- Deselect Duplicate Fields: Deselect the second column when duplicate column names exist. This option is only available with multiple inputs.

View the Output

The Spatial Match tool produces a single or double data stream with one record for each instance of a Target Input record matching a Universe Input record. The schema of the output table is formed by appending the fields from both records into one wide record.

Spatial Outputs

While using spatial tools, you might have more than one spatial object field in the data stream. When you are configuring the final output tool, you must remember that output to files such as .dbf, .xls, or .csv does not accept the spatial object fields, and that spatial files only accept one spatial object field.

Connect a Browse tool to each output anchor to view results.

- M anchors: Matched records that come from this stream are Target records whose object has a match from the Universe stream. The Universe object and selected fields are joined to the Target Record. A Target record may come out of the matched side any number of times, depending on how many Universe objects are matched.
- U anchors: Unmatched records that come from this stream are Target records whose object that had no match from the Universe stream.

BROWSE TOOL:

Use Browse to view data from a connected tool. You can see data Profile information for multiple columns at once in a single holistic view, or for a single column of data. You can view information on data type, number of records, data quality, and a variety of statistics.

When a spatial, report, or behavior analysis data type is connected, an additional tab is available in the Browse tool. This tab shows a preview of the actual object on a Map or a Report.

Tool Components

The Browse tool has 1 anchor.

Input anchor: Use the input anchor to connect to the data that you want to display via the Browse tool.

Configure the Tool

1. Add the Browse tool to your workflow. There are 3 ways to do this:
    - Drag a Browse tool to the canvas, and connect it to an upstream tool.
    - Right-click on a tool on the canvas and select Add Browse After.
    - Use the Shift+Ctrl+B keyboard shortcut and select the tools in a workflow.
2. Connect the Browse tool to the output anchor of the tool that contains the data that you want to view in detail.

Disable Browse Tools in Workflow

Without a Browse tool, the Results window displays up to 1 MB of data from a tool, by default. You can disable the Browse tool if you don't want to store the entire dataset in the memory. To disable Browse tools...

1. Select a random point on the canvas to display the Workflow - Configuration window.
2. In the configuration window, select Runtime.
3. Check Disable All Browse Tools to make the Browse tools in the workflow unavailable. To enable Browse tools, uncheck Disable All Browse Tools.

Disable Data Profiling

By default, data profiling is enabled. To disable data profiling features, go to Options > User Settings > Edit User Settings, and uncheck Collect and display data profile information.

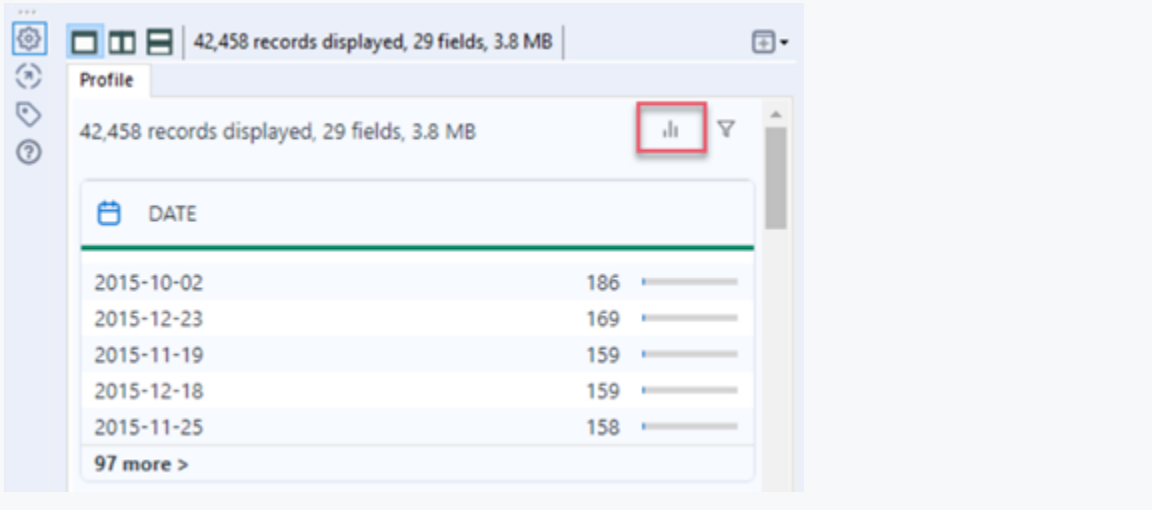
View Data Profile

After you run your workflow, select the Browse tool on the canvas to view data profiling in the tool Configuration window. You can also view data via the Results window.

Holistic View

By default, all columns (fields) of data display in a single holistic view in the Profile tab of the Browse tool Configuration window. This single view includes a container for each column of data, with the column name, a data quality bar, and a list of the column's top values (if applicable). The column's data type is indicated by an icon to the left of the column name.

Select the holistic view toggle (bar graph icon) to switch between the top values view and the data profiling chart view of the associated data.



Top Values View

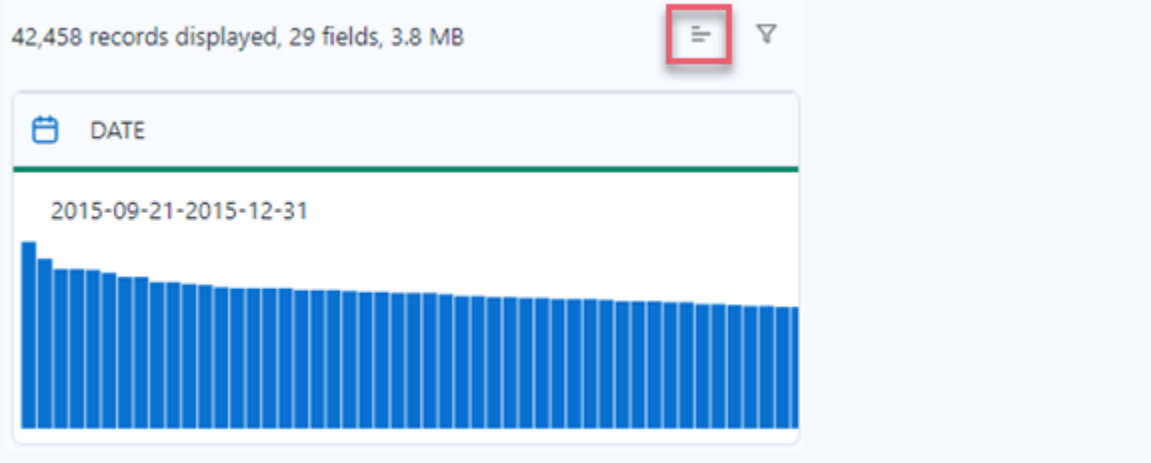
By default, the holistic view displays each compatible column's top values and a color-coded data quality bar. The top 5 values and their counts display in each column container.

- Select the more > link to view up to 1,000 distinct top values for the selected column.
- On the Distinct Values view, select the left-arrow icon to view the data profiling information for the selected column.

If the column's data type is not compatible with data profiling, the *No profiling available* message displays.

Data Profile Charts View

Select the holistic view toggle to switch from the top values view to the data profiling chart view. This view displays a chart of each compatible column's top 50 values and a color-coded data quality bar.



In addition to the chart, more information displays depending on data type:

- For columns with numeric data, a data range displays above the chart.
- For columns with string data, the top 50 values display, as well as the number of the total distinct values in that column.

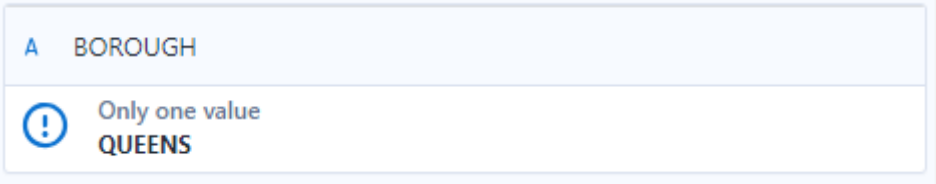
- **For columns with date, time, and date-time data, a data range displays above the chart.**

No Profiling Available

If the column's data type is not compatible with data profiling, the *No profiling available* message displays.

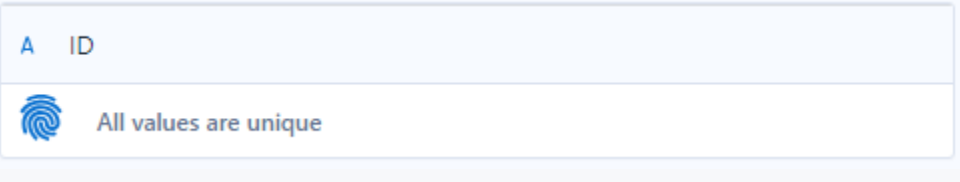
Only One Value (Data Profile Charts)

For columns that contain only one distinct value across all rows, the *Only one value* message displays.



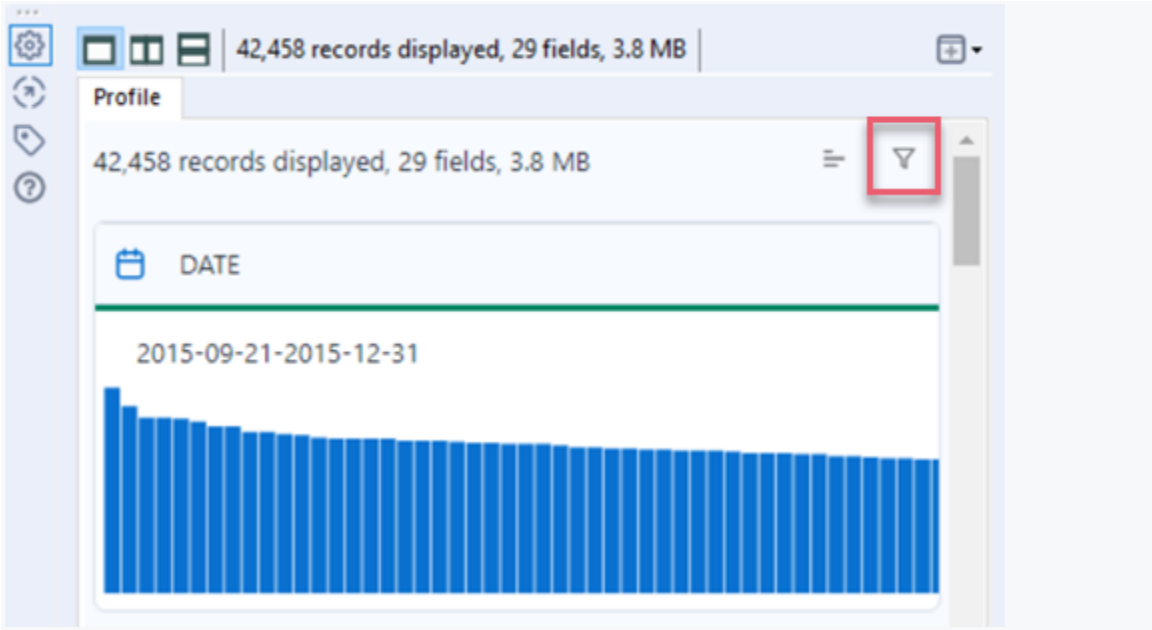
All Values Are Unique (Data Profile Charts)

For columns where each value is unique, the *All values are unique* message displays.



Filter Holistic View

Select the filter (funnel) icon to access filter options for the data profiling holistic view. These filters only apply to the holistic view. If you want to filter your dataset for downstream processing, use the Filter tool.



You can filter based on 2 categories:

- Fields: All fields (columns) in your dataset are checked by default. Uncheck fields to remove them from the holistic view.
- Data Type: All data types are checked by default. Uncheck data types to remove fields with those data types from the holistic view. Note that all possible data types are listed even if your dataset doesn't include those data types.

Any filters that you apply to the above categories are joined by an *and* statement. For example, if you decide to only check a field with a Date data type via the Fields filter and also uncheck all data types via the Data Type filter, no data shows in the holistic view.

Select the Reset Filter link to reset the holistic view to its original state. You can also deselect or click off the Browse tool on your workflow canvas to reset the filters.

Single Column View

Select a column name to view only that column's data profile in the Configuration window. To return to the holistic view, in the single column view select the "x" button next to the column name.

Depending on the column's data type, different information is available in the single-column view Configuration window.

When you select a string, numeric, boolean, or date-time data type in the holistic view, the single-column view Profile tab displays summary information, statistics, and a chart for the selected column. You can also select columns in the Results window to view data profile information specific to those columns.

Summary

When applicable, the Profile Summary section displays data Type, number of Records, and Data Type Size fields, as well as this data quality information:

- **Ok: The number and percentage of values in the column with no identified quality issues, for example, leading or trailing whitespace.**
- **Unique: The number and percentage of unique values in the column. Use the Unique tool to see a full count of unique and duplicate entries.**
- **Null: The number and percentage of values in the column that are null, excluding empty values.**
- **Not Ok: The number and percentage of values in the column with identified quality issues like leading or trailing whitespaces, or embedded newlines.**
- **Empty: For string data types, the number and percentage of values in the column that contain strings with no values. If you convert the string to a different data type, empties are converted to nulls.**

Length and Value Statistics

The statistics for the selected column display below the Summary in the Configuration window. Available statistics depend on the data type in the selected column. See Data Types for a list of data types.

The length and value statistics also include a chart for the selected column. The type of chart shown is based on the type of data you select:

- Blob: A bar chart of null and not null counts.
- Boolean: A pie chart of true, false, and null counts and percentages.
- Numeric: A distribution chart that shows counts and percentages for grouped values of a numeric field.
- Date, Time, Date-Time: A distribution chart that shows counts for values of date, time, or date-time fields.

Frequent Values

String data types display a Frequent Values chart to indicate the string values that appear most frequently in the column of data. The chart displays up to 50 values.

- If the column contains only one value across all rows, the *Only one value* message displays.
- If the column contains a unique value in each row, the *All values are unique* message displays.

Top Values

String, numeric, and date-time data types display a Top Values list to indicate the values in the column of data that have the highest counts. Select the more link to see up to 1,000 distinct top values. Select the left-arrow button to return to the column's data profile.

Grouped Values for Date-Time

Date, time, and date-time data types display a Grouped Values container with a histogram chart. The chart is configured according to these rules:

- If all values lie within a 24-hour range, an hour-based chart is shown.
- If all values lie within a 7-day range, a day-based chart is shown.
- If all values lie within a 12-week range, a week-based chart is shown.
- If all values lie within a 12-month range, a month-based chart is shown.
- If all values lie within a 12-quarter range, a quarter-based chart is shown.
- Otherwise, a year-based chart is shown.

- ## Configure the View

These options are available in the Configuration window when viewing a single column of data:

Views
Records Selected
Rename Window
New Window

Depending on the type of data you are viewing, up to four tabs might display: Profile, Map, Report, and Behavior Analysis. You can view up to 2 tabs at the same time.

Use the view icons to switch between views.

- **Single View icon: Select to view all tabs in a single window.**
- **Left/Right View icon: Select to view all tabs in the left and right halves of the window. Select different tabs in each window to compare data.**
- **Top/Bottom View icon: Select to view all tabs in the top and bottom halves of the window. Select different tabs in each window to compare data.**

Statistics

The statistics for the selected column display on the Profile tab of the Browse tool Configuration window. Available statistics depend on the data type in the selected column. See Data Types, for a list of data types.

String Data
Numeric Data
Date, Time, and Date-Time Data
Boolean Data
Spatial Data

If the selected column contains string values, these statistics are provided:

Type	Description

Type	**The data type of the selected column.**
Records	**The number of rows in the selected column.**
Data Type Size	**The amount of memory reserved for each record in this column.**
Ok	**The number and percentage of values in the column with no identified quality issues, for example, leading or trailing whitespace.**

Unique	**The number and percentage of unique values in the column. Use the Unique tool to see a full count of unique and duplicate entries. See Unique Tool.**
Null	**The number and percentage of values in the column that are null, excluding empty values.**
Not Ok	**The number and percentage of values in the column with identified quality issues like leading or trailing whitespaces, or embedded new lines.**
Empty	**The number and percentage of values in the column that**

	contain strings with no values.
Min	The number of characters in the shortest value in the column.
Max	The number of characters in the longest value in the column.
Average	The average length of values in the column.
Shortest Value	The shortest value in the column.

Longest Value	**The longest value in the column.**
First Alphanumeric Value	**The first string entry in a column that is sorted alphabetically.**
Last Alphanumeric Value	**The last string entry in a column that is sorted alphabetically.**
Blanks	**The number of empty values.**
Values with Leading	**The number of string values with whitespace before the value. Use the Data Cleansing tool or the**

Whitespace	Formula tool trim function to resolve the problem. See Data Cleansing Tool and Formula Tool.
Values with Trailing Whitespace	The number of string values with whitespace after the value.

Data Profiling Limit

Data Profiling in the Browse tool is capped at 300 MB. This allows you to process very large datasets faster. For each record in the incoming dataset, we process the record and add the record size to a counter. Once the counter reaches 300 MB, we stop processing records.

It is important to note that there is no specific number of records that we can process. This depends on the dataset since a record size can range from 1 byte to a few thousand bytes. This record size is different from the file size, displayed in the Results grid and Data Profiling Holistic View. The file size is generally different since it has been compressed to optimize spacing.

In other words, 300 MB of record size is not the same as 300 MB of file size.

Convert Browse Tool to Output Tool

Convert Browse Tool to Macro Output Tool

To convert a Browse tool to a Macro Output tool...

1. Right-click the Browse tool in your workflow.
2. Select Convert To Macro Output.
3. Configure the tool.

You can now use the Browse tool as a Macro Output tool.

Convert Browse Tool to Output Data Tool

To convert a Browse tool to an Output Data tool...

1. Right-click the Browse tool in your workflow.
2. Select Convert To Output Data.
3. Configure the tool.

You can now use the Browse tool as an Output Data tool.

DATA CLEANSING TOOL:

Use Data Cleansing to fix common data quality issues. You can replace null values, remove punctuation, modify capitalization, and more!

Known Limitations

The Data Cleansing tool is not dynamic. If used in a dynamic setting, for example, a macro intended to work with newly generated field names, the tool will not interact with the fields, even if all options are selected. Consider replacing the Data Cleansing tool with a Multi-Field Formula tool.

Visit the Alteryx Community Tool Mastery series to learn even more about this and other tools.

Tool Components

The Data Cleansing tool has 2 anchors.

- Input anchor: Use the input anchor to connect the data you want to cleanse.
- Output anchor: The output anchor outputs the cleansed data.

Configure the Tool

Use the Options tab to determine how data quality issues are managed.

Remove Null Data

Use these options to remove entire rows and columns of null data.

- Remove Null Rows
    - Remove all rows with a null value in every column.
    - Remove rows with null values—doesn't remove rows with empty string values.
    - Only remove rows that have a null value in every column.
    - A message displays in the Results window with the number of rows that were removed.
- Remove Null Columns
    - Remove all columns with a null value in every row.
    - Remove columns with null values—doesn't remove columns with empty string values.
    - Only remove columns that have a null value in every row.

    - A message displays in the Results window with the number of columns that were removed
    - **Select Fields to Cleanse**

Select the fields to cleanse with the configuration options below. Use the All link to select all fields and use the None link to deselect all fields.

String Data Types

All options, except for Replace Nulls with 0, apply to string data types. To specify different options for different fields, use multiple Data Cleansing tools in your workflow.

Replace Nulls

To replace nulls with values other than blanks or 0, use the Imputation tool.

- Replace with Blanks (String Fields): Replace null values with a blank string value. A blank registers as " " rather than [Null]. This option is selected by default.
- Replace with 0 (Numeric Fields): Replace null values with a 0 (zero). This option is selected by default.

Remove Unwanted Characters

- Leading and Trailing Whitespace: Remove leading and trailing whitespace. This option is selected by default.
- Tabs, Line Breaks, and Duplicate Whitespace: Replace any occurrence of whitespace with a single space, including line endings, tabs, multiple spaces, and other consecutive whitespaces.
- All Whitespace: Remove any occurrence of whitespace.
- Letters: Remove all letters, including non-Latin alphabet letters like A *b* Z À *é* ö.
- Numbers: Remove all numbers.

- **Punctuation: Remove these characters:**
  ! " # $ % & ' ( ) * + , \ - . / : ; < = > ? @ [/] ^ _ ` { | } ~

Modify Case

Select Modify Case and then choose an option from the dropdown to change the capitalization of string data types:

- **Upper Case: Capitalize all letters in a string.**
- **Lower Case: Convert all letters in a string to lowercase.**
- **Title Case: Capitalize the 1st letter of all words in a string.**

FORMULA TOOL:

Use Formula to create new columns, update columns, and use 1 or more expressions to perform a variety of calculations and operations. Go to Functions for a list of functions to use to create an expression.

You can use the Formula tool to...

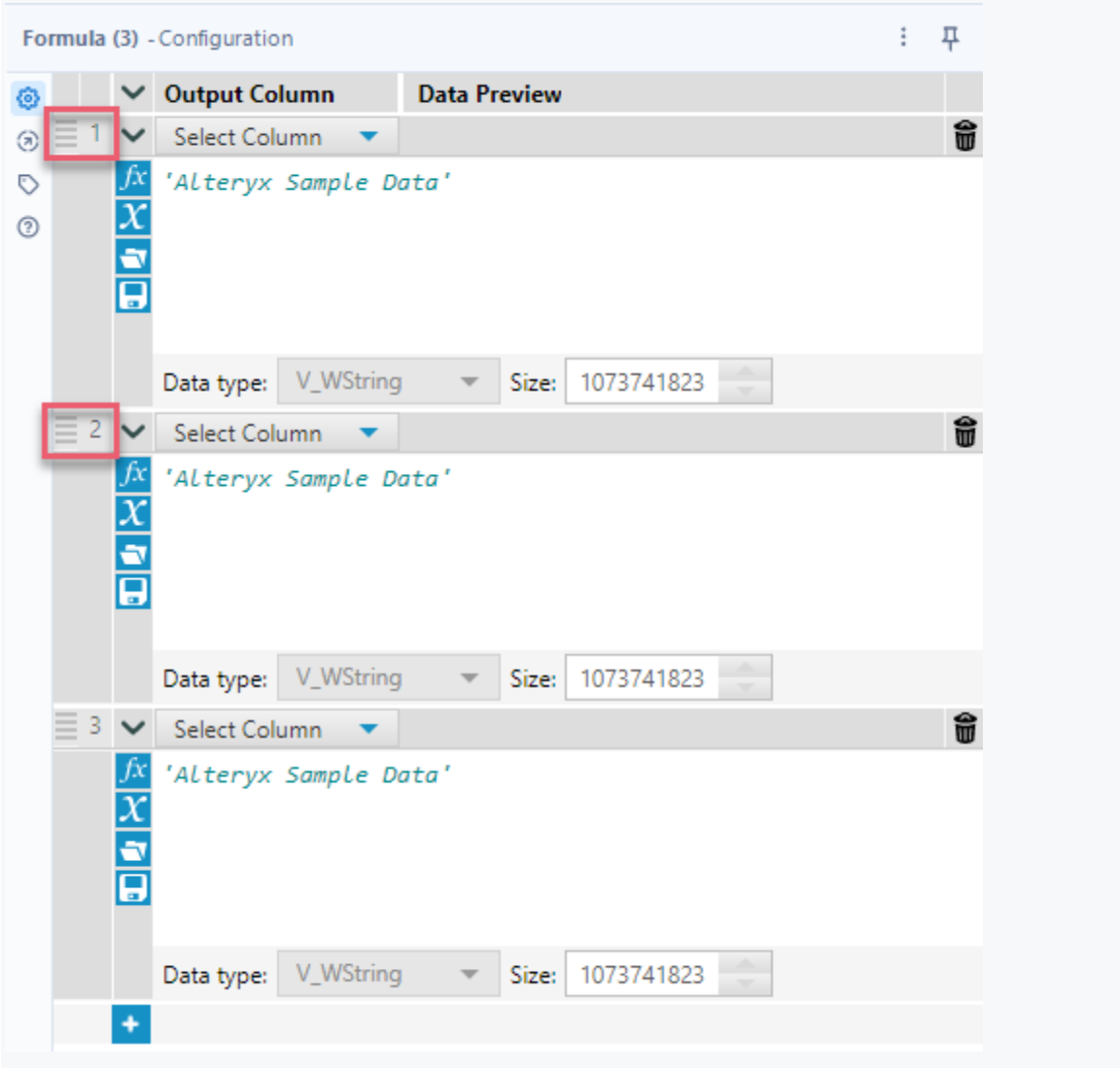
- **Apply conditional statements.**
- **Convert numbers and strings.**
- **Format dates.**
- **Extract file paths.**
- **Apply financial algorithms or mathematical calculations.**
- **Find the minimum and maximum values.**
- **Analyze spatial data.**
- **Cleanse string data.**
- **Perform validation tests on data.**

Configure the Tool

In the Configuration window, you can create multiple expressions. Alteryx assigns an expression ID number to each individual expression in the order it appears in the Configuration window (not necessarily the order it was created). For example, the 1st expression has an ID of 1, the 2nd has an ID of 2, and so on.

Note that if you rearrange your expressions, the IDs aren't rearranged alongside them. For example, if you have 3 expressions and move the 3rd expression to the top, it now has an ID of 1, whereas it previously had an ID of 3.

These IDs can assist with documenting and troubleshooting your expressions since the expression ID is referenced in the error message.



Build Expressions

To build your expression, first, specify an Output Column. The Output Column will contain the results of your expression. You can overwrite an existing column or you can create a new column. Select the Output Column dropdown and choose an existing column or select Add Column and provide a name for your new column.

To add a new column of data...

1. **Select + Add Column and enter the new column name.**
    - **Data type: Select a data type, if necessary.**
      For FixedDecimal values, there is an implicit conversion to Double in the Formula tool.
    - **Size: Select to change the size or width of the data for Fixed Decimal, String, or Spatial Object data types.**
2. **Select the expression editor to build your expression. Once the workflow runs, the Data Preview box displays the 1st row of data from the specified column with the expression applied.**

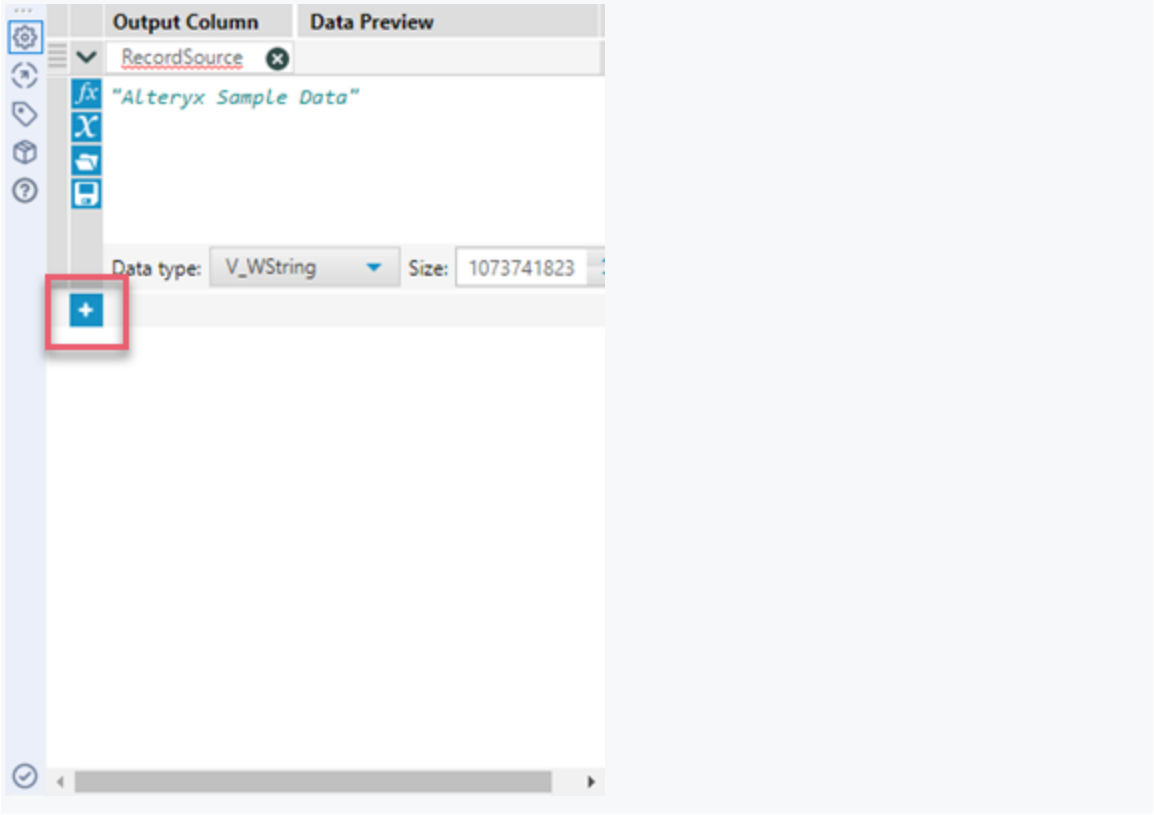
Use any of these methods to build an expression.

- **Enter text directly in the expression editor.**
- **Press Ctrl + Space to view a list of all functions.**
- **Enter a word or phrase to view a matching list of functions.**
- **Enter a [(left bracket) to view a list of variables that you can use in the expression. Variables include...**
    - **Columns: Data from an incoming connection, or from a column created in a previous expression.**
    - **Connections from Questions: Values from an Interface tool connected to the Question anchor of a tool with an expression editor, when the tool is used in an app or macro. Use the Question anchor when you want question values to be used as variables in the expression. Go to Interface Tools for more information.**
    - **Constants: Global variables for a workflow that make it possible to change a value in a single location and have that change apply to the rest of the workflow. Go to Constants for more information.**
- **Select the Functions icon ("fx") to search and browse through categories of functions. Go to Functions for more information.**
- **Select the Columns and Constants icon ("x") to search and browse through incoming or newly created columns and constants.**

    - Existing Columns: Data from an incoming connection, or from a column created in a previous expression.
    - Connections from Questions: Values from an Interface tool connected to the Question anchor of a tool with an expression editor, when the tool is used in an app or macro. Use the Question anchor when you want question values to be used as variables in the expression. Go to Interface Tools for more information.
    - Constants: Global variables for a workflow that make it possible to change a value in a single location and have that change apply to the rest of the workflow. Go to Constants for more information.
- Select the Recent and Saved Expressions icon (folder icon) to search and browse through recent and saved expressions.
- With an expression in the expression editor, select the Save Expression (disc) icon, enter a name, and select Save. Once an expression has been built, it can be saved for use at a later time.

Add Another Expression

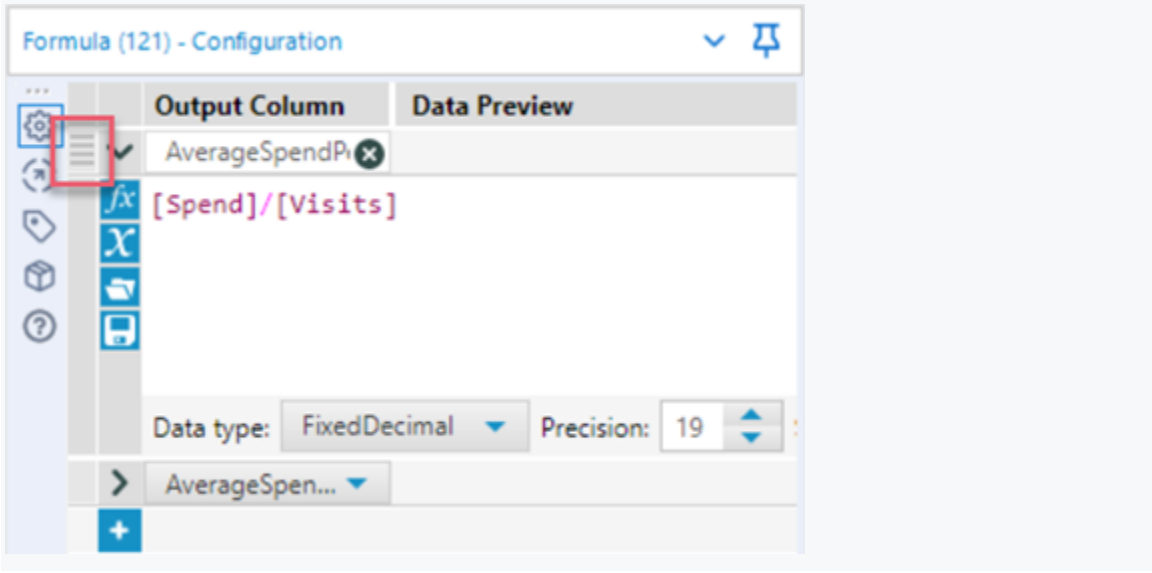
It's helpful to add multiple expressions to a single Formula tool when you modify data in related columns or perform similar operations. When you modify unrelated data or perform unrelated functions, using multiple Formula tools assists with workflow troubleshooting. To add an expression, select the "+" icon.



Reorder Expressions

The sequence in which expressions are applied affects the results when multiple expressions modify the same data. To reorder an expression, select and hold the reorder icon (to the left of the expression editor), and drag the expression up or down.

Note that when you reorder expressions, their IDs are reassigned. Alteryx assigns an expression ID number to each individual expression in the order it appears in the Configuration window.

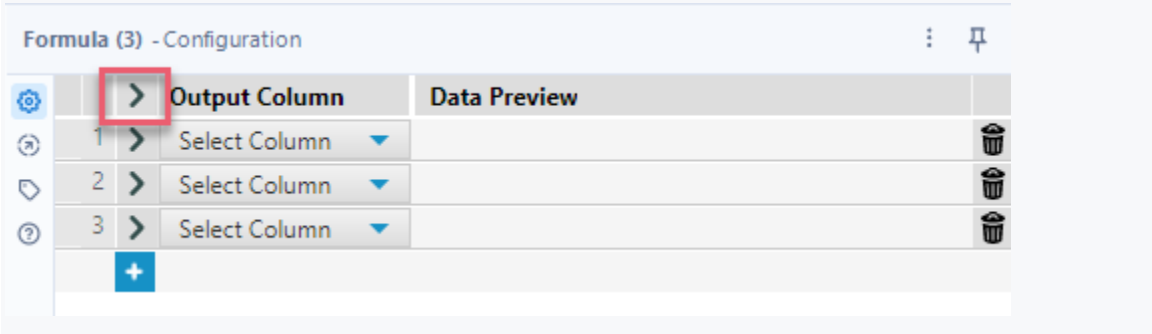


Expand and Collapse Expressions

As you work on your expressions, the Formula tool Configuration window can get a little crowded, especially if you have many individual expressions.

You can use the expand and collapse icons to show and hide individual expressions or to show and hide all expressions at once.

- **To expand and collapse a single expression, select the ">" icon associated with a specific expression ID.**
- **To expand and collapse all expressions, select the ">" icon at the top of the expression editor.**



Please note that each time you access the Formula tool Configuration window, the first expression is expanded and all subsequent expressions are collapsed.

Additional Input Anchor

Because this tool includes an expression editor, an additional input anchor displays when the tool is used in an app or macro workflow. Use the Interface tools to connect to a Question anchor.

FUNCTIONS TOOL:

Use functions to build expressions that perform a variety of calculations and operations.

Types of Functions

These function types are available to help you transform your data. The type of data determines the functions you can use. Go to Data Types for more information.

Conditional

Conditional functions allow you to perform an action or calculation using an IF statement. Learn more in the Conditional Functions article.

Conversion

Conversion functions convert numbers to strings or strings to numbers Learn more in the Conversion Functions article.

DateTime

DateTime functions allow you to perform an action or calculation on a date and time value. Learn more in the DateTime Functions article.

File

A file function builds file paths, checks to see if a file exists, or extracts a part of a file path. Learn more in the File Functions article.

Finance

A finance function applies financial algorithms or mathematical calculations. Learn more in the Finance Functions article.

Math

A math function performs mathematical calculations. Learn more in the Math Functions article.

Math: Bitwise

A bitwise function operates on one or more bit patterns or binary numerals at the level of their individual bits. Use a bitwise function to manipulate values for comparisons and calculations. Learn more in the Math: Bitwise Functions article.

Min/Max

A minimum or maximum function finds the smallest and largest value of a set of values. Learn more in the Min/Max Functions article.

Operators

An operator is a character that represents an action. Use an arithmetic operator to perform mathematical calculations or a Boolean operator to work with true/false values. Learn more in the Operators article.

Spatial

A spatial function builds spatial objects, analyzes spatial data, and returns metrics from spatial fields. Learn more in the Spatial Functions article.

Specialized

These functions perform a variety of specialized actions and can be used with all data types. Learn more in the Specialized Functions article.

String

A string function performs operations on text data. Use a string function to cleanse data, convert data to a different format or case, compute metrics about the data, or perform other manipulations. Learn more in the String Functions article.

Test

A test function performs data comparisons. Use a test function to identify the data type of a value, or determine if a value exists. Learn more in the Test Functions article.

Expression Editor

You can build functions with the expression editor.

Build an Expression

To build your expression, first, specify an Output Column. The Output Column will contain the results of your expression. You can overwrite an existing column or you can create a new column. Select the Output Column dropdown and choose an existing column or select Add Column and provide a name for your new column.

Once you specify an Output Column, use any of these methods to build an expression:

- **Enter the function directly in the expression editor.**
- **Select the Columns and Constants button to browse through variables that can be used in the expression. Select the variable to add it to the expression editor.**
- **Enter a word or phrase to view a matching list of functions.**
- **Enter a [(left bracket) to view a list of variables that you can use in the expression. Variables include...**
    - **Columns: Data from an incoming connection, or from a column created in a previous expression.**
    - **Connections from Questions: Values from an Interface tool connected to the Question anchor of a tool with an expression editor, when the tool is used in an app or macro. Use the Question anchor when you want question values to be used as variables in the expression. Go to Interface Tools for more information.**
    - **Constants: Global variables for a workflow that make it possible to change a value in a single location and have that change apply to the rest of the workflow. Go to Constants for more information.**

Syntax Highlighting

As you edit the expression, the editor applies a color-coding scheme to its various parts to make the parts of the expression easy to distinguish. For example, functions are gold, variables are fuchsia, operators are magenta, and strings are turquoise, a blue-green.

Functions

Select Functions to browse through categories of functions. Select the function to add it to the expression editor.

Columns and Constants

Select Columns and Constants to browse data from incoming connections and global variables.

- Existing Columns: Data from an incoming connection, or from a column created in a previous expression.
- Connections from Questions: Values from an Interface tool connected to the Question anchor of a tool with an expression editor, when the tool is used in an app or macro. Use the Question anchor when you want question values to be used as variables in the expression. Go to Interface Tools for more information.
- Constants: Global variables for a workflow that make it possible to change a value in a single location and have that change apply to the rest of the workflow. Go to Constants for more information.

Recent and Saved Expressions

Select Recent and Saved Expressions to browse through recent and saved expressions. Select the expression to add it to the expression editor.

Save an Expression

1. With an expression in the expression editor, select the Save Expression (disk) icon.
2. Enter a name for the expression and select Save.
3. # Tools with Expression Editor

These tools include an expression editor. Tools that use an expression editor have an additional Input anchor and Question anchor when the tool is used in an app or macro workflow. Use the Interface tools to connect to a Question anchor when you want question values to be used as variables in the expression. Go to Interface Tools for more information.

Action Tool

Condition Tool

Error Message Tool

Dynamic Rename Tool

Filter Tool

Formula Tool

Generate Rows Tool

Multi-Field Formula Tool

Multi-Row Formula Tool

Table Tool

Message Tool

Test Tool

Numeric Data in Formula Functions

Be careful when you use Fixed Decimals in the Formula tool and when you convert Fixed Decimals to Floats or Doubles. In the Formula tool, Fixed Decimals are implicitly converted into Doubles. The maximum precision for the Double data type is 15 digits and for the Float data type, it's 7 digits. If you are converting Fixed Decimals, you need to expect to lose all the data that can't fit into the type you are converting to.

DATETIME FUNCTION:

A DateTime function performs an action or calculation on a date and time value. Use a DateTime function to add or subtract intervals, find the current date, find the first or last day of the month, extract a component of a DateTime value, or convert a value to a different format.

Date Support

Designer cannot process dates prior to January 1, 1400.

Alteryx uses the ISO format yyyy-mm-dd HH:MM:SS to represent dates and times. If a DateTime value is not in this format, Alteryx reads it as a string. To convert a column for use and manipulation in the DateTime format, use the DateTimeParse function in the expression editor or the DateTime tool.

Some DateTime functions require you to set the format for the date. Format strings comprise of specifiers and separators.

Specifiers

Specifiers always begin with a percent sign (%), followed by a case-sensitive letter. The data must include at least a two-digit year.

Specifier	Output from DateTimeFormat	Supported Input with DateTimeParse
`%a`	Abbreviated Weekday Name ("Mon")	Any valid abbreviation of a day of the week ("mon", "Tues.", "Thur"). Returns an error only if the given text is not a day of the week. Note that Alteryx does not check that the specified day name is valid for a particular date.

`%A`	Full Weekday Name ("Monday")	Day name or any valid abbreviation of a day of the week ("mon", "Tues.", "Thur"). Returns an error only if the given text is not a day of the week. Note that Alteryx does not check that the specified day name is valid for a particular date.
`%b`	Abbreviated Month Name ("Sep")	Any valid abbreviation of a month name ("Sep", "SEPT."). Returns an error only if the given text is not a name of a month.
`%B`	Full Month Name ("September")	Month name or any valid abbreviation of a month name ("Sep", "SEPT."). Returns an error only if the given text is not a name of a month.
`%c`	The date and time for the	Not Supported

	computer's locale.	
`%C`	The Century Number ("20")	Not Supported
`%d`	Day of the Month ("01")	1 or 2 digits, ignoring spaces ("1" or "01").
`%D`	Equivalent to %m/%d/%y	Not Supported
`%e`	Day of the month, leading 0 replaced by a space (" 1").	1 or 2 digits, ignoring spaces ("1" or "01").

`%h`	Same as %b ("Sep")	Any valid abbreviation of a month name ("Sep", "SEPT."). Returns an error only if the given text is not a name of a month.
`%H`	Hour in 24 hour clock, 00 to 23.	Up to 2 digits for hour, 0 to 23. Not compatible with %p or %P.
`%I` (capital "eye")	Hour in 12 hour clock, 01 to 12.	Up to 2 digits for hour, 1 to 12. Must follow with %p or %P.
`%j`	The day of the year, from 001 to 365 (or 366 in leap years)	3-digit day of the year, from 001 to 365 (or 366 in leap years)

`%k`	24 hours, leading zero is space, " 0" to "23".	Up to 2 digits for hour.
`%l` (lowercase "ell")	12 hours, leading zero is space, " 1" to "12".	Not Supported
`%M`	Minutes, 00 to 59	Up to 2 digits for minutes.
`%m`	Month number, 01 to 12.	1 or 2-digit month number, 1 or 01 to 12.

`%p`	"AM" or "PM"	Case blind ("aM" or "Pm"). Must follow %I (capital "eye", hour in 12-hour format).
`%P`	"am" or "pm"	Case blind ("aM" or "Pm"). Must follow %I (capital "eye", hour in 12-hour format).
`%S`	Seconds, 00 to 59	Up to 2 digits for seconds.
`%T`	Time in 24-hour notation. Equivalent to %H:%M:%S	Not Supported

`%u`	Day of week as a decimal, 1 to 7, with Monday as 1.	Not Supported
`%U`	This returns the week number, as 00 – 53, with the beginning of weeks as Sunday.	Not Supported
`%w`	Day of week as a number, 0 to 6, with Sunday as 0.	Not Supported
`%W`	This returns the week number, as 00 – 53, with the beginning of	Not Supported

	weeks as Monday.	
`%x`	The date for the computer's locale.	Not Supported
`%X`	The 12-hour clock time, including AM or PM ("11:51:02 AM").	Hours:Minutes:Seconds [AM / PM]

`%y`	Last two digits of the year ("16").	Up to 4 digits are read, stopping at a separator or the end of the string, and mapped to a range of the current year minus 66 to current year plus 33. For example, in 2016, that's 1950 to 2049.
		Limitation with 6-Digit Dates Because up to 4 digits are read for the year, formats that are intended to have only 2 digits without a separator, such as a 6-digit date stamp (for example, %y%m%d for data resembling 170522 for May 22, 2017), are still read as 4 digits. To work around this limitation, you can... • Use 4 digits for the year (for example, 2017 instead of 17), depending on your range of dates. • Use the RegEx tool to insert a space after the first 2 digits in the string.
`%Y`	All four digits of the year ("2016").	2 or 4 digits are read. 2 digits are mapped to a range of the current year minus 66 to the current year plus 33.

		For example, in 2016, that's 1950 to 2049.
`%z`	Offset from UTC time ("-600").	Not Supported
`%Z`	Full timezone name ("Mountain Daylight Time").	Not Supported

Separators

Separators are inserted between DateTime specifiers to form a format string.

Separator	Output from DateTimeFormat	Supported Input with DateTimeParse*
/	/	/ or -
-	-	/ or -
space	A Space	Any sequence of white space characters.
%n	A Newline	Not Supported

`%t`	A Tab	Not Supported
other	Other characters, like comma, period, and colon.	Other characters, like comma, period, and colon.

*DateTimeParse accepts forward slashes (/) and hyphens (-) interchangeably. However, commas, colons, and all other separators must match the incoming data exactly.

Language Parameters

These are the compatible values for the "l" (language) parameter that is supported with the DateTimeFormat and DateTimeParse functions.

English Language Name	Native Language Name	Language Code

English	**English**	**en**
Italian	**Italiano**	**it**
French	**Français**	**fr**
German	**Deutsch**	**de**
Japanese	日本語	**ja**
Spanish	**Español**	**es**

Portuguese	**Português**	**pt**
Chinese	简体中文	**zh**

In addition to the above values, values with at least 2 characters in length that begin with any of the above are also acceptable. For example, eng, engl, engli, etc. for English or esp, espa, sp, spa, span, etc. for Spanish/Español.

DateTimeAdd

`DateTimeAdd(dt,i,u)`**: Adds a specific interval to a date-time value.**

Parameters

`dt`**: Date-time data, expressed as a selected column or a specified date-time value between quotes.**

`i`**: Positive or negative integer of time to add or subtract.**

`u`: Date-time unit, specified between quotes: years, months, days, hours, minutes, or seconds.

Example

`DateTimeAdd(DateTimeToday(), -1, "days")` returns yesterday's date.

`DateTimeAdd(DateTimeFirstOfMonth(), 1, "months")` returns the first of next month.

`DateTimeAdd("2016-01-30", 1, "month")` returns 2016-02-29 (because February does not have a 30th, but its last day that year is the 29th).

`DateTimeAdd("2016-03-30", -1, "month")` returns 2016-02-29 (because February does not have a 30th, but its last day that year is the 29th).

Read More

- Any fraction in the duration is truncated. For example, you cannot add "1.5 hours". Instead, add "90 minutes".
- Adding a unit does not change the value of smaller units. For example, adding hours does not change the value of minutes or seconds. Adding months does not change the day or time, unless the resulting month would not have such a day. In that case, it goes to the last day of that month.

DateTimeDay

`DateTimeDay(dt)`: Returns the numeric value for the day of the month in a date-time value.

Parameters

`dt`: Date-time data, expressed as a selected column or a specified date-time value between quotes.

Example

`DateTimeDay("2017-03-24 11:43:23")` returns 24.

DateTimeDiff

`DateTimeDiff(dt1,dt2,u)`: Subtracts the second argument from the first and returns it as an integer difference. The duration is returned as a number, not a string, in the specified time units.

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

`u`: Date-time unit, specified between quotes: years, months, days, hours, minutes, or seconds.

Example

`DateTimeDiff("2016-02-15 00:00:00", "2016-01-15 00:00:01", "Months")` returns 1 (because the start and end are the same day of the month).

`DateTimeDiff("2012-02-29","2011-03-01","years")` returns 0 (even though 2012-02-29 is 365 days after 2011-03-01, February 29 is before March 1st, so "one year" has not yet been completed).

`DateTimeDiff("2016-02-14", "2016-01-15", "Months")` returns 0 (because the day in February is less than the day in January).

`DateTimeDiff("2016-02-14 23:59:59", "2016-01-15 00:00:00", "Months")` returns 0 (even though it is only one second short of reaching the required day).

`DateTimeDiff('2017-02-28', '2016-02-29', 'Months')` returns 11 (even though the 28th is the last day of February in 2017, the 28 is less than 29).

Read More

- For Month and Year differences, a month is only counted when the end day reaches the start day, ignoring the time of day.
- For precision of Day, Hour, Minute, and Second, the result is calculated precisely, then fractional parts are truncated, not rounded. Therefore... `DateTimeDiff('2016-01-01 00:59:59', '2016-01-01 00:00:00', 'Hours')` is zero. `DateTimeDiff('2016-01-01 23:59:59', '2016-01-01 00:00:00', 'Days')` is zero.
- Precision names can be shortened to their first three characters (like 'sec' and 'min'), case is insensitive.
- Be careful when storing time differences in seconds. An Int32 can only hold a difference of 68 years in seconds or 4082 years in minutes. You can use a Double or an Int64 to hold intervals between all supported dates.

DateTimeFirstOfMonth

`DateTimeFirstOfMonth()`: Returns the first day of the month, at midnight.

DateTimeFormat

`DateTimeFormat(dt,f,l)`: Converts date-time data from ISO format to another specified format (f), in a specified language (l), for use by another application. Output to a string data type.

Parameters

`dt`: Date-time data, expressed as a selected column or a specified date-time value between quotes.

`f`: The format to which to convert the data, expressed in a format string.

`l`: Optional language parameter. The language parameter defaults to your selected Designer language. For example, if Designer is set to French, the function reads *DateTimeParse(dt,f,"Français")* by default. See Language Parameters for accepted language values.

Examples

`DateTimeFormat([DateTime_Out],"%d-%m-%Y")` returns 22-04-2008 for the date April 22, 2008 (ISO format: 2008-04-22).

`DateTimeFormat([DateTime_Out],"%A","Spanish")` returns "martes" for the ISO date 2020-07-14 (where July 14th is a Tuesday).

DateTimeHour

`DateTimeHour(dt)`: Returns the hour portion of the time in a date-time value.

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

Example

`DateTimeHour("2017-03-24 11:43:23")` returns 11.

`DateTimeHour("2017-03-24")` returns 0, as midnight is the assumed hour when no time is specified with a date.

DateTimeLastOfMonth

`DateTimeLastOfMonth()`: Returns the last day of the current month, with the clock set to one second before the end of the day (23:59:59).

Designer uses the date and time when the formula is first parsed. In a batch process, this time is used with each new set of data. This allows for consistency if the process takes a long time.

DateTimeMinutes

`DateTimeMinutes(dt)`: Returns the minutes portion of the time in a date-time value.

Parameters

`dt`: DateTime data, expressed as a selected column or a specified DateTime value between quotes.

Example

`DateTimeMinutes("2017-03-24 11:43:23")` returns 43.

DateTimeMonth

`DateTimeMonth(dt)`: Returns the numeric value for the month in a date-time value.

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

Example

`DateTimeMonth("2017-03-24 11:43:23")` returns 3.

`DateTimeMonth("11:43:23")` returns [Null], because the incoming data is not valid.

DateTimeNow

`DateTimeNow()`: Returns the current system date and time.

DateTimeParse

`DateTimeParse(dt,f,l)`: Converts a date string with the specified format (f), in a specified language (l), to the standard ISO format (yyyy-mm-dd HH:MM:SS).

Parameters

`dt`: Date-time string data expressed as a selected field or a date-time string between quotes. The incoming data must be a String data type, and can be in any format of date-time as long as this format agrees with the format you specify for the f parameter.

`f`: The format of the incoming date string data that you are converting, expressed in a format string between quotes.

`l`: (Optional) The language of the incoming date string data that you are converting. The language parameter defaults to your selected Designer language. For example, if Designer is set to French, the function reads *DateTimeParse(dt,f,"Français")* by default. See Language Parameters for accepted language values.

Examples

`DateTimeParse("2016/28-03","%Y/%d-%m")` returns 2016-03-28.

`DateTimeParse([DateTimeNow],"%A %d %B %Y", "Français")` returns 2020-07-14 where the incoming date string is "mardi 14 juillet 2020" (Tuesday 14 July 2020).

DateTimeSeconds

`DateTimeSeconds(dt)`: Returns the seconds portion of the time in a date-time value.

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

DateTimeStart

`DateTimeStart()`: Returns the date and time when the current workflow started running.

DateTimeToday

`DateTimeToday()`: Returns today's date.

Expected Behavior: DateTimeToday Data Type

Despite its name, `DateTimeToday()` does not return a time value. Rather it only returns a Date with the current date. You can wrap the `DateTimeToday()` function in the `ToDateTime()` function to return a date-time value with the time set to midnight of the current day:

```
ToDateTime(DateTimeToday())
```

DateTimeToLocal

`DateTimeToLocal(dt)`: Converts a UTC date-time to the local system time zone.

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

Examples

`DateTimeToLocal('2014-08-01 20:01:25')` returns the local system time zone (Mountain Time) as 2014-08-01 14:01:25.

DateTimeToUTC

`DateTimeToUTC(dt)`: Converts a date-time (in local system time zone) to UTC.

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

Example

`DateTimeToUTC(DateTimeNow())` returns the Coordinated Universal Time at workflow runtime: 2014-08-01 20:01:25 (where local Mountain time was 2014-08-01 14:01:25).

DateTimeTrim

`DateTimeTrim(dt,t)`: Removes unwanted portions of a date-time and returns the modified date-time.

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

`t`: Trim type. Options include:

- **firstofmonth: Trim to the beginning of the month (this does the same as month).**
- **lastofmonth: Extend to one second before the end of the last day of the month.**
- **year: Trim to midnight on January 1st.**
- **month: Trim to midnight on the first day of the month.**
- **day: Trim to the day (i.e., midnight). This converts a date-time to a day with a time of zero (not a date).**
- **hour: Trim to the hour.**
- **minute: Trim to the minute.**

Trimming a date-time does not round the returned value. For example, the time 15:59:59 trimmed to the hour becomes 15:00:00, not 16:00:00.

Example

`DateTimeTrim("2016-12-07 16:03:00","year")` **returns 2016-01-01 00:00:00.**

DateTimeYear

`DateTimeYear(dt)`**: Returns the numeric value for the year in a date-time value.**

Parameters

`dt`: Date-time data expressed as a selected column or a specified date-time value between quotes.

Example

`DateTimeYear("2017-03-24 11:43:23")` returns 2017.

ToDate

`ToDate(x)`: Converts a string, number, or date-time to a date.

- An incoming string should be formatted as YYYY-MM-DD. For example, 2020-10-31.
- An incoming number should be formatted as an Excel date format where the number represents the number of days since 01-01-1900. For example, 7000 which corresponds to 03-01-1919.
- An incoming date-time should be formatted as YYYY-MM-DD hh:mm:ss. For example, 2020-10-31 12:00:00.

Examples

`ToDate(2020-10-31)` returns 2020-10-31 as a date.

`ToDate(7000)` returns 1919-03-01 as a date.

`ToDate(2020-10-31 12:00:00)` returns 2020-10-31 as a date.

ToDateTime

`ToDateTime(x)`: Converts a string, number, or date to a date-time.

- An incoming string should be formatted as YYYY-MM-DD hh:mm:ss. For example, 2020-10-31 12:00:00.
- An incoming number should be formatted as an Excel date-time format where the number represents the number of days since 01-01-1900. For example, 7000.354167 which corresponds to 03-01-1919 at 8:30 AM.
- An incoming date should be formatted as YYYY-MM-DD. For example, 2020-10-31.

Examples

`ToDateTime(2020-10-31)` returns 2020-10-31 00:00:00 as a date-time.

`ToDateTime(7000.354167)` returns 1919-03-01 08:30:00 as a date-time.

`ToDateTime(2020-10-31 12:00:00)` returns 2020-10-31 12:00:00 as a date-time.

UNIQUE TOOL:

Use Unique to distinguish whether a data record is unique or a duplicate by grouping on one or more specified fields, then sorting on those fields.

Configure the Tool

Column Names: Select the columns where you want to find unique values.

- Use the Select All button to compare entire records. The data is sorted based on the Unique columns. Therefore if you want a specific sort order, use the Sort tool to assign the specific sort order of the file prior to using the Unique tool. *For best results, uncheck the Use Dictionary Order setting in the Sort tool configuration and sort on all the fields selected in the Unique tool before you sort on additional fields.*
- Use Deselect All to deselect all fields.

Output Anchors

The Unique tool has 2 output anchors:

- U anchor: Contains the *unique* records from the dataset. The first record of each group is shown.
- D anchor: Contains the *duplicate* records from the dataset. The remaining records from each group are shown.

Note that manual inspection of the results is often necessary to ensure that rows flagged as duplicates are actually duplicates. For example, you might have 2 customers that share the same name but live at different addresses. If you think that your dataset might include these types of outliers, you might want to select additional columns when you configure this tool.

Output Example

Let's take a look at an example of the Unique tool output based on this sample dataset.

Input Data Stream

In the Unique tool Configuration window, we select both the FirstName and LastName columns from our incoming data stream to make sure that we don't include duplicate entries of the same FirstName-LastName combination.

FirstName	LastName
Pamela	Wright
Melissa	Ruff
Constanti	Vlassis
Amy	Lockemer

Danielle	Valdez
Pamela	Wright
Mary	Kiniry
Melissa	Ruff
Danielle	Valdez

U Anchor Output

The U output anchor returns all unique rows from the above incoming data stream.

FirstName	LastName
Amy	Lockemer
Constanti	Vlassis
Danielle	Valdez
Mary	Kiniry
Melissa	Ruff

Pamela	Wright

D Anchor Output

The D output anchor returns any duplicate rows from the above incoming data stream.

FirstName	LastName
Danielle	Valdez
Melissa	Ruff
Pamela	Wright

CONFIGURATION WINDOW:

Tools are configured in the Configuration window. When a tool is added to a Designer workflow, the Configuration window displays the relevant configuration options for that tool.

Configuration

Use the Configuration Properties to set up the specific function of each tool. The properties here vary depending on the tool chosen. For a detailed description of how to configure each tool, visit **Tool Categories**.

XML View

Displays the XML for each tool's configuration as a reference.

To display this option in the Configuration window, go to Options > User Settings > Edit User Settings > Advanced and select Display XML in Properties Window.

Navigation

Displays all the connections and incoming and outgoing tools connected to the selected tool.

You can double-click on the connected tool name to jump to it on the canvas. The Navigation view of the tool you jumped to will be active in the Tool Configuration window.

Check the Wireless box to make the connection arrow that connects the selected tools wireless.

Tools with multiple outputs include the **Filter tool**, **Join tool**, **Unique tool**, **Find Nearest tool**, and **Spatial Match tool**.

Annotation

The Annotation area allows you to add notes to the project, for later reference. With your tool selected on the canvas, use the F2 key on your keyboard to access the tool's Annotation window.

- Type: Displays the tool being used.
- ID: Tool IDs are assigned as you drop tools onto the canvas. Tool IDs persist. For example, if you delete the third tool in the workflow, the next tool ID is still 4. The order of the tool ID does not guarantee the order of execution. To see a tool's ID, use the Ctrl+F keyboard shortcut. This opens the Find and Replace window and shows all tools with their IDs.
- Name: Defaults to tool name plus the tool ID, but you can enter any name of your choice.
- Show Annotation: Some tools have a default Annotation, some do not.
    - Using Canvas Settings: The annotation populates automatically based on the configuration properties.
    - Always: The annotation is always visible in the document.
    - Never: The annotation is never visible in the document.
- Place Annotation on the Top: The default position for annotations is beneath the tool. Select this box to place the annotation above the tool.
- Annotation: Enter the text you wish to see associated with the tool in the document.

Tool annotations appear when the mouse hovers over the tool.

Assets

Assets, also known as dependencies, are files that are necessary for the tool to perform correctly.

- Auto-detected assets: In the case of an input tool, an autodetected asset is the file chosen as the input.
- User added assets: Use Add File(s) to add assets.

To display this option in the Configuration window, go to Options > User Settings > Edit User Settings > Advanced and select Display Asset Management in Properties Window.

INPUT DATA TOOL:

Use Input Data to add data to your workflow by connecting it to a file or database.

The use of wildcards to read multiple .csv files with the **Hadoop Distributed File System** produces an error.

Configure the Tool

The Input Data **Configuration window** has 2 sections: Connect a File or Database and Options.

Connect a File or Database

The below steps describe the process with Data Connection Manager (DCM) disabled. When enabled, the Connect a File or Database dropdown is replaced with a Set Up a Connection button opening the Data Connections window displaying only data sources supported by DCM, and opening DCM by selecting a technology.

With the Input Data tool on the canvas, follow these steps:

1. In the Configuration window, select the Connect a File or Database dropdown.
2. Designer displays the Data connections window. Configure your data connection using one of these: Recent, Saved, Files, Data Sources, or Server.

Recent
Saved
Files
Data Sources
Server

The Recent connections section contains recently configured files and data connections. You can select a recent connection or select Clear list to delete recent connections.

Select Multiple Files
Excel
Gzip and Zip Files
Supported File Types
Unknown File Types

In the file browse window, enter a wildcard as part of the file path.

Consider a case where you have multiple data files with...

- The same number of fields where data types for each field are the same.
- Similar names in the same directory.

Note

Multiple files are read using the wildcard format, like *.csv or 2019*.csv in a single Input Data tool, as long as the files all contain the same number of fields, where the data types for each field are the same. Designer sets the number of fields and the file types based on the 1st file read. Any subsequent files that do not match are skipped and a warning displays. It is not possible to control which file is read 1st when using a wildcard syntax like *.csv. It is up to the system which file is designated as the first.

Enter the file name that the multiple files have in common and add an * (asterisk) to substitute all subsequent characters or a ? to substitute 1 character. Include the file extension that is common to all files when you specify the file names.

Example 1

This path brings in every .csv file in the **`data\datafiles`** directory with a file name that begins with `ABCD`.

```
data\datafiles\ABCD*.csv
```

It brings in `ABCD_4.csv` and `ABCD_012.csv`.

Example 2

This path brings in every .csv file contained within the **`data\datafiles`** directory with a file name that begins with `ABCD_` and has 1 additional character.

```
data\datafiles\ABCD_?.csv
```

Options

Select file format options. Options vary based on the file or database to which you connect. Go to **File Format Options** for more information.

Preview Data Layout

Preview the data layout in the Preview window. The data layout preview is limited to 100 records or fewer in wide files. If data contains 1500 columns, at least 1 record, and up to 2 rows display. To view all data, use a **Browse tool**.

Duplicate Column Names

If your input file contains multiple columns with the same name, Designer automatically renames the duplicate columns according to these rules:

Duplicate Name Ends with 1 or 9

If the last character in the duplicate column name is either 1 or 9, Designer appends an underscore (_) and a number, starting with 2 to the duplicate column name.

Original Column Name	Duplicate Column (Renamed by Designer)
A1	A1_2
A9	A9_2

Duplicate Name Ends with a Digit Between 2-8 (Inclusive)

If the last character in the duplicate column is a digit between 2 and 8 (inclusive), Designer increments that digit to rename the duplicate column name.

However, if the 2nd to last character is also a digit, Designer appends an underscore (_) and a number, starting with 2 to the duplicate column name.

Original Column Name	Duplicate Column (Renamed by Designer)
A2	A3
A5	A6
A22	A22_2

Duplicate Name Ends with a Letter or Special Character

If the last character in the duplicate column is a letter or special character, Designer adds a number (starting with 2) to rename the duplicate column name.

Original Column Name	Duplicate Column (Renamed by Designer)
age	age2
registered?	registered?2

Visual Query Builder cannot display multi byte characters correctly. Use the tables tab instead.

Use Classic Mode

To use classic mode...

1. Select Options > User Settings > Edit User Settings.
2. On the Defaults tab, check the box Use classic mode for the Input/Output tool menu options.
3. Select Save.
4. Select the canvas or use the F5 keyboard shortcut to refresh.

You can now use the Input Data tool classic mode to select your files and data sources.

Convert an Output Data Tool to an Input Data Tool

You can convert an **Output Data tool** to an Input Data tool.

1. Right-click the Output Data tool you want to convert to an Input Data tool.
2. Select Convert To Input Data.

The output data becomes the input data.

OUTPUT DATA TOOL:

Use Output Data to write workflow results to supported file types or data sources. Use other tools to write to other supported data sources. For a complete list of data sources supported in Designer, go to **Supported Data Sources and File Formats**.

Configure the Tool

Select the Output Data tool in the tool palette, and drag it to the workflow canvas.

The Output Data tool configuration consists of 2 main parts:

- You must first select a file or database for the output via the Write to File or Database section.
- Then, you must configure settings associated with that file or database via the Options section.

To get started, in the Configuration window, select Set Up a Connection under Write to File or Database.

Write to File or Database

Designer displays the Data connections window. Configure your data connection via one of the Recent, Saved, Files, Data Sources, or Server tabs.

While AMP Engine writes SpatialObj data into the file when you save to a CSV file, the original Engine doesn't. This causes file size differences and you might experience decreased performance.

Recent
Saved
Files
Data Sources
Server

Select a recent connection. The Recent connections view contains recently configured files and data connections. Select Clear list to delete all your recent connections.

Output Options

1. Select file format Options.
   Options vary based on the file or database to which you connect. Go to **File Format Options** for important configuration information.
2. (Optional) Select Take File/Table Name From Field to write a separate file for each value in a selected field. Select the dropdown, and select an option:
   - Append Suffix to File/Table Name: Appends the selected field name to the end of the name of the selected table.
   - Prepend Prefix to File/Table Name: Prepends the selected field name to the beginning of the name of the selected table.
   - Change File/Table Name: Changes the file name to the selected field name.
   - Change Entire File Path: Changes the file name to the name of the selected field. The name must be a complete file path. This option can overwrite an existing file if a file exists in the full path directory.
     1. Select Field Containing File Name or Part of File Name and select a field.
     2. (Optional) Select Keep Field in Output.

Disable Output Tool

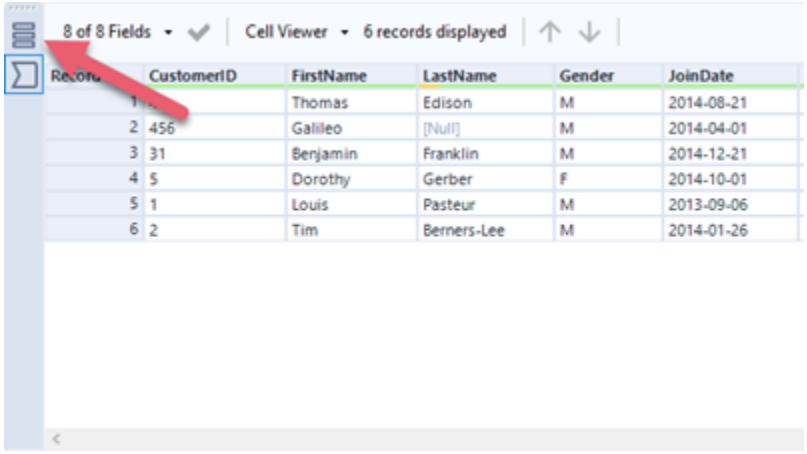
Select the Disable Tool check box to disable the Output Data tool. This prevents the tool from writing data when you run your workflow. Once disabled, the tool will appear grayed out on the workflow canvas.

This feature is particularly useful while you develop or troubleshoot your workflow.

The global setting to Disable All Tools that Write Output (inside the Workflow - Configuration Runtime tab) overrides this tool-specific setting.

View Output File

1. After you run the workflow, select the Output Data tool.
2. In the Results window, select the Messages button.



3. Locate the output file and select the file link to open it.

Convert Output Data Tool to Input Data Tool

You can convert the Output Data tool to an **Input Data tool**. You can undo this change if you have enough undo levels set in your **User Settings**.

Convert the Output Data tool to an Input Data tool:

1. Right-click the Output Data tool in your workflow.
2. Select Convert To Input Data.
3. Configure the tool.

You can now use the Output Data tool as an Input Data tool.

Use Classic Mode

To use classic mode...

1. Select Options > User Settings > Edit User Settings.
2. On the Defaults tab, select the checkbox Use classic mode for the Input/Output tool menu options.
3. Select OK.
4. Select the canvas, or use the F5 key to refresh.

You can now use the Output Data Tool classic mode to select your files and data sources.

UNION TOOL:

Use Union to combine 2 or more datasets on column names or positions. In the output, each column contains the rows from each input. You can configure how the columns stack or match up in the output.

Visit the **Alteryx Community Tool Mastery series** to learn more about the Union tool.

Tool Components

The Union tool has 2 anchors:

- Input anchor: The input anchor connects to the data streams you want to unify. The 2 angle brackets on the input anchor indicate that it accepts multiple inputs.
- Output anchor: The output anchor displays the output dataset.

Configure the Tool

Mode: Choose the configuration mode. The default setting is Auto configure by name.

- Auto configure by name: Stack data by column name.
- Auto configure by position: Stack data by the column order in the stream.
- Manually configure columns: Allows you to manually specify how to stack data. When you choose this method, the columns in each input are displayed (indicated by row #1, #2, etc.).

When the mode is set to Manually configure columns, Alteryx assumes the configuration will not change between the configuration of the tool and the time the workflow is run. If anything is missing, an error occurs and the workflow will stop. For this reason, do not use this configuration mode in analytic apps and macros.

Properties: Auto Config

When Columns Differ

For the auto-configuration modes, you must select how to handle columns that differ.

In the first dropdown, choose your error handling option...

- Error - Stop Processing Records: Throw an error in the Results window and stop processing records.
- Warning - Continue Processing Records: Throw a warning in the Results window, but continue processing records.
- Ignore - Continue Processing Records: Ignore columns that differ and continue processing records.

In the second dropdown, choose your output option...

- Output All Fields: Output includes all columns. Null values populate empty columns.
- Output Common Subset of Fields: Output includes only the columns that each input has in common.

Properties: Manually Configure Fields

For the manually configure columns mode, you have to configure your Output Columns in the Properties section.

To begin, your data streams are staggered horizontally and vertically so that the data from each input dataset are in different cells.

1. (Optional) In the top-right dropdown, you can begin by selecting either By Position or By Name. Select Reset to reset the columns. Use this option if you know that your data streams have some columns that match by either position or name.
2. Next, use the arrows to begin stacking your data. Select a cell and select the left arrow or right arrow to stack it with the data field it matches.
3. Select Non Blocking - Metainfo Will Not Change to pass data rows downstream without waiting for all inputs to send data. Do not use this mode if the upstream metainfo will change between configuration time and runtime.

Output Order

Under Output Order, check Set a Specific Output Order to specify which input dataset's data displays first in the output dataset. Once checked, select one of the data streams and select the up arrow or down arrow to reorder.

The Output Order option can cause slower performance.

Understanding the Output

Two aspects of the Union tool output are important to understand, the column names and the order of the data.

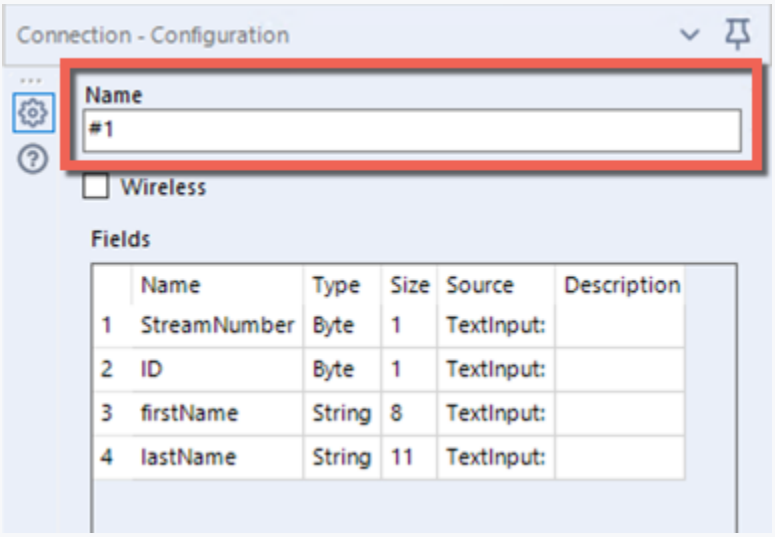
Understanding Output Data Column Names

The column names that are used in the output dataset are pulled from the input stream with the first alphabetical/numerical value.

By default, your input data streams are labeled #1 and #2 based on the order you connected them to the Union tool input anchor. So, if the column names differ, the output dataset will use the column names from the #1 input dataset.

If you prefer to use the column names from the #2 input dataset, you can change the Name for the input connections. To do so, select the input streams and enter new

values in the Name field of the connections. The output column names are taken from the connection with the first alphabetical/numerical value in its Name.



Understanding Output Data Order

The default output order often corresponds to the order you connected your input datasets to the Union tool input anchor but might vary. Go to the **Output Order** section to learn how to set the order of your output data.

FILTER TOOL

Use Filter to select data using a condition. Rows of data that meet the condition are output to the True anchor. Rows of data that do not meet the condition are output to the False anchor.

The Filter tool can...

- Select rows by comparing a column against a static value. See **an example**.
- Select rows with or without missing data. See **an example**.
- Select rows using date-time data. See **an example**.
- Select rows using a multiple-column condition. See **an example**.
- Select rows using a compound condition. See **an example**.

Tool Components

The Filter tool has 3* anchors.

- Input anchor: Use the input anchor to select the data you want to filter.
- T (True) anchor: The True anchor outputs the rows of data that meet the filter condition.
- F (False) anchor: The False anchor outputs the rows of data that do not meet the filter condition.

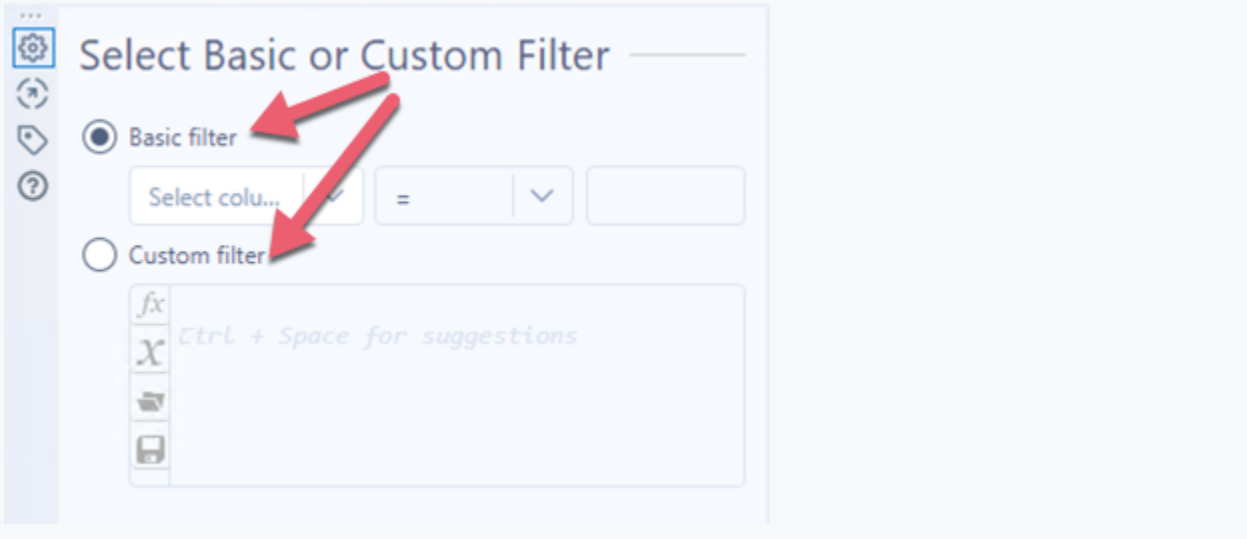
*Because the Filter tool includes an expression editor, an additional input anchor displays when you use Filter in an app or macro. Use the **Interface tools** to connect to a Question anchor.

Configure the Tool

Select Basic filter or Custom filter.

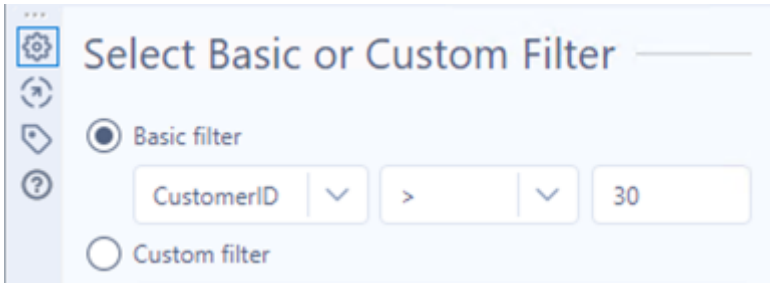
- Use the Basic filter to build a simple query on a single column of data.

- Use the Custom filter to build complex conditions or conditions using more than one column.



Build a Basic Filter

1. Select the column of data to filter by in the Select column dropdown.
2. Select the operator in the next dropdown. Available operators depend on the data type of the column you selected to filter by. See **Basic Filter Operators** below.
3. Enter a value to complete the condition.



Basic Filter Operators

Available operators depend on the data type of the column you select to filter by. Learn more about **Data Types**.

Operator	Description	Available Data Types
=	Value matches input.	Numeric, Date, DateTime
Equals	Value matches input.	String

!=	Value does not match input.	Numeric, Date, DateTime
Does not equal	Value does not match input.	String
>	Value is greater than input.	Numeric, Date, DateTime
>=	Value is greater than or equal to input.	Numeric, Date, DateTime
<	Value is less than input.	Numeric, Date, DateTime

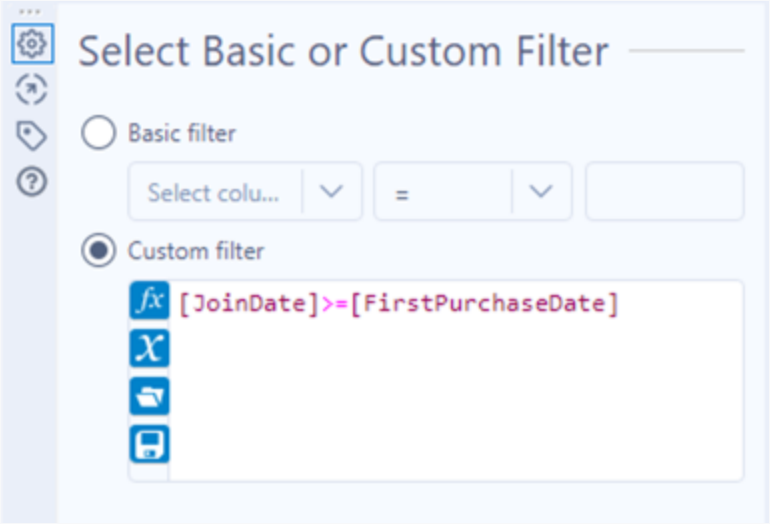
<=	Value is less than or equal to input.	Numeric, Date, DateTime
Is null	Value is a missing or unknown value.	Numeric, Date, DateTime, Time, String, Spatial, Boolean
Is not null	Value is not a missing or unknown value.	Numeric, Date, DateTime, Time, String, Spatial, Boolean
Comes before (<)	Value sorts to come before input.	String

Comes after (>)	Value sorts to come after input.	String
Contains	Value is found in any part of the string.	String
Does not contain	Value is not found in any part of the string (case sensitive).	String
Is empty	Value is Null or "".	String
Is not empty	Value is not Null or "".	String

Range	Value is a selected start and end date.	Date, DateTime
Start date and periods after	Value is the selected first date and a set number of periods that follow.	Date, DateTime
End date and periods before	Value is the select last date and a set number of periods that precede.	Date, DateTime
Is true	Value is true.	Boolean
Is false	Value is not true.	Boolean

Build a Custom Filter Using Expressions

To build a custom filter condition, enter your expression syntax into the expression editor. There are also many tools to assist with building Custom filter conditions. See **Expression Editor Tips**.



EXPRESSION EDITOR TIPS

These tools are available within the expression editor to assist with building Custom filter conditions.

1. Press Ctrl + Space to view a list of all functions.
2. Type a word or phrase to view a matching list of functions.

3. Type a [(left bracket) to view a list of variables to use in the expressions. Variables can be...
    - Data from an incoming connection or a column created in a previous expression.
    - Values from an Interface tool connected to the Question anchor of a tool with an expression editor when the tool is used in an app or macro. Use the Question anchor when you want to use question values as variables in the expression. See **Interface Tools.**
    - Global variables that are defined in workflow configuration. See **Constants**.
4. Select the fx icon to search and browse functions. See **Functions.**
5. Select the x icon to browse or search columns and constants.
6. Select the folder icon to browse or search recent and saved expressions.

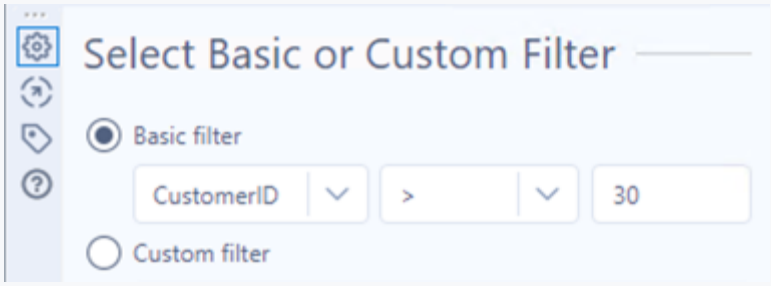
Save a Custom Filter

Once you have built an expression you can save it for later use. Select the save icon. Enter your expression name and select Save.

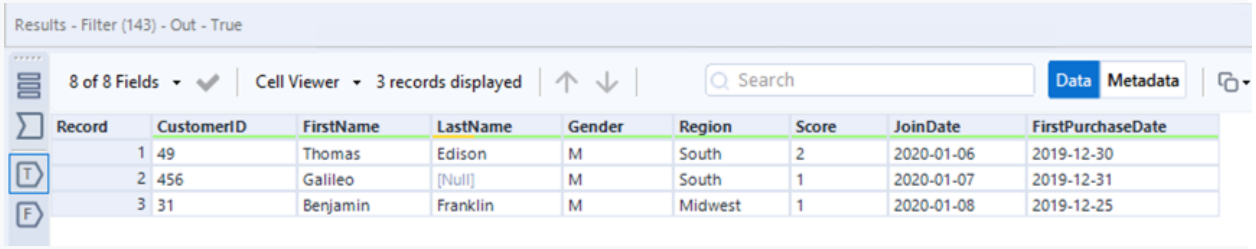
Tool Examples

Example 1. Select Rows Using a Basic Comparison

Use the Basic filter to select rows by comparing a column against a static value.

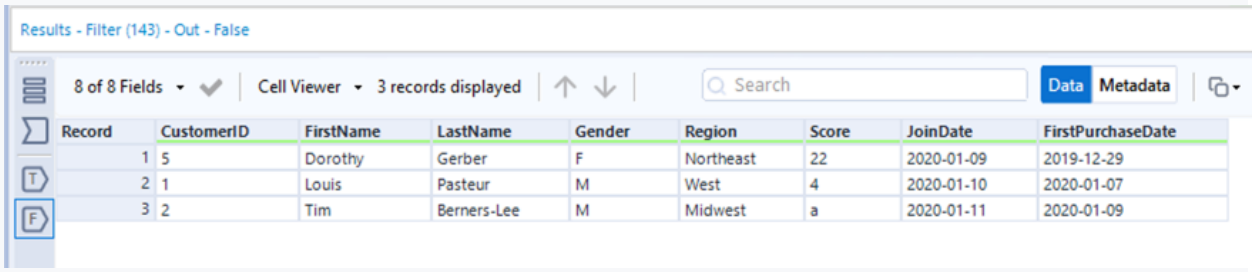


According to the condition of the above Basic filter, rows with a CustomerID value greater than 30 are output to the True anchor.



Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	49	Thomas	Edison	M	South	2	2020-01-06	2019-12-30
2	456	Galileo	[Null]	M	South	1	2020-01-07	2019-12-31
3	31	Benjamin	Franklin	M	Midwest	1	2020-01-08	2019-12-25

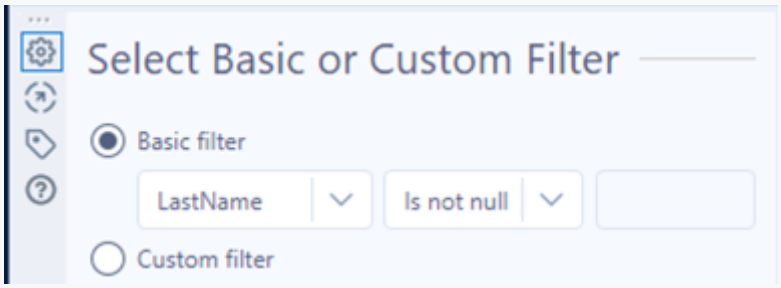
Rows with a CustomerID value that is not greater than 30 are output to the False anchor.



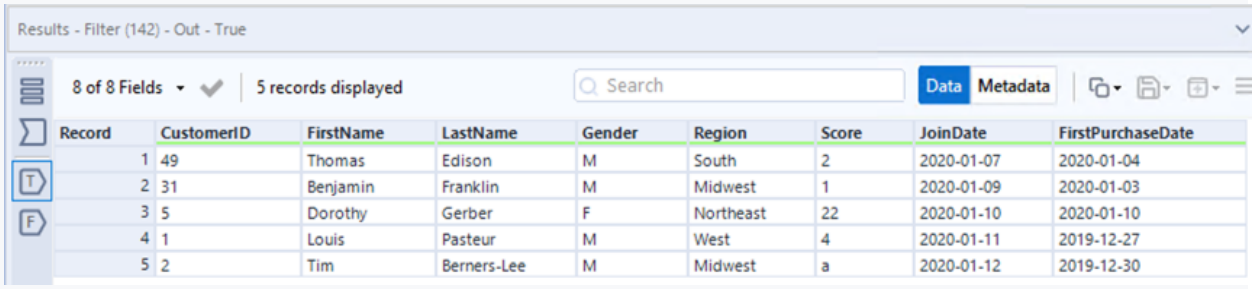
Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	5	Dorothy	Gerber	F	Northeast	22	2020-01-09	2019-12-29
2	1	Louis	Pasteur	M	West	4	2020-01-10	2020-01-07
3	2	Tim	Berners-Lee	M	Midwest	a	2020-01-11	2020-01-09

Example 2. Select Rows With or Without Missing Data

Use the Basic filter to select rows without missing data.

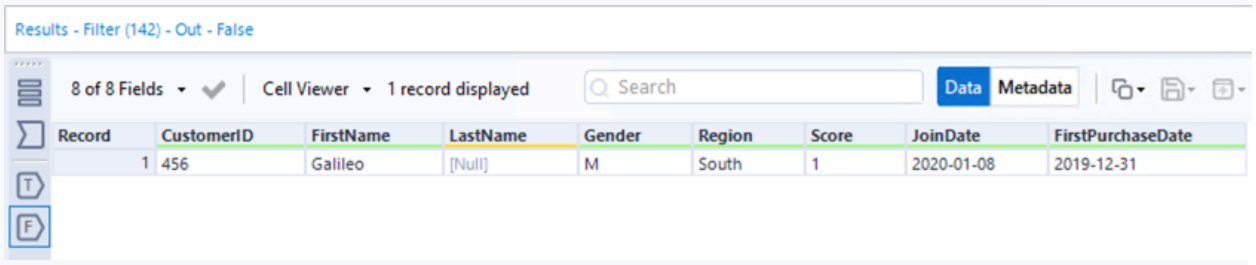


According to the condition of the above Basic filter, rows with a LastName value that is not null (missing) are output to the True anchor.



Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	49	Thomas	Edison	M	South	2	2020-01-07	2020-01-04
2	31	Benjamin	Franklin	M	Midwest	1	2020-01-09	2020-01-03
3	5	Dorothy	Gerber	F	Northeast	22	2020-01-10	2020-01-10
4	1	Louis	Pasteur	M	West	4	2020-01-11	2019-12-27
5	2	Tim	Berners-Lee	M	Midwest	a	2020-01-12	2019-12-30

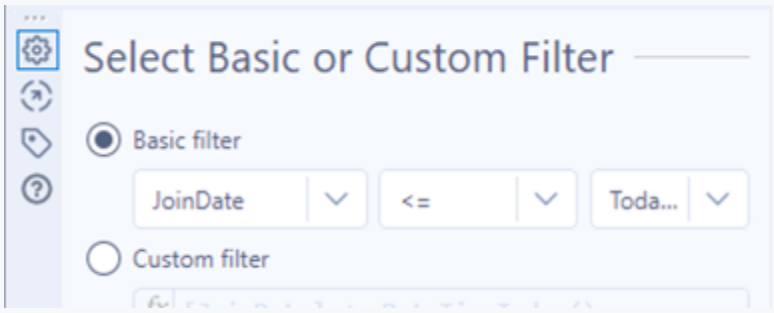
Rows with a null value in LastName are output to the False anchor.



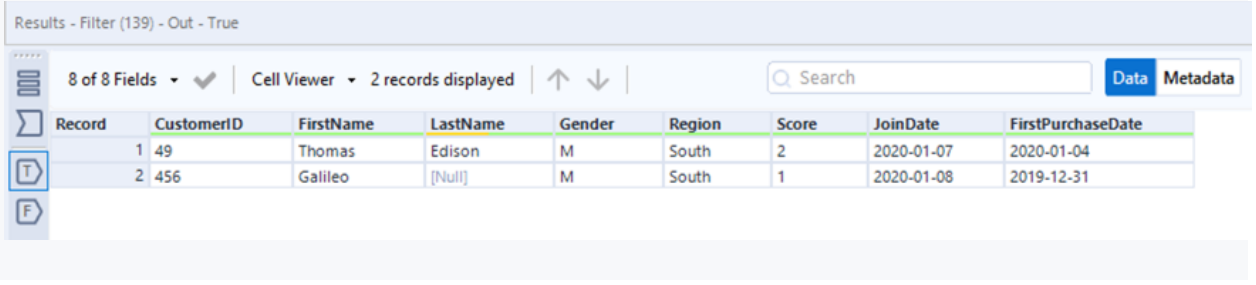
Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	456	Galileo	[Null]	M	South	1	2020-01-08	2019-12-31

Example 3. Select Rows Using Date-Time Data

Use the Basic filter to select rows with a relative date.

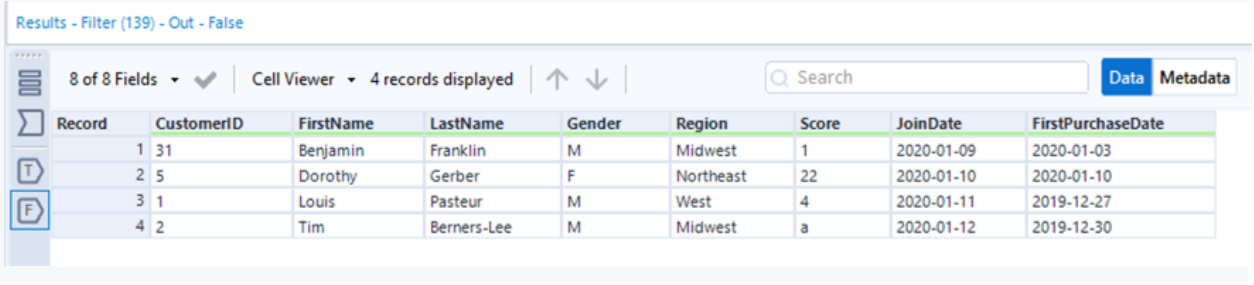


According to the condition of the above Basic filter, rows with a JoinDate that is less than or equal to today's date are output to the True anchor.



Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	49	Thomas	Edison	M	South	2	2020-01-07	2020-01-04
2	456	Galileo	[Null]	M	South	1	2020-01-08	2019-12-31

Rows with a date after today's date are output to the False anchor.



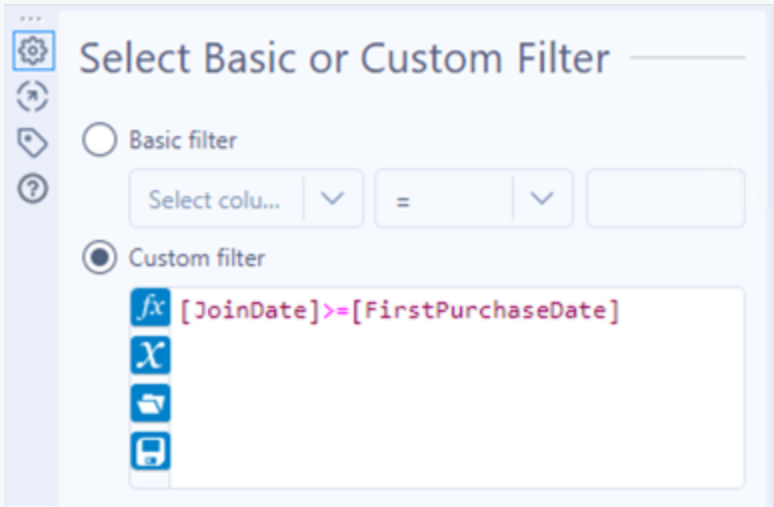
Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	31	Benjamin	Franklin	M	Midwest	1	2020-01-09	2020-01-03
2	5	Dorothy	Gerber	F	Northeast	22	2020-01-10	2020-01-10
3	1	Louis	Pasteur	M	West	4	2020-01-11	2019-12-27
4	2	Tim	Berners-Lee	M	Midwest	a	2020-01-12	2019-12-30

DATE-TIME FILTER TIPS

- The dynamic options, today, tomorrow, and yesterday, update the workflow to that relative date when the workflow is run.
- The Start date and periods after or End date and periods before operators allow you to specify a date range by selecting a specific date, a Period type (Days, Months, Weeks, Quarters, or Years), and the Number of periods before or after.
- Select Filter only Date data to truncate date-time data to use only the date data.

Example 4. Select Rows Using a Multiple-Column Condition

Use the Custom filter to create a condition that references more than one column to select rows.



According to the condition of the above Custom filter, rows with a JoinDate that is greater than or equal to the FirstPurchaseDate are output to the True anchor.

Results - Filter (141) - Out - True

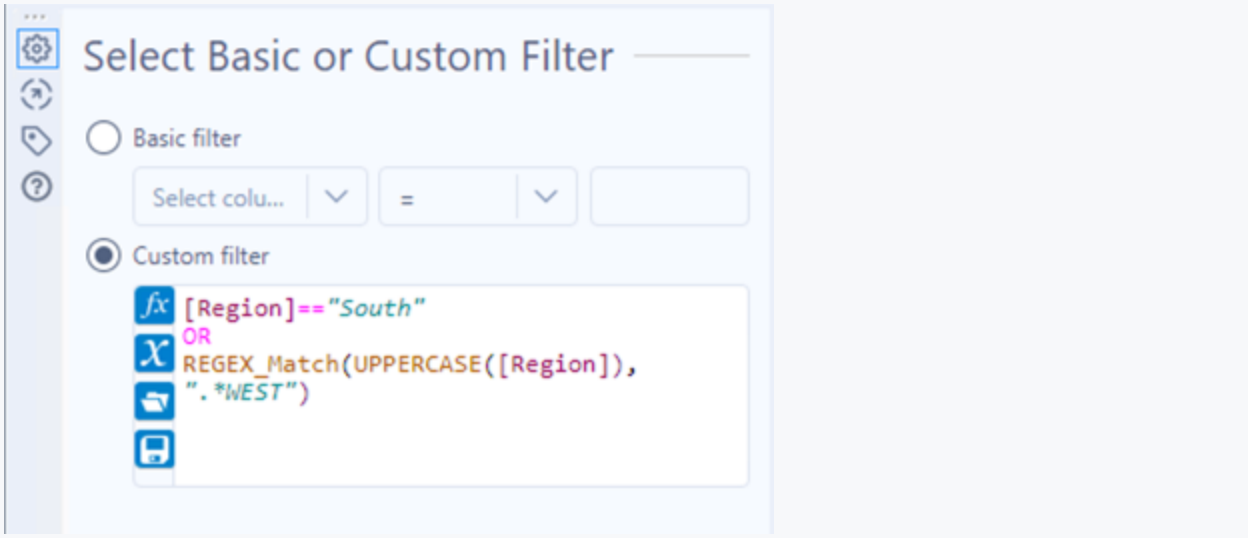
8 of 8 Fields | Cell Viewer | 6 records displayed | Search | Data | Metadata

Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	49	Thomas	Edison	M	South	2	2020-01-07	2019-12-26
2	456	Galileo	[Null]	M	South	1	2020-01-08	2020-01-03
3	31	Benjamin	Franklin	M	Midwest	1	2020-01-09	2020-01-05
4	5	Dorothy	Gerber	F	Northeast	22	2020-01-10	2019-12-28
5	1	Louis	Pasteur	M	West	4	2020-01-11	2020-01-05
6	2	Tim	Berners-Lee	M	Midwest	a	2020-01-12	2020-01-01

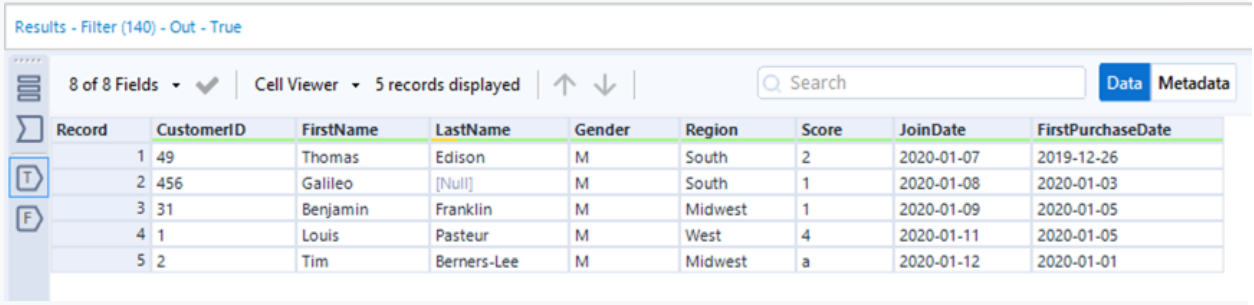
Rows with a JoinDate that is less than the FirstPurchaseDate are output to the False anchor. In this case, there are no rows that have a JoinDate less than the FirstPurchaseDate.

Example 5. Select Rows Using a Compound Condition

Use the Custom filter to create compound conditions, that is, more than one condition joined by and/or operators.

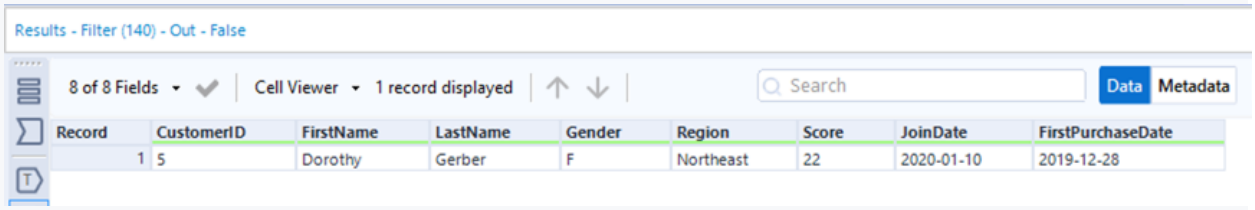


According to the condition of the above Custom filter, rows where the region is either South or contains the word West, are output to the True anchor.



Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	49	Thomas	Edison	M	South	2	2020-01-07	2019-12-26
2	456	Galileo	[Null]	M	South	1	2020-01-08	2020-01-03
3	31	Benjamin	Franklin	M	Midwest	1	2020-01-09	2020-01-05
4	1	Louis	Pasteur	M	West	4	2020-01-11	2020-01-05
5	2	Tim	Berners-Lee	M	Midwest	a	2020-01-12	2020-01-01

All other rows are output to the False anchor.



Record	CustomerID	FirstName	LastName	Gender	Region	Score	JoinDate	FirstPurchaseDate
1	5	Dorothy	Gerber	F	Northeast	22	2020-01-10	2019-12-28

Troubleshooting

Treat numbers with more than 15 digits as strings to prevent loss of precision. You can set the field type to a string using the **Select Tool**.

STRING FUNCTIONS

Contains

`Contains(String, Target, CaseInsensitive=1)`: Searches for the occurrence of a particular string within a string. Returns True if (String) contains (Target), else returns False.

Example

`Contains('123ABC', 'ABC')` returns True.

`Contains('123ABC', 'abc')` returns True.

`Contains('123ABC', 'abc', 0)` returns False.

CountWords

`CountWords(string)`: Returns the count of words in the specified string. Words are defined by characters separated by a space.

Example

`CountWords("Basic Variables Households")` returns 3.

`CountWords("Basic Variables Age:Female (Pop)Age  1")` returns 5.

DecomposeUnicodeForMatch

`DecomposeUnicodeForMatch(String)`: Removes accents and expands compound characters while converting to narrow. This function takes an Alteryx *WString* data type and converts it to a lowercase, narrow *String* data type. All accents and other decorations are removed. Refer to Data Types for more information about Alteryx data types.

This function is useful for matching only. It is not considered a normalized string.

The function is not designed for use with non-western character sets like Japanese. You should avoid using this function on strings that may contain wide characters and note that wide characters are converted to '?'.

Example

`DecomposeUnicodeForMatch("Prénoms français")` returns prenoms francais.

EndsWith

`EndsWith(String, Target, CaseInsensitive=1)`: Checks if a string ends with a particular string. Returns True if (String) ends with (Target), else returns False. It defaults to case insensitive.

Example

`EndsWith('123ABC', 'ABC')` returns True.

`EndsWith('123ABC', 'abc')` returns True.

`EndsWith('123ABC', 'abc', 0)` returns False.

FindString

The `FindString` function is case sensitive.

`FindString(String,Target)`: Searches for the occurrence of a particular string (Target) within another string (String) and returns the numeric position of its occurrence in the string.

Returns the 0-based index of the first occurrence of (Target) in (String). Returns -1 if no occurrence.

Example

`FindString([Name], "John")` returns 0 when the string starts with John and returns -1 when the string does not.

`IF (FINDSTRING([Name], "John") =0) THEN "John Smith" ELSE "Other" ENDIF` returns John Smith when the string starts with John and returns Other when the string does not.

GetWord

`GetWord(string, n)`: Returns the Nth (0-based) word in the string. Words are defined as a collection of characters separated by a space. 0-based index, means the first word is at the 0 position.

Example

`GetWord("Basic Variables Households", 0)` returns "Basic".

`GetWord("Basic Variables Households", 1)` returns "Variables".

Left

`Left(String, len)`: Returns the first (len) characters of the string (String). If len is less than 0 or greater than the length of String, String remains unchanged.

Example

`Left("92688", 3)` returns a value of "926".

Length

`Length(String)`: Returns the length of the string (String).

Example

`Length("92688")` returns a value of 5.

PARSE TOOL

The Parse category includes tools that separate data values into a standard table schema.

 **DateTime Tool: The Date Time tool standardizes and formats date and time data so that it can be used in expressions and functions from the Formula or Filter tool.**

 **RegEx Tool: The Regular Expression tool uses regular expression syntax to parse, match, or replace data.**

 **Text To Columns Tool: The Text to Columns tool takes the text in one column and splits the string value into separate, multiple fields based on a single or multiple delimiters.**

 **XML Parse Tool: The XML Parse tool reads in a chunk of Extensible Markup Language and parses it into individual fields.**

IN/OUT TOOL

The In/Out category includes tools for providing inputs and outputs for workflows. The Input Data and Output Data tools have different configuration properties, depending on the file type that is used. The Browse tool offers a temporary view of what the data looks like in table, map, or report format.

Visit the Alteryx Community Tool Mastery series to learn even more about these and other tools.


Browse Tool: The Browse tool displays data from a connected tool as well as data profile information, maps, reporting snippets, and behavior analysis information in the data.


Date Time Now Tool: The Date Time Now tool returns a single record: the Date and Time at the workflow runtime, and convert the value into the string format of the user's choosing.


Directory Tool: The Directory tool returns all the files in a specified directory. Along with file names, other pertinent information about each file is returned, including file size, creation date, last modified, and much more.


Input Data Tool: The Input Data tool brings data in to your workflow by connecting to a file or database.


Map Input Tool: The Map tool makes it possible to draw or select map objects (points, lines, and polygons) to be stored in the workflow.


Output Data Tool: The Output Data tool writes the results of a workflow to a file or database.


Text Input Tool: The Text Input tool makes it possible to manually type text to create small data files for input, which can be useful for creating Lookup tables.

XDF Input Tool: The XDF Input tool reads data from an XDF (.xdf) file, which is the format used by Microsoft R ScaleR functions to scale predictive analytics to millions of records for either using the .xdf file as input to a predictive analytics tool or reading the file into an Alteryx data stream for further data cleansing or blending.

XDF Output Tool: The XDF Output tool writes an Alteryx data stream to an XDF (.xdf) file, which is the format used by Microsoft R ScaleR functions to scale predictive analytics to millions of records.

POSSIBLE QUESTIONS:

What is the difference between the Find/Replace input anchors?
-F input anchor: This input is the initial input table ("F" for "Find"). This is the table that is updated in the tool's results.
-R input anchor: This input is the lookup table ("R" for "Replace"). This is the table that contains data used to replace data in (or append data to) the initial input.

What are the two sections of the Input Data Configuration window?
Connect a File or Database AND Options

What does entering "*" do with an input file?
It brings in anything that starts with the characters before the "*" and anything after it

What does entering "?" do with an input file?
It brings in anything that starts with the characters before the "?" plus one character

What are the limits for the data layout preview window in the Input Data tool?
100 records or fewer in wide files

How do you convert an Output Data Tool to an Input Data Tool?
1.) Right-click the Output Data tool you want to convert to an Input Data tool.
2.) Select Convert To Input Data.

What are the 3 ways to add the Browse tool to the workflow?
-Drag a Browse tool to the canvas, and connect it to an upstream tool.
-Right-click on a tool on the canvas and select Add Browse After.
-Use the Shift+Ctrl+B keyboard shortcut and select the tools in a workflow.

Without the browse tool, up to how much data shows in the Results window?
1 MB of data

How do you disable a browse tool?
-Select a random point on the canvas to display the Workflow - Configuration window.
-In the configuration window, select Runtime.
-Check Disable All Browse Tools to make the Browse tools in the workflow unavailable. To enable Browse tools, uncheck Disable All Browse Tools.

What happens in the Configuration Window of the Browse Tool if a column's data type is not compatible with data profiling?
"No Profiling Available" message will display

What happens in the Configuration Window of the Browse Tool if there is only one value in each column?
"Only one value" message displays

What happens in the Configuration Window of the Browse Tool if each value in the columns is unique?
"All values are unique" message displays

In the Configuration Window of the Browse Tool, what are the two categories you can filter based on?
Fields (columns) and Data Type

What is the data profiling limit of the Browse Tool?
300 MB

Is record size the same as file size?
No

How to convert Browse Tool to Macro Output Tool
1.) Right-click the Browse tool in your workflow.
2.) Select Convert To Macro Output.
3.) Configure the tool.

How to convert Browse Tool to Output Data Tool
1.) Right-click the Browse tool in your workflow.
2.) Select Convert To Output Data.
3.) Configure the tool.

What does the "Append Suffix to File/Table Name" option do to the output data file?
Appends the selected field name to the end of the name of the selected table.

What does the "Prepend Prefix to File/Table Name" option do to the output data file?
Prepends the selected field name to the beginning of the name of the selected table.

What does the "Change File/Table Name" option do to the output data file?
Changes the file name to the selected field name

What does the "Change Entire File Path" option do to the output data file?
Changes the file name to the name of the selected field. The name must be a complete file path. This option can overwrite an existing file if a file exists in the full path directory

What does Default Sort do to numeric string data?
Using the default sort, numeric strings are sorted left to right, character by character

What does Dictionary Sort do to numeric string data?
Using the dictionary sort, numeric strings are sorted from the smallest to largest number

What does the Auto Field Tool do?
Use Auto Field to read through all of the records of an input and set the field type to the smallest possible size relative to the data contained within the column.
The tool correctly assigns a numeric field to a string data type where any record starts with zero and not a number.

What should you do after running the Duplicates tool?
Manual inspection. Manual inspection of the results is often necessary to ensure that rows flagged as duplicates are actually duplicates. For example, you might have 2

customers that share the same name but live at different addresses. If you think that your dataset might include these types of outliers, you might want to select additional columns when you configure this tool.

What is Sample tool used for?
Use Sample to limit the data stream to a specified number, percentage, or random set of rows. In addition, the Sample tool applies the selected configuration to the columns selected to group by

What is the option in the Sample tool to further sample the data?
Group by column: If a group or groups are specified, N rows are returned for each group.

If you select to Group by a column named City, specify N as 2, and select First N Rows, Alteryx returns the first 2 rows for each City.

What other tools contain the Select tool functionality?
Append Fields tool, Find Nearest tool, Join tool, Join Multiple tool, Select In-DB tool, and Spatial Match tool

What is the Select tool used for?
Use Select to include, exclude, and reorder the columns of data that pass through your workflow. Excluding columns can limit the data passing through a workflow and improve performance. You can also use the Select tool to modify the type and size of data, rename a column, or add a description.

How do you change the supported length or measurement of data in the Select tool?
Select size and enter a number. Size varies by data types and can be edited for fixed decimal numeric types and all string types

What are the ways you can use the Formula tool?
Apply conditional statements.
Convert numbers and strings.
Format dates.
Extract file paths.
Apply financial algorithms or mathematical calculations.
Find the minimum and maximum values.
Analyze spatial data.
Cleanse string data.

Perform validation tests on data.

What are the three functions of the Formula tool?
Build an Expression, Add an Additional Expression, Reorder an Expression

What is the Multi-Row Formula tool used for?
Utilize row data as part of the formula creation and is useful for parsing complex data, and creating running totals, averages, percentages, and other mathematical calculations

What are the steps to configure the Multi-Row Formula tool?
1.) Choose to Update Existing Field or Create New Field. If creating a new field, enter a name, and select the Type and Size.

2.)Use Num Rows to set the row variables that display as in the expression editor. When set to 1, these variables display
Row - 1: The row before the active row.
Row + 0: This is the Active Row. The active row is where the result goes into.
Row + 1: The row after the active row.

3.)When the Active row is the first row, you need to specify the Values for Rows that don't exist.
Null: Null values are applied to nonexistent rows.
0 or Empty: The values are set to 0 or left empty (default).
Set to Values of Closest Valid Row: The values of the closest valid row are set to the nonexistent rows.

4.)Group by (Optional): Either select fields individually or use the All or Clear buttons.

5.)Build the expression that will update the chosen field. Visit Expression Editor for details.

What is the Append Fields Tool and what is it used for?
Use Append Fields to append the fields of one small input (Source) to every record of another larger input (Target). The result is a Cartesian join. In a Cartesian join, every row from one table is joined to every row of another table. For example, if table A has 100 rows, and table B has 1,000 rows, the Cartesian join of these two tables results in 100,000 rows

What are some of the capabilities of the Append Fields Tool?

Select, Deselect, and Reorder Columns, Modify Data Type and Size, and Rename a Column or Add a Description

What happens if you generate too many records?
Warn/Error on Too Many Records Being Generated: Since the Append Fields tool performs a Cartesian join, you can unintentionally produce an excessive amount of records. You can configure warnings or errors to be reported to ensure that too many records are not produced.

-Allow All Appends: All records will be appended to all records with no error or warning.

-Warn on appends of more than 16 Records: If more than 16 records are in the Source file (S input) a warning is reported and the workflow continues processing.

-Error on appends of more than 16 Records: If more than 16 records are in the Source file (S input) an error is reported and the workflow stops processing.

What are the two options to performing a Join?
1.) Join by Record Position: Select this option when the two tables to be joined have the same field structure, and the data will be joined by its position within the two tables.
2.) Join by Specific Field: Select this option when the two tables have one or more fields in common (like an ID) and the data will be joined together. You can choose to Join based on multiple fields. Each Join should be a separate row in the grid.

What do you need to do if you need multiple join fields?
-Select the dropdown to choose an additional join field, per input.
-To delete a join field, select a number on the left-hand side and select the Delete button.