

# TIPS AND TRICKS 2018

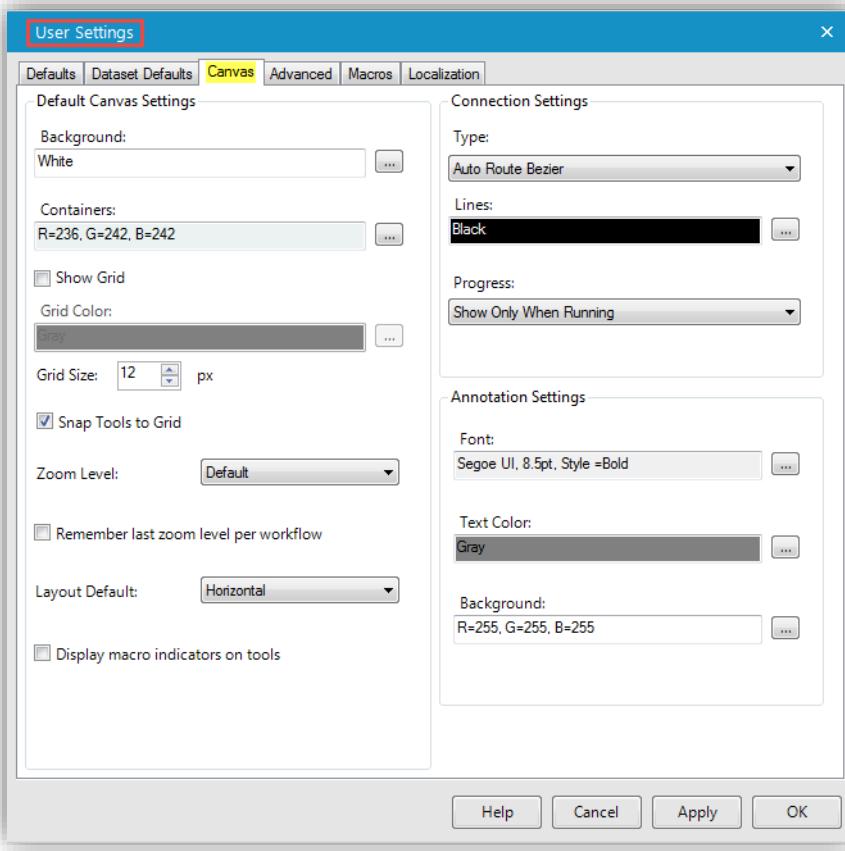
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# DESIGNING AND ORGANIZING WORKFLOWS

# DESIGNING AND ORGANIZING WORKFLOWS

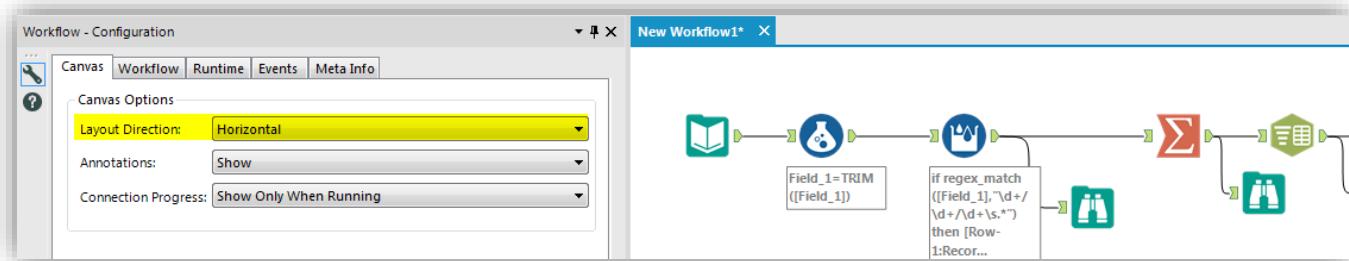
## USER SETTINGS: MAKE YOUR ALTERYX CANVAS WORK FOR YOU



Make your Alteryx Canvas efficient by personalizing the orientation of your workflow, connection type, zoom levels, and container colors. The **User Settings** option allows you to set new defaults for all your workflows. It can be found in *Options> User Settings> Edit User Settings > Canvas*. These settings can also be configured for individual workflows, as described below.

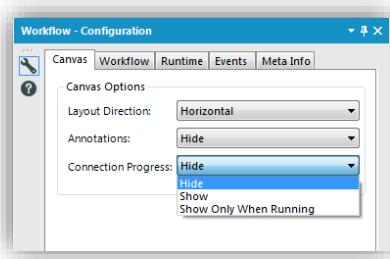
## WORKFLOW LAYOUT: HORIZONTAL OR VERTICAL?

Although the default setting is horizontal, workflows can be built out vertically or horizontally. To change the layout for a single workflow, click anywhere on your canvas, and in your *Workflow Configuration* window, under *Canvas* options, select your *Layout Direction* as horizontal or vertical.



## CONNECTION PROGRESS: WHAT TO SHOW

The Connection Progress configuration allows you to keep an eye on the number of records and data size being passed from one tool to the next. This is helpful when troubleshooting, i.e. to spot a bad join, to find the step where records were lost, or to check the data size.



There are three options to choose from. The default setting is *Show Only When Running* which shows the connection progress only when your workflow is executing. If you prefer an uncluttered look, you can *Hide* the connection progress.

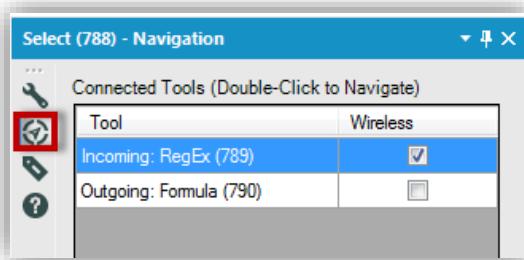
If you'd like to be able to keep the connection information visible, even after the workflow has finished processing, select *Show*.

To set a new default for a single workflow go to *Workflow – Configuration > Canvas > Connection Progress*.

## CONNECTION TYPE: LOOPY, PERPENDICULAR, STRAIGHT, OR WIRELESS

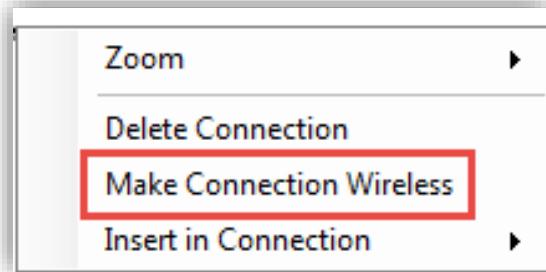
Connectors in a bunch? Can't find where your tools are leading you? With different connection types, you can make it easier for yourself and others to follow your workflow. You can change your loopy connectors to perpendicular or straight lines under *Options > User Settings > Edit User Settings > Canvas*.

You can even make your connections **Wireless**!



Right-click on any tool and then select *Make [Incoming/Outgoing] Connections Wireless* or select the Wireless checkbox under the Navigation menu for the tool.

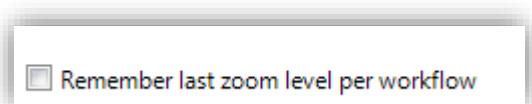
Select/highlight a group of tools to make incoming/outgoing connections wired for multiple tools at once. This can only be set at a workflow level.



To quickly make a connection wireless, right-click on the connection and select *Make Connection Wireless*.

## REMEMBER YOUR WORKFLOW'S LAST ZOOM LEVEL

As you are developing your workflow, you may change the zoom level to have a better view of your work.

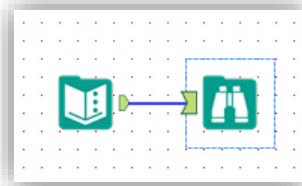


If checked, *Remember last zoom level per workflow*, will recall the zoom level at which the workflow was last saved. This can be a good time saver, and by default, the option is not enabled.

## OTHER USEFUL CANVAS FEATURES

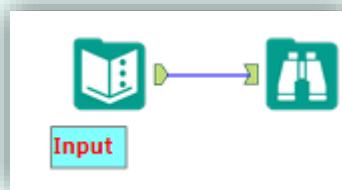
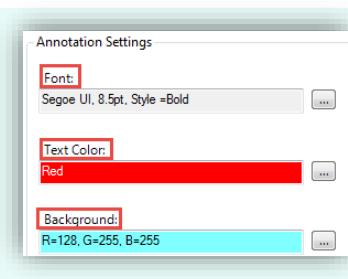
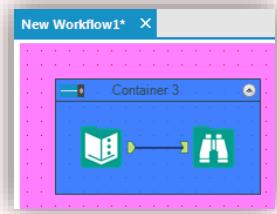
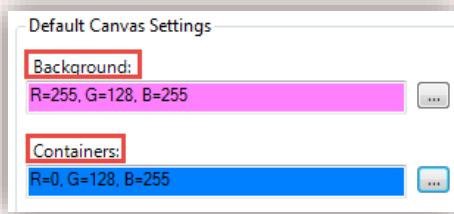
### GRIDS

Grids allow you to easily align tools on the canvas. By default, the grid is disabled. To enable, check the *Show Grid* checkbox. Grid Color and size can also be personalized.



### ADDING SOME COLORS

Alteryx allows you to personalize colors in the canvas. The *Canvas* and *Containers* backgrounds can be personalized...



...As well as *Annotation* background, font, text color...

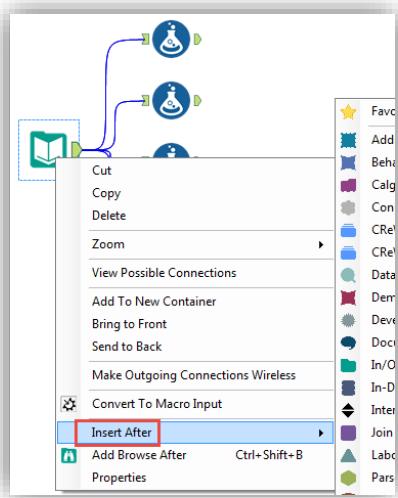


And *connection lines*

# CONNECTING AND RECONNECTING

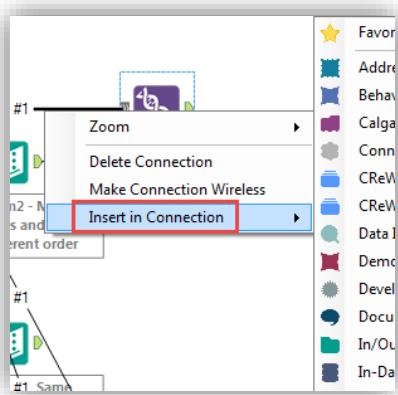
Connecting and Reconnecting tools on the canvas is how we build our masterpieces.

## INSERT [TOOL] AFTER: NO NEED TO RECONNECT



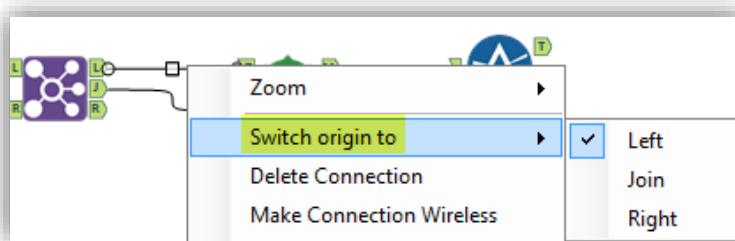
All Alteryx users have been there, the light bulb goes off: “This tool should be moved, but there are multiple connections.”

No need to reconnect, right-click on the tool then *select Insert After* and select the tool to Insert. All the connections will go out of the inserted tool.



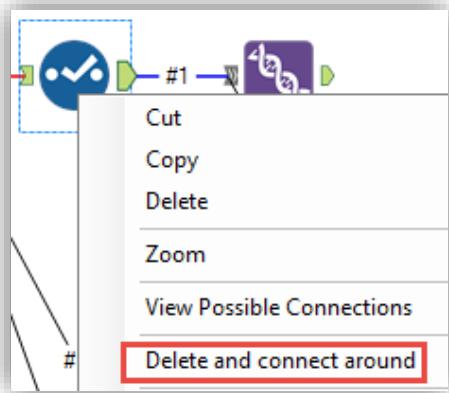
Realized you need a tool in between? Add it quickly with swift clicks: right-click on *connection* > *Insert in Connection* > *Category* > *select tool to add*.

## SWITCH CONNECTION ORIGIN



When a tool has multiple output anchors, the anchor in use can be changed by right-clicking on the connection and selecting *Switch Origin to*, then choose from available options.

## DELETE AND CONNECT AROUND

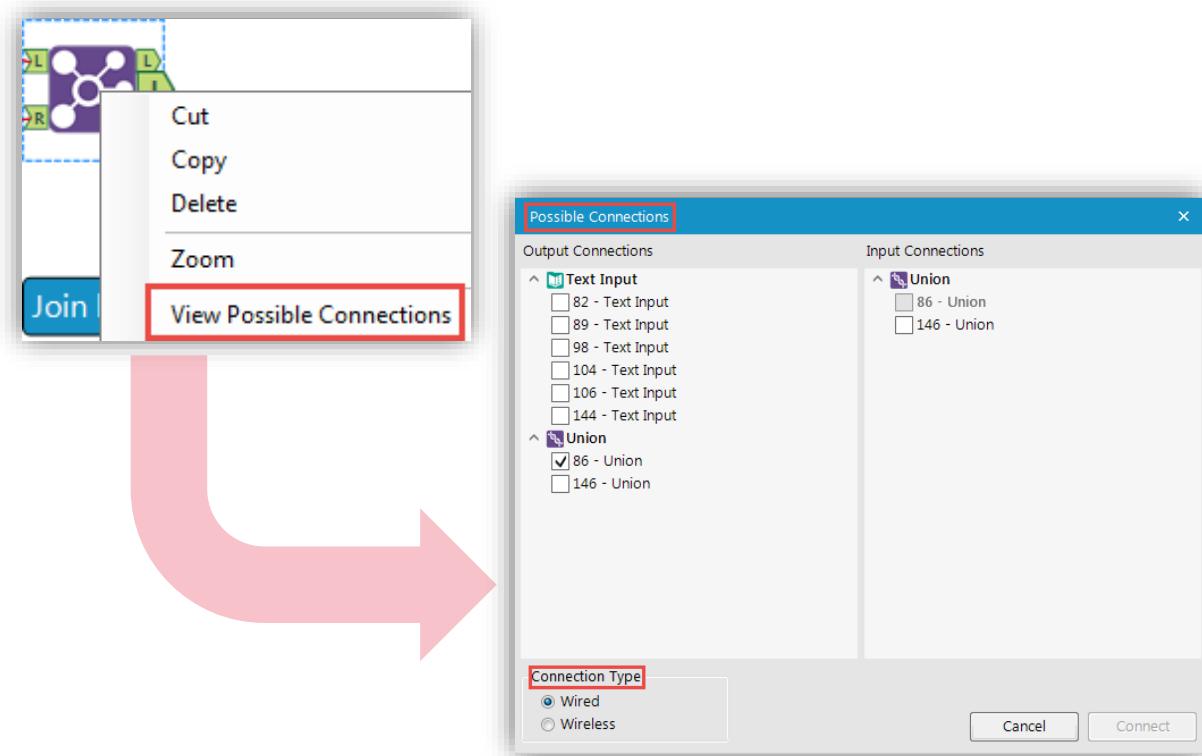


When deleting a tool that is connected, right-click on the tool and select *Delete and connect around*. This will not be enabled for tools that have multiple inputs and/or outputs.

## VIEW POSSIBLE CONNECTIONS

Multiple Inputs connecting to a Union tool?

Instead of manually connecting each Input tool, right-click on any of the tools to select the *View Possible Connections* option, a window will pop up to show you all available tools and their possible connections, just check the boxes in *Output Connections* and the tool to connect to in *Input Connections*.

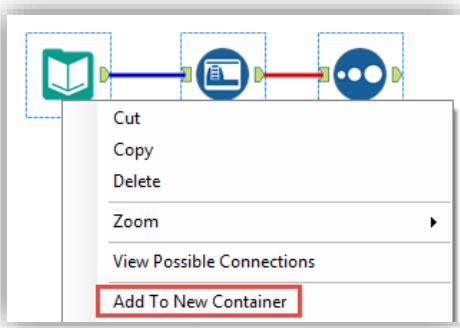


# MAD ABOUT ORGANIZATION

In addition to having functionality, everyone wants their workflows to look pretty. Shortcuts have been added to increase your efficiency and to keep workflows lean and mean.

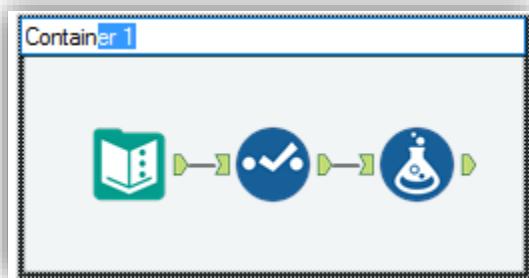
## TOOL CONTAINER

### ADD TO NEW CONTAINER



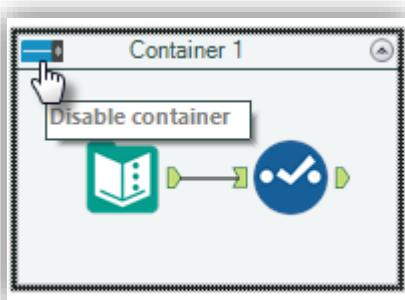
Often, there are several tools on the canvas before you realize they would be better off organized in a container. Instead of dragging a Tool Container to the Canvas and manually moving each tool into it, select one or more tools on the canvas, right-click, and select *Add To New Container*.

### UPDATE TOOL CONTAINER CAPTION DIRECTLY ON TOOL



The Tool Container caption can be edited directly on the canvas by double-clicking on the caption and typing directly in the box.

### QUICKLY DISABLE A TOOL CONTAINER



Need to disable a container? Click on the button at the top left of the container to disable in one click.



## FROM THE TIP MEISTERS TOOL CONTAINERS TO GROUP TOOLS BY SPECIFIC FUNCTION BY SGOLNIK

Use Tool Containers to group tools in your workflow that perform a specific function and give them meaningful labels. This is useful if you have a large workflow as you can right-click and use the zoom feature to zoom in on a specific tool container.



## FROM THE TIP MEISTERS COLOR CODED TOOL CONTAINERS BY NICK612HAYDEN

Pick a color scheme for the containers in your workflows, and stick with it. Add the container-color legend right next to your logo and other workflow specs for easy reference.. I have found it to be very beneficial when debugging or reviewing my workflows with other users. During workflow audits, everyone can easily identify a few key elements of every workflow quickly.

For example:

Green for the container(s) that store your Input tools, which maybe use those multiple db sources, (+ all those select tools, filters, etc.)

Blue for that Text Input tool which needs to be manually updated for the upcoming Find and Replace tool.

Purple for that part of the workflow that requires your user to input a value.

Yellow for that container that has all those transformations/Formula tools

Orange for that temp table you just created to reference in a later part of the workflow...

Red for your end repository/Output

It's a little thing that goes a long way when you're talking about Data Flow documentation in highly regulated environments.

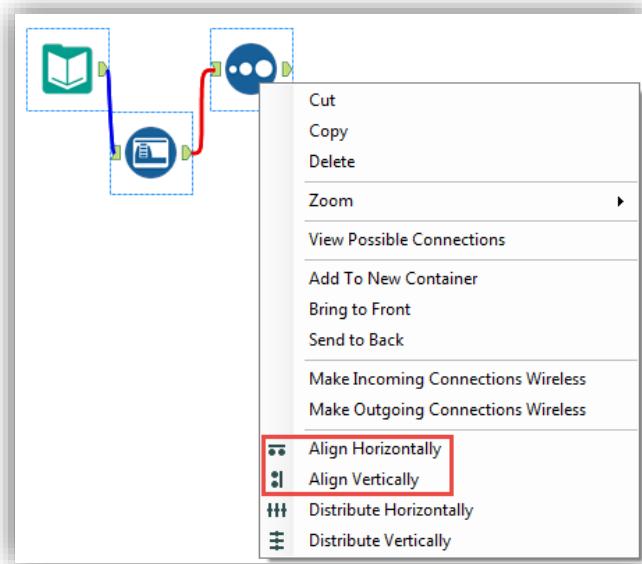
## AIM AND PASTE

One of the neat things about Alteryx is that you can copy tools or sections of a workflow and paste them to the same workflow or another workflow. With Alteryx you have control over the exact paste location on your canvas. To drive where copied tools get placed on the canvas, right-click & paste rather than Ctrl-V (Paste shortcut).

## ALIGNMENT

Got a workflow that's trying to do its own thing? Get it into formation with these handy tips.

### ALIGN HORIZONTALLY OR VERTICALLY



Select or Highlight the tools to align, right-click on them, and select your favorite alignment, either *Align Horizontally* or *Align Vertically*.

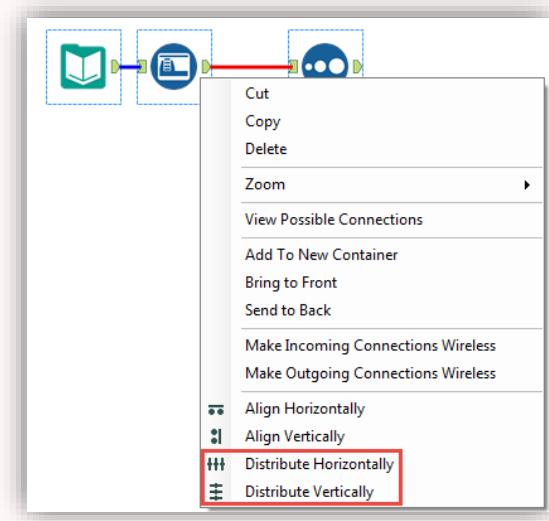
If you like **shortcuts**

Align Horizontally: ***Ctrl + Shift + -***

Align Vertically: ***Ctrl + Shift + +***



### DISTRIBUTE TOOLS VERTICALLY AND HORIZONTALLY OPTION



Evenly space the tools in your canvas.

Select or Highlight the tools to distribute, right-click on them and select the appropriate distribution, depending on the orientation of your tools. *Distribute Horizontally* or *Distribute Vertically*.

# DOCUMENTATION... DOCUMENTATION

Documentation is an essential part of designing workflows. The benefits of documenting (early in the process) include improving workflow presentation and organization, allowing others to understand your workflow more easily and helping you when modifying the workflow at a later date.



FROM THE TIP MEISTERS

DOCUMENTATION AND WORKFLOW ORGANIZATION BY  
NICOLE JOHNSON

I am a big fan of the documentation and workflow organization options in Alteryx as a way to keep track of where things are happening in my workflows, and helping provide explanations to those who are trying to interpret or learn from the workflows I've created.

By simply adding comment boxes and tool containers to help organize the steps of the workflow, it becomes very easy to walk through a workflow and explain what is happening in each tool or group of tools, rather than having to click into each tool to see what configurations were used, or scrolling all over the workflow to find the next step in the process.

## COMMENT TOOL

The handy-dandy Comment tool is the most used tool in our *Sample Workflows* (*Help > Sample Tools*). Utilizing the Comment tool to strategically place explanations and notes is a great way to explain what's going on in a workflow.

The screenshot shows the Alteryx interface with the "RegEx Tool" selected. A tooltip provides a brief description of the tool's purpose: "The RegEx tool is able to leverage the powerful pattern matching abilities of regular expression syntax for the sake of parsing, matching, or replacing string data." Below the tool are two numbered steps: "1) Run the workflow (Ctrl+R)." and "2) Select a tool to view its output in the Results window." A "More Info" section titled "Introduction" contains a general description of regular expressions. A specific example is shown for the "RegEx Match" tool, which takes a string input and a regular expression pattern "(.)\*". A tooltip for this example states: "The 'Match' output method of the RegEx tool returns a boolean value of true if the specified string matches the regular expression, and false if it does not. This method looks for full string matches rather than partial matches." A green book icon is also visible on the left side of the interface.



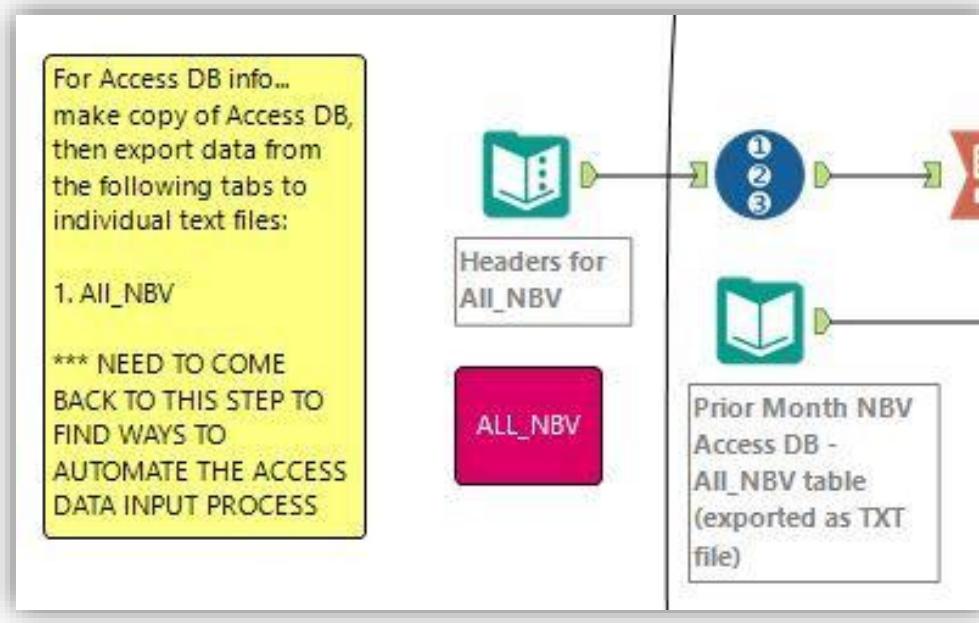
**FROM THE TIP MEISTERS**  
**CREATE A “COMMENT LIBRARY” FOR TIME SAVING BY**  
**DEREKBELYEA**

If you are spending too much time adjusting the formatting of Comment objects you can place examples of your preferred layouts in a workflow that serves as a Comment Library. Keep this file loaded all the time when you are creating or editing workflows. Then cut and paste from the library as needed. This is a great place maintain branding elements like logos, images and copyright notices for quickly adding to your work.



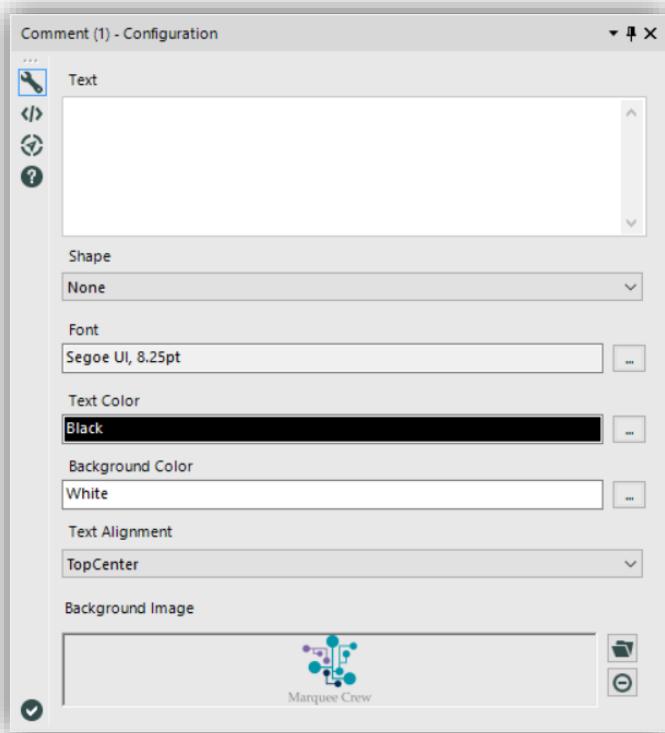
**FROM THE TIP MEISTERS**  
**EASY TO SPOT REMINDERS THROUGH COLORFUL**  
**COMMENTS BY NICOLEJOHNSON**

I always leave comments throughout in-development workflows to remind me of places that I need to come back to for further revision. Highlighting them in bright colors makes them pop out as I continue to refine the workflow, and help make sure I don't forget about the little things that still need to be tweaked!





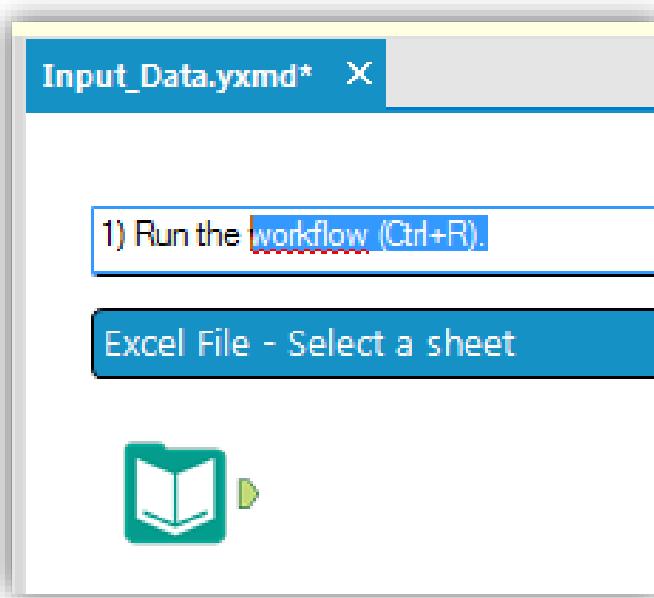
## FROM THE TIP MEISTERS ADD A LOGO TO YOUR WORKFLOW BY MARQUEE CREW



Steps to add logo:

1. Add Comment tool
2. Set Shape None
3. Click on Folder Open
4. Browse to select your logo

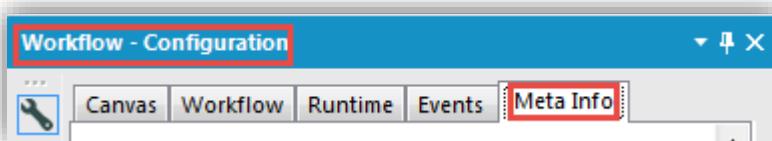
## UPDATE COMMENT TOOL CAPTION DIRECTLY ON TOOL



The Comment tool caption can be edited directly on the canvas by double-clicking on the caption and typing directly in the box.

## WORKFLOW META INFO: DATA ABOUT DATA ABOUT DATA...

Document important details about your workflow such as description of the workflow and Author information in the Meta Info tab



### FROM THE TIP MEISTERS META INFO FOR GALLERY USERS BY NICOLEJOHNSON

I have found that it is extremely helpful to take the time to fill in the *Meta Info* tab on the *Workflow Configuration* window prior to saving to the Gallery.

The screenshot shows a workflow item in the gallery. On the left is a thumbnail image of a pink and purple radial burst pattern. To its right is a detailed view of the workflow's meta information:

- ARRE Change Log** (highlighted with a red box)
- Accounting Department - Nicole Johnson** (highlighted with a red box)
- Latest:** Version 2 - Uploaded Yesterday at 8:25:32 AM
- Published:** Version 2 - Uploaded Yesterday at 8:25:32 AM
- Run:** 2 times
- Add Tags** button
- RUN**, **DOWNLOAD**, **SCHEDULE**, **Sharing** buttons
- Description:** Identifies changed records in lookup tables in ARRE during specified date range. (highlighted with a red box)
- Author:** Nicole Johnson (highlighted with a red box)
- Name/Workflow:** ARRE Change Log (highlighted with a red box)

Including a basic description of what the workflow is doing, with information about who created it is so helpful for future questions & troubleshooting. URL's can be included to point users to workflow help files, information about data sources, or other resources. This provides context to the user about cases when the workflow should be used, or could be used as a way to communicate steps that need to be taken prior to running the workflow.

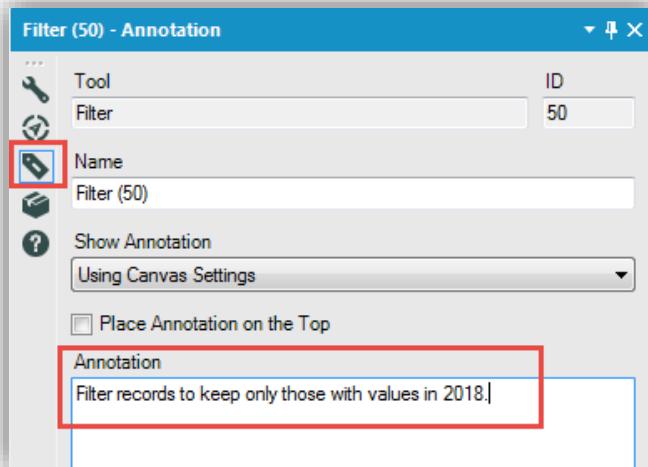
Description of workflow as well as the name of the author are shown when you click on the workflow to run it - helpful when determining who to go to when revisions are needed!

## TOOL ANNOTATION

The tool annotation area is like finding extra storage space in your house. Here you have more space to add notes to each of your tools.



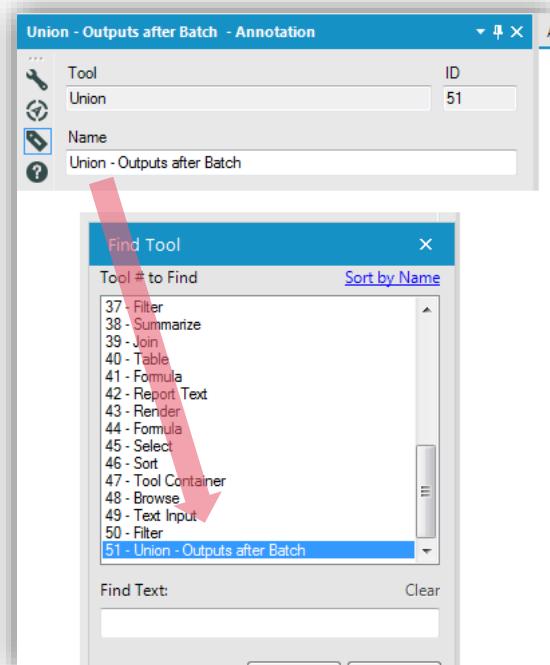
### FROM THE TIP MEISTERS CLEANING UP ANNOTATIONS TO PROVIDE CLEAR DESCRIPTIONS BY NICOLEJOHNSON



Annotate tools to provide simple explanations of what is being done in each tool (Filtering for X, Sorting by RecordID, Eliminating *null* values, etc.)



### FROM THE TIP MEISTERS ANNOTATING TOOL NAMES AND USING THE FIND TOOL BY IVOLLER



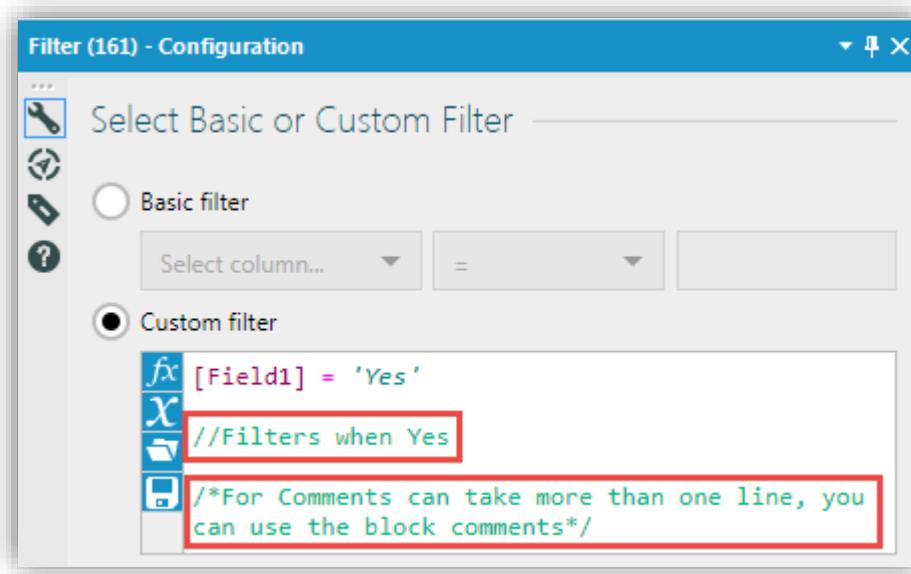
Annotating tool names and using the *Find tool* option from the right-click menu can really help when working with complex flows. For example: "Union - outputs after batch" is easier to track down than "Union (36)".

The Name parameter is another place that can be used to help document additional details about the process.

To bring up the Find tool, right-click on any empty space in the canvas and select Find Tool or type Ctrl+ F

## EXPRESS YOURSELF IN YOUR EXPRESSIONS

Further document your workflow by adding comments to your Expressions. Tools with an Expression or Custom Filter box support block comments /\*Comment\*/ and single line comments //Comment).



**FROM THE TIP MEISTERS**  
**DOCUMENT AND SHARE YOUR PRINTED WORKFLOWS BY**  
**DEREK BELYEA**

The screenshot shows the Camtasia Studio interface with a workflow titled 'Print FillMissingPeriods.ymd'. The workflow is titled 'FILL IN MISSING PERIODS'. It starts with four parallel tasks labeled 'GROW MFT A', 'GROW MFT B', 'GROW MFT C', and 'GROW MFT D', which converge into a 'JOIN' task. This is followed by a 'FORMAT DATE' task, then a 'SELECT' task, and finally a 'PRINT' task. A table is shown below the workflow. On the right side of the interface, there are print options: 'Fit to Page' and 'Original Scale'. A red box highlights the 'Fit to Page' button.

If you want a way to document and share your workflows without providing the original files you can print directly to a PDF.

For a more useable image use the *Fit to Page* option.

# NIMBLE NAVIGATION

When your little workflow is not so little anymore, you'll need these navigation tips & tricks handy.

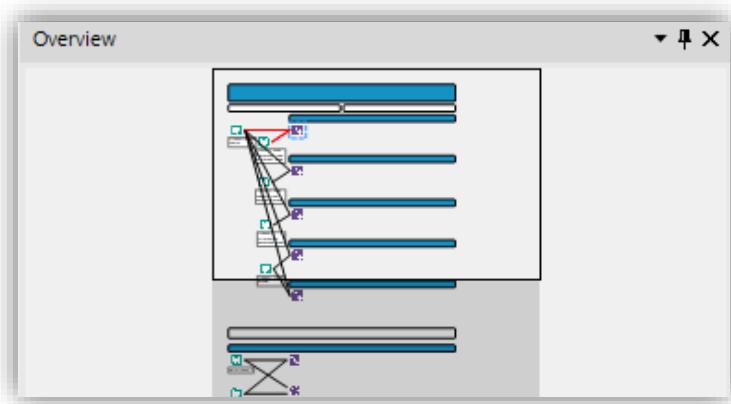
## WORKFLOW NAVIGATION

If scrollbars are not your thing, scroll with the mouse wheel to move up/down or scroll with the mouse wheel while holding the shift key to move left/right. Also try holding the space bar while right-clicking and dragging the canvas to scroll around.

Double click the scroll wheel on your mouse to zoom in and out of your whole workflow. (or use *Ctrl + 0* keyboard shortcut).

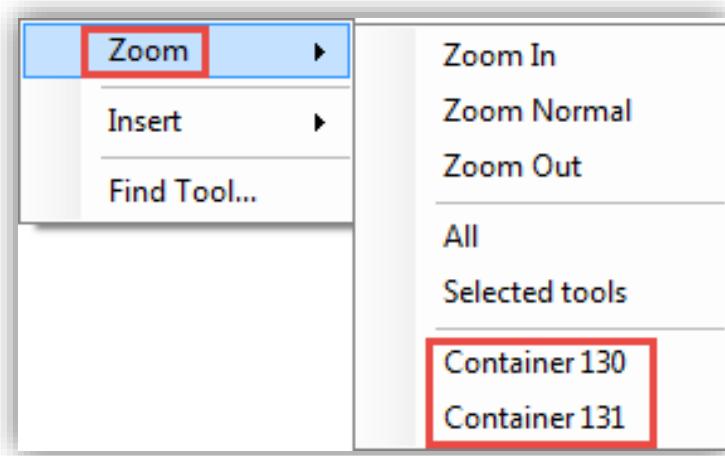
Right-click and drag selects an area of your workflow to zoom in to.

## OVERVIEW VIEW



The Overview (in the View menu bar) allows you to navigate through your workflow while it is running.

## ZOOM TO CONTAINER

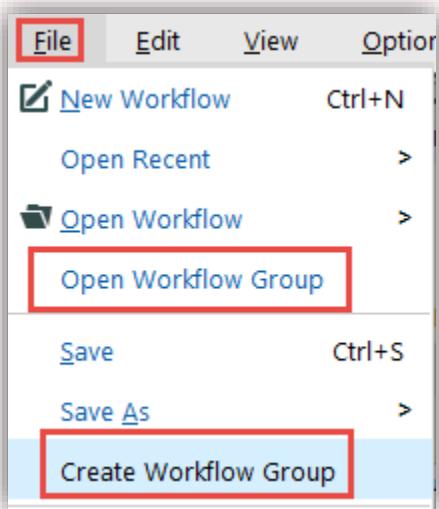


Zoom from one container to another. *Right-click* on any empty space on the canvas then Zoom into a specific tool container.

# MANAGING WORKFLOWS



## WORKFLOW GROUPS



Do you work with multiple workflows and wish you could open them all at once?

Workflow Groups allow users to save many workflows into a single short cut so they can be opened together.

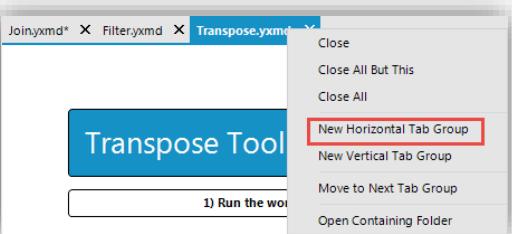
The Create Workflow Group option saves multiple workflows as a workflow group (.yxwg). This file can then be opened as a single workflow group file (Open Workflow Group). Workflow groups can only be created with existing and locally saved workflows.



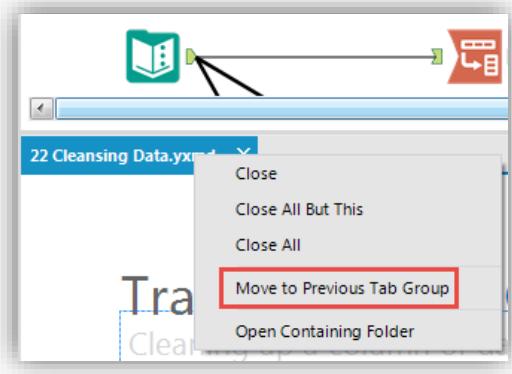
### FROM THE TIP MEISTERS

### LOOK AT 2 WORKFLOWS ON A SINGLE INSTANCE OF ALTERYX BY MARQUEE CREW

Sometimes, you will want to look at two workflows at once in a single instance of Alteryx. You can divide the canvas either horizontally or vertically and see both workflows simultaneously.



Right-click the workflow that you want to move to a new group



To revert to a single view, select Move to Next Tab Group or Move to Previous Tab Group



## HOVER TO DISCOVER

Hover over the workflow tab to discover where this workflow lives. Hovering over the tab displays the entire File path to the workflow.

11 Connecting to Data.ymd X

C:\Program Files\Alteryx\bin\..\Samples\en\01 Tutorials\01 Input and View Data\11 Connecting to Data.ymd

## DEPENDENT ON DEPENDENCIES

This is a useful and underutilized designer feature. The Workflow Dependencies allow you to save time by managing input and output paths and data specifications in a workflow from a single location. You can update dependencies by groups or for individual tools.

Edit	Location	Dependency	Table Name/Query
Edit	Input Data (6)	..\..\SampleData\TutorialData.yxdb	
Edit	Explorer Box (12)	..\Tutorial23.htm	
Edit	Explorer Box (16)	..\SupportingResourceHTML\Cleansing Data.html	

The default is set to Group by Dependency. To show by Individual tool, click on show in Individual tools.



## TIPS FROM THE MEISTER ASSISTING YOUR WORKFLOW: PREFER TO STAY IN ALTERYX WHEN CONSULTING HELP? BY DEREK BELYEA

Comment    Explorer Box    Tool Container

Explorer Box (1) - Configuration

New Workflow1\*

URL: https://community.alteryx.com/

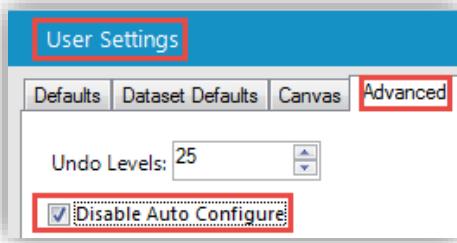
Hide Address Bar

alteryx | COMMUNITY

Search the Community

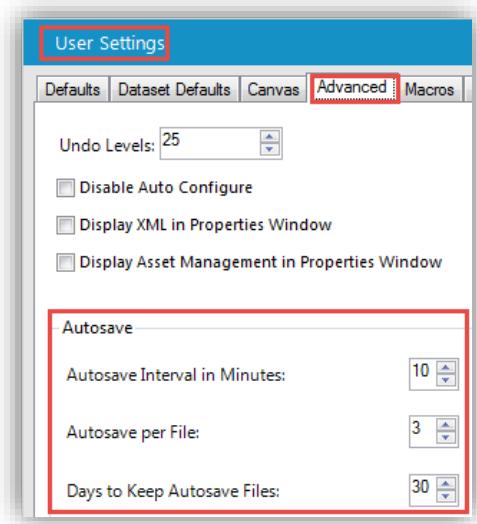
Create a new workflow using the Explorer Box to point to your help source.

## SPEED UP CONFIGURING COMPLEX WORKFLOWS: DISABLE AUTOCONFIGURE



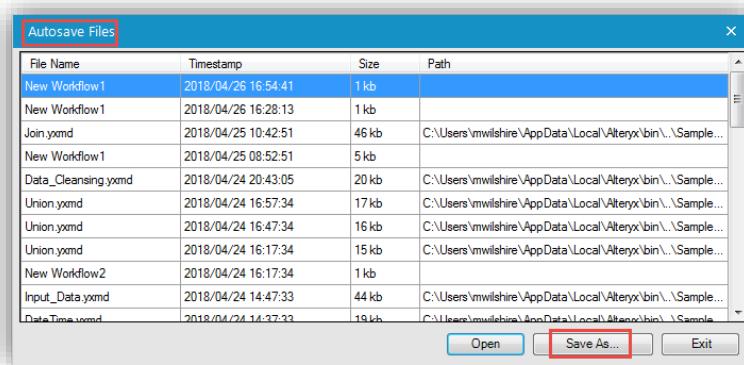
When editing a workflow with a connection to a large data source on a network drive or with Allocate tools, check the 'Disable Auto Configure' box and resources may be allocated more efficiently. Remember to hit F5 to refresh tool configurations.

## TURN BACK TIME WITH AUTOSAVED WORKFLOWS



The Autosave feature allows you to save the workflow you are working on at the interval of your choosing.

Find the Autosave settings at *Options > User Settings > Edit User Settings > Advanced*.



Access your Autosaved files by navigating to *File > Open Workflow > Open Autosaved file*. A list of available files will appear for you to select. From there the workflow can be *Saved As*.

# THE GO-TO TIME SAVERS

## ON SHORTCUTS

---

Remember when you were younger and were told that you had to do everything the long and hard way? Well now that we're the adults, we can do whatever we want - like take shortcuts without receiving any disapproving looks. We've got you covered when it comes to cheating the system with some of our favorite shortcuts!



### A NEW SHORTCUT WAS BORN: SAVE ALL WORKFLOWS

---

A new useful shortcut is available: Save all open workflows **Ctrl + Shift + S**

### FAST ACCESS TO HELP

---

You are only a shortcut away from Global Search. **Ctrl+ Shift + F**

### A CROWD PLEASER: ADD MULTIPLE BROWSES AT ONCE

---

Add multiple Browse tools at a time. This shortcut adds a Browse tool after selected tool(s). If the selected tool has multiple outputs, a browse will be added for each. **Ctrl + Shift + B**

### REFRESH WORKFLOW: F5 TO THE RESCUE

---

F5 is for Refresh tool configurations. Here are two common use cases:

Your incoming data source has changed. Press F5 to refresh all the tools with the new metadata.

By design, tool configurations are not being refreshed. If the Disable Auto Configure option has been selected in user settings, press F5 to manually refresh tool configurations.

### MORE SHORTCUTS AT:

[https://help.alteryx.com/2018.2/index.htm#HotKeys\\_Shortcuts.htm](https://help.alteryx.com/2018.2/index.htm#HotKeys_Shortcuts.htm)

## NO WINDOW LEFT BEHIND

Every Alteryx user been there. You are a speed monster while building your workflows, however, there are casualties along the way...lost a window or two? Don't lose precious time trying to find them with these handy tricks.

### WORKFLOW - CONFIGURATION WINDOW... WHERE DID YOU GO?

Double click on the canvas to bring the Workflow – Configuration window back.

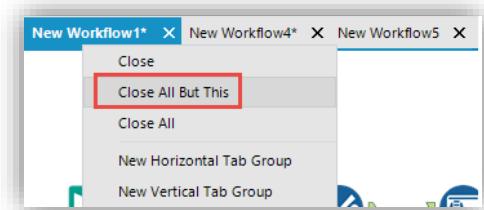
### RAPID RESULTS

Accidentally closed the results window? No need to go back into the View menu to enable it. Simply click on the anchor for any tool on your canvas, and the results window will reappear...magic!

### A LAST RESORT: RESTORE DEFAULT SETTINGS

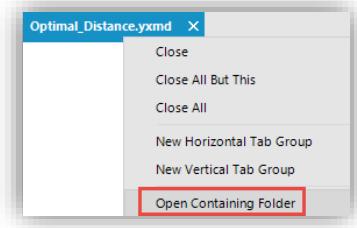
Not afraid to go back to default settings? Do you just like that “new Alteryx Designer smell” Then Restore Defaults will be your best friend (*Options > User Settings > Restore Defaults*)

### CLOSE ALL BUT THIS



Doing a bunch of tests on separate workflows and finally figured it out? Save clicks and go to your main workflow tab, right-click, and *Close All But This*.

### OPEN CONTAINING FOLDER



Need quick access to the folder that contains your current workflow? The containing folder can now be opened by right-clicking the workflow tab and selecting *Open Containing Folder*.



#### FROM THE TIP MEISTERS EASY ACCESS TO YOUR ASSETS BY SRUHL

If you have a chained app uploaded to the Gallery and need to adjust one of the other workflows or assets in the chain, you can easily open the file location by right-clicking the workflow name and choosing *Open Containing Folder*.

## GLOBAL VARIABLES, THE ONLY CONSTANT IS CHANGE

Have you ever needed to change a value in multiple places within your workflow? Within Alteryx, Global Variables are called Constants. User Constants can be added as needed in *Workflow – Configuration > Workflow tab > Constants*.

The screenshot shows the 'Workflow - Configuration' interface with the 'Workflow' tab selected. In the 'Type' section, 'Standard Workflow' is chosen. The 'Constants' table lists several entries:

Type	Name	Value
Engine	TempFilePath	C:\ProgramData\Alteryx\F
Engine	Version	2018.1.0.46020
Engine	WorkflowDirectory	C:\Users\mwilshire\AppData\Learn_one_tool_at_a_time
Engine	WorkflowFileName	Union.ymd
Engine	GuiInteraction	True
User	Test_String	01001
User	Test_Num	15

A red box highlights the 'Test\_String' and 'Test\_Num' rows. A red circle with a plus sign is located in the top right corner of the table header.

To add a User Constant, click on the *plus sign* on the top right-hand corner, give it a name, a value and check the box if it is a number.

FYI - There are 4 default Engine type constants at workflow level (TempFilePath, Version, WorkflowDirectory and GuiInteraction)

The screenshot shows the 'Filter (159) - Configuration' interface. In the 'Expression Box' under 'Basic or Custom Filter', the query is: `[ZIP] = [User.Test_String]`. The 'ZIP' column is selected from the 'Existing Columns' dropdown. The 'User.Test\_String' constant is selected from the 'Constants' dropdown. Both the expression and the constant are highlighted with red boxes.

Any of the Engine constants or user constants that you create can be used throughout the workflow. To reference one from tools that support the Expression Box, expand the Constants list and select the desired one.

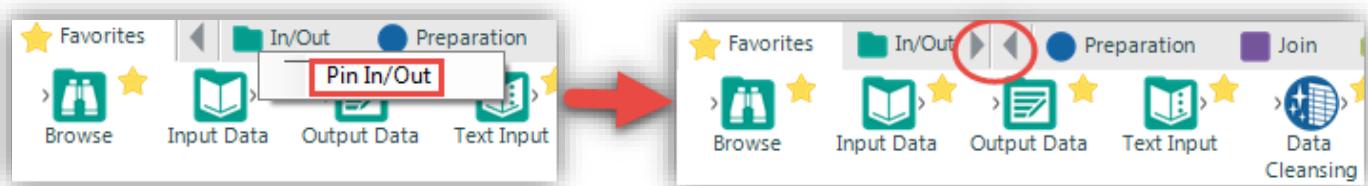
The screenshot shows the 'Trade Area (162) - Configuration' interface. Under 'SpatialObject Field of Point Source', 'SpatialObj' is selected. In the 'Radius, Doughnuts or Drivetime' section, the 'Specific Value' radio button is selected, and the expression `%User.Test_Num%` is entered into the input field. This expression is highlighted with a red box.

Another way to reference constants is by using `%User.ConstantName%`

## TOOL PALETTE

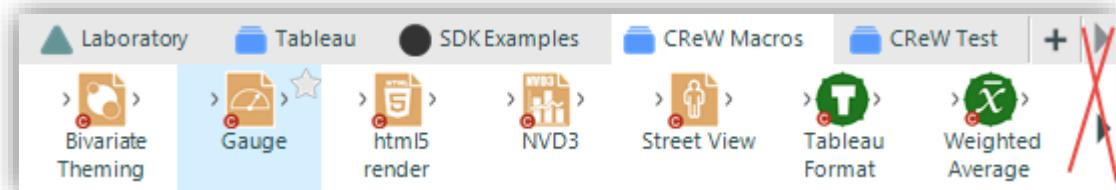
### PINNED POSSIBILITIES

Are there one or more tool categories you use on a regular basis? Do you often find yourself scrolling through the Tool Palette? Good news! You can pin those categories to the front of the tool palette. Right-click on the tool category on the *Tool Palette* you wish you Pin, and Select *Pin [Category Name]*.



### JUMP ON THE MOUSE WHEEL FOR FAST SCROLLING

The Alteryx team recently discovered a gem, and had a life changing experience. Hover over the Tool Palette, then move the wheel of your mouse to scroll through the tool categories or the tools within the category.



\*IF for some reason the hover over then scrolling is not working, try clicking on any category first to then scroll through the categories, or on any tool within a category first to then scroll through those tools.



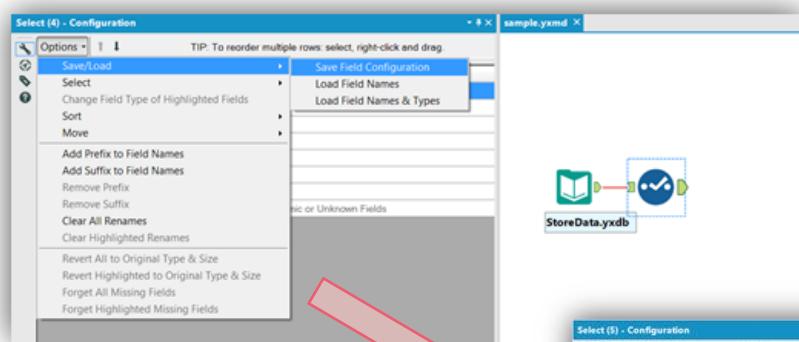
# DATA PREPARATION AND BLENDING

# DATA PREP AND BLENDING

## SELECTING DATA

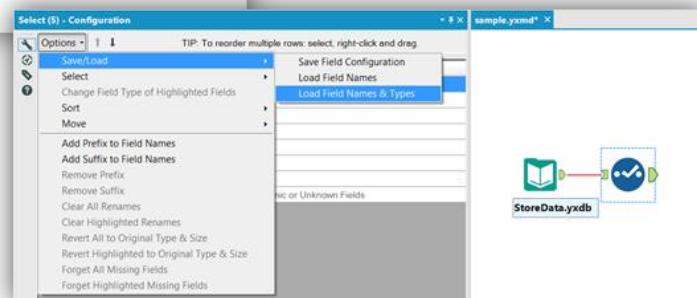
When working with the Select tool don't forget to utilize all the tool's features as there are many features in this versatile tool aside from de-selecting and renaming fields. Save time during development by leveraging advanced options in the Select tool.

### SAVE SELECT CONFIGURATION



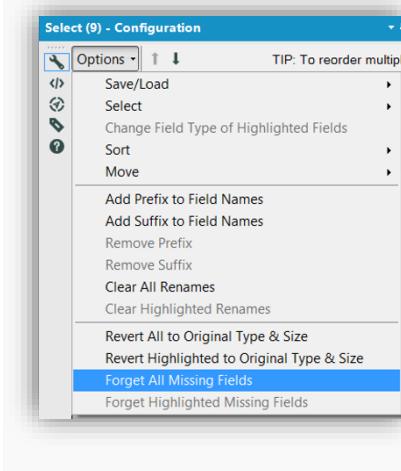
...Then load it into another workflow

Have you adjusted your field names and types for a dataset and need to use the same selection on a different workflow? Save the configuration...



FROM THE TIP MEISTERS

LORDNEILLORD'S FORGET ALL MISSING FIELDS



After changing your data choose *Options > Forget all Missing Fields* to remove the missing fields from your Select tool. This will give you a cleaner look.

Added bonus: This works for other tools that have Select functionality such as Summarize and Join.

## UN-CHECK UNKNOWN FIELDS

When you have a stable workflow that you want to use in a production environment, put a Select tool directly after the input, and un-check the row labeled *\*Unknown* at the bottom of the list of fields. By de-selecting unknown fields, you are covered if your input data changes. The workflow won't be able to add any new fields that your destination file or database is not expecting.

## OTHER CONFIGURATIONS WITHIN THE SELECT TOOL

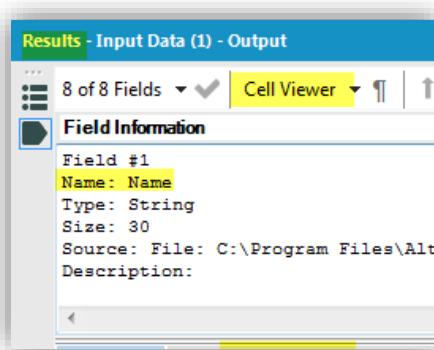
- To change field types of all highlighted rows choose *Options > Change Field Type of Highlighted Rows*.
- To move highlighted fields to top or bottom choose *Options > Move*.
- To reorder multiple fields at once, highlight them, then right-click and drag.
- Changed your mind? To revert to incoming field order choose *Options > Sort*.

## VIEWING RESULTS AND BROWSING DATA

### JUST BROWSING

The insightful Browse tool is one of the most used tools in the tool palette and the Results Window allows for fast development.

### CELL VIEWER



Available on the Browse tool and Results window, Click on the Cell Viewer to view metadata for each column (when clicking on the column name) or the content of a selected cell (when clicking on the data).

A screenshot of the Cell Viewer window titled "Results - Input Data (1) - Output". It shows "31 of 31 Fields" and has a "Cell Viewer" dropdown selected. Under "Record #1, Field City (String)", it shows the value "Gillette". Below, a data grid shows records 1, 2, and 3 with columns for Record #, City, State, ZIP, and STD\_ER. The "City" column for record 1 has a tooltip "This cell has leading spaces.".

Record #	City	State	ZIP	STD_ER
1	Gillette	This cell has leading spaces.		
2	Douglas	WY	82633	
3	Casper	WY	82609	

This is the easiest way to see white space or hidden characters in your data.

Click on the cell and make sure to have the Show Whitespace icon selected. Notice the red corner, if you hover over it will give you additional information

## NEW WINDOW FOR THE SELECTED FEW

Easily compare two or more records in the Browse tool with the two different methods below.

A screenshot of the Alteryx Browse tool interface. At the top, there are tabs for 'Data' and 'Metadata'. Below the tabs is a toolbar with icons for saving, opening, and other operations. A context menu is open over a selected row, with options 'New Window (All Records)' and 'New Window (Selected Records)'. The menu items are highlighted with yellow boxes. The main area shows a grid of data with columns labeled 'City', 'State', 'Zip', and several numerical values.

City	State	Zip	New Window (All Records)	New Window (Selected Records)
/ER	CO	80224		
/ER	CO	80223	39.7009275356545	-105.012175941
/ER	CO	80221	39.7939240392764	-105.015644744
/ER	CO	80218	39.74162	-104.966148340

Highlight the desired records with *Ctrl + Click/Drag*, then go to the 'Open results in a new window icon' on the upper-right corner and select: *New Window (Selected Records)*

Highlight the desired records with *Ctrl + Click/Drag*, go to the up and down arrows on the top bar of the results window and use them to toggle between all of your selected records

A screenshot of the Alteryx Results window titled 'Results - Browse (2) - Input'. It displays a list of four records with columns for 'Record #' and 'Name'. At the top of the window, there are navigation controls including an 'Up' arrow, a 'Down' arrow, and a count of '15 rec'. The 'Up' and 'Down' arrows are circled in red.

Record #	Name	PI
1	All Creatures Great and Small	(307) 68
2	Animal House	(307) 35
3	Aquatics and Critters	(307) 23
4	Barn	(307) 58

## WE GOT YOUR METADATA COVERED

The Results window has your data's metadata, no need to run the workflow to see it.

A screenshot of the Alteryx Results window titled 'Results - Input Data (1) - Output'. It displays a table of input data with columns for 'Record #', 'Name', 'Type', 'Size', and 'Source'. The 'Source' column shows file paths. At the top right of the window, there is a tab labeled 'Metadata' which is circled in red. The 'Data' tab is also visible.

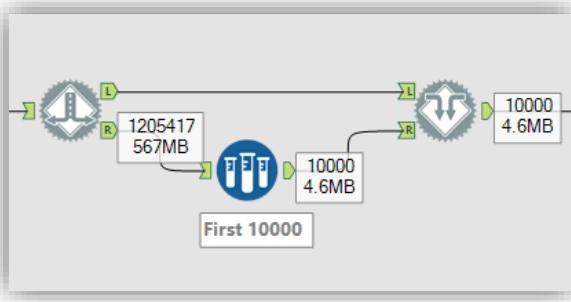
Record #	Name	Type	Size	Source
1	Name	String	30	File: C:\Program Files\Alteryx\Samples\en\Sam...
2	Phone	String	15	File: C:\Program Files\Alteryx\Samples\en\Sam...

# SAMPLE TOOL



FROM THE TIP MEISTERS

## SAMPLE TOOL WITH DETOURS FOR FASTER DEVELOPMENT BY DAVID-CARNES



Using a Sample tool is great for limiting the cycle time when adding in and testing resource intensive processing downstream. Rather than removing it only to add it back in for later development, just wrap it in a Detour and leave it in place.

## JOINING AND BLENDING DATA

The Join tool and many other tools in the Join category have select functionality. Don't forget you can de-select and rename un-needed fields right in the Join tools. No need to use a separate Select.

### RENAME FIELDS BEFORE JOINING

If you are appending fields using the Join tool, rename the fields with a prefix (or suffix) before joining to another data set that contains the same field names. Then you can union all 3 outputs to complete a full outer join without any misaligned fields.

Consider a use case where you have stores and customers, each with addresses.

Record #	ADDRESS	CITY	STATE	Total	StoreNum	Right_StoreNum	NAME	Right_ADDRESS	Right_CITY	Right_STATE	ZI
1	Dr	Gillette	WY	142.7	1	1	Pet Food Outlet	200 E Lakeway Rd	Gillette	WY	8271
2	St	Douglas	WY	858	1	1	Pet Food Outlet	200 E Lakeway Rd	Gillette	WY	8271
3	# A	Buffalo	WY	193.4	2	2	Petland	3769 E Lincolnway	Cheyenne	WY	8200
4	Iorn Ave	Cody	WY	101.1	3	3	Pets-N-Stuff	1842 Sugarland Dr Ste 113	Sheridan	WY	8280
5	r St	Riverton	WY	252.8	4	4	Purr-Fect Pets	180 S Bent St	Powell	WY	8243
6	oming Blvd Unit 252	Casper	WY	1250.5	5	5	Summit Pets	932 Main St	Evanston	WY	8293

Without adding prefixes, the join would produce Right\_ prefixes on the data, making it hard to tell which address belongs to the customer and which belongs to the store

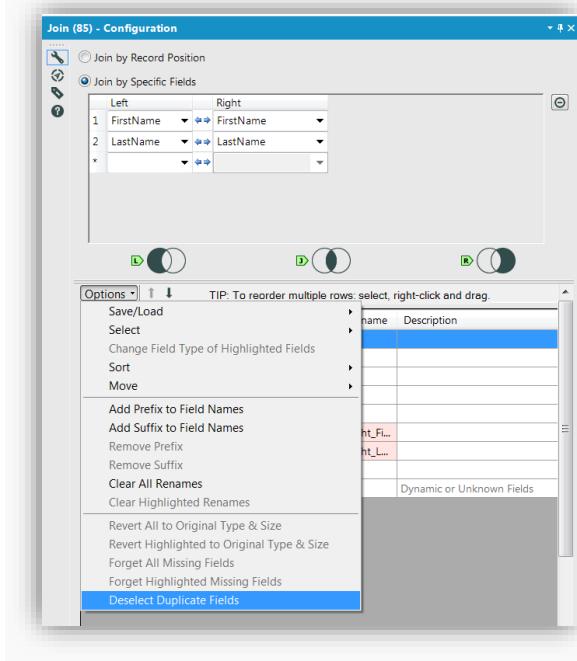
Record #	Cust_ADDRESS	Cust_CITY	Cust_STATE	Total	StoreNum	NAME	Store_ADDRESS	Store_CITY	Store_STATE	Store_ZIP
1	00 Camel Dr	Gillette	WY	142.7	1	Pet Food Outlet	200 E Lakeway Rd	Gillette	WY	82718
2	23 S 2nd St	Douglas	WY	858	1	Pet Food Outlet	200 E Lakeway Rd	Gillette	WY	82718
3	09 Fort St # A	Buffalo	WY	193.4	2	Petland	3769 E Lincolnway	Cheyenne	WY	82001
4	625 Big Horn Ave	Cody	WY	101.1	3	Pets-N-Stuff	1842 Sugarland Dr Ste 113	Sheridan	WY	82801
5	12 E Main St	Riverton	WY	252.8	4	Purr-Fect Pets	180 S Bent St	Powell	WY	82435
6	01 SE Wyoming Blvd Unit 252	Casper	WY	1250.5	5	Summit Pets	932 Main St	Evanston	WY	82930

After adding prefixes, the join fields are neat and clearly labeled with the source they came from.



FROM THE TIP MEISTERS

DESELECT DUPLICATES IN THE JOIN TOOL BY KCGREEN



A common issue when viewing joined data is that both streams can share certain fields (in particular, this can be an issue with the join field). Use Options>Deselect Duplicate Fields to remove duplicates in one quick and easy step.

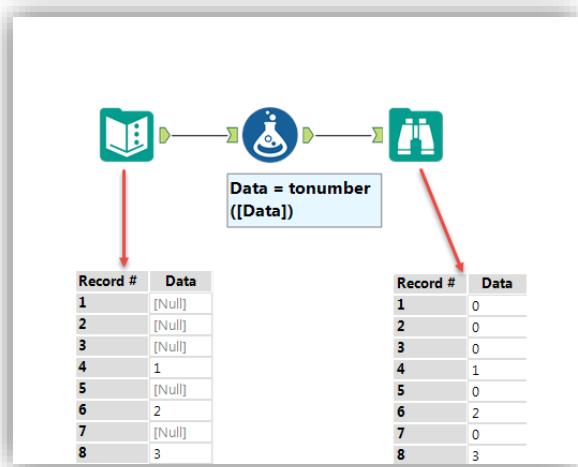
## FORMULAS

Have a new expression to write? Remember to check

<https://help.alteryx.com/current/index.htm#Reference/Functions.htm> for a full list of functions available in the formula tool.

## QUICKLY REMOVE NULLS IN YOUR DATA WITH THE FORMULA TOOL

If you have a numeric field that has nulls that you want to quickly change to zero, try using the ToNumber function: ToNumber([Field1]).



Other tools in the palette that can help with removing nulls include



[Data Cleansing](#)



[Imputation Tool](#)



FROM THE TIP MEISTERS

## INSERT DOUBLE QUOTES IN STRING FIELD BY PATRICK\_DIGAN

The screenshot shows the 'Formula (2) - Configuration' window. It contains two rows of formulas:

- Row 1:** Output Column is 'output' with Data Preview "Hello World". The formula is `"""+Hello World"""+"""`. A note says "Use "" to add quotes".  
Data type: V\_WString, Size: 1073741823.
- Row 2:** Output Column is 'output2' with Data Preview "Hello World". The formula is `CharFromInt(34)+"Hello World"+charfromint(34)`. A note says "For cleaner formula use charfromint(34)".  
Data type: V\_WString, Size: 1073741823.

A large blue arrow points from both rows to the text "Both Produce Same Output".

Working with string data and need to use double quotes? You can either switch back and forth between single and double quotes using "" to insert a double quote or you can use Patrick\_Digan's trick to use CharFromInt(34) to insert a double quote.

"Hello World"

What is the **CharFromInt()** function? The function returns the character that is Unicode # x. Looking at a list of Unicode characters you will see the double quote ("") represented by 34.

## SAVE CUSTOM EXPRESSIONS THAT ARE FREQUENTLY USED

Have a frequently used formula that you seem to re-write over and over again? Don't forget you can save expressions in the formula tool.

The screenshot shows the 'Formula (13) - Configuration' window. The formula is `IF [Sales]<1000000 THEN "High" ELSE "Low" ENDIF`. A red arrow points to the 'Save Expression' button in the toolbar.

The 'Save Expression' dialog is open, showing 'Saved Expression 1'. There are 'Save' and 'Cancel' buttons at the bottom.

When you are ready to use it click the open button in the formula tool. Note the open button also loads a list of recently used expressions!

## USE IIF INSTEAD OF 'IF THEN ELSE' FOR CONDITIONAL STATEMENTS

One trick that can be very useful for conditionally updating fields is the Boolean IIF function.

IIF is basically a shorthand version of a single condition test. While the documentation suggests that you'd be performing the function against a Boolean field, you can also create the Boolean test within the expression.

For example, you'd like to populate a string type designator field based on numeric data like sales – Stores with sales numbers below \$1,000,000 are high risk stores. A simple IF/THEN is a typical way to do this, but the Boolean IIF function can do the same thing and it's much quicker to write out!

The screenshot shows the Alteryx Formula configuration window with two rows of code. The first row is an "If Then Else Statement" with the formula: `IF [Sales]<1000000 THEN "High" ELSE "Low" ENDIF`. The second row is an "IIF Statement" with the formula: `IIF([Sales]<1000000, "High", "Low")`. Both rows have a "Data type" of "V\_WString" and a "Size" of 1073741823.

### IF THEN ELSE SYNTAX:

```
IF [Sales]<1000000 THEN "High" ELSE "Low"  
ENDIF
```

### IIF SYNTAX (SHORTER)

```
IIF([Sales]<1000000, "High", "Low")
```

## SUMMARIZING DATA



FROM THE TIP MEISTERS

SORT DATA WITH THE SUMMARIZE TOOL BY LODNEILLORD

The screenshot shows an Alteryx workflow. An input source labeled "StoreData.xdb" feeds into a "Summarize" tool, which is represented by a blue circle with a wavy line and a red sigma symbol. Red arrows point from the input and output of the summarize tool to two tables below. The left table, titled "Record # Store", has the following data:

Record #	Store
1	1
2	5
3	19
4	7
5	3
6	15
7	13
8	1
9	6

The right table, also titled "Record # Store", has the following data:

Record #	Store
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7
9	8

Did you know that you know the Summarize tool sorts data? The Summarize tool will sort based on the field(s) selected for group by. Try using it for a unique, select, and sort in one go as suggested by LordNeilLord.

Want to know more about which tools sort in Alteryx? Check out the below article

<https://community.alteryx.com/t5/Alteryx-Knowledge-Base/Sorting-Procedures-in-Alteryx/ta-p/37336>

# TILE TOOL

## CREATE A 'GROUP BY' RECORD ID WITH THE TILE TOOL

The screenshot shows the 'Tile (2) - Configuration' window. In the center, there's a 'New Workflow2\*' panel with a 'Unique Value' step. Below it is a 'Results - Tile (2) - Output' table with the following data:

Record #	name	Tile_Num	Tile_SequenceNum
1	Store 1	1	1
2	Store 1	1	2
3	Store 1	1	3
4	Store 1	1	4
5	Store 2	2	1
6	Store 2	2	2
7	Store 2	2	3

Ever wanted to create a record ID with a group by?

Consider using the Tile tool to create a Record ID for each group in your data.

Simply use the Tile Method "Unique Value" and select the field(s) you would like to have the record IDs "grouped" on.

This will reset the record ID (renamed from the "Tile\_SequenceNum" field) counter for each unique value in your specified Unique Fields

# PARSING DATA



## FROM THE TIP MEISTERS SRUHL'S EXTRACT DATA FROM A STRING WITH REGEX: TOKENIZE

If you want to extract a piece of data from a string where the strings around the data don't change (really useful for getting tokens for use in access authentication for the downloader), you can use a simple marked group in the RegEx tool set to tokenize. Paste your string into the Regular Expression box then replace the piece you want to extract with `(.+)`.

The screenshot shows the 'Field to Parse' configuration for the Tokenize tool. The 'Regular Expression' field contains the pattern `<Response><Success>message='(.*?)'</Response>`. The 'Properties' section has 'Split to Columns' selected with 1 column and 'Output Root Name' set to 'DMP\_Candy'.

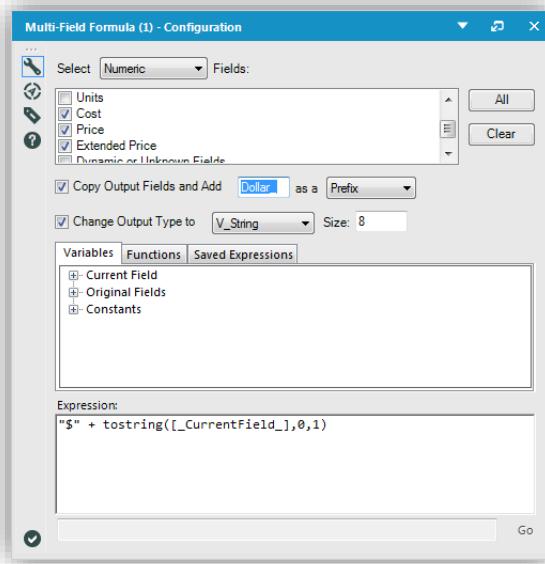
That will grab anything inside there. Watch out for characters that need to be escaped such as / or ".

This example looks for a token for a web service that will be used over and over again. It's encrypted so there's no way to tell what the string format is going to be, but the text around it is going to stay the same every time. All you need to do is escape the quotation marks and slashes.

That's about as simple as you can get with RegEx. I use it all the time to get information out of "string frames".

# MULTI FIELD AND MULTI ROW FORMULA TOOLS

## MULTI FIELD FORMULA TOOL



The Multi-Field Formula tool makes it easy to execute a single function on multiple fields.

It will present you with a list of fields to select. You can either select numeric or text fields. These are the fields that the formula will manipulate, all other fields will remain untouched. This does **not** function as a Select tool removing fields from the data stream.

You have the option to overwrite the existing fields or to create new fields. If you decide to copy the fields, you will have the option to change the field names by adding a prefix or suffix.

You also have the option to change the output type. This is convenient if you are converting dates to strings, or numbers to strings to format them.

Selecting [\_CurrentField\_] under the variables will modify **all** of the selected fields. You also have the option to use specific fields.

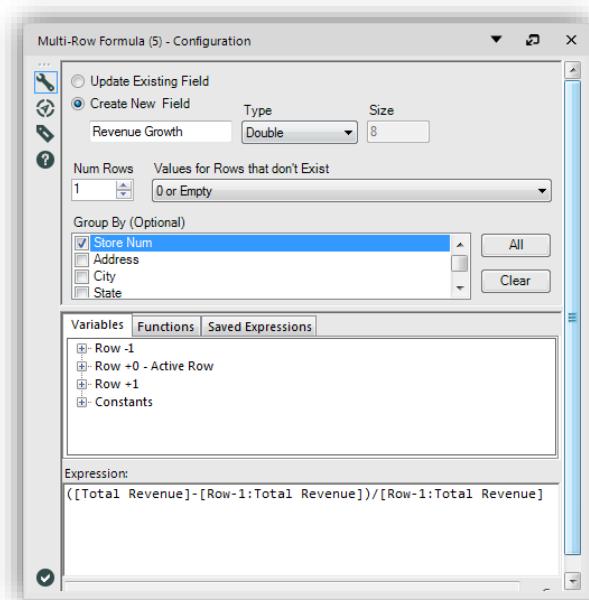
In this example, the fields Cost, Price, and Extended Price are being changed to text fields, with a "\$" symbol and separating commas added to the number. E.g. 463956 is changed to \$463,956.

This tool is also convenient if you are working with data that was manually entered by a user as it lets you perform data cleaning actions (e.g. TRIM()) on all of your fields.

## MULTI ROW FORMULA TOOL

The Multi-Row Formula tool takes the concept of the Formula tool a step further, allowing users to utilize row data as part of the formula creation. This tool is useful for parsing complex data, creating running totals, averages, percentages, and other mathematical calculations.

Assuming that the data is sorted correctly, this example will calculate Revenue Growth by Store and create a new column for the percentages.



## COMBINED MULTI ROW AND MULTI FIELD FORMULA TOOL EXAMPLE

Have you ever seen data like this and wanted to use the store value to fill in the blanks?

Results - Text Input (1) - Output				
Record #	Store	Year	Revenue	Cost
1	Store A	2013	\$256	\$128
2	[Null]	2014	\$238	\$119
3	[Null]	2015	\$589	\$295
4	[Null]	2016	\$2	\$1
5	Store B	2013	\$3,698	\$1,849
6	[Null]	2014	\$3,589	\$1,795
7	[Null]	2015	\$7,589	\$3,795
8	[Null]	2016	\$265	\$133
9	Store C	2013	\$123	\$62
10	[Null]	2014	\$125	\$63

The Multi-Row Formula is your friend! This function will populate the whole store column for you.

This screenshot shows the configuration for a Multi-Row Formula. The 'Update Existing Field' option is selected, and the target field is 'Store'. The 'Values for Rows that don't Exist' dropdown is set to '1 or Empty'. Under 'Group By (Optional)', 'Store' is checked. In the 'Variables' tab, there are entries for 'Row -1', 'Row +0 - Active Row', 'Row -1', and 'Constants'. The expression is defined as:

```
if isempty([Store]) then [Row-1:Store] else [Store] endif
```

But wait! The revenue and cost fields don't look pretty either. Let's use the Multi-Field Formula to clean them up.

This screenshot shows the configuration for a Multi-Field Formula. The 'Select' dropdown is set to 'Text'. Under 'Fields', 'Revenue' and 'Cost' are checked. The 'Copy Output Fields and Add' checkbox is checked, and the output type is set to 'Double' with a size of 8. The expression is defined as:

```
tonumber(replacechar([_CurrentField_],"$,""))
```

Results - Multi-Field Formula (3) - Output				
Record #	Store	Year	Revenue	Cost
1	Store A	2013	256	128
2	Store A	2014	238	119
3	Store A	2015	589	295
4	Store A	2016	2	1
5	Store B	2013	3698	1849
6	Store B	2014	3589	1795
7	Store B	2015	7589	3795
8	Store B	2016	265	133
9	Store C	2013	123	62
10	Store C	2014	125	63

The results: pretty data!

# **DATABASE PROCESSING**

# DATABASE PROCESSING

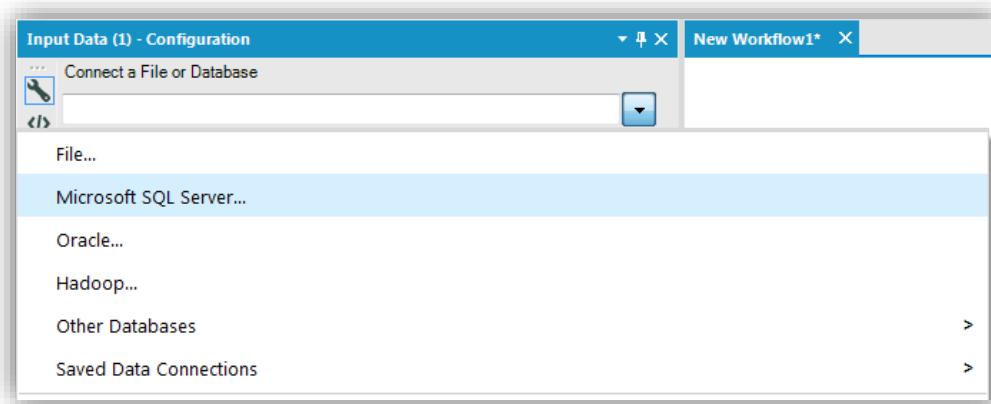
## CONNECTION OPTIONS

### FIND YOUR DRIVER AND CHECK FOR SUPPORTED DRIVER

A list of supported data sources and verified drivers can be found in the Documentation under *Data Sources > Supported Data Sources*. Alteryx has been authorized to distribute the following drivers by Simba: Cassandra/DataStax, Google BigQuery, Hive, Impala and Spark. To download them, please visit <http://pages.alteryx.com/Alteryx-Driver-Downloads-LP.html>

### DSN LESS CONNECTION STRINGS

Alteryx allows users to connect to databases without referencing a DSN by creating a connection string that contains all relevant information to connect and entering it manually in the connection box. This requires users to have the relevant information ready and know the syntax to use. Starting with Alteryx 11 for MS SQL Server and Oracle users, there is the option to use built-in Wizards to create connection strings without needing to know the syntax. Alteryx will create the connection string and automatically save it as a *Saved Data Connection*.



This option can be found under *Connect a File or Database > Microsoft SQL Server and Oracle*:

### SAVED DATA CONNECTIONS

Saved Data Connections help keep database connections organized and allow for passwords to be updated in one place rather than having to update individual workflows. Saved Data Connections can be created locally by individual users or on the gallery and shared with multiple users.

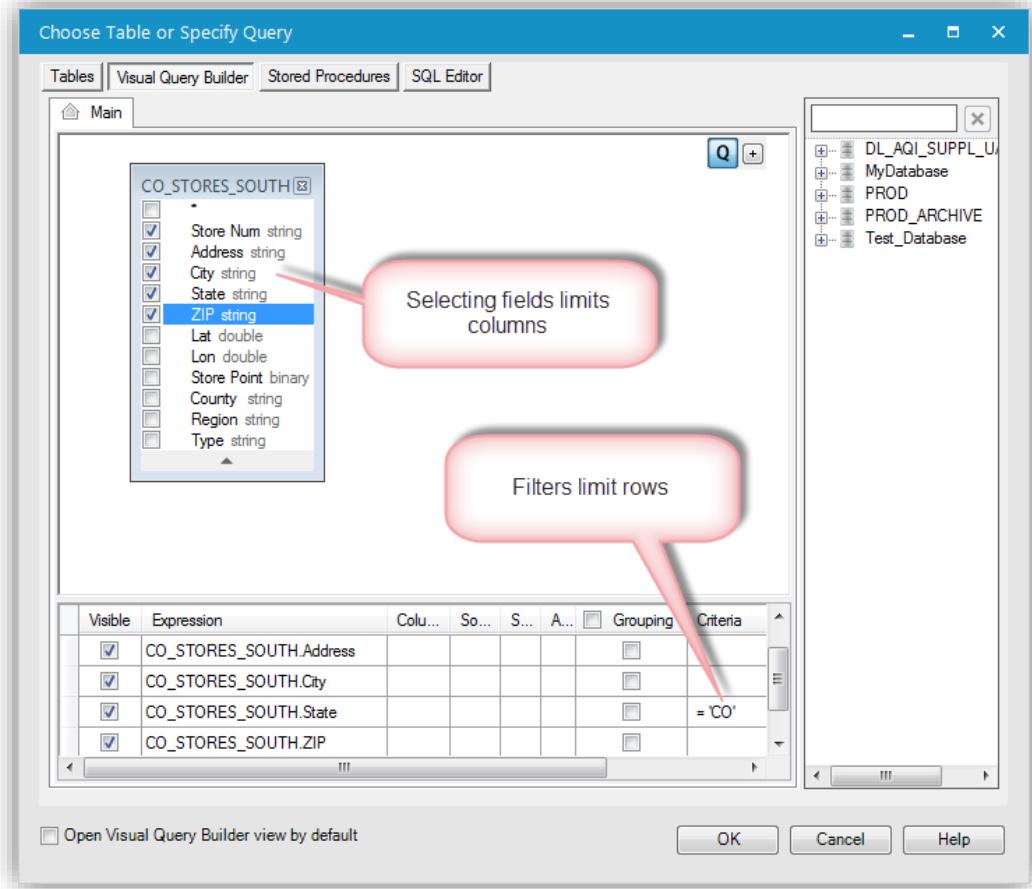
Locally, Saved Data Connections can be found under *Options > Advanced Options*. These connections are only available on the local machine. For details on how to set up saved data connections, please visit the community at <https://community.alteryx.com/t5/Alteryx-Knowledge-Base/Manage-Data-Connections-Alteryx-11-0/ta-p/45228>

On the Gallery, only the Gallery Admin can create Saved Data Connections and share them with users. They can be found under the Admin options. More information can be found at: <https://community.alteryx.com/t5/Alteryx-Knowledge-Base/Database-Connection-Share-Through-Gallery-Admin-Alteryx-11-0/ta-p/46409>

# WORKFLOW EFFICIENCY

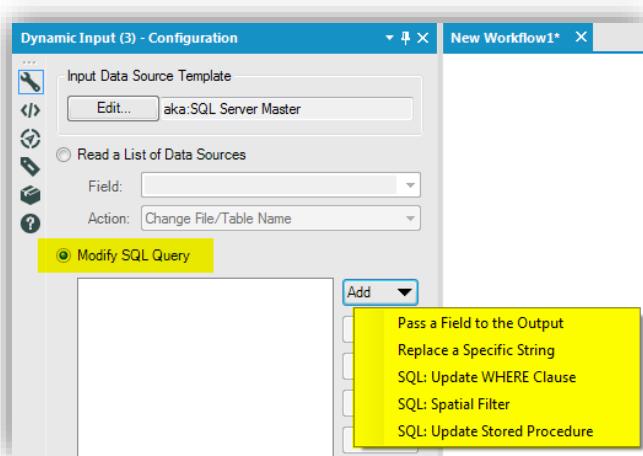
## LIMIT DATA BROUGHT INTO ALTERYX

The less data is brought into Alteryx, the faster it will be processed. Use the Visual Query Builder and/or SQL Editor to limit the number of columns and rows being brought in:



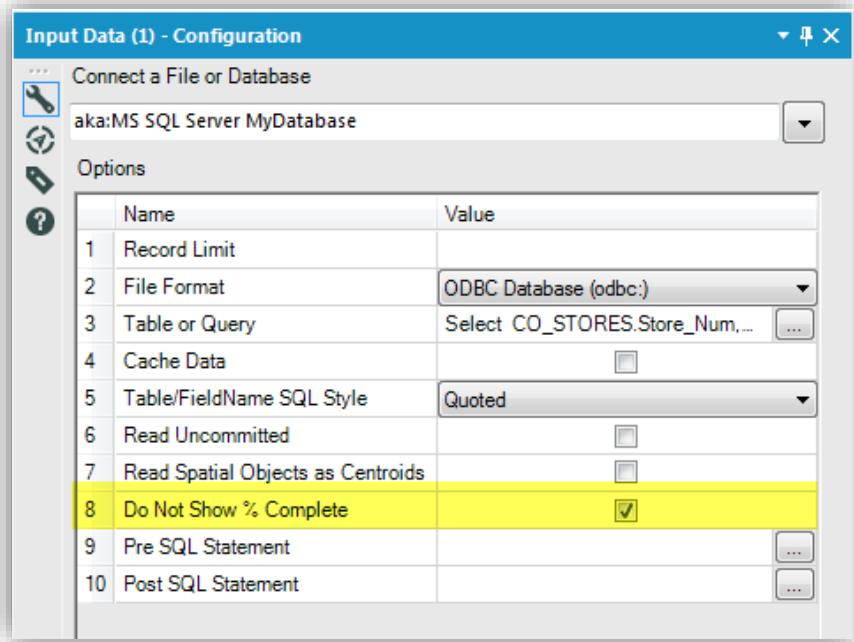
## USE THE DYNAMIC INPUT TOOL

Use the dynamic input tool to dynamically update SQL queries, speeding up your processing time as it filters the data and only returns the user specified criteria.



## DO NOT SHOW % COMPLETE

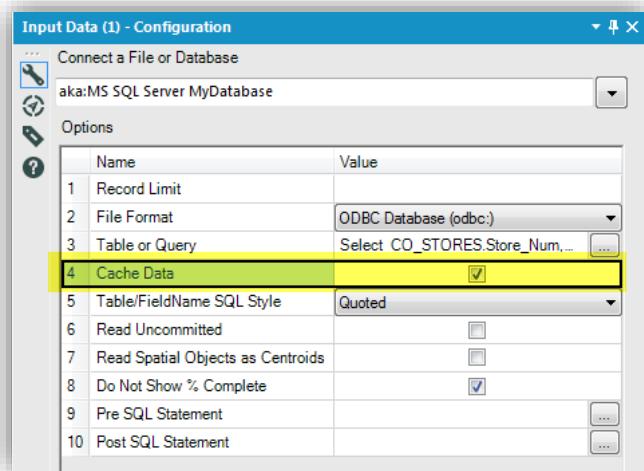
When checked, Alteryx will not report the status of reading in the data, thus speeding up read time.



## CACHE DATA DURING WORKFLOW DEVELOPMENT OR USE .YXDB FILES

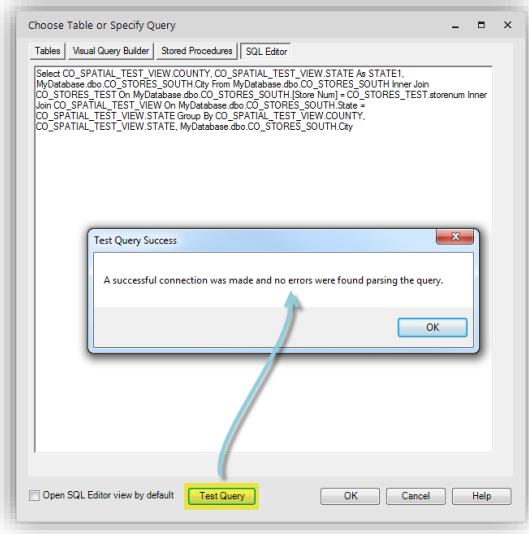
When the *Cache Data* option is checked, data is only read from the database the first time the workflow is run. Subsequent runs read from a locally stored .yxdb file which can be significantly faster than reading directly from the database. This setting is ignored in the scheduler, the gallery, or when running the workflow via command line.

Messages in the output window will indicate whether cached data or live data is used.



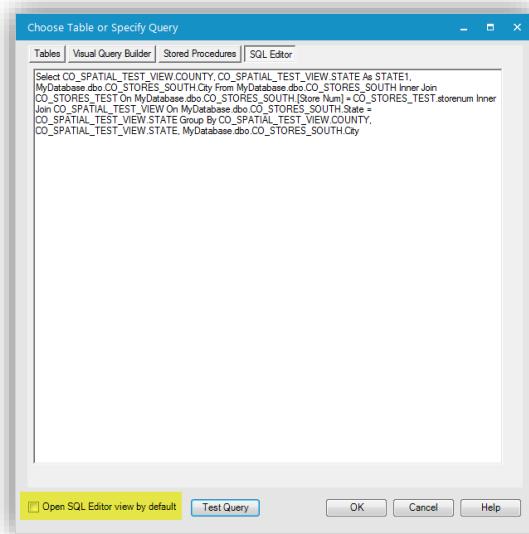
You can also manually create .yxdb files and use those for development.

## TEST QUERY BUTTON



When manually entering a SQL query through the SQL Editor window, the Test Query button allows users to verify the syntax before trying to run the workflow.

## SELECT DEFAULT VIEW



You can select the default view to be displayed in the Choose Table or Specify Query window as either the list of Tables, Visual Query Builder (VQB), Stored Procedure, or SQL Editor. If you have a lot of tables, using the SQL Editor as the default view can make the editor load much faster.

## SET NOCOUNT ON FOR STORED PROC

NOCOUNT stops the message that shows the count of the number of rows affected by a Transact-SQL statement or stored procedure from being returned as part of the result set. When SET NOCOUNT is ON, the count is not returned. When SET NOCOUNT is OFF, the count is returned. For stored procedures that contain several statements that do not return much actual data, or for procedures that contain Transact-SQL loops, setting SET NOCOUNT to ON can provide a significant performance boost, because network traffic is greatly reduced. (see Microsoft documentation: <https://docs.microsoft.com/en-us/sql/t-sql/statements/set-nocount-transact-sql?view=sql-server-2017>). Setting NOCOUNT ON will also prevent Alteryx thinking incorrectly that a stored procedure is finished because it has returned data.

## TRANSACTION SIZE

The *Transaction Size* option in the Output tool determines how many records are committed to the table at once. By default, the option is set to 10,000 records. A larger transaction size translates to fewer transactions with more records, while a smaller transaction size means more but smaller loads. Depending on database configurations, a larger or smaller transaction size can increase speeds.

## RECORD SIZE ON OUTPUT

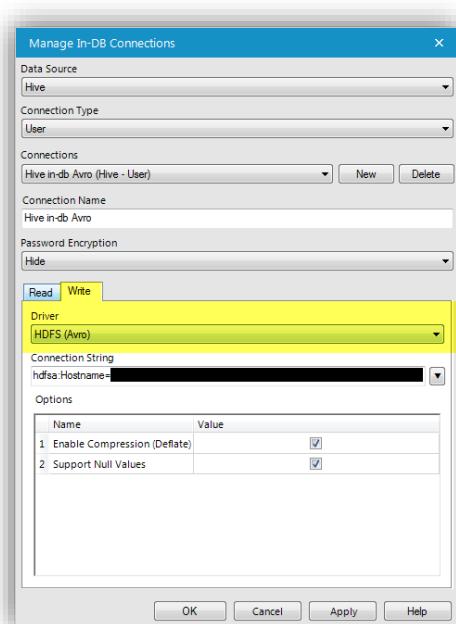
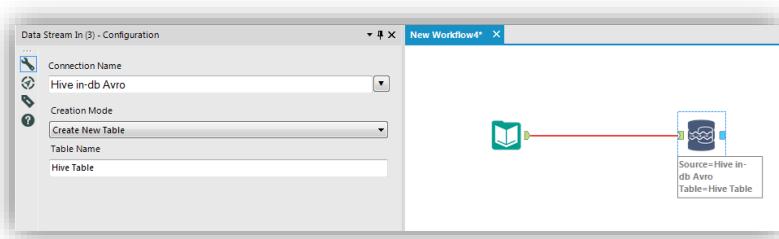
The smaller the dataset to be loaded, the faster it can load. Alteryx uses the field sizes right before the Output tool instead of looking at the actual data. Making sure that field sizes aren't unnecessarily large (e.g. a V\_String(255) field that contains only state abbreviations) lets Alteryx load data faster.

## BLOCK UNTIL DONE

The Block Until Done tool halts all downstream processing until upstream processing has been completed. If used right before an Output tool, all processing finishes before starting to write data. If used right after an Input tool, all data is read in before processing starts. This can help when the connection to the database tends to time out or is very slow. It will also enable you to read in data from one table, edit it, and then update the same table.

## USE HDFS TO WRITE TO HIVE AND IMPALA

Hive ODBC can be slow when writing to tables. If you are looking to create a new table or overwrite an existing table, use the In-DB tools with the write option set to HDFS(Avro) to improve speeds (NOTE: In-DB does not support updates). You can use the Data Stream In tool instead of the regular Output tool:



## THINK OUTSIDE ALTERYX - CHECK DRIVER SETTINGS

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Sometimes, settings in the ODBC driver can significantly impact read/write speeds. For example:

The Amazon Redshift driver allows choosing between data being delivered row by row or in one set that has to be put into memory. Depending on the size of the dataset, computer specs, and other processing happening reading in data row by row can be faster and more reliable.

The Hive ODBC driver allows users to set a default string column length. The larger the default string column is, the longer the data will take to load.

Many other drivers allow customization of buffers, cache sizes, and other settings to optimize read and write speeds. Check the driver documentation for options.

## USE BULK LOADERS

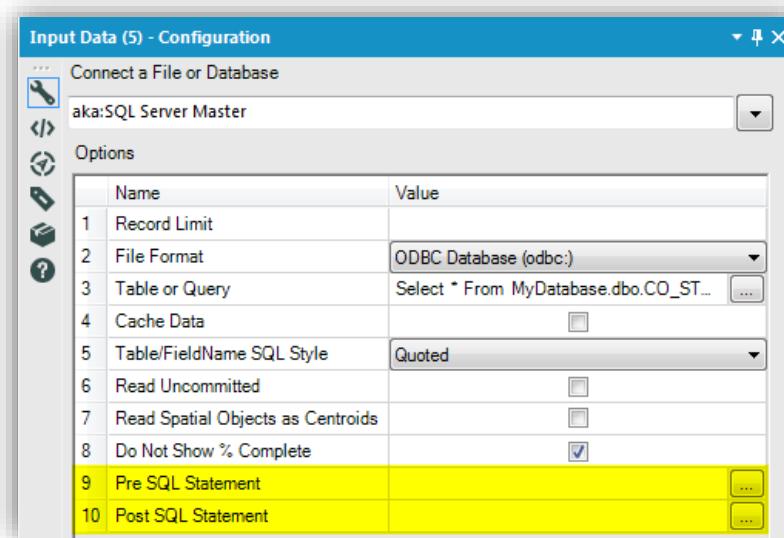
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Bulk loading increases write speeds. It is currently available for Oracle, SQL Server, Teradata, Amazon Redshift, and Amazon Athena. Reference the Alteryx Product Documentation for more information on setting up individual bulk loaders.

## USE PRE- AND POST-SQL STATEMENTS

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The Input and Output tools have the option to enter Pre- and Post-SQL statement to be executed before and after the read or write respectively. The statements are freeform text and sent to the database as-is, without any validation from Alteryx. They can be used for things such as deleting certain rows before writing out data, executing stored procedures, and adding or altering columns on a table.



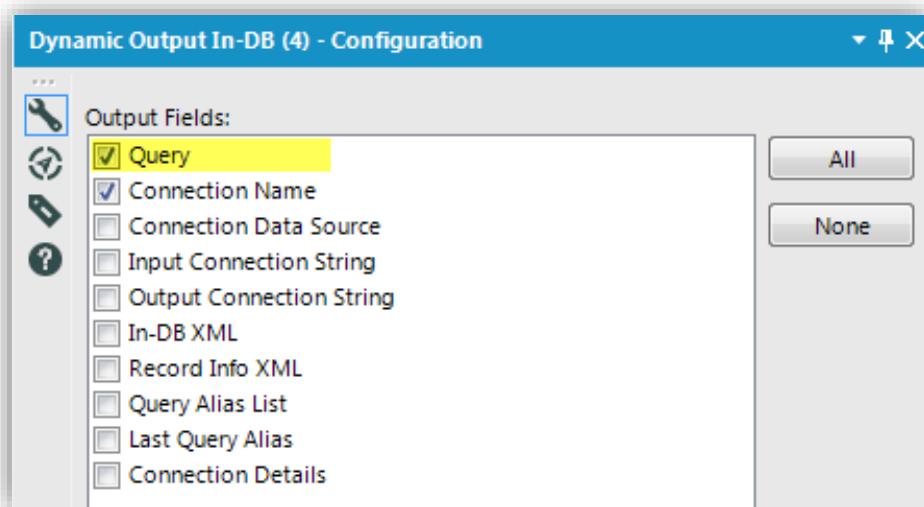
## IN - DB

The In-DB tools help users build complex queries to be executed on the database without needing to have a deep knowledge of the database query language. The query components are put together using tools with a look and feel similar to the regular tools used in Alteryx. Alteryx then compiles a query based on the tools on the canvas and sends it to the database to be executed there instead of on your local machine, thus taking advantage of the database server's processing power.

Find more information about the In-DB tools in our product documentation.

### VISUALIZE THE QUERY

The Dynamic Output In-DB tool can display the query being built by the In-DB workflow to help with trouble shooting.



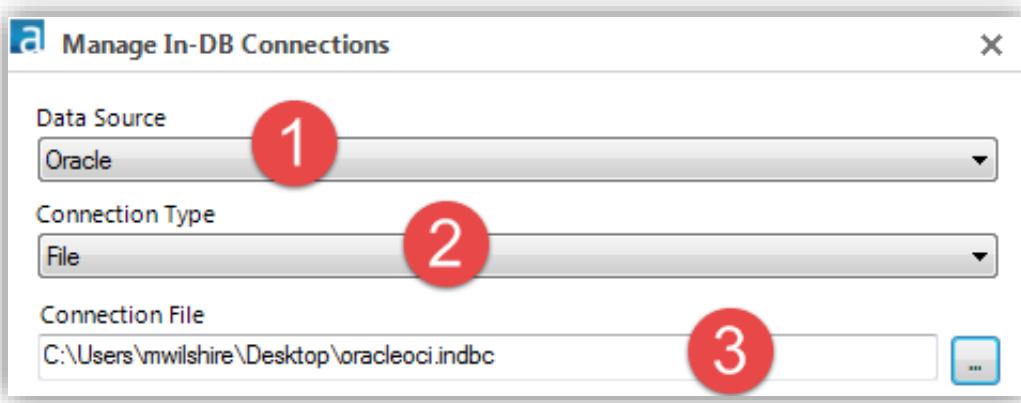
Copy the query out of the results window. Then paste it into the editor of your choice or the regular Input tool for testing.

Results - Dynamic Output In-DB (4) - Output		
Record #	Query	Connection Name
1	WITH "Tool1_10fa" AS (Select * From "MW_Transactions") SELECT * FROM "Tool1_10fa" WHERE "Order_ID" = '90200'	alteryx oracle

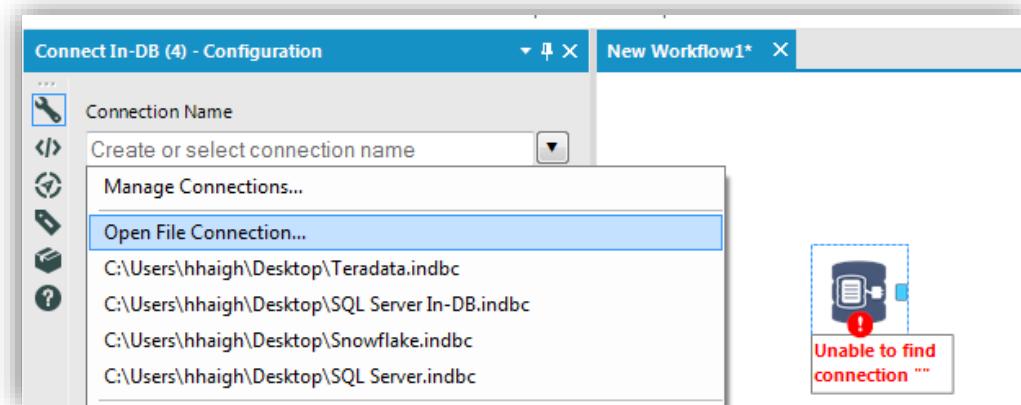
## SHARE YOUR IN-DB CONNECTION WITH A CONNECTION FILE

In-DB Connections can be saved to a file that allows sharing the connection with other users as well as packaging it with the workflow when loading a workflow to the gallery or scheduler. Database connections are saved to .INDBC files with the password encrypted in the file.

To create a new Database connection file, select the Data Source from the dropdown (1), then select File for the connection type (2), navigate to a folder where the INDBC file will be stored and provide a name for this file (3).



Once the file has been created, it will show up as an option in the Connect In-DB tool:



For more details, check this Alteryx Community post at: <http://community.alteryx.com/t5/Alteryx-Knowledge-Base/Alteryx-In-DB-Connection-File/ta-p/17574>

# SPATIAL



## SPATIAL PROCESSING

### SPATIAL RELATIONSHIP: SPATIAL MATCHING TIPS

So you have two sets of spatial objects and want to find the spatial relationship between them; the Spatial Match tool would do the job, but how could you set up your inputs into this tool for faster processing (Universe and Target)? Understanding the following will help you:

1. The Spatial Match tool will put everything in the Universe (U) tab into a temporary YXDB with a spatial index.
2. Then it has to look at every Target (T) object, but it can quickly ignore all Universe-side objects whose bounding rectangles don't intersect the bounding rectangle of the Target object. (A Bounding Rectangle is the rectangle that bounds the spatial object.)
3. As an example, for the common case of a smaller number of larger objects (e.g. Store trade areas) being matched against a large, wide-spread set of smaller objects (e.g. nationwide customer points); it's better to put the large set of wide-spread small objects on the universe side.
4. There are multiple methods for spatially matching two sets of spatial objects. A Venn diagram of each of those methods can be found in the Spatial Match tool's Help Menu.
5. The records that come from the Match (M) tab will be Target (T) records whose object had a match from the Universe (U) stream. The Universe object and selected fields are joined to the Target Record. The records from the Unmatched (U) tab will be Target records whose object had no match from the Universe stream.
6. The **IMPORTANT Message** is: The Spatial Match can ignore most Universe records that won't match the Target record without even looking at them.

# OTHER SPATIAL MATCH OPTIMIZATION TIPS

## USE FILE INPUT

The screenshot shows the 'Spatial Match (27) - Configuration' dialog and a corresponding workflow diagram. In the configuration, under 'Targets (T Input)', 'Use Records from U Input' is selected with 'testdata.yxdb' chosen. Under 'Spatial Object Field', 'SpatialObj' is selected. The workflow diagram consists of a 'File Input' node connected to a 'Spatial Match' node, which then connects to a '30 Miles' radius buffer node and finally to a 'SpatialObject\_TradeArea\_Contains\_SpatialObj' output node.

When using spatial processes with large datasets, consider using the file input option within the tool for increased performance.

## LIGHTEN THE LOAD: DE-SELECT UNNECESSARY SPATIAL OBJECTS

The screenshot shows the 'Spatial Match (27) - Configuration' dialog. Under 'Targets (T Input)', 'Use Records from U Input' is selected with 'testdata.yxdb'. Under 'Spatial Object Field', 'SpatialObj' is selected. In the 'Input' table, the 'Target\_Centroid' field is highlighted with a yellow selection bar, indicating it is being deselected.

For faster downstream processing, use the spatial match configuration to de-select un-needed spatial fields.

## SPATIAL MATCHING POINT IN POLYGON INTERSECTIONS WITH CALGARY JOIN

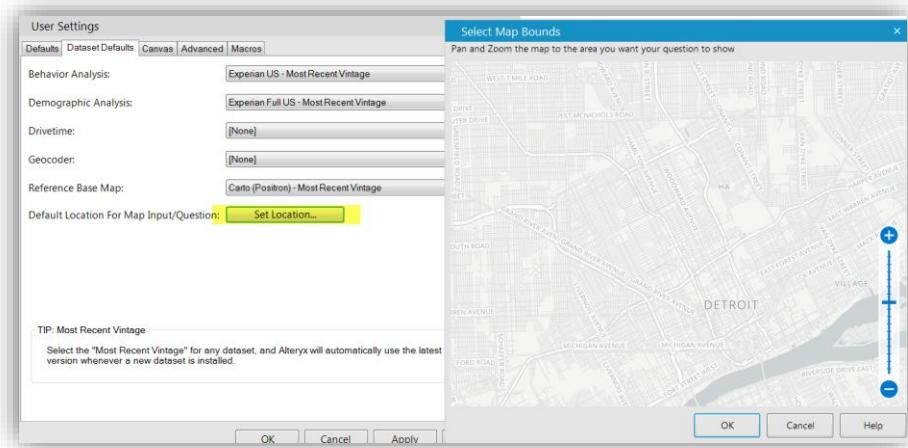
For large point in polygon spatial matches consider loading the point layer to a Calgary data file, then using a Calgary Join tool. Configure the join to map spatial field to spatial field.

The screenshot shows the 'Calgary Join (3) - Configuration' dialog and a corresponding workflow diagram. In the configuration, 'Calgary Data File' is set to 'D:\2016 Q4 Data US Release\Experian\_CV\_Analytical\_File\_Q4\_2016\HouseholdConsume'. Under 'Query Criteria', 'lat' and 'lon' are selected as input fields, and 'SpatialObj' is selected as the index field with 'Exact Value' query type. The workflow diagram shows a 'File Input' node connected to a 'Calgary Join' node, which then connects to a '30 Miles' radius buffer node and finally to a 'calgary join 5.1 seconds' output node.

# MAP INPUT

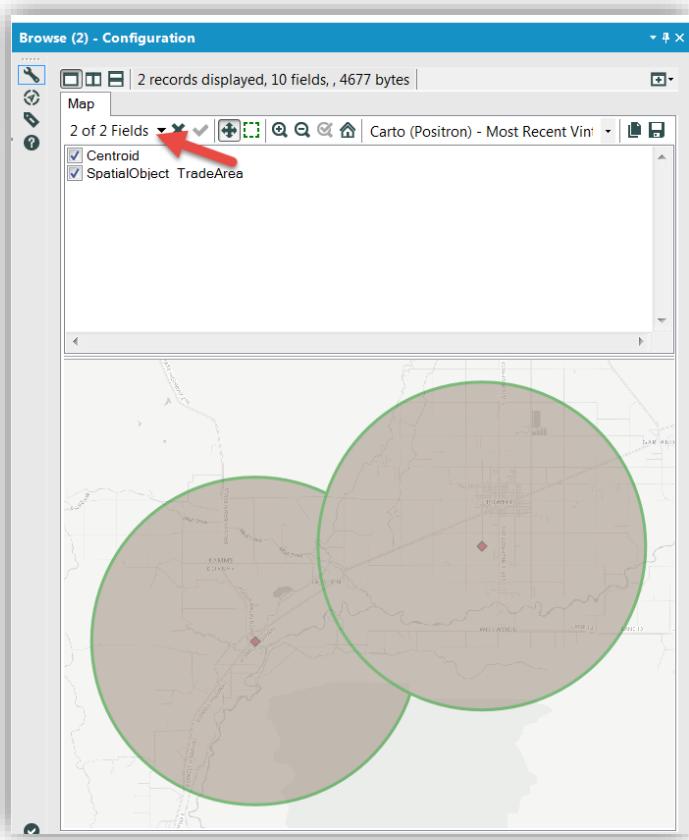
## SET DEFAULT LOCATION

To make development faster, use a default location for the map input tool so you don't need to scope each time.



# BROWSING SPATIAL DATA

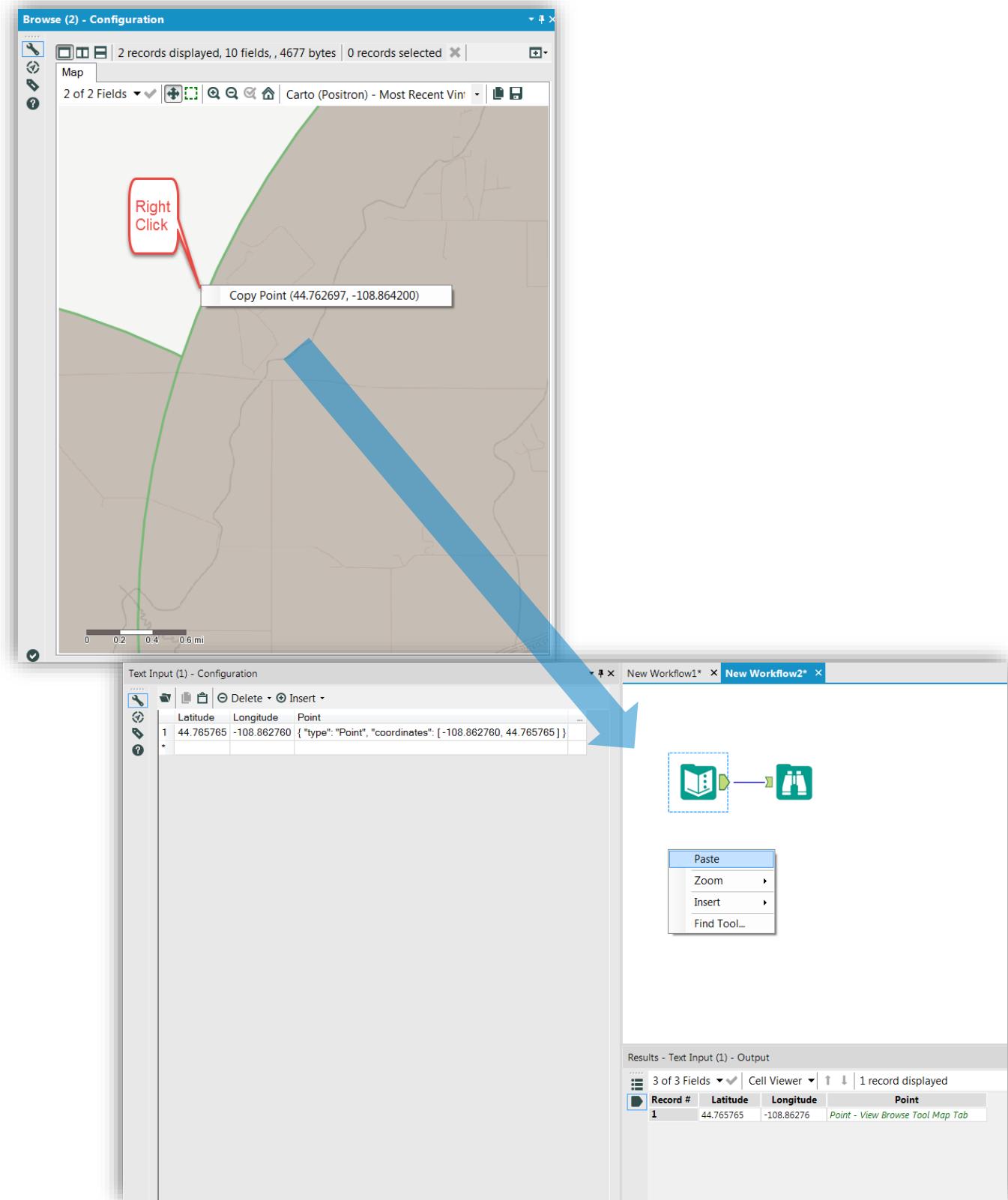
## CONTROL WHICH SPATIAL OBJECTS SHOW IN BROWSE TOOL



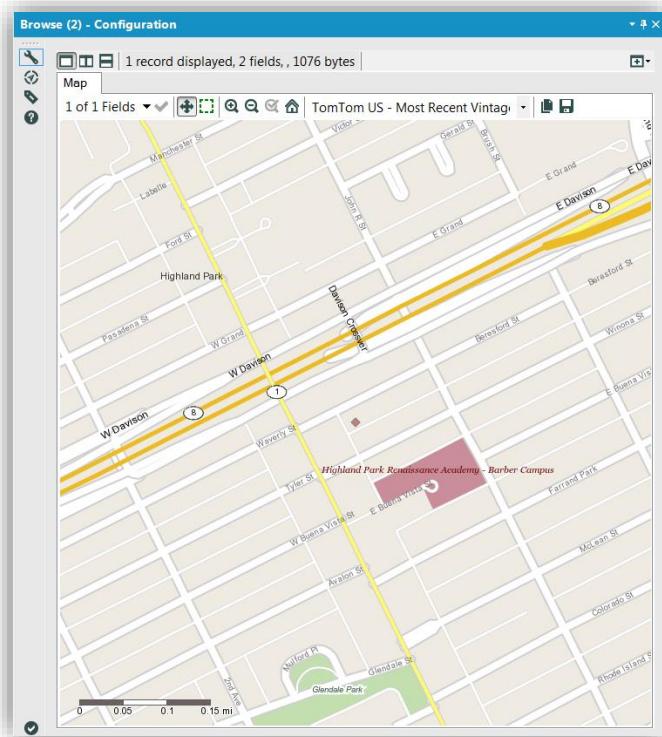
Click on the top left of the Browse configuration where it shows the number of fields in order to expand a menu for layer selection. Use this interface to de-select unwanted layers in order to give yourself a cleaner view or to view features that overlap each other.

## COPY SPATIAL FEATURES FROM BROWSE TOOL

Right-click on a point in a browse tool to copy the coordinates. Then right-click anywhere on the canvas to paste the copied point in as a new text input with spatial object.



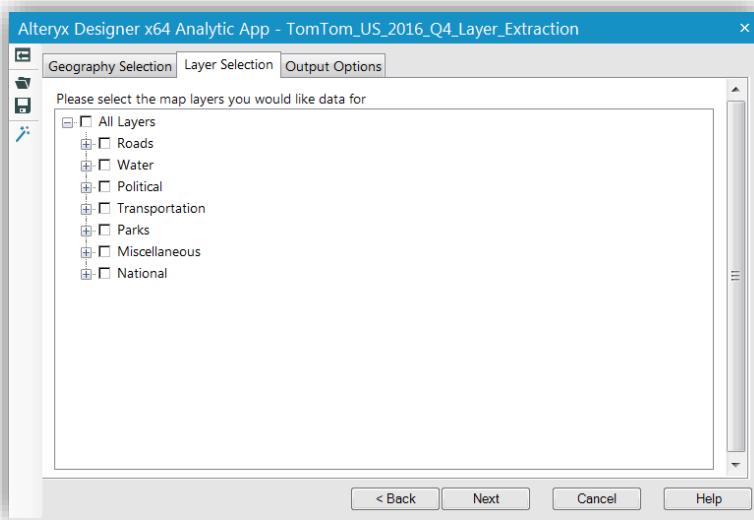
# TOM TOM SPATIAL DATA EXTRACTION



Looking for spatial data to use in Alteryx such as roads or schools? Did you know you can extract the spatial data that powers the Tom Tom Base map when you have a spatial license? Alteryx users who have purchased the TomTom Alteryx Maps data set can extract layers into various formats using the Tom Tom Layer Extraction App.

Look for the App in the location where you installed the Spatial Data. The default location is listed below.

C:\Program Files 86)\Alteryx\DataProducts\AlteryxMap\TomTom\_US\_2016\_Q4\Analytic\_Apps



Run the App to select layers by geography and extract them to a location on your machine as yxdb layers.

Or, if you prefer, you can access the file for all geographies by locating the Data folder in the install directory.

Default data location:

C:\Program Files (x86)\Alteryx\DataProducts\AlteryxMap\TomTom\_US\_2016\_Q4\Data

Documentation for the layers can be found in the documentation folder under 'spatial'



# APPS AND MACROS

# APPS AND MACROS

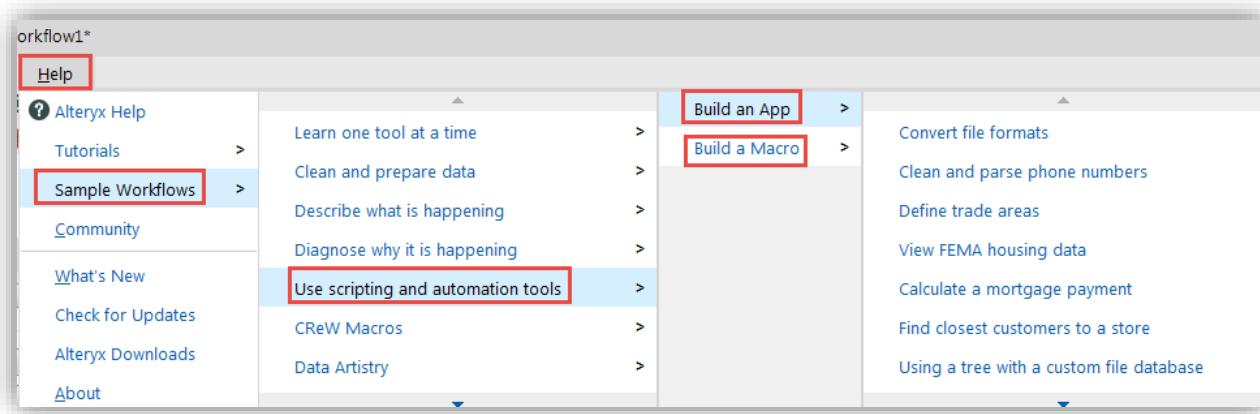
## USER-BUILT TOOLS AND APPS

Creating macros and apps is one of the most powerful things you can do with Alteryx. Create a tool of your own (Macros – yxmc file type) or create a user interface for your users to interact with your workflow (Analytic Apps – yxwz file type). Both can be shared with your co-workers and users through the Alteryx Analytics Gallery or a private Gallery.

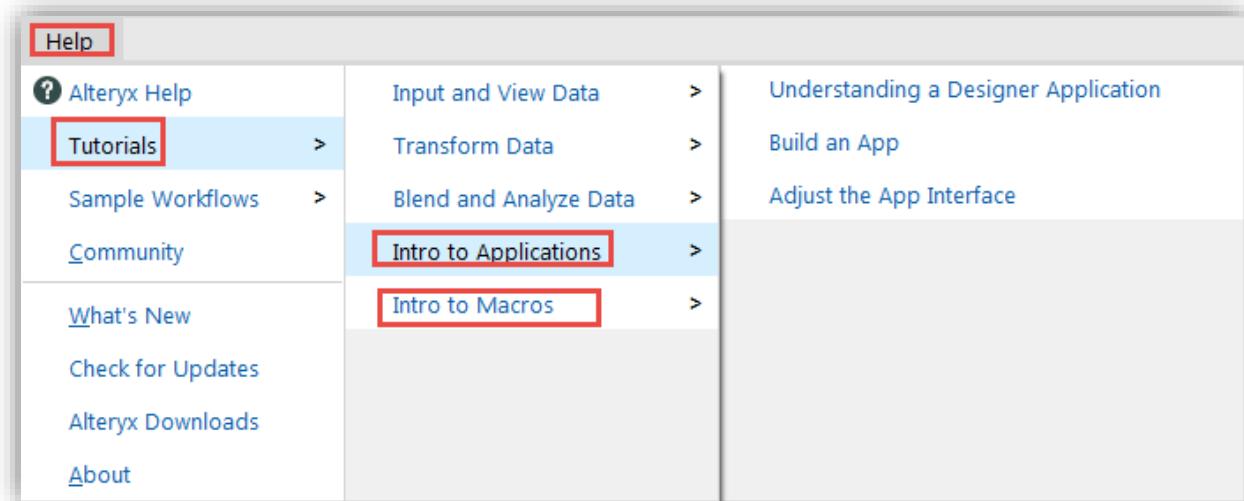
## ANALYTIC APPS AND MACROS BEST PRACTICES

### RESOURCES: SAMPLE WORKFLOWS AND TUTORIALS

Analytic apps, macro samples, and tutorials are great resources for ramping up. Sample workflows can be found under *Help > Sample Workflows > Use scripting and automation tools > Build an App / Build a Macro*.



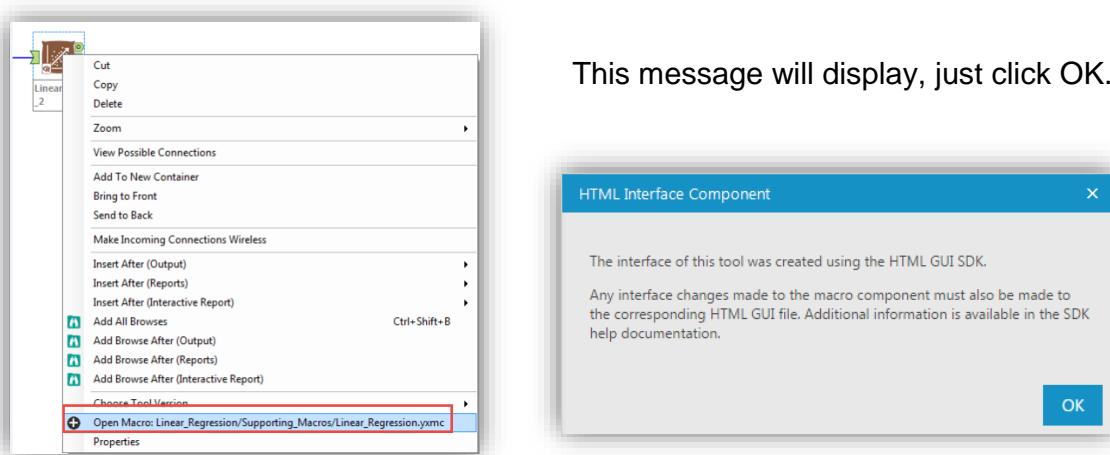
Tutorials can be found under *Help > Tutorials > Intro to Applications / Intro to Macros*



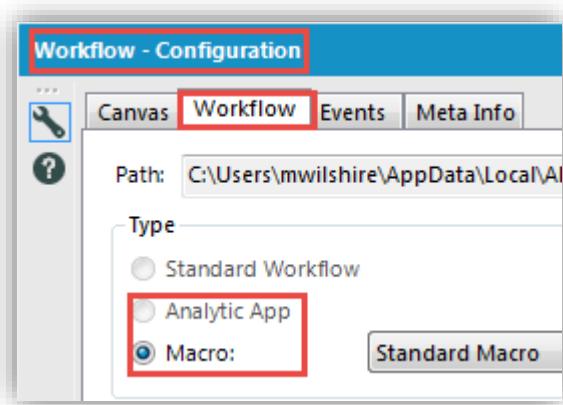
## RESOURCES: ALTERYX HTML MACROS

Crack the Alteryx HTML tools open! These tools are macros that you can open in Designer. Learn from them and leverage them as examples for building your own macros.

Right-click on an HTML tool, e.g. the Linear Regression tool, and select *Open Macro*



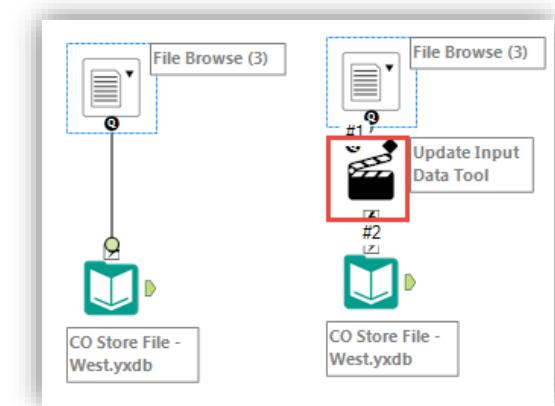
## WORKFLOW TYPE ASSIGNMENT MADE EASY



Adding any tool(s) from the Interface Tool Category to the canvas automatically changes your workflow type from a standard workflow to an analytic app or macro.

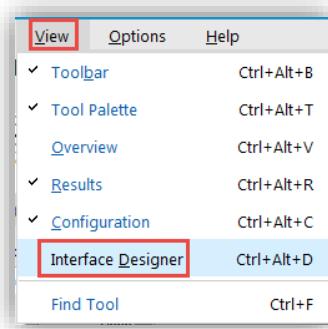
Analytic apps are saved as ywxz files, while macros are saved as ycmc files.

## FAST ACTION [TOOL] INSERTION



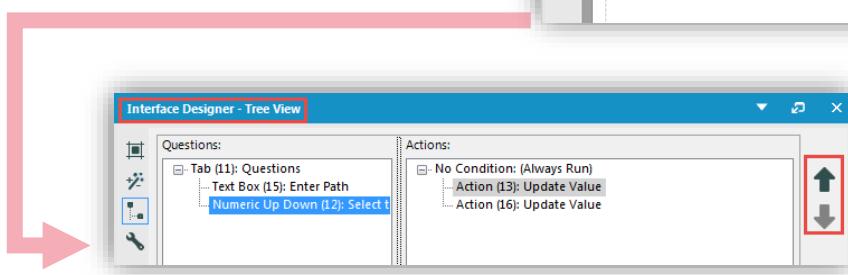
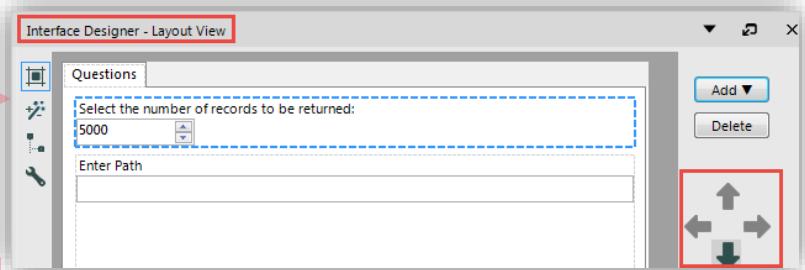
Connecting an Interface Question tool directly to another tool with a lightning bolt anchor will automatically create an Action tool.

## REARRANGING QUESTIONS



You can rearrange the format of your macro or app configuration in the Interface Designer. To do this, first turn on the Interface Designer View.

Move Questions around the User Interface using the Up, Down, Right, and Left arrows in the Layout View of the Interface Designer , or...

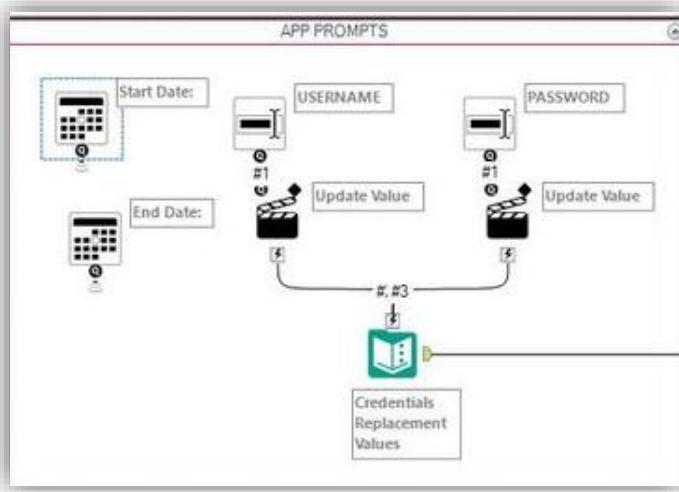


You can rearrange your questions in the Tree View of the Interface Designer using the Up and Down arrows. This view is especially helpful for nesting questions.



FROM THE TIP MEISTERS

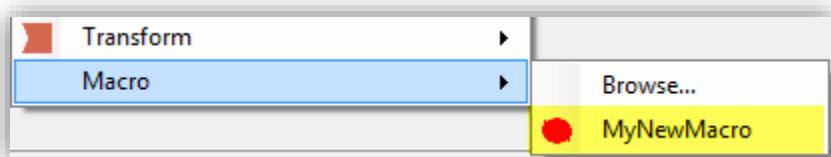
USE TOOL CONTAINERS FOR TRACKING PURPOSES BY  
NICOLE JOHNSON



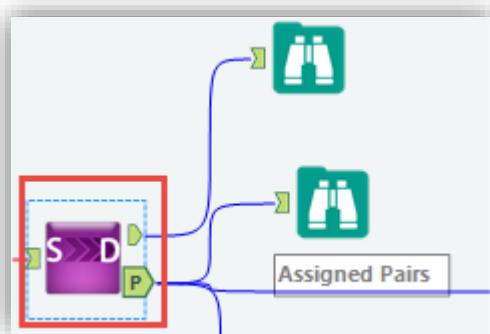
You might find it helpful to keep your app or macro prompts in a specific "App Prompts" container. This will allow you to easily keep track of all the prompts being used, and quickly connect them to the various tools throughout the workflow. This can also be a helpful practice for Error Outputs, as it allows you to keep track of all of your errors in one place.

## EASY MACRO INSERT!

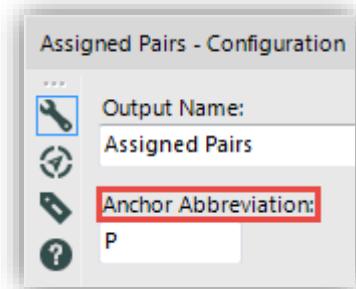
Macros can now be easily added to a workflow as soon as they are built and saved by right-clicking on the canvas, and inserting the new macro.



## MACRO ANCHOR ABBREVIATION

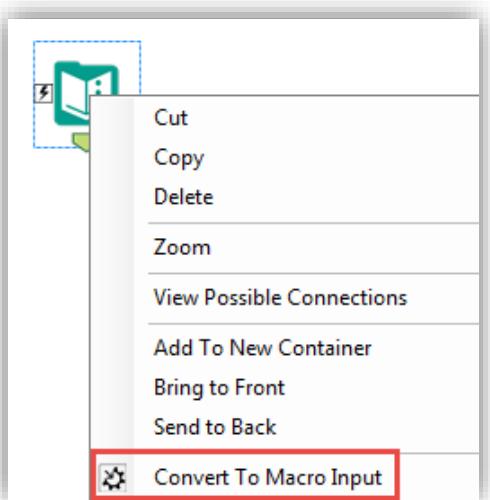


You can assign a letter abbreviation to a macro's anchor(s) to make it more intuitive to the user. For example, this Iterative Supply and Demand macro has an output anchor named **P** to indicate the output that will produce the assigned pairs.



To create or change the anchor abbreviation assignment, go to the Macro Input or Output tool's configuration window, and modify the Anchor Abbreviation.

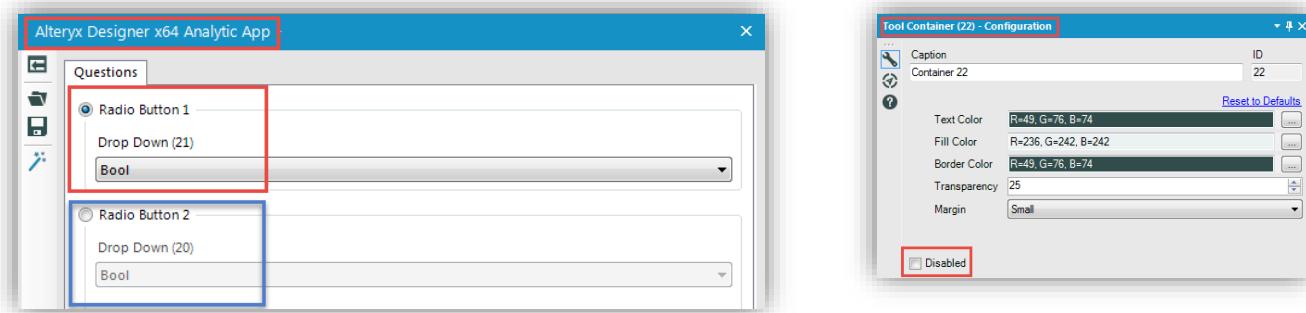
## MACRO INPUT SHORTCUT



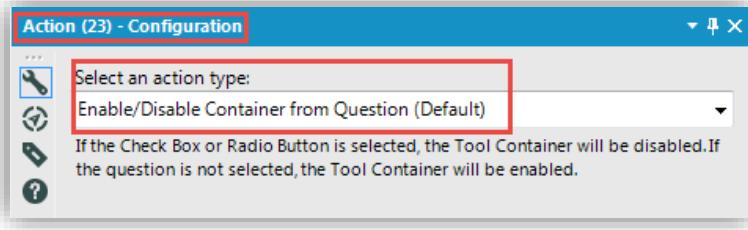
Did you know that you can easily convert Input tools into Macro Input tools? As you turn your workflows into macros, this handy-dandy trick allows you to easily and quickly make the conversion. Right-click on the Input or Text Input tool, and select *Convert to Macro Input*.

## DETOUR WITH CONTAINERS

The Tool Container's Disabled checkbox feature is great for app/macro building. When checked, the tools within the disabled container will not process data. This is the easiest way to bypass a set of tools based on the user's input. This can be used instead of the Detour and Detour End tools.



When connecting an Action tool to the Container, the default action type is *Enable/Disable Container from Question*



## WIRELESS CONNECTIONS

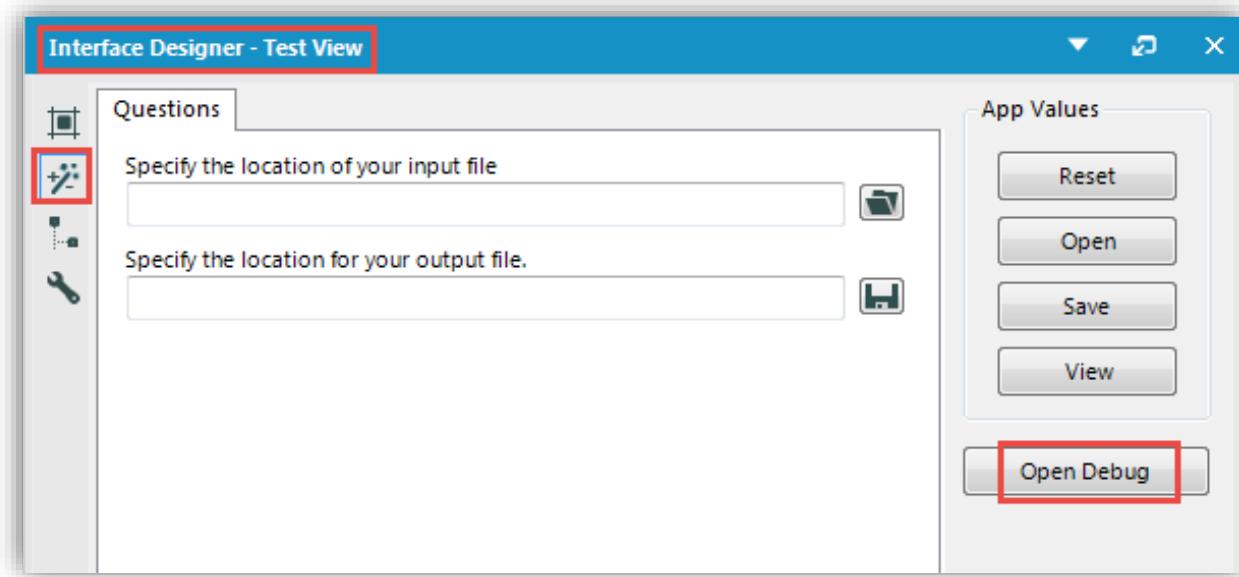
For a less cluttered look, you can use wireless connections for the Action tools. To make your connections wireless, click on the connection and check the Wireless box, or right-click on a tool and select *Make Incoming/Outcoming connection wireless*

# ANALYTIC APPS AND MACROS TROUBLESHOOTING TIPS

## DEBUG WORKFLOW

Using Open Debug is highly recommended when developing an analytic app or macro. With Open Debug, you can make sure each tool in your app or macro is being updated as expected. This is especially helpful when troubleshooting.

To use the Open Debug feature, first open the Interface Designer View (*Views > Interface Designer*), and select the Test View (the second option from the top in the left column, symbolized by a wand). Fill out the information requested by your app or macro, then click on Open Debug. A debug workflow will open as a new tab in your current Alteryx session. Run the debug workflow to make sure it is creating your desired results.

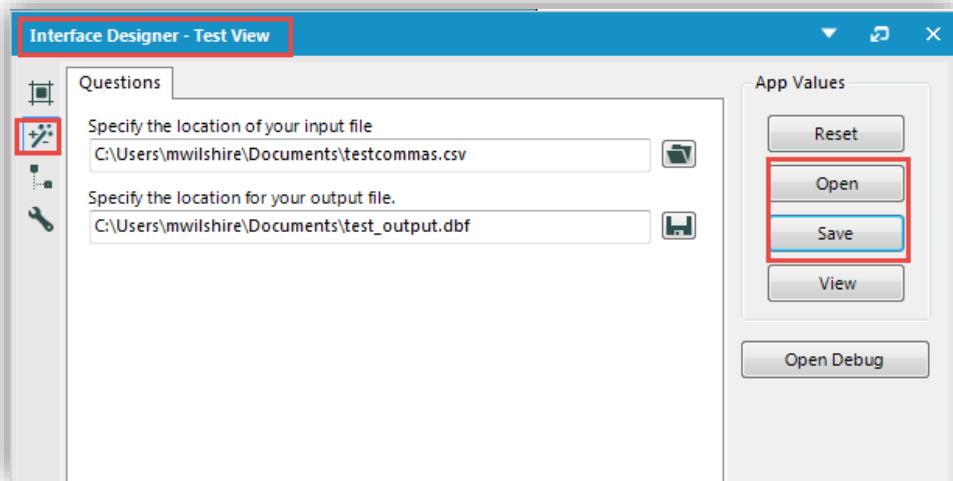


### FROM THE TIP MEISTERS DEBUG FUNCTIONALITY...A BEST KEPT SECRET? BY DYNAMOMO

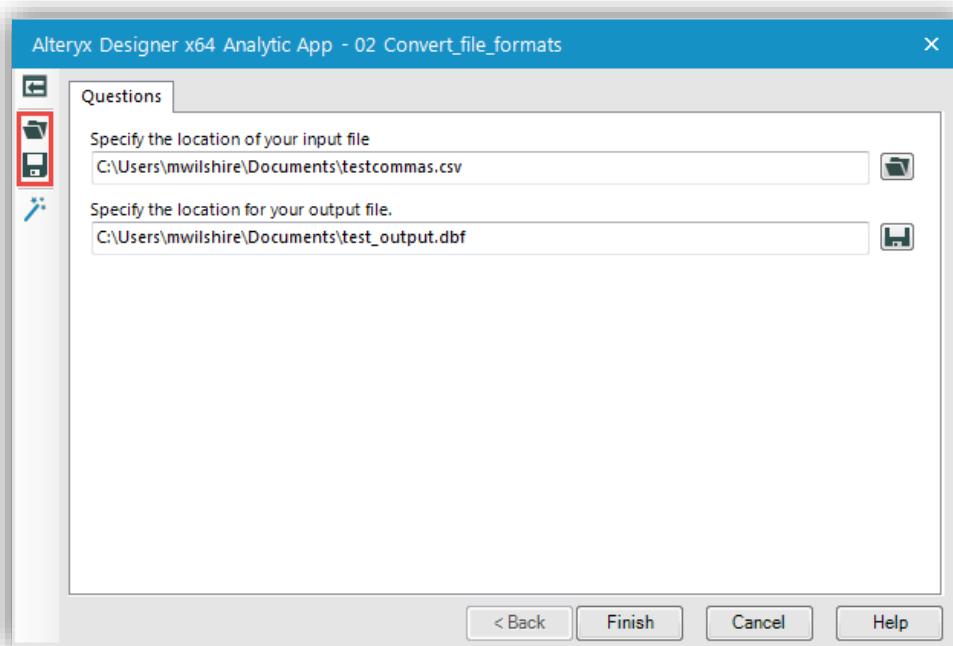
I'm always surprised at how many people build analytic apps but don't know about the Debug functionality available in the Interface designer which enables the user to test out the app and view where it is breaking if it fails...

## KEEP YOUR APP & MACROS VALUES

This one is a time-saver when testing and troubleshooting. Fill out the questions in the Interface Designer – Test View just once, save them, and from that point on you can re-use those values for testing.



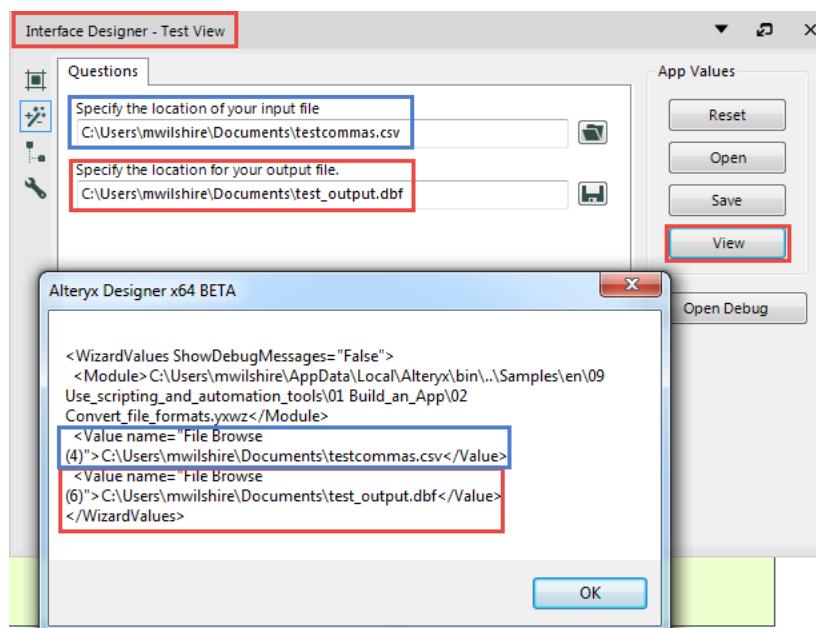
Hitting the save button under App Values creates a .yxvw file with your inputs. These values can then be retrieved with the open option. This feature is available for both apps and macros.



Another option for analytic applications is to save your values from the App Interface, after clicking on the magic wand icon.

## VIEW YOUR APPS AND MACROS VALUES

The View values feature is a must know and must do when building apps and macros. This feature quickly shows how the value(s) being entered into your app or macro will go on to update your workflow. If unexpected leading zeros, spaces, or return characters are causing your inputs to fail, you will see them first!

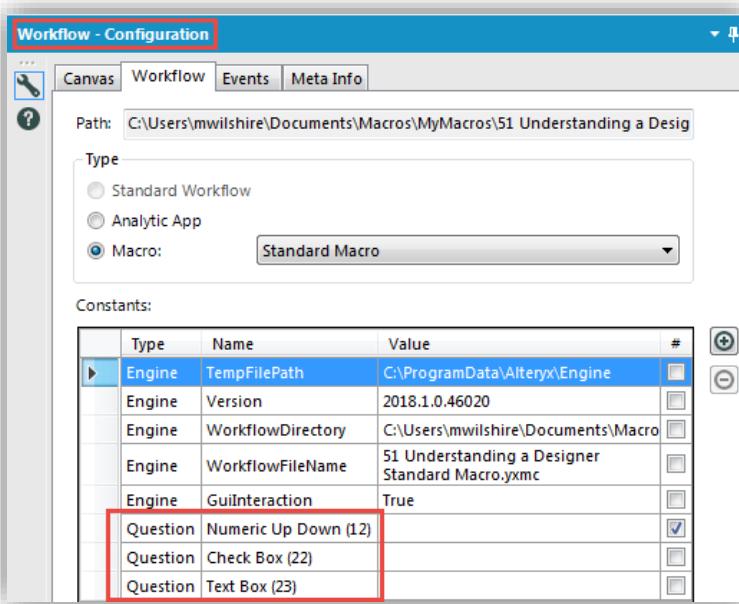


In the Interface Designer – Test View, click on View. You will see the Question followed by the value.

## QUESTION CONSTANTS TO THE RESCUE

Exciting news! Many of the Interface tools display as Question Constants!!!

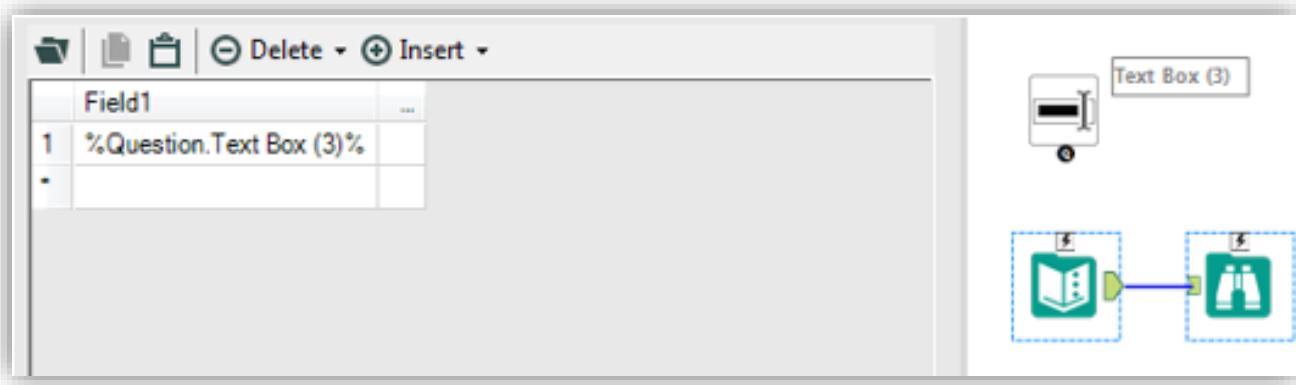
Alteryx Constants are global variables that make it possible to change repeated values in a workflow in one location. The name of the constant will correspond to the name of the Interface tool.



## EASIER APP AND MACRO DEBUGGING

While debugging, you can run your app or macro like a normal workflow by providing it with test data in the Question Constant values for the Interface tools (*Workflow Configuration Window > Workflow Tab > Constants*).

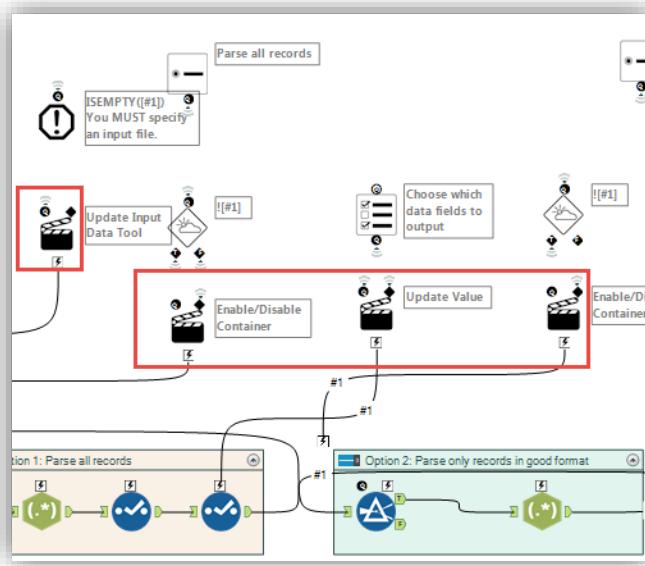
Interface tools need to be referred to in the following format to be recognized by Alteryx:  
%Question.InterfaceToolName%



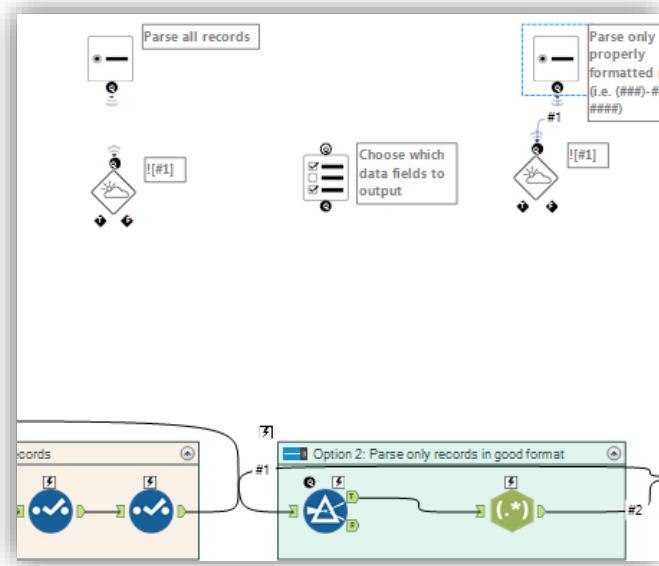
## THE MAGIC OF TIDYING UP CLUTTERED APPS/MACROS ... WITH QUESTION CONSTANTS

Question Constants allow you to update your workflow without Action tools, giving the workflow a cleaner and less cluttered look.

BEFORE



AFTER





FROM TIP MEISTERS

## QUESTION CONSTANTS AS PARAMETERS BY RYAN LAMBERT

Did you know you can use the Interface tools to create parameters within a workflow? In order to do this, first name the Interface tool under annotation/name in the tool's configuration window. Then you can call the value of that parameter within your workflow.

For example, if you name a question "Tip Tricks," you could use the value generated by the Interface tool without any Action tools by calling the variable: %Question.TipsTricks%.

This is a handy trick for apps and macros because you can use the parameter in tool formulas (e.g. the Formula tool, the Filter tool) without connecting an Action tool.



FROM THE TIP MEISTERS

## TROUBLESHOOTING NESTING MACROS BY DAVID\_FETTERS

If you're developing complicated nesting macros (e.g. an outer macro containing an iterative macro that contains a batch macro) it can be difficult to figure out what went wrong when your final workflow doesn't produce the output you expect. However, if you add an extra Output interface tool to each of the macros, and hook it up to a default Text Input, then you have a ready-made debugging connection. Open the deepest nested macro, attach one of your other tools to the debugging output, then attach each debugging output all the way up until you get to your top-level macro. When you run the workflow, you can see the data exactly as it passes through the tool three layers deep.

Internally, I've reserved the '#' hash character to signify debugging outputs on my macros during development. It's helped me figure out a couple of really confusing problems where my formulas didn't cause an error but broke on a couple of edge cases in our live data.



FROM THE TIP MEISTERS

## CHAIN FLOWS WITH BATCH MACRO BY SEANADAMS

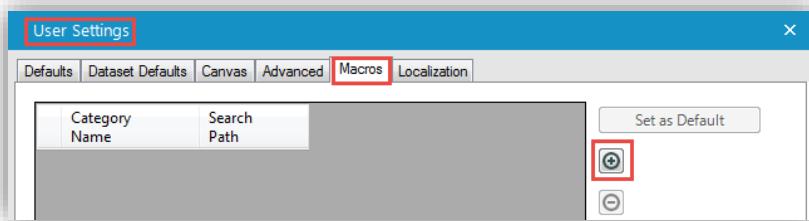
To chain different workflows together and operate in a particular order, you can use a batch macro. For example, append an excel spreadsheet into your database; and then run a separate job that summarizes all the rows and performs additional processing.

Batch macros are the only type of macro that will not pass data downstream until each iteration of the macro is complete. This allows you to create a very complex chain of workflows with each step contained in its own Alteryx macro, guaranteeing that will process strictly in order.

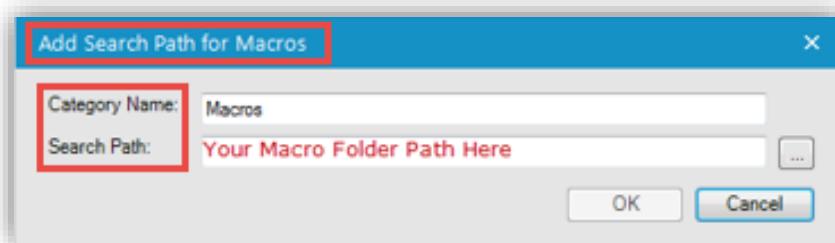
## MANAGEABLE MACROS

Do you need easy and fast access to those cool custom macros you've built? Create a repository of macros and Alteryx will display these macros in the Tool Palette.

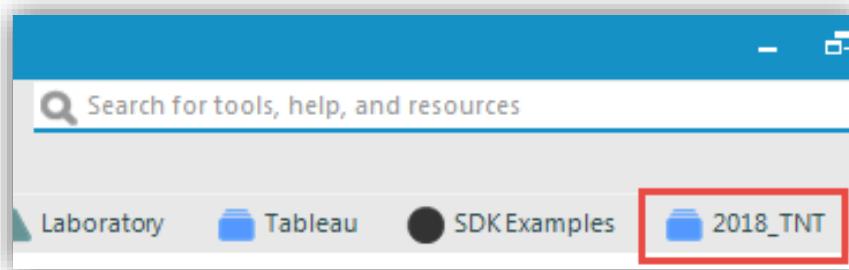
1. Create one (or many) macro(s)!
2. Save your macro(s) in the same directory
3. In Designer, go into *Options > User Settings > Edit User Settings*
4. Click on the Macros tab and click the plus sign:



5. Enter a name for your custom category, and enter the path where you have saved your macro(s)



6. Scroll to the end of your tool Categories and you will now see a custom folder with any macros saved in your specific directory as tool icons you can now quickly drag and drop into your workflow



7. Make sure to check out the Tool Palette tips & tricks in the *Designing and Organizing your Workflow* section of this booklet to learn how to quickly scroll through the categories and how to pin your new macro category to the front of the palette.

# THE CREW MACROS

CReW macros have become very popular among our users, as they simplify common repetitive processes.

These macros are not part of an official Alteryx release. They have not been through the full testing process like tools in the product. Some of them are prototypes and experimental.

Download the latest CReW macro pack from community. After installation, these macros will be placed in a category of their own in the Tool Palette. Sample workflows will be added under *Help > Sample Workflows > CReW macros*. Here are a few examples of examples of cReW macros.

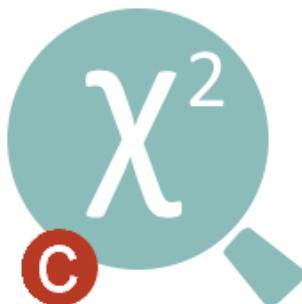
## WHAT'S NEW?

### New Macros



**Wildcard XLSX Input** - This macro was contributed by Joe Mako and came from a discussion on [this community post](#). Ever wanted to read in multiple XLXS files and worksheets? Then this is the macro for you! (This is the only macro in the pack which is currently missing from the 9.5 version as it makes use of 10.0 features)

Description - *"Reads in multiple sheets from multiple Excel files from a directory. Optionally can filter out sheets, can pull field names from a header row, can auto configure field types, can sample N random sheets, and if the headers do not match then raw data for the sheets that did not match will be in the 'N' output."*



**Chi Square Test** - Our second new macro author this month, this one is from Mark Frisch or MarqueeCrew another very active member of the new community site.

Description - *"Have you created a sample set and wanted to know if there was a bias in the sample? Random doesn't always mean you get an even quantity of data across your variables. This test will check to see if the distribution of domain values (for a specific variable) are representative of the parent population."*

*Best to double check your samples before you run your tests!"*



**Moving Summarize** - This is a macro I wrote almost a year ago now and featured on this blog [here](#). But it really has been that long since the last macro pack release!

Description - *"Calculate moving averages or any type of moving summarize"*

The background image shows a vast expanse of ocean with large, white-capped waves crashing against a dark, rocky shoreline. The sky above is a clear, pale blue.

**PREDICTIVE**

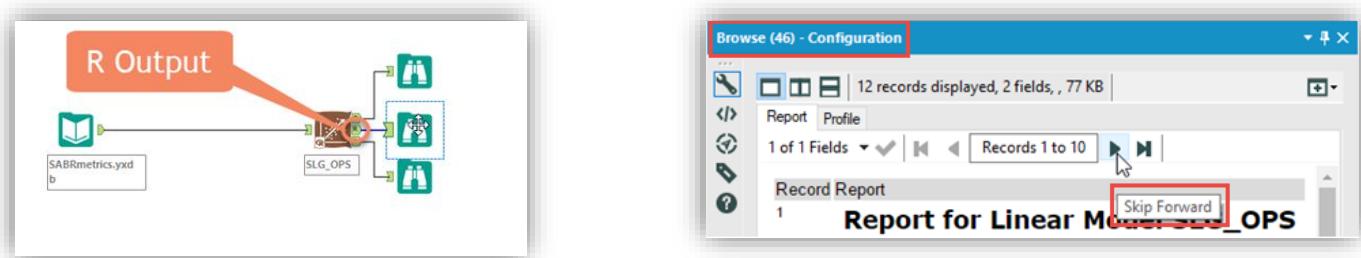
# PREDICTIVE

## POLISHING YOUR CRYSTAL BALL

Sometimes you want to be predictable. Sometimes you don't want to be predictable. But 100% of the time, you want it to be easier to perform predictive analytics. Coming to your local machine are your Predictive Tips and Tricks!

### SKIP FORWARD IN REPORT ANCHOR

The Skip Forward button of the R Output for the predictive tools will reveal additional fit statistics that users typically miss. The more information you know about your model, the more equipped you will be to make decisions with it.

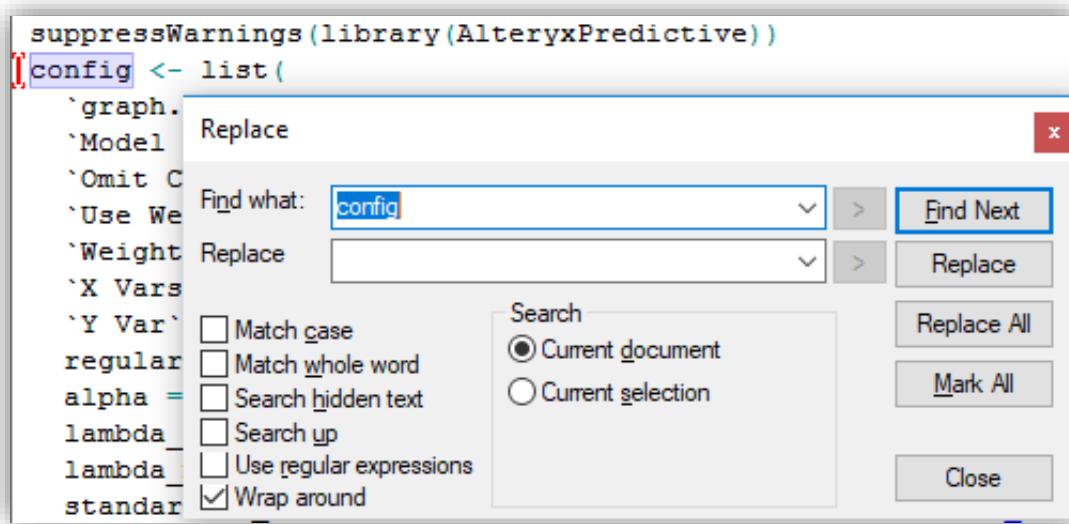


### THE R TOOL SHORTCUTS

The R tool has a variety of shortcuts that can help navigate the code in a much easier way than scrolling.

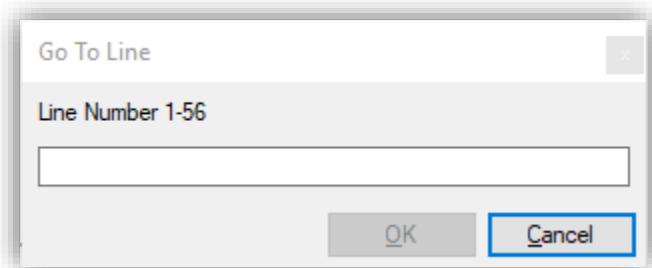
#### CTRL + H

While in the R tool, *Ctrl+H* will bring up a Find window that can help you search for specific code inside the tool.



## CTRL+G

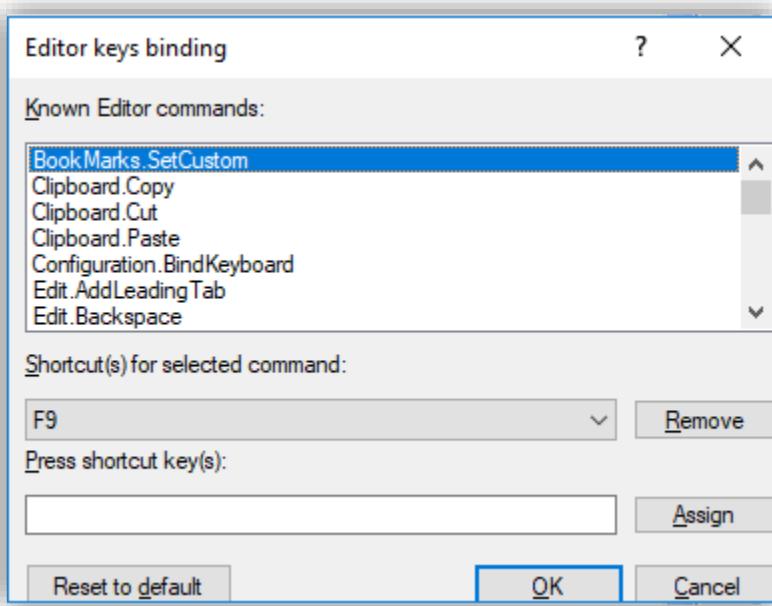
Typing *Ctrl+G* will allow you to navigate to a specific line.



## CTRL+B

The ultimate Trick of the R tool is shortcut customization! *Ctrl+B* will show any keyboard shortcuts available (and change them as long as the R tool is selected).

Example: reassign File.Open to *Ctrl+Alt+Shift+O* allows you to open a file from R tool directly



# REPORTING

# REPORTING

## TRANSPOSE FOR A BETTER FITTING TABLE

Table too wide? Can't get your table with only one record to fit in an elegant way in your final report? Try the Transpose tool!

If you intend to group your report elements, select a unique ID field as your Key Field, and subsequently choose all of the fields you are interested in seeing in the final report snippet. At this point your data will move from a wide table...

Record #	StoreID	Trade Area Size	Density Class	DMA	County	DMA Store Count	DMA Market Share	Nearest Store Name	Nearest Store Distance
1	101	8 min	Urban	Phoenix (Prescott) AZ	Maricopa	5	10.4%	102 PHOENIX	7.28 miles
2	102	17 min	Exurban	Phoenix (Prescott) AZ	Maricopa	5	10.0%	104 PHOENIX	2.96 miles
3	103	12 min	Suburban	Phoenix (Prescott) AZ	Maricopa	5	8.8%	104 PHOENIX	3.52 miles
4	104	12 min	Suburban	Phoenix (Prescott) AZ	Maricopa	5	3.5%	102 PHOENIX	2.96 miles
5	105	12 min	Suburban	Phoenix (Prescott) AZ	Maricopa	5	9.6%	101 PHOENIX	11.39 miles

Record #	StoreID	Name	Value
1	101	Trade Area Size	8 min
2	101	Density Class	Urban
3	101	DMA	Phoenix (Prescott) AZ
4	101	County	Maricopa
5	101	DMA Store Count	5
6	101	DMA Market Share	10.4%
7	101	Nearest Store Name	102 PHOENIX
8	101	Nearest Store Distance	7.28 miles
9	102	Trade Area Size	17 min
10	102	Density Class	Exurban
11	102	DMA	Phoenix (Prescott) AZ
12	102	County	Maricopa

...To something more manageable to place in a static report.

Next, you'll feed your transposed data into a Table tool, and set the grouping field to your unique id (in this example, StoreID).

The final trick is to set the name of this particular table. To do so click on the "Name" value in the "Per Column Configuration" window, and choose to Rename the field. You can also set a Column Rule that affects only the header, and make it larger and bold. Next, choose the "Value" value in the same section of the Configuration window, and choose to rename the value with a plain space.

Location Detail	
Trade Area Size	8 min
Density Class	Urban
DMA	Phoenix (Prescott) AZ
County	Maricopa
DMA Store Count	5
DMA Market Share	10.4%
Nearest Store Name	102 PHOENIX
Nearest Store Distance	7.28 miles

The result is a nice looking, single table element with the former column names and formatted data represented in a concise report snippet.

## METRIC SYSTEM FOR FINITE ADJUSTMENTS

When trying to refine your reports, you may find yourself adjusting the padding of the report snippets, particularly in the Overlay tool. Sometimes, even moving snippets by the smallest allowable unit of measurement of 1/10th of an inch still doesn't articulate the placement of a snippet well enough. How can this be resolved? Set default distance units in user settings to 'kilometers' instead of 'miles'. Now report placement can be articulated by smaller units of measurement (~2.5mm : 1/10th of an inch).

# ALTERYX RESOURCES

# ALTERYX RESOURCES

## COMMUNITY

Go to <http://community.alteryx.com> to connect with your peers and take advantage of all our community has to offer! Here, you can take interactive lessons, post questions, search for previously discussed topics, learn from experts in the Knowledgebase, peruse blogs, and share your ideas for product enhancement and new features!

## ALTERYX ACADEMY

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Alteryx Academy puts all of our learning resources under one roof. There are **Interactive Lessons** that get you up to speed with videos and activities, **Live Training** sessions focusing on practical use cases, **Weekly Challenges** to put your Alteryx skills to the test, and the **Certification Program** allowing you to receive recognition for your accomplishments!

## DISCUSSIONS

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The Discussions board allows users to post and answers questions. Search the forum to see if other users had the same questions you're facing!

## KNOWLEDGEBASE

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The Knowledgebase is a place for Alteryx experts to share their wisdom. You can find things such as the Tool Mastery Series here as well as specific use cases. Search this section for specific tools. Pro Tip: Tool Mastery articles also show up in the global search inside Designer!

## BLOGS

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In this section, you will find popular features such as the Engine Works Blog that peeks under the hood of Alteryx and the **NEW** Data Sciences Blog discussing machine learning and data science.

## DEV SPACE

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The Developers community is a new forum for users to share how they are customizing and extending Alteryx. This is the place to go if you are working with the Alteryx Gallery API or are creating custom tools.

## IDEAS

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Submit your ideas for product enhancements or new features! Search existing ideas to see if it has been submitted already. If it has, it needs your vote and comments, otherwise submit a brand-new one. Include your rationale, business use case, screenshots, or anything you feel illustrates the idea best.

## ALTERYX RESOURCES

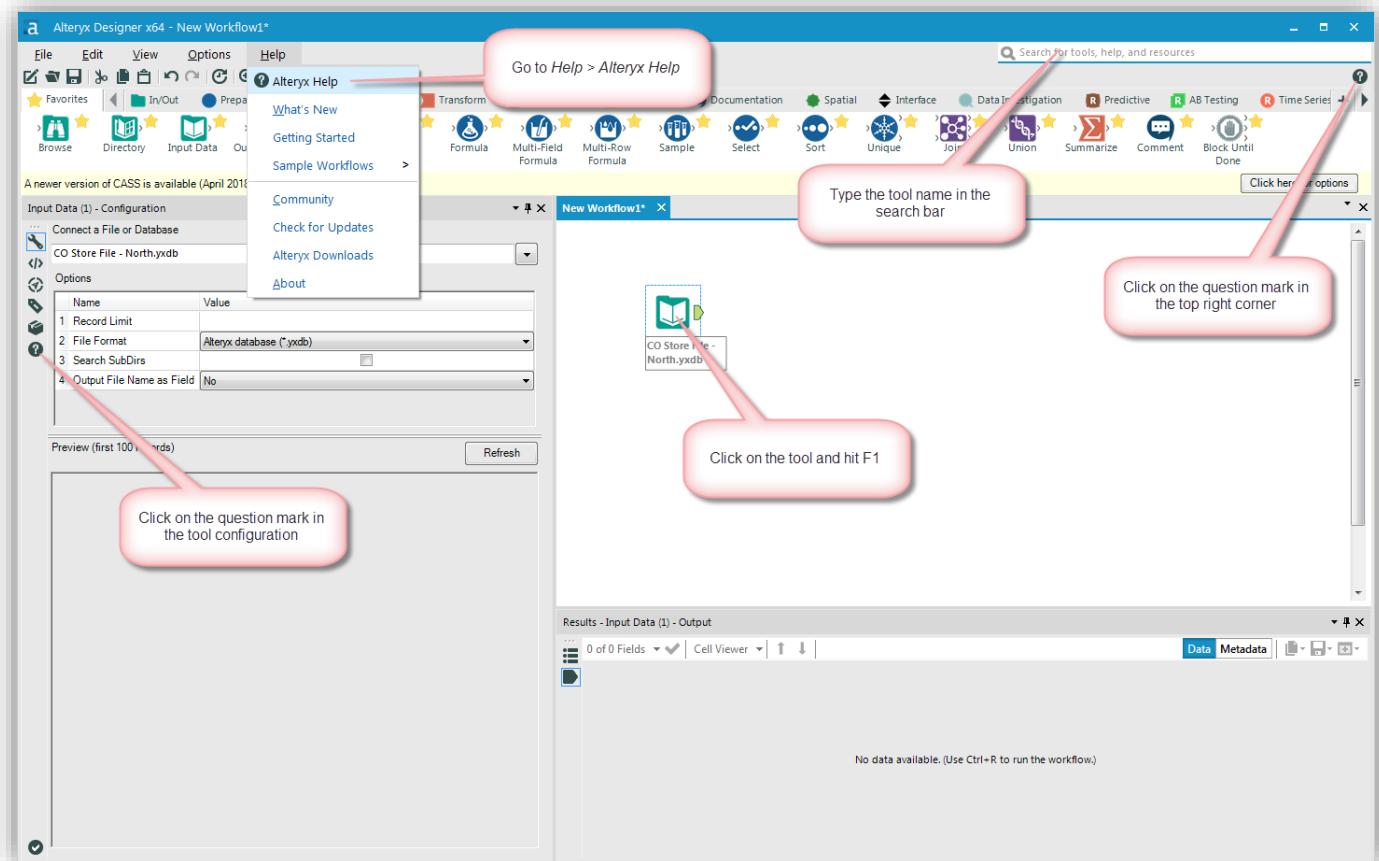
Last but not least, the community also links to our other fantastic resources

- Alteryx.com Home Page
- Product Documentation (see below for more options on accessing the Product Documentation)
- Alteryx Public Gallery
- Legacy Downloads
- Support

## IN PRODUCT RESOURCES

### PRODUCT DOCUMENTATION

There are many ways accessing product documentation from the designer:





## DESIGNER HELP ONLINE IS ORGANIZED BY DATA SOURCES, TOOLS, WORKFLOWS, AND APPS AND MACROS:

The screenshot shows the Alteryx Designer Help online documentation. At the top, there's a navigation bar with the Alteryx logo and the word "DOCUMENTATION". To the right are links for "Get Started", "Data Sources", "Tools", "Workflows", "Apps and Macros", and a search bar with a magnifying glass icon. Below the navigation bar, the title "ALTERYX DESIGNER HELP" is centered. A sub-instruction "To get started, select from a menu, click an icon, or use the Search bar." follows. Then, four large icons are displayed in a row, each with a corresponding category name below it: "DATA SOURCES" (blue folder icon), "TOOLS" (red wrench and screwdriver icon), "WORKFLOWS" (teal flowchart icon), and "APPS AND MACROS" (purple network graph icon).

### SAMPLE WORKFLOWS

Under *Help > Sample Workflows* and under the Get Started section on the help page, you can find fully annotated workflows, macros, and apps. Get a sense of how to use the Alteryx Interface with the paint-by-number training approach in the “Tutorials”. Then move on to the one tool examples and more complex samples that cover everything from basic data joins to Predictive Analytics!

# TOOL INDEX

# TOOL INDEX

## IN / OUT

 Browse	Offers complete views of underlying data within the Alteryx workflow. A browser can be outputted via a Browse tool to view the resulting data anywhere within the workflow stream.	 Date Time Now	This macro will return 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	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	Input Data tool brings data in to your workflow by connecting to a file or database.
 Map Input	Manually draw or select map objects (points, lines, and polygons) to be stored in the workflow.	 Output	The Output Data tool writes the results of a workflow to a file or database.
 Text Input	Makes it possible for the user to manually type text to create small data files for input. It is useful for creating Lookup tables on the fly, for example.	 XDF Input	Reads data from an 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	Writes an Alteryx data stream to an XDF file, which is the format used by Microsoft R ScaleR functions to scale predictive analytics to millions of records.		

## PREPARATION

 Auto Field	<p>Reads through an input file and sets the field type to the smallest possible size relative to the data contained within the column.</p>	 Create Samples	<p>Splits the input records into two or three random samples. In the tool you specify the percentage of records that are in the estimation and validation samples. If the total is less than 100%, the remaining records fall in the holdout sample.</p>
 Data Cleansing	<p>Fixes common data quality issues using a variety of parameters.</p>	 Formula	<p>Powerful processor of data and formulas. Use it to add a field to an input table, to create new data fields based on an expression or by assigning a data relationship, or to update an existing field based on these same premises.</p>
 Filter	<p>Queries records based on an expression to split data into two streams, True (records that satisfy the expression) and False (those that do not).</p>	 Impute Values	<p>Updates specific values in a numeric data field with another selected value. Useful for replacing NULL values.</p>
 Generate Rows	<p>Creates new rows of data, at the record level. This tool is useful to create a sequence of numbers, transactions, or dates.</p>	 Multi-Field Formula	<p>Makes it easy to execute a single function on multiple fields.</p>
 Multi-Field Binning	<p>Groups multiple numeric fields into tiles or bins, especially for use in predictive analysis.</p>	 Oversample Field	<p>Samples incoming data so that there is equal representation of data values to enable effective use in a predictive model.</p>

 Multi-Row Formula	<p>Takes the concept of the Formula tool a step further, allowing the user to utilize row data as part of the formula creation. This tool is useful for parsing complex data, and creating running totals, averages, percentages and other mathematical calculations.</p>	 Record ID	<p>Creates a new column in the data and assigns a unique identifier, that increases sequentially, for each record in the data.</p>
 Random % Sample	<p>This macro will return an expected number of records resulting in a random sample of the incoming data stream.</p>	 Select	<p>Multi-function utility that allows for selected fields to be carried through downstream, renaming fields, reordering field position in the file, changing the field type, and loading/saving field configurations.</p>
 Sample	<p>Extracts a specified portion of the records in the data stream.</p>	 Sort	<p>Arranges the records in a table in alphanumeric order, based on the values of the specified data fields.</p>
 Select Record	<p>Selects specific records and/or ranges of records including discontinuous ranges. Useful for troubleshooting and sampling.</p>	 Unique	<p>Distinguishes whether a data record is unique or a duplicate by grouping on one or more specified fields, then sorting on those fields. The first record in each group is sent to the Unique output stream while the remaining records are sent to the Duplicate output stream.</p>
 Tile	<p>Assigns a value (tile) based on ranges in the data.</p>		

## JOIN

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 Append Field	<p>Appends the fields of one small input (Source) to every record of another larger input (Target). The result is a Cartesian Join where all records from both inputs are compared.</p>	 Dun & Bradstreet Business File Matching	<p>Matches customer or prospect files to the Dun &amp; Bradstreet business file.</p>
 ConsumerView Matching	<p>An updated version of the Household File Matching tool with functionality and new matching criteria</p>	 Find Replace	<p>Searches for data in one field from the input table and replaces it with a specified field from a different data table. Similar to an Excel VLOOKUP.</p>
 Fuzzy Match	<p>Identifies non-identical duplicates of a database by specifying parameters to match on. Values need not be exact to find a match, they just need to fall within the user specified or prefabricated parameters set forth in the configuration properties.</p>	 Join	<p>Combines two inputs based on a commonality between the two tables. Its function is like a SQL join but gives the option of creating 3 outputs resulting from the join</p>
 Join Multiple	<p>Combines two or more inputs based on a commonality between the input tables. Only the joined records are outputted through the tool, resulting in a wide (columned) file.</p>	 Make Group	<p>Takes data relationships and assembles the data into groups based on those relationships.</p>
 Union	<p>Appends multiple data streams into one unified stream. The tool accepts multiple inputs based on either field name or record position, creating a stacked output table. The user then has complete control to how these fields stack or match up.</p>		

## PARSE

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 Date Time	Standardizes and formats date/time data so that it can be used in expressions and functions from the Formula or Filter tools.	 RegEx	The Regular Expression tool is a robust data parser. There are four types of output methods that determine the type of parsing the tool will do. These methods are explained in the Configuration Properties.
 Text to Columns	Takes the text in one column and splits the string value into separate, multiple fields based on a single or multiple delimiter(s).	 XML Parse	Reads in a chunk of Extensible Markup Language and parse it into individual fields.

## TRANSFORMATION

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 Arrange	<p>Allows you to manually transpose and rearrange your data fields for presentation purposes. Data is transformed so that each record is turned into multiple records and columns can be created by using field description data.</p>	 Count Records	<p>Returns a count of how many records are going through the tool.</p>
 Cross Tab	<p>Pivots the orientation of the data table. It transforms the data so vertical data fields can be viewed on a horizontal axis, summarizing data where specified.</p>	 Running Total	<p>Calculates a cumulative sum, per record, in a file.</p>
 Summarize	<p>Conducts a host of Summary Processes, including: grouping, summing, count, spatial object processing, string concatenation, and much more.</p>	 Transpose	<p>Pivots the orientation of the data table. It transforms the data so you may view Horizontal data fields on a vertical axis.</p>
 Weighted Average	<p>Calculates the weighted average of an incoming data field. A weighted average is similar to a common average, but instead of all records contributing equally to the average, the concept of weight means some records contribute more than others.</p>		

## IN-DATABASE TOOLS

 Browse Data In-DB	<p>Reviews data at any point in an In-DB workflow. Note: Each In-DB Browse triggers a database query and can impact performance.</p>	 Connect In-DB	<p>Establishes a database connection for an In-DB workflow</p>
 Data Stream In	<p>Streams data from a standard workflow into an In-DB workflow.</p>	 Data Stream Out	<p>Streams data from an In-DB workflow to a standard workflow, with an option to sort the records.</p>
 Dynamic Input In-DB	<p>Takes In-DB Connection Name and Query fields from a standard data stream and inputs them into an In-DB data stream.</p>	 Dynamic Output In-DB	<p>Outputs information about the In-DB workflow to a standard workflow for Predictive In-DB.</p>
 Filter In-DB	<p>Filters In-DB records with a Basic filter or with a Custom expression using the database's native language (e.g. SQL).</p>	 Formula In-DB	<p>Creates or updates fields in an In-DB data stream with an expression using the database's native language (e.g. SQL).</p>
 Join In-DB	<p>Combines two In-DB data streams based on common fields by performing an inner or outer join.</p>	 Macro Input In-DB	<p>Creates an In-DB input connection in a macro and populate it with placeholder values.</p>
 Macro Output In-DB	<p>Creates an In-DB output connection in a macro.</p>	 Sample In-DB	<p>Limits the In-DB data stream to a number or percentage of records.</p>

 Select In-DB	<p>Selects, deselects, reorders, and renames fields in an In-DB workflow.</p>	 Summarize In-DB	<p>Summarizes In-DB data by grouping, summing, counting, counting distinct fields, and more. The output contains only the result of the calculation(s).</p>
 Union In-DB	<p>Combines two or more In-DB data streams with similar structures based on field names or positions. In the output, each column will contain the data from each input.</p>	 Write In-DB	<p>Uses an In-DB data stream to create or update a table directly in the database.</p>

## REPORTING

 Charting	<p>Allows the user to display data in various chart types.</p>	 Email	<p>Allows you to select from fields inputted to e-mail to recipients instead of having to use a batch e-mail as before. Automatically detects SMTP address, and will allow attachments or even e-mail generated reports.</p>
 Image	<p>Allows the user to add graphics to reports.</p>	 Layout	<p>Enables the user to arrange reporting snippets.</p>
 Map Legend Splitter	<p>This macro will take a legend from the Map tool and split it into its component parts. Once split, the legend can be customized using other tools. Be sure to use the Legend Builder macro to easily build the legend again.</p>	 Map Legend Builder	<p>This macro takes the components output from the Legend Splitter macro and builds them back into legend table. If you add a Legend Builder tool immediately after a Legend Splitter tool, the resulting legend will be the same as the legend output originally from the Map tool. The purpose of the two macros is that you can change the data between them and therefore creating a custom legend.</p>

 Overlay	<p>Arrange reporting snippets on top of one another for output via the Render tool.</p>	 Render	<p>Transforms report snippets into presentation-quality reports in PDF, HTML, XLSX, DOCX, RTF and Portfolio Composer (*.pcxml) formats.</p>
 Report Footer	<p>This macro will allow a user to easily setup and put a footer onto their report.</p>	 Report Header	<p>This macro will allow a user to easily setup and put a header onto their report.</p>
 Report Map	<p>Enables the user to create a map image from the Alteryx GUI. The tool accepts multiple spatial inputs, allows for layering these inputs, and supports thematic map creation. Other cartographic features can be included such as a legend, scale, and reference layers.</p>	 Report Text	<p>Allows the user to add text to reports and documents.</p>
 Table	<p>Allows the user to create basic data tables and pivot tables from their input data.</p>		

## DOCUMENTATION

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 Comment	Adds annotation to the project workspace. This is useful to jot down notes, explain processes to share or reference later.	 Explorer Box	Can be populated with a web page or file location of the user's specification.
 Tool Container	Allows the user to organize tools in a workflow. Tools can be placed inside the container to isolate a process. The container can then be collapsed, expanded, or disabled.		

## SPATIAL

 Buffer	<p>Takes any polygon or polyline spatial object and expands or contracts its extents by the user specified value.</p>	 Create Points	<p>Creates a point-type spatial object by specifying input fields containing the X coordinate (Longitude) and the Y coordinate (Latitude).</p>
 Distance	<p>Calculates the ellipsoidal direct point-to-point, point-to-edge, or the drive distance between two sets of spatial objects.</p>	 Find Nearest	<p>Identifies the shortest distance between points or polygons in one file and the points, polygons, or lines in a second file.</p>
 Generalize	<p>Decreases the number of nodes that make up a polygon or polyline, making a simpler rendition of the original spatial object.</p>	 Heat Map	<p>Generates polygons representing different levels of "heat" (e.g. demand) in a given area, based on individual records (e.g. customers).</p>
 Make Grid	<p>Takes a spatial object and creates a grid. The resulting grid is either a single grid, bound to the extent of the input spatial objects, or individual grids that dissect each input polygon.</p>	 Non Overlap Drivetime	<p>Creates drivetime trade areas, that do not overlap, for a point file. This macro requires licensed installation of Alteryx Drivetime to run successfully.</p>
 Poly-Build	<p>Takes a group of spatial point objects and draws a polygon or polyline in a specific order to represent that group of points.</p>	 Poly-Split	<p>Takes polygon or polyline objects and splits them into their component point, line, or region objects.</p>

 Smooth	<p>Takes a polygon or polyline object and adds nodes to smooth sharp angles into curves along the lines that make up the object.</p>	 Spatial Info	<p>Extracts tabular information about the spatial object. Attributes such as: area, spatial object, number of parts, number of points, and centroid Latitude/Longitude coordinates can be appended.</p>
 Spatial Match	<p>Establishes the spatial relationship (contains, intersects, touches, etc.) between two sets of spatial objects. The tool accepts a set of spatial objects from the Left Input (Targets) and a set of spatial objects from the Right Input (Universe). At least one input stream should contain Polygon type spatial objects.</p>	 Spatial Process	<p>Performs high-level spatial object editing from a simple, single tool. You can combine multiple objects or cut the spatial objects of the input table.</p>
 Trade Area	<p>Creates regions around specified point objects in the input file. Trade Areas are created one of two ways: either by defining a radius around a point, or by a drivetime. Drive time trade area creation is only an option if a licensed installation of Alteryx Drivetime is detected.</p>		

## INTERFACE

 Action	Updates values of development tools with the values from the interface questions at runtime.	 Check Box	Displays a check box option in an app.
 Condition	Tests for the presence of user selections. The state is either true or false.	 Control Parameter	Creates a Control Parameter input for a batch macro.
 Date	Displays a calendar in app.	 Drop Down	Displays a single selection list in an app.
 Error Message	Displays an error message.	 File Browse	Displays a file browse control in an app. This tool can be used to read an input or write an output.
 Folder Browse	Displays a folder browse control in an app. This tool is not supported for running apps in the Alteryx Analytics Gallery.	 List Box	Displays a multi-selection check box list in an app.
 Macro Input	Creates an input for a macro.	 Macro Output	Creates an output for a macro.
 Map	Displays an interactive map for the user to draw or select map objects in an app.	 Numeric Up/Down	Displays a numeric control in an app.
 Radio Button	Displays a mutually exclusive option in an app.	 Text Box	Displays a free form text box in an app.



Tree

Displays an organized, hierarchical data structure in an app.

## DATA INVESTIGATION

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 Association Analysis	<p>Determine which fields in a database have a bivariate association with one another.</p>	 Basic Data Profile	<p>Outputs basic metadata such as data type, min, max, average, number of missing values, etc.</p>
 Contingency Table	<p>Create a contingency table based on selected fields, to list all combinations of the field values with frequency and percent columns.</p>	 Distributed Analysis	<p>Allows you to fit one or more distributions to the input data and compare them based on a number of Goodness-of-Fit statistics. Based on the statistical significance (p-values) of the results of these tests, the user can determine which distribution best represents the data.</p>
 Field Summary	<p>Analyzes data and creates a summary report containing descriptive statistics of data in selected columns. Use the Field Summary tool to gain insight into data and receive recommendations for managing data.</p>	 Frequency Table	<p>Produce a frequency analysis for selected fields - output includes a summary of the selected field(s) with frequency counts and percentages for each value in a field.</p>

 Heat Plot	<p>Uses a heat plot color map to show the joint distribution of two variables that are either continuous numeric variables or ordered categories.</p>	 Histogram	<p>Provides a histogram plot for a numeric field. Optionally, it provides a smoothed empirical density plot. Frequencies are displayed when a density plot is not selected, and probabilities when this option is selected. The number of breaks can be set by the user, or determined automatically using the method of Sturges.</p>
 Importance Weights	<p>Provides methods for selecting a set of variables to use in a predictive model based on how strongly related each possible predictor is to the target variable.</p>	 Pearson Correlation	<p>measures the linear dependence between two variables as well as the covariance. This tool replaces the now deprecated Pearson Correlation Coefficient macro.</p>
 Plot of Means	<p>Take a numeric or binary categorical (converted into a set of zero and one values) field as a response field along with a categorical field and plot the mean of the response field for each of the categories (levels) of the categorical field.</p>	 Scatterplot	<p>Produce enhanced scatterplots, with options to include boxplots in the margins, a linear regression line, a smooth curve via non-parametric regression, a smoothed conditional spread, outlier identification, and a regression line.</p>

 Spearman Correlation	<p>Assesses how well an arbitrary monotonic function could describe the relationship between two variables without making any other assumptions about the particular nature of the relationship between the variables.</p>	 Violin Plot	<p>shows the distribution of a single numeric variable, and conveys the density of the distribution. In addition to concisely showing the nature of the distribution of a numeric variable, violin plots are an excellent way of visualizing the relationship between a numeric and categorical variable by creating a separate violin plot for each value of the categorical variable.</p>
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## PREDICTIVE

 <b>Boosted Model</b>	<p>Provides generalized boosted regression models based on the gradient boosting methods of Friedman. It works by serially adding simple decision tree models to a model ensemble so as to minimize an appropriate loss function.</p>	 <b>Count Regression</b>	<p>Estimate regression models for count data (e.g., the number of store visits a customer makes in a year), using Poisson regression, quasi-Poisson regression, or negative binomial regression. The R functions used to accomplish this are <code>glm()</code> (from the R stats package) and <code>glm.nb()</code> (from the MASS package).</p>
 <b>Cross-Validation</b>	<p>Compares the performance of one or more Alteryx-generated predictive models using the process of cross-validation. It supports all classification and regression models with the exception of Naive Bayes.</p>	 <b>DataRobot Automodel</b>	<p>Uploads data to the DataRobot machine learning platform.</p>
 <b>DataRobot Predict</b>	<p>Scores data using models generated with the DataRobot machine learning platform.</p>	 <b>Decision Tree</b>	<p>Predicts a target variable using one or more variables that are expected to have an influence on the target variable, and are often called predictor variables.</p>
 <b>Deploy</b>	<p>Uploads models directly to the Promote platform.</p>	 <b>Forest Model</b>	<p>Predict a target variable using one or more predictor variables that are expected to have an influence on the target variable, by constructing and combining a set of decision tree models.(an "ensemble"</p>

			of decision tree models).
 Gamma Regression	Relate a Gamma distributed, strictly positive variable of interest (target variable) to one or more variables (predictor variables) that are expected to have an influence on the target variable.	 Lift Chart	Produces two very commonly used charts of this type, the cumulative captured response chart (also called a gains chart) and the incremental response rate chart.
 Linear Regression	Relates a variable of interest (a target variable) to one or more variables that are expected to have an influence on the target variable, and are often called predictor variables.	 Logistic Regression	Relates a binary (e.g., yes/no) variable of interest (a target variable) to one or more variables that are expected to have an influence on the target variable, and are often called predictor variables.
 Model Coefficients	Extracts the model coefficients from a standard Alteryx Count, Gamma, Linear, or Logistic Regression model for use in customized reports or downstream calculations.	 Model Comparison	Compares the performance of one or more different predictive models based on the use of a validation (or test) data set.
 Naive Bayes	Creates a binomial or multinomial probabilistic classification model of the relationship between a set of predictor variables and a categorical target variable.	 Nested Test	Examine whether two models, one of which contains a subset of the variables contained in the other, are statistically equivalent in terms of their predictive capability.

 Network Analysis	<p>Creates an interactive visualization of a network along with summary statistics and distribution of node centrality measures.</p>	 Neural Network	<p>Create feedforward perceptron neural network model with a single hidden layer.</p>
 Score	<p>Calculate a predicted value for the target variable in the model.</p>	 Spline Model	<p>Predict a variable of interest (target variable) based on one or more predictor variables using the two-step approach of Friedman's multivariate adaptive regression (MARS) algorithm.</p>
 Stepwise	<p>R-based stepwise regression tool makes use of both backward variable selection and mixed backward and forward variable selection.</p>	 Support Vector Machine	<p>Support Vector Machines (SVM), or Support Vector Networks (SVN), are popular supervised learning algorithms used for classification problems, and are meant to accommodate instances where the data (i.e., observations) are considered linearly non-separable.</p>
 Survival Analysis	<p>Generate a survival model that can be used by the Survival Score tool to estimate relative risk and restricted mean survival time.</p>	 Survival Score	<p>Provides both the estimated relative risk and restricted mean survival time based on a Cox proportional hazards model, which can be estimated using the Survival Analysis tool.</p>

 <p>Test of Means</p>	<p>Compare the difference in the mean values for a numeric response field between a control group and one or more treatment groups.</p>	 <p>Variance Inflation Factors</p>	<p>Produces a coefficient summary report that includes either the variance inflation factor or a generalized version of the VIF (GVIF) for all variables except the model intercept (which always has a VIF or GVIF that equals one).</p>
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## AB TESTING

 AB Analysis	<p>Compare the percentage change in a performance measure to the same measure one year prior.</p>	 AB Controls	<p>Match one to ten control units (e.g., stores, customers, etc.) to each member of a set of previously selected test units on the criteria such as seasonal patterns and growth trends for a key performance indicator, along with other user provided criteria.</p>
 AB Treatments	<p>Determine which group is the best fit for AB testing.</p>	 AB Trend	<p>Create measures of trend and seasonal patterns that can be used in helping to match treatment to control units (e.g., stores or customers) for A/B testing. The trend measure is based on period to period percentage changes in the rolling average (taken over a one-year period) in a performance measure of interest. The same measure is used to assess seasonal effects. In particular, the percentage of the total level of the measure in each reporting period is used to assess seasonal patterns.</p>

## TIME SERIES

 TS ARIMA	<p>Estimate a univariate time series forecasting model using an autoregressive integrated moving average (or ARIMA) method.</p>	 TS ETS	<p>Estimate a univariate time series forecasting model using an exponential smoothing method.</p>
 TS Compare	<p>Compare one or more univariate time series models created with either the ETS or ARIMA tools.</p>	 TS Covariant Forecast	<p>Provides forecasts from an ARIMA model estimated using covariates for a user-specified number of future periods. In addition, upper and lower confidence interval bounds are provided for two different (user-specified) percentage confidence levels. For each confidence level, the expected probability that the true value will fall within the provided bounds corresponds to the confidence level percentage. In addition to the model, the covariate values for the forecast horizon must also be provided.</p>
 TS Filler	<p>This tool allows a user to take a data stream of time series data and "fill in" any gaps in the series.</p>	 TS Forecast	<p>Provide forecasts from either an ARIMA or ETS model for a specific number of future periods.</p>

 TS Forecast Factory	<p>Provides forecasts from groups of either ARIMA or ETS models for a user-specified number of future periods.</p>	 TS Model Factory	<p>Estimates time series forecasting models for multiple groups at once using the autoregressive moving average (ARIMA) method or the exponential smoothing (ETS) method.</p>
 TS Plot	<p>Provides a number of different univariate time series plots that are useful in both better understanding the time series data and determining how to proceed in developing a forecasting model.</p>		

## PREDICTIVE GROUPING

 Append Cluster	<p>Appends the cluster assignments from a K-Centroids Cluster Analysis tool to a data stream.</p>	 Find Nearest Neighbor	<p>Finds the selected number of nearest neighbors in the "data" stream that corresponds to each record in the "query" stream based on their Euclidean distance.</p>
 K-Centroids Analysis	<p>Represents a class of algorithms for doing what is known as partitioning cluster analysis. These methods work by taking the records in a database and dividing (partitioning) them into the "best" K groups based on some criteria.</p>	 K-Centroids Diagnostics	<p>Makes an assessment of the appropriate number of clusters to specify given the data and the selected clustering algorithm (K-Means, K-Medians, or Neural Gas). The tool is graphical, and is based on calculating two different statistics over bootstrap replicate samples of the original data for a range of clustering solution that differ in the number of clusters specified.</p>
 Market Basket Affinity	<p>Takes "transaction" data and constructs a matrix where each row is a transaction and the columns are the set of "items" that could appear in the transaction.</p>	 Market Basket Inspect	<p>Step 2 of a Market Basket Analysis: Take the output of the MB Rules tool, and provide a listing and analysis of those rules that can be filtered on several criteria in order to reduce the number of returned rules or item sets to a manageable number.</p>

 <b>Market Basket Rules</b>	<p>Step 1 of a Market Basket Analysis: Take transaction oriented data and create either a set of association rules or frequent item sets. A summary report of both the transaction data and the rules/item sets is produced, along with a model object that can be further investigated in an MB Inspect tool.</p>	 <b>Multidimensional Scaling</b>	<p>Separates univariate data based upon variance. Conceptually, MDS takes the dissimilarities, or distances, between items described in the data and generates a map between the items. The number of dimensions in this map are often provided prior to generation by the analyst. Usually, the highest variance dimension corresponds to the largest distances being described in the data. The map solution relies on univariate data, so the rotation and orientation of the map dimensions is not significant. MDS uses dimensional analysis similar to Principle Components.</p>
 <b>Principal Components</b>	<p>Reduce the dimensions (number of numeric fields) in a database by transforming the original set of fields into a smaller set that accounts for most of the variance (i.e., information) in the data. The new fields are called factors, or principal components.</p>		

## PREScriptive

 Optimization	<p>Solve linear programming (LP), mixed integer linear programming (MILP), and quadratic programming (QP) optimization problems using matrix, manual, and file input modes.</p>	 Simulation Sampling	<p>Samples data parametrically from a distribution, from input data, or as a combination best fitting to a distribution. Data can also be "drawn" if you are unsure of the parameters of a distribution and lacking data.</p>
 Simulation Scoring	<p>Samples from an approximation of a model object error distribution. Whereas standard scoring attempts to predict the mean predicted value, Simulation Scoring also considers the error distribution to provide a range of possible values.</p>	 Simulation Summary	<p>Visualizes simulated distributions and results from operations on those distributions. It also provides visual and quantitative analyses of input versus output variables.</p>

## CONNECTORS

 Adobe Analytics	<p>Authenticates to the Adobe Analytics report suites (to which you have access) and generates ad hoc reports based on multiple parameters via the Adobe Analytics Reporting API.</p>	 Alteryx Web Data Connector for Tableau	<p>Enable an analytic app to be used as a data source in Tableau.</p>
 Amazon S3 Download	<p>Retrieves data stored in the cloud where it is hosted by Amazon Simple Storage Service.</p>	 Amazon S3 Upload	<p>Transfers data from Alteryx to the cloud where it is hosted by Amazon Simple Storage Service.</p>
 Cognitive Services Text Analytics	<p>Uses the Cognitive Services Text Analytics API to perform sentiment analysis, key phrase extraction, language detection, and topic detection.</p>	 Download	<p>Retrieves data from a specified URL to be used in downstream processing or to be saved to a file.</p>
 Foursquare Search	<p>Searches Foursquare Venues by location with an option to filter by a search term.</p>	 Google Analytics	<p>Downloads data from Google Analytics directly into your Alteryx workflow, allowing non-technical business users to utilize the Google Analytics API.</p>
 Google Sheets Input	<p>Downloads data from a Google Sheets spreadsheet directly into your Alteryx workflow.</p>	 Google Sheets Output	<p>Publishes data from an Alteryx workflow to a Google Sheets spreadsheet.</p>
 Marketo Append	<p>Retrieves Lead and Activity records from Marketo and appends them to an incoming data stream.</p>	 Marketo Input	<p>Reads Marketo records for a specified date range.</p>

 Marketo Output	Writes data back to Marketo using an 'Upsert' operation.	 Mongo Input	Reads data stored in MongoDB databases.
 Mongo Output	Writes data to MongoDB databases.	 Publish to Power BI	Uses the Power BI REST API to upload a data table from your Alteryx workflow to the Power BI web application.
 Publish to Tableau Server	Publishes a data stream in Alteryx to an instance of Tableau as a Tableau data source (.tde) file.	 Salesforce Input	Allows you to read and query tables from Salesforce.com into Alteryx.
 Salesforce Output	Allows you to write to Salesforce.com tables from Alteryx.	 Salesforce Wave Output	Publishes data from an Alteryx workflow as a dataset in Wave Analytics.
 SharePoint List Input	Reads lists from Sharepoint to be used as a data input in a workflow.	 SharePoint List Output	Writes the content of a data stream to a Sharepoint list.
 Twitter Search	Searches tweets of the last 7 days by given search terms with location and user relationship as optional properties.		

## ADDRESS

 <b>CASS</b>	<p>Standardize address data to conform to the U.S. Postal Service CASS (Coding Accuracy Support System) or Canadian SOA (Statement of Accuracy).</p>	 <b>Parse Address</b>	<p>Parse a single address field into different fields for each component part such as: number, street, city, ZIP. Consider using the CASS tool for better accuracy.</p>
 <b>Reverse Geocoder</b>	<p>Coordinates latitude and longitude locations by querying and downloading data from the TomTom Reverse Geocoder API. Produces a record-for-record reverse geocode result which includes formatted address fields and latitude/longitude coordinates. In addition, a summary output is produced that provides a count of records that were successfully and unsuccessfully reverse geocoded.</p>	 <b>Street Geocoder</b>	<p>Associates geographic coordinates with input addresses, letting you pinpoint locations and carry out geography-based analyses.</p>
 <b>US Geocoder</b>	<p>Uses many methods to geocode a customer file. This macro requires licensed installations of Alteryx Geocoder, CASS, and the ZIP + 4 coder to run successfully.</p>	 <b>US ZIP9 Coder</b>	<p>Associates geographic coordinates with input ZIP9 (also known as ZIP+4) codes in an address file, enabling the user to carry out geography-based analyses.</p>

## DEOMGRAPHIC ANALYSIS

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 Allocate Append	Appends demographic fields from an existing Allocate installation.	 Allocate Input	Allows the user to pick geographies and data variables from any Allocate dataset installed on the user's system.
 Allocate Metainfo	Returns pertinent information about installed Allocate datasets.	 Allocate Report	Allows the user to retrieve and run any pre-formatted or custom report associated with Allocate.

## BEHAVIOR ANALYSIS

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 Behavior Metainfo	<p>Returns pertinent information about installed Behavior Analysis data sets.</p>	 Cluster Code	<p>Appends a Cluster Code field to a stream of records using a Cluster Level ID, such as a Block Group Key.</p>
 Compare Behavior	<p>Analyses two Profile sets, comparing one against the other. Think of it as building a sentence: "Analyze '<i>this/these</i>' Using '<i>this/these</i>'."</p>	 Create Behavior Profile	<p>Takes an incoming data stream and constructs a Behavior Profile from its contents. A Profile can be built via different modes including: Spatial Object, Known Geography Key, Combine Profiles, Cluster Code, and Cluster Level ID.</p>
 Behavior Detail Fields	<p>Returns detailed field information at the Cluster or Group level specific to the Profile.</p>	 Behavior Profile Set Input	<p>Allows you to select a specific type of dataset known as a Profile Set to use as an input in your workflow. Profile Sets are composed of Profiles. A Profile is an object, whether it be a geography, a customer database, or a product within a syndicated product file - that has been assigned segmentation codes. Segmentation codes are assigned based on the Block Group assignment of the object.</p>

 Behavior Profile Set Output	<p>Takes an incoming data stream containing a Profile or collection of Profiles and writes out a Profile Set *.scd file.</p>	 Profile Rank Report	<p>Takes two Profile inputs (a Geography and a Product profile) and generates a rank report.</p>
 Profile Comparison Report	<p>Accepts two Profile inputs and generates a comparison report.</p>	 Profile Detail Report	<p>Accepts a Profile input and generates a detailed report.</p>

## CALGARY

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 Calgary Input	Enables users to query a Calgary database.	 Calgary Join	Provides users with the ability to take an input file and perform joins against a Calgary database where an input record matches a Calgary database record based on specific join criteria.
 Calgary Loader	Enables users to create a Calgary database (*.cydb) from any type of Input file. Each field contained in the Input file can be indexed to maximize the Calgary database performance.	 Calgary Cross Count	Enables users to aggregate data across multiple Calgary database fields to return a count per record group.
 Calgary Cross Count Append	Provides users with the ability to take an input file and append counts to records that join to a Calgary database where an input record matches a Calgary database record based on specific join criteria.		

 API Output	<p>This tool has no configuration. See the API help for more information.</p>	 Base64 Encoder	<p>Issues a base 64 encode string for a specified string field.</p>
 Blob Convert	<p>The Blob Convert tool will take different data types and either convert them to a Binary Large Object (Blob) or take a Blob and convert it to a different data type.</p>	 Blob Input	<p>The Blob input tool will read a Binary Large Object such as an image or media file, by browsing directly to a file or passing a list of files to read.</p>
 Blob Output	<p>The Blob Output tool writes out each record into its own file.</p>	 Block Until Done	<p>Stops downstream processing until all records come through. This tool makes it possible to overwrite an input file.</p>
 Detour	<p>Useful in constructing analytic app or macro workflows, where the developer can prompt a user to bypass a process in a workflow.</p>	 Detour End	<p>Will unify the data processes from a resulting Detour upstream into a single stream for further analysis in analytic app and macro workflows.</p>
 Dynamic Input	<p>Allows the user to read from an input database at runtime and dynamically choose what records to read in. Alteryx does not input the entire database table content, instead it filters the data and only returns the user specified criteria and joins it to the data coming into the tool.</p>	 Dynamic Rename	<p>Allows the user to quickly rename any or all fields within an input stream by employing the use of different methods. Additionally, dynamic or unknown fields can be renamed at runtime.</p>
 Replace	<p>Allows the user to quickly replace data values on a series of fields. Say you have a hundred different income</p>	 Select	<p>Allows fields to be selected either by field type or via a formula.</p>

Dynamic Replace	fields and instead of the actual value in each field, you want to represent the number with a code of A, B, C, D, etc. that represents a range. The Dynamic Replace tool can easily perform this task.	Dynamic Select	Additionally, dynamic or unknown fields will also be selected by field type or via formula at runtime.
	Allows the user to see in tabular form, the name of fields within a datastream as well as the field order, field type and field size.		Separates Java Script Object Notation text into a table schema for the purpose of downstream processing.
	Allows the user to report messages about the process to the Results window.		Code editor for users of R, an open-source code base used for statistical and predictive analysis.
	Allows the user to run external command programs within Alteryx. This tool can be used as an Input, Output or as a pass through, intermediary tool.		Allows the user to connect directly to a Spark cluster instance and run commands directly from Alteryx.
	Verifies data or processes in a workflow. Since the Test tool accepts multiple inputs, with a single Test tool you can create multiple tests and test multiple sets of data and processes.		Slows down the speed of the downstream tool by limiting the number of records that are passed through.

 <b>JSON Build</b>	<p>Takes the table schema of the JSON Parse tool and builds it back into properly formatted Java Script Object Notation.</p>	 <b>Make Columns</b>	<p>Takes rows of data and arranges them by wrapping records into multiple columns. The user can specify how many columns to create and whether they want records to layout horizontally or vertically.</p>
 <b>Python SDK Example</b>	<p>Creates a unique identifier column, regardless of if a data stream is present.</p>	 <b>Transpose In-DB</b>	<p>Pivots the orientation of a data table in an In-DB workflow. It transforms the data so you may view horizontal data fields on a vertical axis.</p>
 <b>Visual Layout</b>	<p>Brings together reporting elements so they can be arranged on a page and output in a report via the Render tool. It accepts multiple inputs, provides a preview of report elements, offers multiple output types and sizes, and allows for both a horizontal and vertical layout.</p>		