

alteryx

Tips & Tricks



2015

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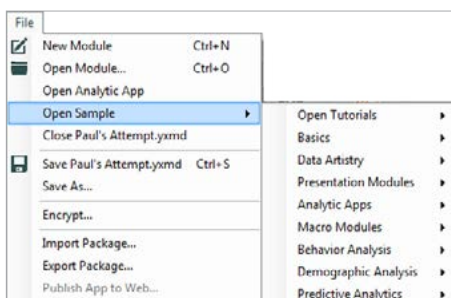
Getting Started – Alteryx Resources



Getting Started with Alteryx

Samples:

There are a number of Samples that come prepackaged in your Alteryx installation. Simply go to **File > Open Sample** to find fully annotated Workflows, macros, and apps. Their purpose is to show you real world analytical problems and how to solve them. Get a sense of how to use the Alteryx Interface with the paint-by-number training approach in the “Open Tutorials”. Then move on to the more complex samples that cover everything from basic data joins to Predictive Analytics!



Community:

Check out <http://community.alteryx.com> to engage in the Alteryx open forum for all users! Here you can post questions, answer questions, and search for previously discussed topics. Users also have access to the Knowledgebase which contains articles written by the analytics and data visualization experts from the Alteryx staff. Also feel free to drop Ideas in our Idea Center. This is a place for you to share your ideas or vote on existing ideas for improvements or tweaks to Alteryx. Your suggestions will ultimately drive the advancements in the future versions of Alteryx!

Gallery:

Check out the Analytics Gallery at <http://gallery.alteryx.com>. Here you can browse the Alteryx Public Gallery to find apps that solve business problems across a variety of industries. Many of these apps can also be downloaded to your machine and opened in your Designer! Use the gallery to learn how apps are constructed and how data flows through properly configured tools. You can reverse engineer apps you are interested in and incorporate those features into your own workflows. The Macro District is also available and always growing with useful macros that simplify reusable processes. You can download Macros from the Gallery and add them to future workflows.

Alteryx Blogs:

Look to blogs written by Alteryx employees to learn more about new macros and Alteryx concepts at *Engine Works Blog* (<http://www.alteryx.com/blog/engine-works>) and *Chaos Reigns Within* (<http://www.chaosreignswithin.com/>). The *Engine Works Blog* features information about new macros published in the Macro District, details about new releases, Inspire related posts, and more. *Chaos Reigns Within* is the personal blog of a Software Developer at Alteryx and he publishes a Blog Macro Pack each quarter. Some of the macros are prototypes and most have not gone through the extensive testing process it takes to make it into the product, but you just might find a solution to the problem you have been struggling with and it is as easy as downloading a macro!

Product Training:

Alteryx offers an abundance of training online at <http://www.alteryx.com/product-training>. The Getting Started section is great for beginners and includes short videos, accompanying help files, and exercises to solidify the concepts. The On Demand videos cover a variety of topics and can be used to learn about a subject in general or you can watch a video pertaining to the tool or process you are specifically interested in exploring. The Virtual Training Sessions are WebEx's designed to be interactive and offered for users at all levels of Alteryx experience. If you are unable to make the scheduled time for the session, you can always watch

a previous recording. Alteryx also offers Classroom Training at the Irvine, CA and Naperville, IL office locations. You will get hands-on experience with one of our trainers and leave with a better understanding of the product and how you can use it to solve your data quandaries.

Support:

There are four ways to contact Alteryx for support: email, live chat, by phone, and the community. Emailing clientservices@alteryx.com is good for a variety of questions ranging from simple to complex. You can send screenshots or attach workflows and provide a description of what you are trying to achieve and someone from Client Services will reach out to you. Live Chat is ideal for simple questions that can be answered quickly. If the question is more intricate than what Live Chat allows for, a Client Services Rep will schedule a phone call or screen sharing session. You can also call us at 1-888-255-1207 for basic questions and troubleshooting. The Community provides you with an opportunity to find the solution to your problem or turn to other users for their input. You can also submit a support ticket if necessary. Links to all of these avenues of support are available at <http://www.alteryx.com/support>.

Kits for Tableau & Qlik

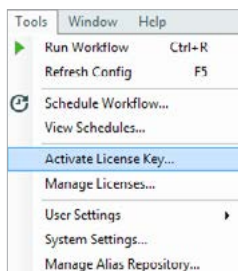
Present the output of your Alteryx workflow in a visually appealing way by downloading the Visual Analytics Kits for Tableau and Qlik. The kits contain key analytic applications, visualizations, and tutorial information. The Tableau kit is available at <http://alteryx.com/kit> and the Qlik kit can be found at http://pages.alteryx.com/VisualAnalyticsKitforQlik_Reg-LP.html.

Activate Your License Key

Before you can get started with Alteryx, you will need to activate your License Key.

Please activate your License Key by doing the following:

1. Open Alteryx, click on **Tools > Activate License Key**.
2. Enter your License Key.
3. Enter your email address, click on **Next**.



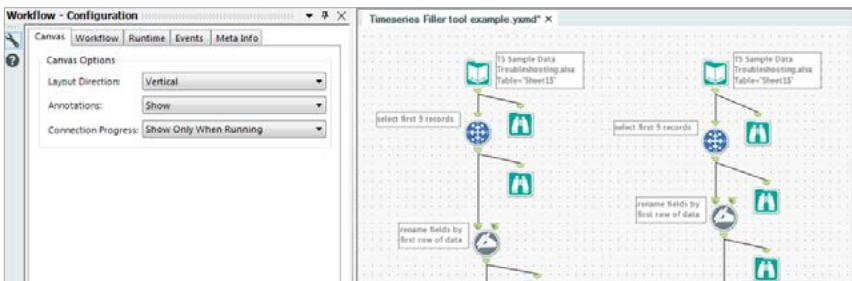
Getting Started – Workflow Design



Workflow Configuration

Canvas Layout:

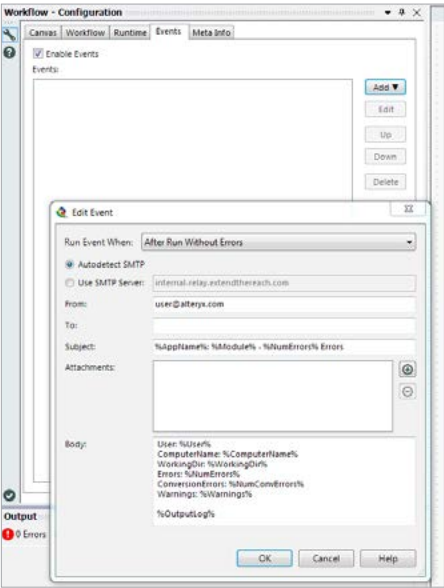
Build out your workflows vertically or horizontally. To change a single workflow, click anywhere on your canvas, and in your Workflow – Configuration window, under Canvas options, select your Layout Direction as horizontal or vertical. To set either as the default direction, go to Tools on the menu bar, **User Settings > Edit User Settings > Document**. Here you can specify default settings: Layout direction, zoom levels, container colors and canvas/ grid colors.



Runtime Tab:

Set your workflow specifications here: define record limits for all inputs in that specific workflow to test your configurations on a smaller dataset; show all Macro messages to better track down errors; disable Output tools for pre-production testing and investigation; or disable all Browse tools for faster production runs.

Events Tab:

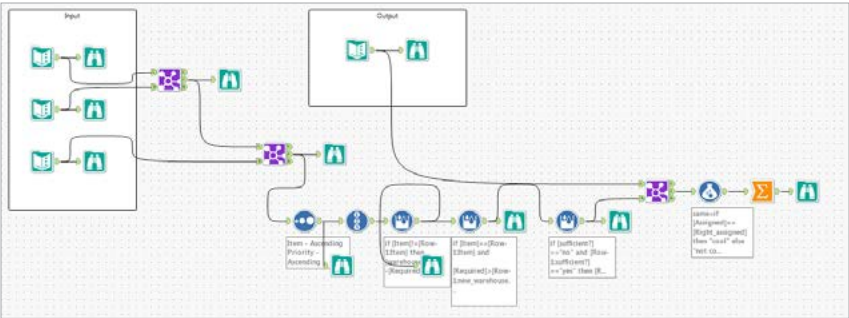


Want to trigger a secondary workflow based on the successful run of an initial workflow? Or send email reports after successful workflow runs, or be alerted to runtime errors? Under the Events tab, add an Email Event to send an email after a run with errors, or use the Run Command to run subsequent workflows, reference files from specified directories, or even move/delete files from those directories.

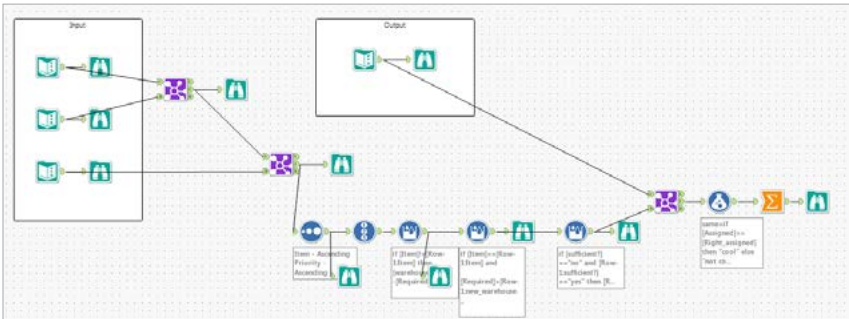
Arrows:

Do your tool connector arrows get a little confusing? Change their route under **Tools > User Settings > Edit User Settings > Arrows**. Then your loopy connectors become perpendicular or straight lines. You can even make your connections wireless! Right-click on any tool to select wireless Incoming or Outgoing connectors.

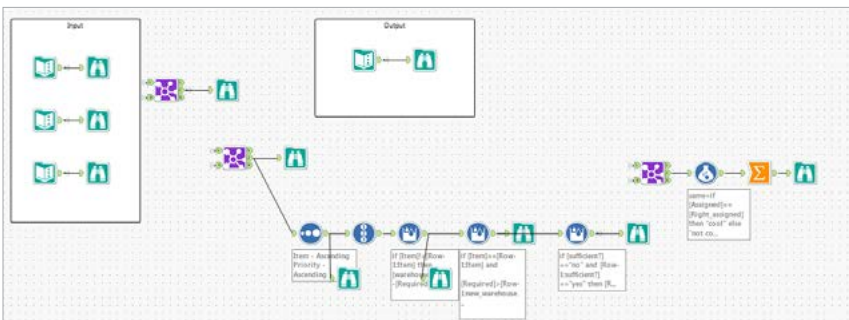
Auto Route Bezier:



Straight:



Wireless:



Dataset Defaults:

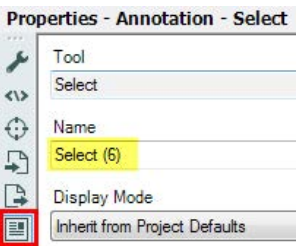
Instead of selecting your preferred dataset each time you bring in a new tool or macro, set your Dataset Defaults under **Tools > User Settings > Edit User Settings > Dataset Defaults**. Selecting the “Most Recent Vintage” option tells Alteryx to automatically use the latest installed version of your data, to avoid updating your defaults each time your Core Data Bundle is updated.



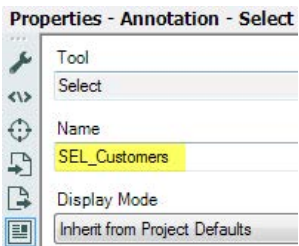
Renaming Tools

Change tool names based upon how they are being used. Renaming is useful when a tool is used many times throughout the course of your Workflow, but are configured differently. Renaming your tools is especially important when building Wizards and Macros where the tool will be updated with an Action and the tool to update has to be selected from a list that shows all the tools used in the Workflow.

Before Renaming:

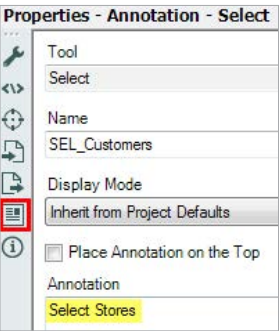


After Renaming:



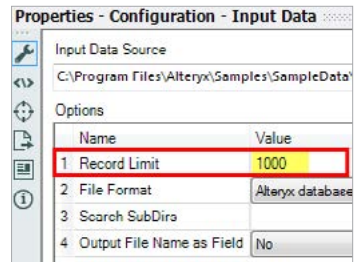
Annotating Tools:

Label your tools for clarity within your workflow by adding an annotation to the tool. This label moves with the tool.



Set Record Limits for the Inputs

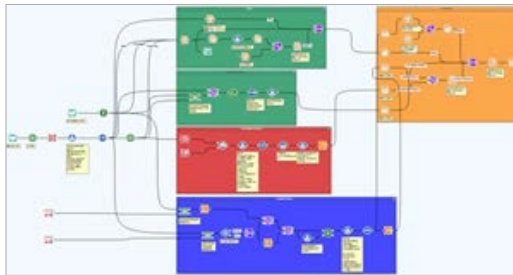
When developing your Workflow, there is no need to bring in all your data during testing. Use the Record Limit option in the Properties for the Input to bring enough records for testing. You can also do this under the Runtime tab on your Workflow – Configuration.



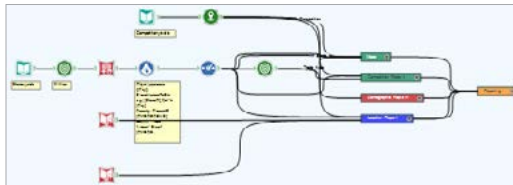
Thinking Inside the Box: Tool Containers

The **Tool Container** allows the user to organize tools in a Workflow; it can be collapsed to give your Workflow an 'uncluttered' look.

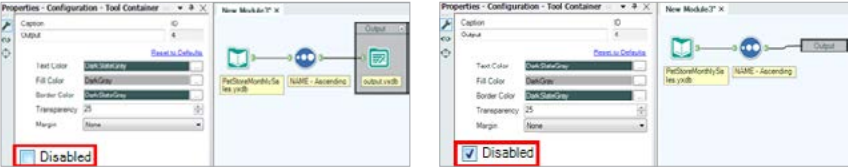
Before Tool Containers:



After Tool Containers:



Tools can be placed inside the container to isolate a process. Disabling the tool container will make the container collapse; the tools within the container won't be executed. This is especially handy when working with Analytic Apps and Macros, as you can update the checkbox with an Action based on the end-user's input.

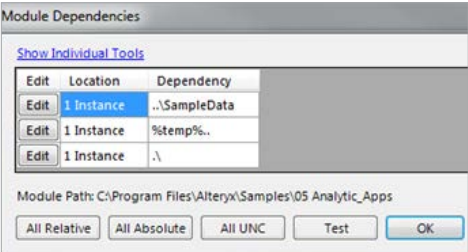


Workflow Packager (.yxwz file)

Sharing your Workflow has never been easier. Package your Workflow and its dependencies with the Export Package option which can be found in the menu bar under File, this will create a .yxwz file.

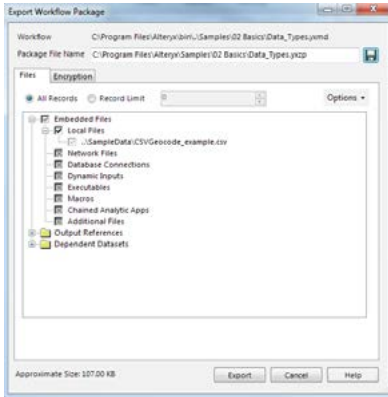
Best Practices when packaging Workflows:

1. Before exporting the package, make all your file paths relative. Go to **Edit > Workflow Dependencies > Click 'All Relative,'** since all the associated files are saved in the same folder when imported, the Workflow will find them.

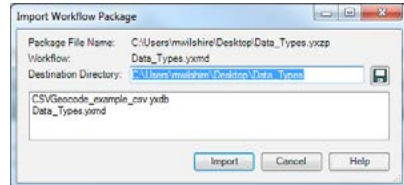


2. To package a Workflow, go to **File > Export Package**, the name by default is the Workflow name; this and the folder to save it can be changed here. To Import a package go to **File > Import Package**, select where to save import it, a list of files included in the package are listed.

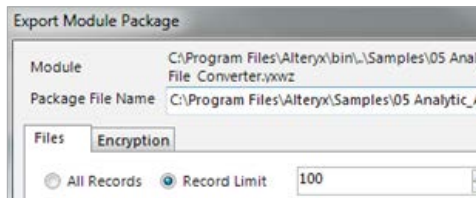
Export Workflow Package:



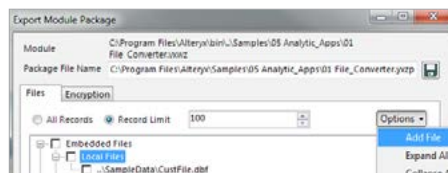
Import Workflow Package:



3. If you would like to send a sample of your data, use the Record Limit option when exporting, this will limit all your Inputs within your Workflow.



4. All the Input files will be converted to .yxdb; if you don't wish that to happen, deselect the file from the Local files list and add the file from **Options > Add File**.



Getting Started – Workflow Optimization



Resource Optimization Settings

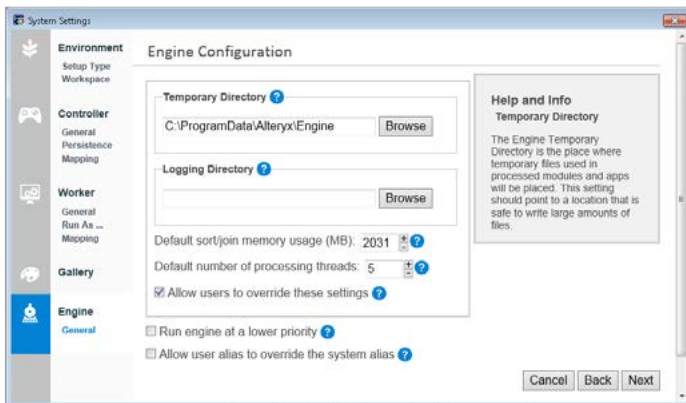
Alteryx is designed to use all of the resources it possibly can. In order to make Alteryx run as fast as possible, it tries to balance the use of as much CPU, memory, and disk I/O as possible.

The good news is that most of the resource utilization can be controlled. You can limit the amount of memory that is used on a system, user, or Workflow level.

The Sort/Join memory setting is not a maximum memory usage setting; it's more like a minimum. One part of Alteryx (sorts) that benefits from having a big chunk of memory will take that entire amount right from the start. It will be split between all the sorts in your Workflow, but other tools will still use memory outside that sort/join block. Some of them (e.g. drive times with a long maximum time) can use a lot.

If a sorting can be done entirely in memory, it will go faster than if we have to fall back to temp files, so that's why it's good to set this higher. But if the total memory usage on the system pushes it into virtual memory, you'll be swapping data to disk in a much less optimal way, and performance will be much worse and that's why setting it too high is a bigger concern.

The Default Dedicated Sort/Join Memory Usage can be found in Alteryx at **Tools > System Settings**.



Best Practices

1. Memory Settings

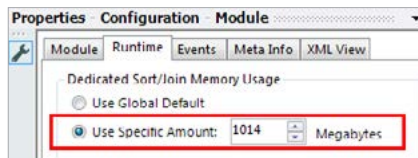
32-bit machines:

Setting should be on the lower, conservative side. No matter how much actual RAM is there, it only has at maximum 1 GB available, as soon as it is set higher, the machine will cross over into virtual memory and be unable to recover. A 32-bit machine should never have a setting over 1000MB, and 512 is a good setting. Set it low (128 MB), especially when using Adobe products simultaneously with Alteryx.

64-bit machines:

Set this in the system settings to half your physical memory divided by the number of simultaneous processes you expect to run. If you have 8 GB of RAM and run 2 processes at a time, your Sort/Join memory should be set to 2GB. You might set it lower if you expect to be doing a lot of memory intensive processes on the machine besides Alteryx

2. Set your Dedicated Sort/Join Memory Usage lower or higher on a per-Workflow basis depending on the use of your computer, doing memory intensive non-sort work (i.e. large drive-times) then lower it, doing memory intensive sort-work then higher.



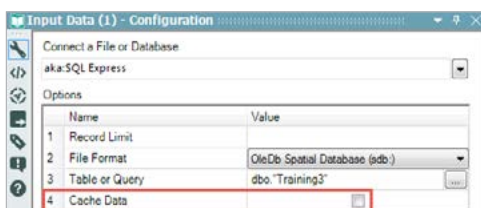
3. Run Alteryx at a lower priority: This will ensure that the Alteryx Engine runs at a lower priority than all the other applications running on the same machine. By doing so, even the Alteryx GUI will remain responsive when you are running a large Workflow in the background. This is an especially good idea for a shared server.
4. Shared Servers: For a shared server, the system owner/IT person should set the memory to no more than $(\text{total memory} - 2\text{GB}) / (\text{Number of Users})$. This way if all the users are running Workflows at the same time the system won't go into virtual memory, which really slows things down.

5. *Web Servers:* When running Alteryx on a web server, you really want to set the memory to the minimum possible without impacting the performance too much. I would recommend trying a system memory setting of 64MB and then increasing the memory on a per Workflow basis as needed. It is important to note that the user setting for memory usually has no impact since the web service typically runs as a separate system user. Make sure to use the system settings.
6. *Background Processing:* Any time you are planning to run a Workflow in the background while you are going to continue doing other work, it is a good idea to run it with less memory.
7. It is also a good idea to have the temporary directory point to a separate physical hard drive from your boot drive. If your temp drive points to C:\temp and you run a Workflow that consumes 100's of GB of Temp space (it happens), your system may become unstable.

New to 9.5: Cache Data for Relational Databases

Cache Data:

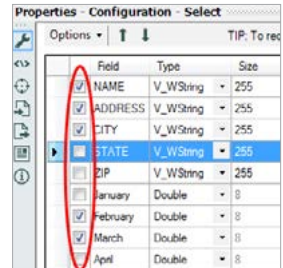
Designer has a new ability of caching data from relational databases through the Input tool. When checked, data is stored in a yxdb file on disk so that data sources are not hit repeatedly during workflow development. Data can only be cached when running a workflow in an Alteryx Designer session. The setting is ignored when the workflow is run in the scheduler, in the gallery, or from the command line. Messages will be reported in the Output Window when data is being read from a cached location rather than the original data source.



Select Tool & Filter Tool: Optimize by Reducing Data (Fields & Rows)

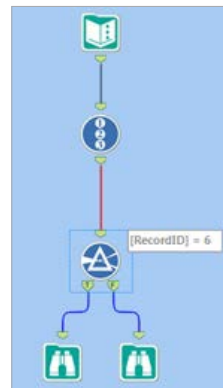
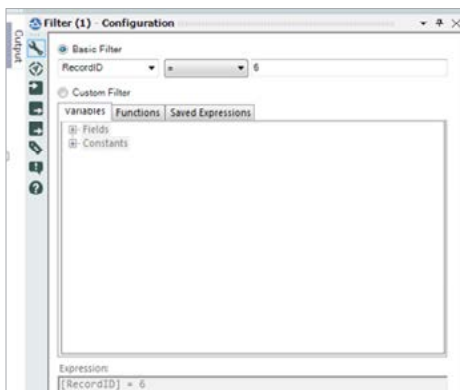
Select Tool:

A best practice to optimize the performance of your Workflows is to remove data that won't be needed for downstream processing as quickly as possible. The **Select** tool removes fields or columns from your data. Other tools such as Join, Join Multiple, Spatial Match, Find Nearest, and to a certain degree Transform tools and Reporting tools have some Select functionality.



Filter Tool:

Another good way to optimize Workflow performance is using the **Filter** tool to remove unnecessary data. The Filter tool queries records in your file that meet specified criteria and identifies these records in your file that meet specified criteria and identifies these records in your data, such as Record ID=6. You may choose to handle records that come from the True output differently than the False output by connecting additional tools to the workflow on either side. This will allow smaller amounts of data being passed downstream.



Data Blending



New to 9.5: In-Database Tools

Exciting new set of tools to 9.5 for connecting to your Oracle and SQL databases (more platforms to be added in subsequent releases). These tools enable the analysis to be done in the database, where the data resides, eliminating time & costs. Below the FAQ's.

Establishing connections

Is the driver support the same for In-Database and standard Alteryx workflows?

With In-Database, driver support has been simplified in order to optimize for speed:

- For 32-bit Alteryx, 32-bit drivers for SQL Server and Oracle are supported with In-Database.
- For 64-bit Alteryx, 64-bit drivers for SQL Server and Oracle are supported with In-database.
- 32-bit drivers are not supported for 64-bit Alteryx.

What permissions are required to initiate an In-Database workflow using the Connect In-DB tool?

Read privileges are required to access the underlying database.

What permissions are required to output data to the database using the Write In-DB tool?

Write privileges are required to create a table in the database.

What permissions are required to stream data into an In-Database workflow using the Data Stream In tool?

- Either read-only or write privileges are sufficient when using SQL Server.
- Write privileges to the GLOBAL TEMPSPACE directory are required when using Oracle.

What happens to the temporary tables created by the Data Stream In tool?

The temporary tables are deleted at the end of the run. If Alteryx crashes while the Data Stream In tool is being run, then the next time that an In-DB Workflow, all temp files created by Alteryx in the db in the previous three days are cleaned out.

Are the underlying 'rules' (e.g., database time outs) maintained during an In-DB process, or does Alteryx modify or circumvent those?

The underlying 'rules' are maintained during the process the same as with the DB connections via the standard Input and Output Data tools. If there is a database timeout or if there is a limit to the number of queries per day that the user can run, it will affect the user's connection to the database.

SQL Statement Generation

How is the SQL statement created?

A SELECT statement is triggered by the Connect In-DB tool and additional queries are created by downstream tools and nested within this query. The addition of one of the following three tools completes the query and sends it to the underlying database: Write In-DB, Data Stream Out, Browse In-DB.

A user can input his or her own SQL statement in the Query box for the Connect In-DB tool, which also gets embedded within the SELECT statement.

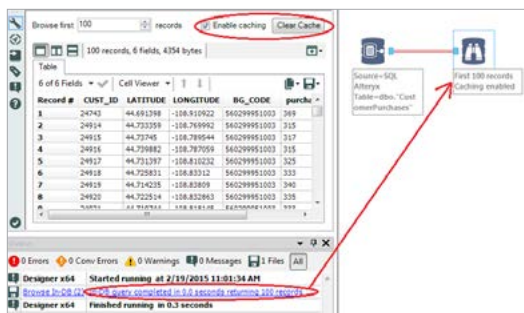
When is the SQL statement processed?

The SQL query for the underlying database is triggered at runtime for each Browse, Data Stream Out or Write Data tool.

How is Browse Caching Enabled?

The Browse Data In-DB tool can be configured to cache the data as a .yxdb file when the workflow is run.

Once the data is cached, if the workflow is re-run and the database connection or query (including the number of records to browse) has not changed, the query will not be re-run. Instead, the data will be pulled from the cache.



An output message indicates whether or not the data was cached. Clicking the link will open the data results as a .yxdb file in a separate window.

What are the differences between caching in the Input Data tool and caching in an In-DB workflow?

Using the “Cache data” option in the Input Data tool prevents redundant data transfer from a database to Alteryx, which can significantly reduce the time it takes to run a workflow.

Using the “Enable caching” option in the Browse Data In-DB tool prevents the workflow from sending redundant queries to the underlying database. The “Enable caching” option is on by default.

When is the In-DB cache used?

The In-DB cache is used any time a workflow is re-run without changes to upstream tools. Making a change to any upstream tool will trigger a new query and a new cache will be created.

Does the “Browse first [100] records” option impact the amount of data processed by the workflow?

No, the “Browse first [100] records” option only limits the number of records displayed in the Browse. Other tools in the workflow will process the number of records that pass through at any given point.

For more information, please see the **In-Database Overview** in the Alteryx Help.

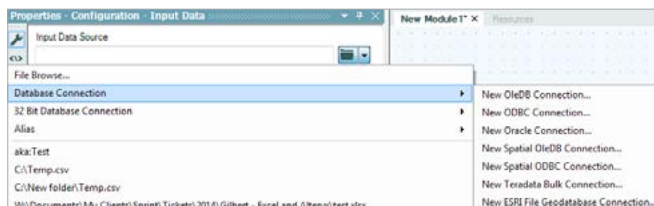
Tips & Tricks for Database Connections

Alteryx Input and Output tools handle three types of database connections, OLE DB, ODBC and Oracle Spatial. Here are few tips to follow when connecting to databases.

Database Connection

Database Type

1. **OCI (Oracle Connection)** is the fastest when connecting to Oracle. Oledb is recommended for SQL databases. Teradata Bulk Connection for Teradata. ODBC for Hadoop and Impala (These two ODBC drivers get installed with Alteryx).

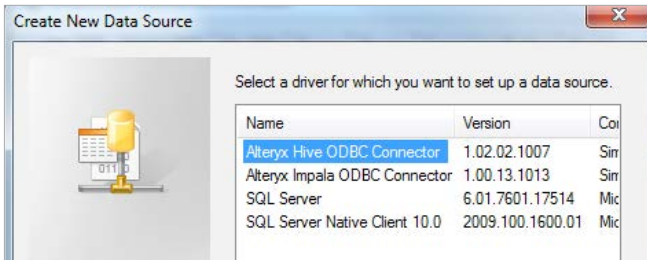


2. **Teradata Bulk Connection:** Increases the speed when reading and loading records to Teradata. Requires Teradata Tools and Utilities to be installed (preferably v14), at minimum: Shared ICU Libraries, ODBC Driver for Teradata, Teradata GSS Client, Teradata Parallel Transporter Base and Teradata Parallel Transporter Stream. Ideally, running Alteryx 64-bit (using 64-bit ODBC driver)

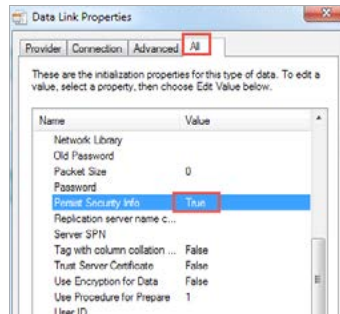
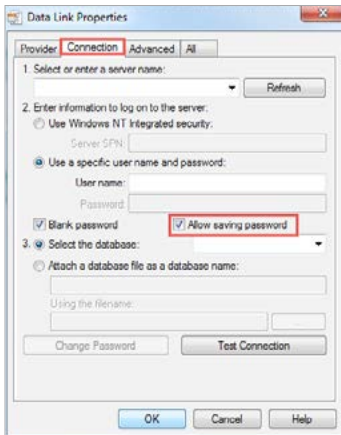
Selecting Driver

3. It is best to use the **native client driver** provided by the database company. Also make sure you are selecting the version that matches your database. Native Driver names would look like OraClient10g_home2 or SQL Server Native Client 10.0.

4. Alteryx Hive ODBC Connector (to connect to Hadoop) and Alteryx Impala ODBC Connectors get installed with Alteryx.



5. **Allow saving password** for OleDb connection: When setting up an OleDb connection, check the **Allow saving password** box in the Connection tab. This way the session will store the password and won't discard it once the test is successful, also change the Persist Security info in the All tab to **True**.

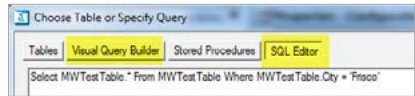


Workflow Speed

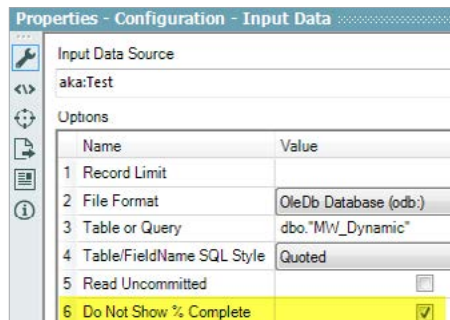
To improve Workflow Speed when:

Reading-in

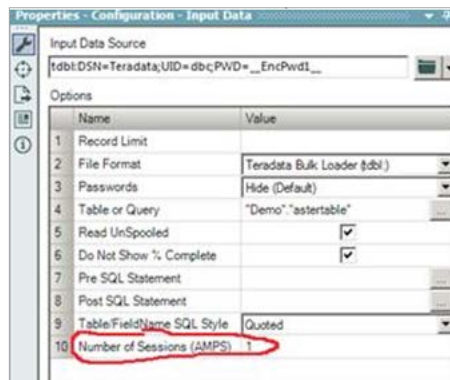
6. In the Input tool, use the **SQL editor/Visual Query Builder** to limit the fields coming in.



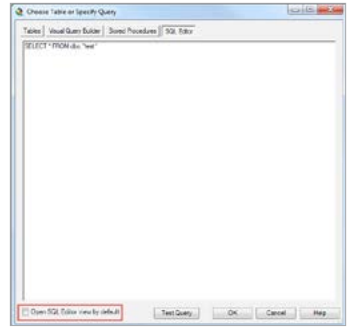
7. **Do not show % Complete:** When checked, Alteryx will not try to report the status of reading in the file, thus speeding up the read time.



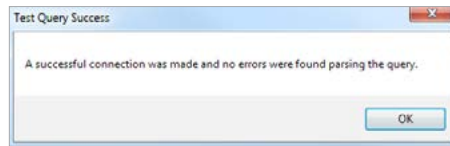
8. For Teradata Queries, Alteryx 9.0 allow you to specify the # of amps to leverage from your Teradata instance to process the query.



9. **Select your default view.** When connected to your database with the Input tool, you can select your default view to be either the list of Tables (if you have too many it could take a while to load), Visual Query Builder (VQB), Stored Procedure or SQL Editor.

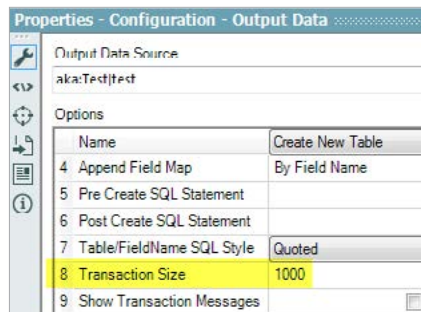


10. **Test your Query Now** you have the ability to Test your query before submitting, this makes sure your SQL syntax has no errors.



Outputting

11. **Commit as you go:** It is possible to commit a number of records at a time, i.e. to 1,000 records at a time.



12. **Problems with connections timing out:** add a Block Until Done tool (in the developer section of the toolbox) after your Input tool and before the Output tool. This also increases the overall speed of the Workflow.

13. Leverage our connectors to connect to MongoDB, Amazon S3, SharePoint, Salesforce, Marketo and Google Analytics, these tools are in the Connectors Category.



14. A List of supported data sources can be found at <http://www.alteryx.com/technical-specifications>.

Salesforce.com Connector

The Salesforce Input tool allows you to read and query tables from Salesforce.com into Alteryx.



In order to configure this tool you will need your Salesforce User name, Password, Security Token, Remote Access Consumer Key, and Consumer Secret which can be obtained from your Salesforce.com Administrator. The Remote Access Consumer information is found in Salesforce under Remote Access Authentication.

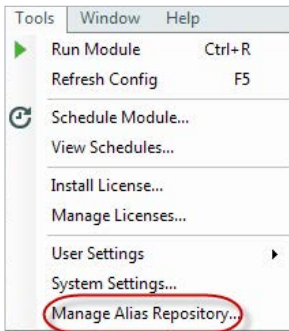
1. **Salesforce Login URL:** enter your Salesforce URL, <https://login.salesforce.com/>. If you have already saved a connection history, you can choose a URL from the dropdown. *(REQUIRED Field)*
2. **User Name:** enter your Salesforce user name associated with the Salesforce URL specified above, this is the same username you use to log-in to your Salesforce.com org. *(REQUIRED Field)*
3. **Password:** enter your password for the Salesforce user name specified above. This information will be encrypted.
NOTE: Whenever you change your password in Salesforce.com, you will also need to change your password here. (REQUIRED Field)

4. **Security Token:** enter your Salesforce Security Token. This information will be encrypted. *(REQUIRED Field)*
5. **Remote Access Consumer Key:** enter your Salesforce Consumer Key. *(REQUIRED Field)*
6. **Remote Access Consumer Secret:** enter your Salesforce Consumer Secret. This information will be encrypted. *(REQUIRED Field)*
7. **Save Connection History:** when checked, the selections specified above will be saved for future use and available via the URL dropdown. *(REQUIRED Field)*

Alias Repository

Alias Repository

Creating an Alias to manage your database connections is a must-do; it will make it easier to access your data and to manage the connection which allows you to update passwords in a single location rather than having to update every Input tool. To add an Alias, go to Tools, Manage Alias Repository, Add a System or User type, give it a name and then for the connection click on the pencil on the top and either select an existing connection string or create one.



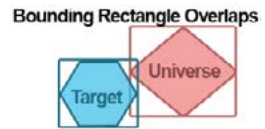
Spatial Relationship: Spatial Matching Tips

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 a 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.

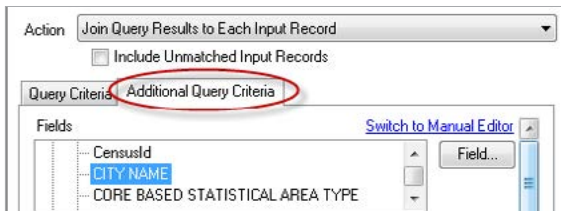
4. There are many multiple methods for spatially matching two sets of spatial objects. A venn diagram of each of those methods can be found in the **Spatial Match Tool's Help Menu**.

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.

Calgary Best Practices

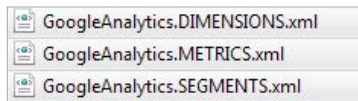
- If you are loading a very large database (over 100 million records) and know the type of index you will need (High or Low Selectivity), manually set your index type. This will save time in the long run as the Calgary Loader will not have to automatically try to determine what type of index to create for each record.
- If you want to use a 'Contains' query on your Calgary database, you will have to use the **Load a Single Advanced Index** option. This can only be performed after you have created your Calgary database.
- If you are querying a large database, try to narrow down your search criteria based on an indexed field using the 'Additional Query Criteria' tab.



- » This is especially helpful when performing a Spatial Matching in Calgary and you know your incoming records fall within a certain city or state.
- For further information on the Calgary tools and Calgary indexes please refer to the **Calgary Tools Help Menu**.

Google Analytics: Adding Custom Dimensions, Metrics, & Segments

- Do you have custom dimensions, metrics, and segments that don't show up with the default dimensions, metrics, and segments?
 - » You can add your custom dimensions, metrics, and segments so that they appear in the Google Analytics tree by default by adding them to their appropriate XML's.
 - » The dimension, metric, and segment XML files are located here: **C:\Program Files\Alteryx\bin\RuntimeData\Macros\Supporting_Macros.**



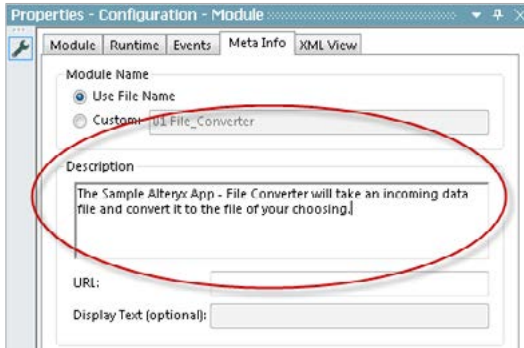
- » Updating those XML files with account-specific properties can be done using any text editing software.

Analytic Apps and Macros

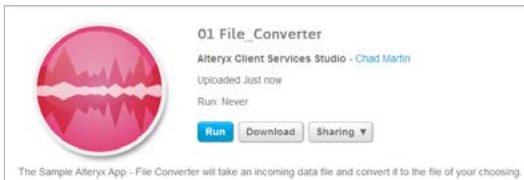


Adding Descriptions to Your App & Changing Your App Icon

Adding a description to your app can help users understand the purpose and goal of your app.



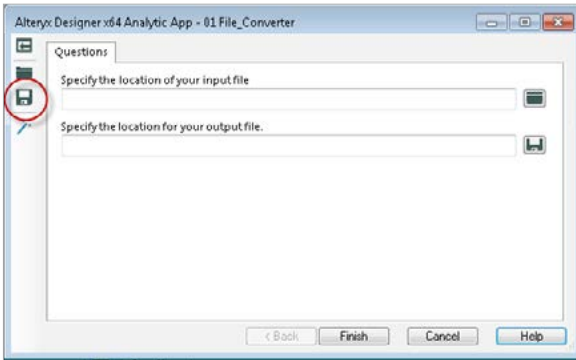
If publishing to the Alteryx Analytics Gallery, this description will display on the app's home screen.



Analytic App Values

When you are developing an Analytic App, you have the ability to save the values you have been using for testing, then call those values back through the user interface. This is especially helpful if you are developing an app with several inputs.

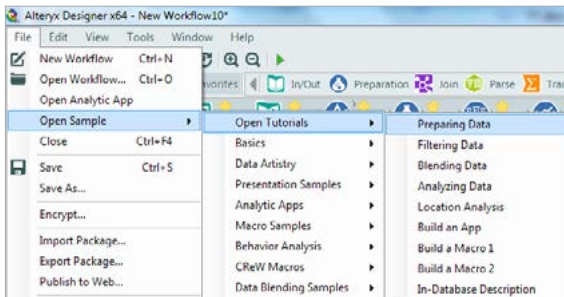
To save, click the **Save** icon on the left of your app UI then choose your specific file name (MyAppValues.yxwv).



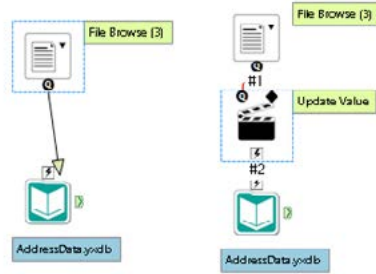
To open, click the **Open File** icon, then browse to your App Values file.

Analytic Apps Best Practices

- New Analytic App and Macro building tutorials can be found in the list of samples!



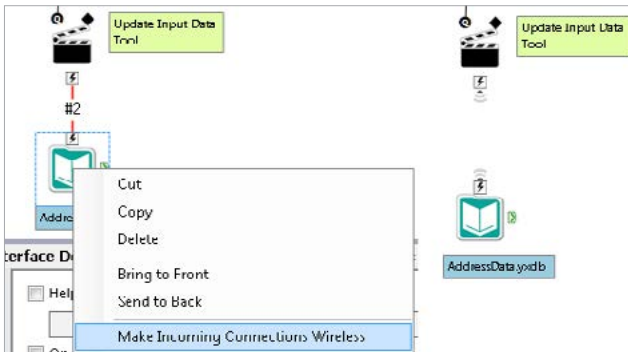
- Dragging any **Interface Tool** to the canvas automatically changes your App Type to 'Analytic App'.
- You can connect a **Question Tool** directly to another Tool. The result is an **Action Tool** is automatically added.



- You now have the ability to move Analytic App questions around the UI using the **Interface Designer**.



- The new **Interface Tools** are extremely helpful, but may cause a bit of clutter for all of the new connections you have. Make sure you are utilizing the **Wireless Connections** feature!

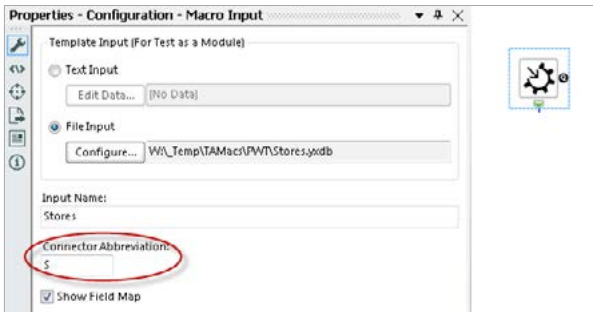


Macro Connection Abbreviations

In the sample **Trade Area Creation Pie Wedge Macro**, we see the custom macro has abbreviations for each of its two inputs.

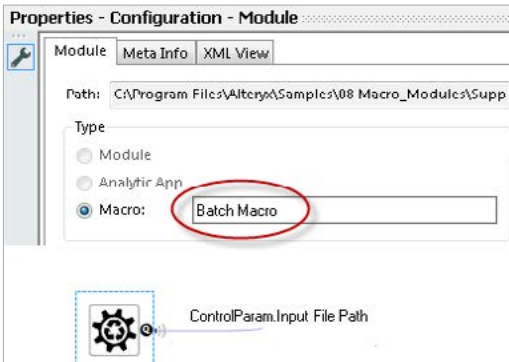


This helps the user identify where to connect their data stream and can be created by specifying a character in the **Connector Abbreviation** section of the **Macro Input Properties**.



Batch Macros

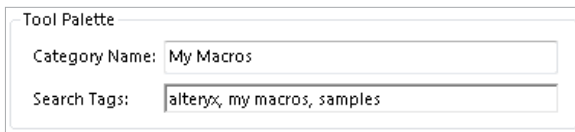
- When utilizing a batch macro specific **Interface Tool**, such as a **Control Parameter**, the Macro Properties will default to Batch Macro and you will not be able to accidentally change this.



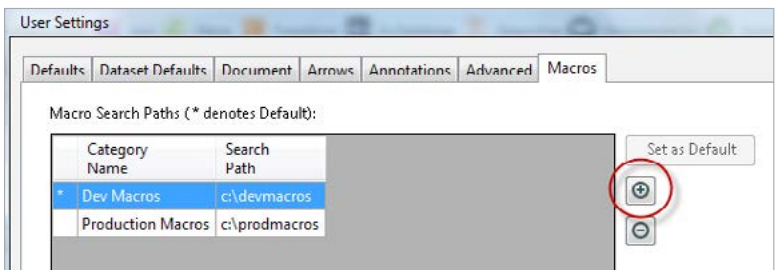
- **Protip!** While a Control Parameter is often used with a batch macro, it is not entirely necessary!
- Specify a custom tool name to make your macro unique.



- Specify a Category Name and search tags for Alteryx to recognize your macro in the Tool Palette and to make it searchable.



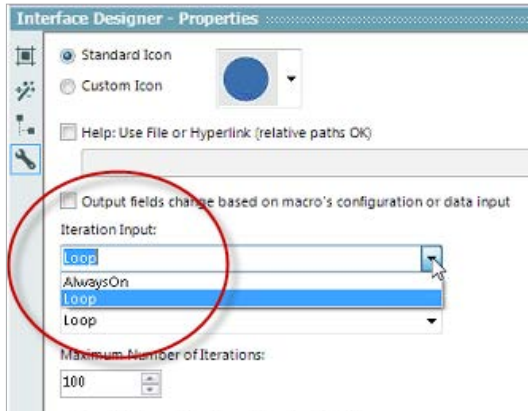
- Create your own custom macro tool categories within User Settings.
 - » Click **Tools > User Settings > Edit User Settings**.
 - » Click the **Macros** tab.
 - » Click the plus sign to add a new macro location.



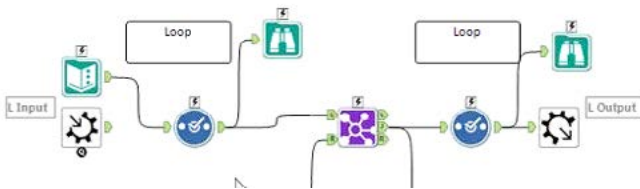
- » When developing macros, it is recommended to have both Development and Production categories for better organization (as shown above).

Iterative Macros

- Name your inputs and outputs accordingly! This will help keep you organized when specifying the iteration inputs and output.



- Try to keep your data streams organized. If your loop input is on the top, keep your loop output on the top as well (don't cross the streams).

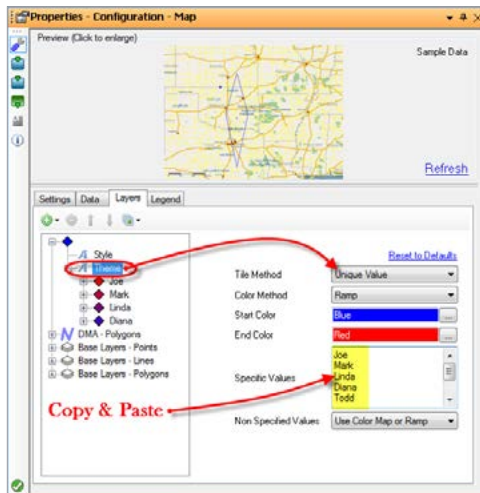


Reporting




Copy & Paste for Map Tool Unique Value Theme Settings

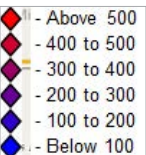
When building a thematic map with many unique values it can be very tedious to need to type out each of the “Specific Values” manually. A simple method to help you populate a consolidated list of unique values is to use either the Summarize tool or the Unique tool on the field you intend to base your thematic map. Using the Summarize tool, select the field in question and choose Group By, in the Unique tool simply choose your thematic field in the check box list. Put a Browse tool after either one of your aggregation methods, and run the Workflow. The result will be a simple list made up of one field containing each of the “Specific Values” for your Report Map Tool. Select all of the rows and hold **Ctrl+C** to copy the list of values then paste them in to the Specific Values window in the Report Map Tool.



Using Legend Splitter/Builder to Modify the Legend

The Legend Splitter and Legend Builder tools allow for additional modifications of the legend from the Report Map tool as long as the “Position” of the legend is “Separate Field”. The Legend Splitter takes the legend and breaks it down into several columns:

Text	Image	ThemeName	ThemeBand	ThemeBandFrom	ThemeBandTo	TextStyle	ImageStyle	Group
- Above 500		Test	Above500	500	[null]	text-align:left; vertical-align:middle; backgrou...	text-align:center; vertical-align:middle; width:...	Qiana



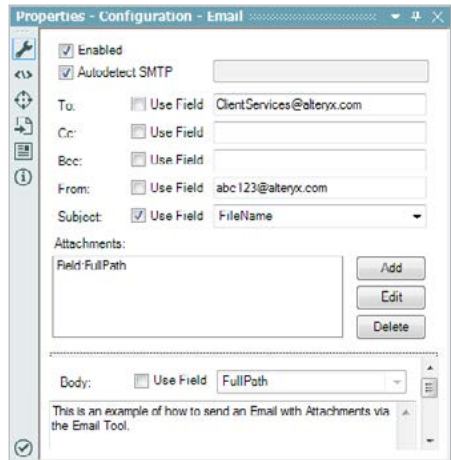
Now that the data is broken up into columns and text, you can use other tools to modify the data. For this example, the focus will be on the Text column. In this scenario, the user wants to eliminate the Above and Below entries because all of the data falls between 100 and 500.



After the Legend Splitter, a Filter can be used to remove the Above and Below rows from the legend. Once filtered out, bring in the Legend Builder tool to re-create the Legend image with the modified data. If done correctly, the legend should appear like the legend to the left:

Reporting Email

Alteryx Reporting tools give you the ability to create detailed and well organized reports whenever they are needed. In some cases, reports may need to be generated and emailed to their intended audience once a week. To help speed up that process, Alteryx has an Email tool which will allow you to create a Workflow that upon completion will email the results to whomever they need to go to! Choose to send a single email to a single recipient, or a list of recipients!



The following image shows how you can choose to select a Field in your data stream to populate the email address lists, subject lines, even the Body of the Email! Also, by using the Directory Input tool to get a list of the files necessary to send out, the Email tool can also include Attachments.

It is important to note, that some organization's IT departments will not allow a 3rd party software access to their email system without making some changes internally. Check with your IT administrator if you are having issues with Alteryx sending emails.

Gallery



New to 9.5: Workflow and Macro Sharing


You can now publish and share your Workflows and Macros with other Alteryx Gallery users. Like Alteryx Apps, Workflows can also be run in the Gallery. Macros can only be downloaded and added to your own Workflows and Apps.

Workflows and Macros are uploaded the same way Alteryx Apps are. Simply open the Workflow in the Alteryx Desktop Designer and click **File > Publish to Web**. Select **Analytics Gallery – My Private Studio** as the location you would like to publish the app to and fill out your credentials to the Alteryx Public Gallery. If you need to make changes to what will be included with your Workflow or Macro, like including sample data, click the File tab and link or delink to these files. You can also include extra files, by clicking on the **Options > Add File** button in the top right corner of the window. When you are ready, click the **Publish** button. Once the Workflow or Macro has been published, you can find it in your Private Studio.



New to 9.5: Workflow Tags

With Workflow Tags, users can now add preset descriptions to their Alteryx Apps, Workflows, and Macros. Tags allows our search engine to return better search results and can also add your Workflow to the Public Gallery Districts.

To add a Tag on your Workflow, open the properties of the Workflow by clicking its title. In the center of the properties above the Rating Stars will be a Plus Sign icon.

 Click this icon to display the Tag definition dropdown list. Current Tags available are:

- Cloud
- Database
- Spatial
- Predictive
- Macro
- Workflow
- App
- United Kingdom
- Salesforce
- Macros
- Retail
- Real Estate
- MSP
- General/Cross Industry
- Financial Services
- Communications
- Demographics

Choose the Tag that most suits your Workflow. After the Tag has been selected, click the Green Check icon  next to the dropdown list. You can select multiple Tags for a Workflow by repeating the previous steps. If you wish to remove a Tag, click the  found in the Tag box.

New to 9.5: Gallery API

The Gallery API allows users to list apps, run apps, and retrieve app results from applications or web pages outside of the Private Gallery. A Gallery API Key and Shared Secret is required to use the Gallery API. These credentials can be found in your Private Studio Settings. The Private Studio Settings page can be found by clicking your Name in the top right corner of the Gallery (next to your avatar) and then clicking the Private Studio tab in the main page.

Documentation for the Gallery API and interactive examples can be found at:

<https://gallery.alteryx.com/api-docs/>

Or if you have access to a Private Gallery:

<http://<your site>/api-docs/>

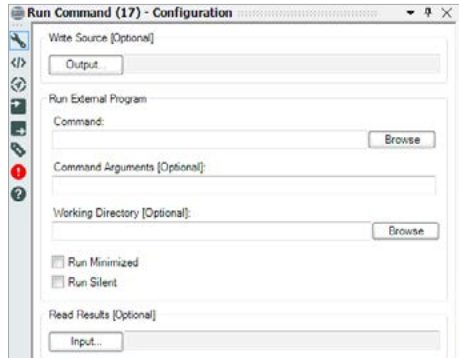
Run Command

The **Run Command Tool** is a very powerful tool in the Developer Tool Set.



To properly understand the tool, let's take a look at the Properties.

It seems odd that the 'Output' would be at the top of the tool properties. If we look at this with a top down approach, we then understand that the first thing the tool can do is output data. This is because many external command prompt programs need additional data. Since Alteryx stores data in memory, the Run Command cannot access it unless it is a file, hence the 'Output' option.



After the output, we specify the actual external program to run.

Next, we have the option to specify any command arguments, or parameters for this tool. If an Output is specified in the Output option, you would generally call this information here.

Next, we have the ability to specify the directory where we are running the external program.

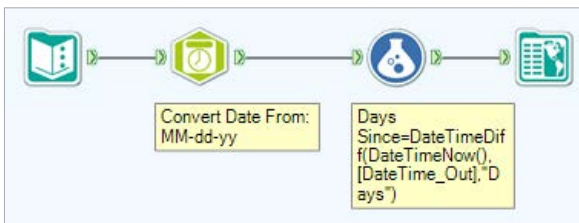
The next two options are highly recommended. If 'Run Minimized' is selected, the actual command prompt will stay minimized at runtime. If 'Run Silent' is selected, you will never see the actual command prompt pop up.

Finally, if the external program created an additional file, you can specify this file in your 'Read Results' section. This will be output to your Alteryx data stream where you can continue with your processing.

DateTime Tool and Time-based Calculations

If your data is already formatted as YYYY-MM-DD then Alteryx will most likely read that field in as a Date; however, one of the most common issues with a Date field is that most often the source data reads Dates as a String Field because it is not in the proper format. Alteryx can only do calculations with dates if the field is a true Date/Time Field. One of the most common mistakes is taking that string field in to a Select Tool and changing the field type to Date. Unfortunately, that method has the same effect as calling an apple an orange. Most likely the date is not formatted in the proper way, and when converted to a Date in the Select tool, the results will be all null values. String based Date fields require a special conversion tool called the DateTime Tool. This tool has the capability to convert a string into a Date/Time field based on the format of the date in the data. The tool can also re-convert the data back to string accordingly.

For example, with dates formatted as MM-DD-YYYY in the data and a need to convert that date into something we can calculate with, use the DateTime Tool as seen below, and make sure that “Convert From String Field to Date/Time Field” is selected. Then find the Format of your date string in the table below. Here you are telling Alteryx what to look for and how to convert it. This tool can also be used to convert a properly formatted Date/Time field back into a string.



Sample Tool



The Sample tool is one of those overlooked tools, very helpful when selecting a specified portion of the records in the data stream.

One of its powerful options is the Grouping Fields which allows you to do the Sample selection within a specific group of records.

A screenshot of the 'Sample (1) - Configuration' dialog box. The dialog has a title bar with a blue icon and the text 'Sample (1) - Configuration'. On the left is a vertical toolbar with icons for configuration, code, refresh, save, undo, redo, delete, warning, and help. The main area contains several radio button options: 'First N Records' (selected), 'Last N Records', 'Skip 1st N Records', '1 of every N Records', 'Random 1 in N Chance for each Record', and 'First N% of Records'. Below these is a text field for 'N' with the value '100'. At the bottom is a section titled 'Grouping Fields (Optional)' with two checkboxes, 'Name' and 'Phone', both of which are checked.

Sample (1) - Configuration

☒ First N Records

☐ Last N Records

☐ Skip 1st N Records

☐ 1 of every N Records

☐ Random 1 in N Chance for each Record

☐ First N% of Records

N =

Grouping Fields (Optional)

☒ Name

☒ Phone

Other Tips



Keyboard Shortcuts

- Opening files: Did you know that you can drag files from Windows Explorer directly onto your canvas? Workflow files (*.yxmd, *.yxwz, *.yxmc) will open directly in a new tab on the workflow canvas. Data files will be represented by a configured Input tool for each data file on the active workflow.
- Copy color values: You can copy/paste a color value without opening the color editor:
 1. Click inside the color box – don't highlight the values – click Ctrl+C
 2. Click inside the other color box – don't highlight the values – click Ctrl+V
- Splash Screen: If you want the splash screen to go away while the program is loading, simply click on the splash screen image.
- The usual suspects work within and between workflows: use Ctrl Z to **undo**, Ctrl Y to **redo**, Ctrl X to **cut**, Ctrl C to **copy**, Ctrl V to **paste**, and Ctrl F to **find** tools within the current workflow.

Key Stroke

F1

F5

Ctrl + + (plus sign)

Ctrl + - (minus sign)

Ctrl + Shift + B

Ctrl + Alt + B

Ctrl + Alt + T

Ctrl + Alt + V

Ctrl + Alt + O

Ctrl + Alt + P

Ctrl + Alt + D

Action

Show the Help page for the selected tool.

Refresh Configuration.

Align selected tools vertically.

Align selected tools horizontally.

Add a Browse tool after the selected tool(s).

If the selected tool has multiple outputs, a browse will be added for each.

Show Toolbar.

Show Tool Palette.

Show Overview.

Show Output Window.

Show Properties Window.

Show the Interface Designer

Double click any tool to reopen the Properties window after closing it.

Hold down the mouse wheel to pan the canvas.

Alt + Left mouse button will pan the canvas.

Shift + mouse wheel will scroll the canvas horizontally.

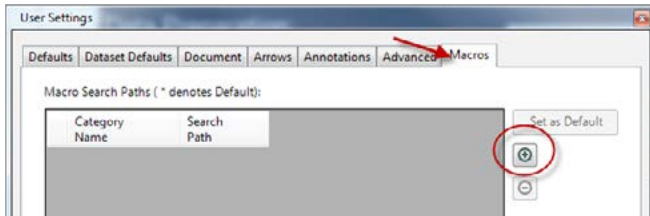
Ctrl + roll middle mouse wheel will zoom the canvas.

Ctrl + Arrow key will nudge a tool by one pixel.

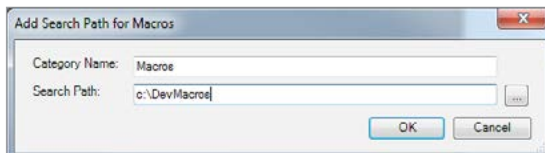
Adding A Custom Macro Folder to Your Tool Set

You now have the ability to add a custom macro category to your tool set. This can be a great help in keeping development and production macros organized.

- Click **Tools > User Settings > Edit User Settings**.
- Click the **Macros** tab, then the **Plus (+)** sign.



- Enter a **Category Name**, then navigate to your search path.



New to 9.5



Alteryx Excel Driver (XLSX) vs. MS Excel Driver (XLSX)

Alteryx has built-in native read and write drivers for Microsoft Excel (.xlsx) to address data loss and performance issues reported with the Microsoft Excel Driver. Some of the features include:

- Microsoft Access Data Engine is not required.
- Up to 10x read performance improvement for large sheets.


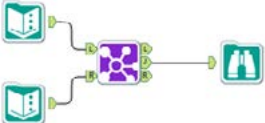

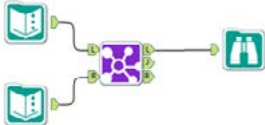

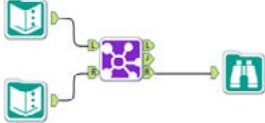

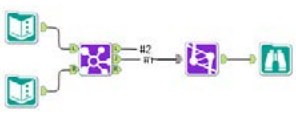

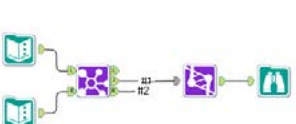

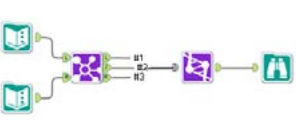
By default, all Workflows with xlsx files will be switched to Microsoft Excel (.xlsx) starting with Alteryx 9.5. Users will still be able to use the MS Driver for Microsoft Excel by switching manually to Microsoft Excel Legacy (*.xlsx) in the Input tool.

Below are some of the key differences between both drivers:

	ALTERYX DRIVER FOR MICROSOFT EXCEL	MS DRIVER FOR MICROSOFT EXCEL
Maximum Number of Columns (limit specified by Excel)	16,384 (1-2k recommended for performance)	255
Column name length and field names limits	Limited only by string size 256 recommended for compatibility	Column names are truncated to 64 characters
Exceeding record limits (1,048,575 rows) (16,384 columns)	Any remaining records/ columns will be truncated. No file is written	Writes out the maximum number of records/ columns and dumps the rest of the data.
Numbers Rounding:	The formatting assigned to the cell will be ignored. For example, if a cell contains the value 1.27452 and the cell is formatted to show 2 decimal places the full value of 1.27452 will be returned instead of 1.28.	Data will be returned using the formatting assigned to the cell. For example, decimal points set to a number lower than the data contains will result in data loss such as 1.27452 being returned as 1.28.

Join Me, Together We Will Rule the Universe—Doing Different Types of Joins

See the table below for using the Join tool to execute different types of joins.

<p>Inner Join: contains records that joined from the L input to those records in the R input.</p>			<p>The J output of the Join tool contains the result of an Inner Join.</p>
<p>Left Unjoin: contains records from the L input that did NOT join to records from the R input.</p>			<p>The L output of the Join tool contains the result of a Left Unjoin.</p>
<p>Right Unjoin: contains records from the R input that did NOT join to records from the L input.</p>			<p>The R output of the Join tool contains the result of a Right Unjoin.</p>
<p>Left Outer Join: all records from the L input including the records that joined with the R input.</p>			<p>To do a Left Outer Join, connect the J and L outputs of the Join tool to the Union tool.</p>
<p>Right Outer Join: records from the R input including the records that joined with the L input.</p>			<p>To do a Right Outer Join, connect the J and R outputs of the Join tool to the Union tool.</p>
<p>Full Outer Join: all of the records from both L and R inputs.</p>			<p>To do a Full Outer Join, connect the J, L, and R outputs of the Join tool to the Union tool.</p>

Everything Is Equal

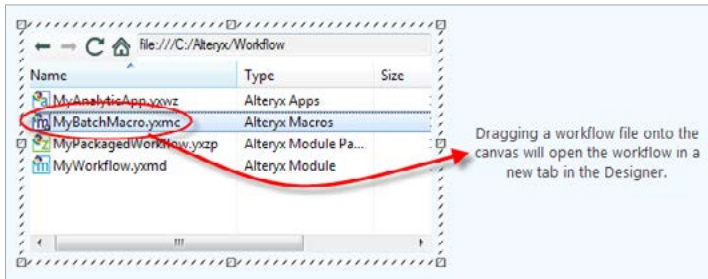
When writing expressions, "=" now works the same as "==".

[GEOLEVEL]="Street"

[GEOLEVEL]=="Street"

Go With the Workflow










The Explorer Box tool can be used to display local and network directories with the same functionality of Windows Explorer. Simply type the directory path in the URL box to reveal the contents of a directory. The Explorer Box tool now supports the opening of a workflow file (*.yxmd, *.yxwz, *.yxmc) by dragging the file onto the canvas.









Tool Overview














In/Out





 Browse	Review your data at any point in the work flow.	 Date Time Now	Input the current date and time at module runtime, in a format of the user's choosing. (Useful for adding a date-time header to a report.)
 Directory	Input a list of file names and attributes from a specified directory.	 Input	Bring data into your module by selecting a file or connecting to a database (optionally, using a query).
 Map Input	Manually draw or select map objects (points, lines, and polygons) to be stored in the module.	 Output	Output the contents of a data stream to a file or database.
 Text Input	Manually add data which will be stored in the module.	 XDF Input	This tool enables access to an XDF format file (the format used by Revolution R).
 XDF Output	This tool reads an Alteryx data stream into an XDF format file, the file format used by Revolution R.		







Preparation

 Auto Field	Automatically set the field type for each string field to the smallest possible size and type that will accommodate the data in each column.	 Date Filter	Easily filter data based on a date criteria using a calendar based interface.
 Filter	Query records based on an expression to split data into two streams, True (records that satisfy the expression) and False (those that do not).	 Formula	Create or update fields using one or more expressions to perform a broad variety of calculations and/or operations.
 Generate Rows	Create new rows of data. Useful for creating a sequence of numbers, transactions, or dates.	 Impute Values	Update specific values in a numeric data field with another selected value. Useful for replacing NULL() values.





 Multi-Field Binning	Group multiple numeric fields into tiles or bins, especially for use in predictive analysis.	 Multi-Field Formula	Create or update multiple fields using a single expression to perform a broad variety of calculations and/or operations.
 Multi-Row Formula	Create or update a single field using an expression that can reference fields in subsequent and/or prior rows to perform a broad variety of calculations and/or operations. Useful for parsing complex data and creating running totals.	 Random % Sample	Generate a random number or percentage of records passing through the data stream.
 Record ID	Assign a unique identifier to each record.	 Sample	Limit the data stream to a number, percentage, or random set of records.
 Select	Select, deselect, reorder and rename fields, change field type or size, and assign a description.	 Select Record	Select specific records and/or ranges of records including discontinuous ranges. Useful for troubleshooting and sampling.
 Sort	Sort records based on the values in one or more fields.	 Tile	Group data into sets (tiles) based on value ranges in a field.
 Unique	Separate data into two streams, duplicate and unique records, based on the fields of the user's choosing.		

Join

 Append Field	Append the fields from a source input to every record of a target input. Each record of the target input will be duplicated for every record in the source input.	 Business Listing Matching	Match your customer or prospect file to the Dun & Bradstreet business file.
 Consumer-View Matching	An updated version of the Household File Matching Tool with functionality and new matching criteria	 Find Replace	Search for data in one field from one data stream and replace it with a specified field from a different stream. Similar to an Excel VLOOKUP.




 <p>Fuzzy Match</p>	<p>Identify non-identical duplicates in a data stream.</p>	 <p>Household File Matching</p>	<p>Match your customer file to the Experian Consumer View Household file.</p>
 <p>Join</p>	<p>Combine two inputs based on a common field or record position. In the joined output, each row will contain the data from both inputs.</p>	 <p>Join Multiple</p>	<p>Combine two or more inputs based on a common field or record position. In the joined output, each row will contain the data from each input</p>
 <p>Make Group</p>	<p>Assemble pairs of matches into groups based on their relationships. Generally used with the Fuzzy Match tool.</p>	 <p>Union</p>	<p>Combine two or more data streams with similar structures based on field names or positions. In the output, each column will contain the data from each input.</p>

Parse

 <p>Date Time</p>	<p>Transform date/time data to and from a variety of formats, including both expression-friendly and human readable formats.</p>	 <p>RegEx</p>	<p>Parse, match, or replace data using regular expression syntax.</p>
 <p>Text to Columns</p>	<p>Split the text from one field into separate rows or columns.</p>	 <p>XML Parse</p>	<p>Read in XML snippets and parse them into individual fields.</p>


Transform

 <p>Arrange</p>	<p>Manually transpose and rearrange fields for presentation purposes.</p>	 <p>Count Records</p>	<p>Count the records passing through the data stream. A count of zero is returned if no records pass through.</p>
 <p>Cross Tab</p>	<p>Pivot the orientation of the data stream so that vertical fields are on the horizontal axis, summarized where specified.</p>	 <p>Running Total</p>	<p>Calculate a cumulative sum per record in a data stream.</p>




 Summarize	Summarize data by grouping, summing, counting, spatial processing, string concatenation, and much more. The output contains only the results of the calculation(s).	 Transpose	Pivot the orientation of the data stream so that horizontal fields are on the vertical axis.
 Weighted Average	Calculate the weighted average of a set of values where some records are configured to contribute more than others.		

Reporting


 Charting	Create a chart (Area, Column, Bar, Line, Pie, etc.) for output via the Render tool.	 Email	Send emails for each record with attachments or e-mail generated reports if desired.
 Image	Add an image for output via the Render tool.	 Layout	Arrange two or more reporting snippets horizontally or vertically for output via the Render tool.
 Map Legend Builder	Recombine the component parts of a map legend (created using the Map Legend Splitter) into a single legend table, after customization by other tools.	 Map Legend Splitter	Split the legend from the Report Map tool into its component parts for customization by other tools. (Generally recombined by the Map Legend Builder.)
 Overlay	Arrange reporting snippets on top of one another for output via the Render tool.	 Render	Output report snippets into presentation-quality reports in a variety of formats, including PDF, HTML, XLSX and DOCX.
 Report Footer	Add a footer to a report for output via the Render tool.	 Report Header	Add a header to a report for output via the Render tool.
 Report Map	Create a map for output via the Render tool.	 Report Text	Add and customize text for output via the Render tool.




 <p>Table</p>	<p>Create a data table for output via the Render tool.</p>
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Documentation













 <p>Comment</p>	<p>Add annotation or images to the module canvas to capture notes or explain processes for later reference.</p>	 <p>Explorer Box</p>	<p>Add a web page or Windows Explorer window to your canvas.</p>
 <p>Tool Container</p>	<p>Organize tools into a single box which can be collapsed or disabled.</p>		






Spatial

 <p>Buffer</p>	<p>Expand or contract the extents of a spatial object (typically a polygon).</p>	 <p>Create Points</p>	<p>Create spatial points in the data stream using numeric coordinate fields.</p>
 <p>Distance</p>	<p>Calculate the distance or drive time between a point and another point, line, or polygon.</p>	 <p>Find Nearest</p>	<p>Identify the closest points or polygons in one file to the points in a second file.</p>
 <p>Generalize</p>	<p>Simplify a polygon or polyline object by decreasing the number of nodes.</p>	 <p>Heat Map</p>	<p>Generate polygons representing different levels of "heat" (e.g. demand) in a given area, based on individual records (e.g. customers)</p>
 <p>Make Grid</p>	<p>Create a grid within spatial objects in the data stream.</p>	 <p>Non Overlap Drivetime</p>	<p>Create drive time trade areas that do not overlap for a point file.</p>
 <p>Poly-Build</p>	<p>Create a polygon or polyline from sets of points.</p>	 <p>Poly-Split</p>	<p>Split a polygon or polyline into its component polygons, lines, or points.</p>
 <p>Smooth</p>	<p>Round off sharp angles of a polygon or polyline by adding nodes along its lines.</p>	 <p>Spatial Info</p>	<p>Extract information about a spatial object, such as area, centroid, bounding rectangle, etc.</p>



 <p>Spatial Match</p>	Combine two data streams based on the relationship between two sets of spatial objects to determine if the objects intersect, contain or touch one another.	 <p>Spatial Process</p>	Create a new spatial object from the combination or intersection of two spatial objects.
 <p>Trade Area</p>	Define radii (including non-overlapping) or drive-time polygons around specified points.		





Interface

 <p>Action</p>	Updates the configuration of a module with values provided by interface questions, then run as an app or macro.	 <p>Check Box</p>	Display a check box option to the end user in an app or macro.
 <p>Condition</p>	Tests for the presence of user selections. The state is either true or false.	 <p>Control Parameter</p>	Control Parameter tool is the input for each iteration in the Batch Macro.
 <p>Date</p>	Allows users to select a date.	 <p>Drop Down</p>	Allows users to make a single selection from a drop down list.
 <p>Error Message</p>	Display an error message and halt processing.	 <p>File Browse</p>	Allow users to select a file to use as an input or output via a traditional file browse window.
 <p>Folder Browse</p>	Allow users to browse to a folder via a traditional file browse window.	 <p>List Box</p>	Allow users to make multiple selections from a list box.
 <p>Macro Input</p>	Create an input connection on a macro.	 <p>Macro Output</p>	Create an output connection on a macro.





 Map	Display an interactive map to allow the user to draw or select location objects	 Numeric Up/Down	Allow users to choose a number from a predefined range.
 Radio Button	Allow users to select an option from a mutually exclusive list when used with other radio button tools.	 Text Box	Allow users to enter characters in a free form text box.
 Tree	Allow users to make one or more selections from an organized, hierarchical data structure.		











Data Investigation

 Association Analysis	Determine which fields in a database have a bivariate association with one another.	 Contingency Table	Create a contingency table based on selected fields, to list all combinations of the field values with frequency and percent columns.
 Create Samples	Split the data stream into two or three random samples with a specified percentage of records in the estimation and validation samples.	 Distributed Analysis	Allows you to fit one or more distributions to the input data and compare them based on a number of Goodness-of-Fit statistics.
 Field Summary	Produce a concise summary report of descriptive statistics for the selected data fields.	 Frequency Table	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.
 Heat Plot	This tool plots the empirical bivariate density of two numeric fields using colors to indicate variations in the density of the data for different levels of the two fields	 Histogram	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.
 Oversample Field	Sample incoming data so that there is equal representation of data values to enable effective use in a predictive model.	 Pearson Correlation	Correlation (often measured as a correlation coefficient, p), indicates the strength and direction of a linear relationship between two or more random variables.

 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 based on a kernel smoother that indicates the density of values (via width) of the numeric field.</p>





Predictive




 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>

 <p>Boosted Model</p>	<p>Create 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>	 <p>Count Regression</p>	<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.</p>
 <p>Decision Tree</p>	<p>Predict a target variable using one or more predictor variables that are expected to have an influence on the target variable by constructing a set of if-then split rules that optimize a criteria.</p>	 <p>Forest Model</p>	<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" of decision tree models).</p>
 <p>Gamma Regression</p>	<p>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.</p>	 <p>Lift Chart</p>	<p>Compare the improvement (or lift) that various models provide to each other as well as a 'random guess' to help determine which model is 'best.' Produce a cumulative captured response chart (also called a gains chart) or an incremental response rate chart.</p>
 <p>Linear Regression</p>	<p>Relate a variable of interest (target variable) to one or more variables (predictor variables) that are expected to have an influence on the target variable. (Also known as a linear model or a least-squares regression.)</p>	 <p>Logistic Regression</p>	<p>Relate a binary (yes/no) variable of interest (target variable) to one or more variables (predictor variables) that are expected to have an influence on the target variable.</p>
 <p>Market Basket Inspect</p>	<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 or returned rules or item sets to a manageable number.</p>	 <p>Market Basket Rules</p>	<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>






 Naïves 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.
 Neural Networks	Create feedforward perceptron neural network model with a single hidden layer.	 Score	Calculate a predicted value for the target variable in the model.
 Spline Model	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.	 Stepwise	Determine the "best" predictor variables to include in a model out of a larger set of potential predictor variables for linear, logistic, and other traditional regression models.
 Support Vector Machine	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.	 Test of Means	Compare the difference in the mean values for a numeric response field between a control group and one or more treatment groups

Time Series



 TS ARIMA	Estimate a univariate time series forecasting model using an autoregressive integrated moving average (or ARIMA) method.	 TS Compare	Compare one or more univariate time series models created with either the ETS or ARIMA tools.
 TS Covariant Forecast	Provide forecasts from an ARIMA model that uses covariates. The number of periods to forecast is determined by the number of periods of covariate data provided.	 TS ETS	Estimate a univariate time series forecasting model using an exponential smoothing method.


 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 Plot	<p>Create a number of different univariate time series plots, to aid in the understanding the time series data and determine how to develop a forecasting model.</p>		

Predictive Grouping



 Append Cluster	<p>Appends the cluster assignments from a K-Centroids Cluster Analysis tool to a data stream containing the set of fields (with the same names, but not necessarily the same values) used to create the original cluster solution.</p>	 Find Nearest Neighbor	<p>Find 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>Partition records into “K groups” around centroids by assigning cluster memberships, using K-Means, K-Medians, or Neural Gas clustering.</p>	 K-Centroids Diagnostics	<p>Assess the appropriate number of clusters to specify, given the data and the selected Predictive Grouping algorithm (K-Means, K-Medians, or Neural Gas).</p>
 Principal Components	<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>		





Connectors

 Amazon S3 Download	<p>Read CSV, DBF and YXDB files from Amazon S3.</p>	 Amazon S3 Upload	<p>Write CSV, DBF and YXDB files to Amazon S3.</p>
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 Download	Retrieve data from a specified URL, including an FTP site, for use in a data stream.	 Google Analytics	Bring in data from Google Analytics
 HDFS Input	Reads data from a Hadoop Distributed File System.	 HDFS Output	Writes data to a Hadoop Distributed File System.
 Marketo Append	Retrieves Lead and Activity records from Marketo and appends them to an incoming datastream	 Marketo Input	Read Lead and Change Marketo records for a specified date range
 Marketo Output	Writes data to Marketo using an upsert function.	 MongoDB Input	Read and query data from a MongoDB database. MongoDB is a scalable, high-performance, open source NoSQL database.
 MongoDB Output	Write data to a MongoDB database. MongoDB is a scalable, high-performance, open source NoSQL database.	 Salesforce Input	Read and query data from Salesforce.com.
 Salesforce Output	Write data to Salesforce.com.	 SharePoint List Input	Read a list from SharePoint.
 SharePoint List Output	Write data to a list in SharePoint.		

Address







 Canada Geocoder	Determine the coordinates (Latitude and Longitude) of an address and attach a corresponding spatial object to your data stream. Uses multiple tools to produce the most accurate answer.	 CASS	Standardize address data to conform to the U.S. Postal Service CASS (Coding Accuracy Support System) or Canadian SOA (Statement of Accuracy).
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 <p>Parse Address</p>	<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>	 <p>Street Geocoder</p>	<p>Determine the coordinates (Latitude and Longitude) of an address and attach a corresponding spatial object to your data stream. Consider using the U.S. Geocoder or Canadian Geocoder macros for better accuracy.</p>
 <p>US Geocoder</p>	<p>Determine the coordinates (Latitude and Longitude) of an address and attach a corresponding spatial object to your data stream. Uses multiple tools to produce the most accurate answer.</p>	 <p>US ZIP9 Coder</p>	<p>Determine the coordinates (Latitude and Longitude) of a 5, 7, or 9 digit ZIP code.</p>

Demographic Analysis






 <p>Allocate Append</p>	<p>Append demographic variables to your data stream from the installed dataset(s).</p>	 <p>Allocate Input</p>	<p>Input geographies and demographics into a data stream from the installed dataset(s).</p>
 <p>Allocate Metainfo</p>	<p>Input demographic descriptions and unabbreviated variable names ("popcy" is displayed as "population current year") from the installed dataset(s).</p>	 <p>Allocate Report</p>	<p>Create pre-formatted reports associated with Allocate data from the installed dataset(s).</p>

Behavior Analysis





 <p>Behavior Metainfo</p>	<p>Input behavior cluster names, IDs and other meta info from an installed dataset.</p>	 <p>Cluster Code</p>	<p>Append a behavior cluster code to each record in the incoming stream.</p>
 <p>Compare Behavior</p>	<p>Compare two behavior profile sets to output a variety of measures such as market potential index, penetration, etc.</p>	 <p>Create Profile</p>	<p>Create behavior profiles from cluster information in an incoming data stream.</p>
 <p>Detail Fields</p>	<p>Split a behavior profile set into its individual clusters and details.</p>	 <p>Profile Input</p>	<p>Input a behavior profile set from an installed dataset or external file.</p>

 <p>Profile Output</p>	Output a profile set (*.scd file) from behavior profile sets in an incoming data stream. Generally only used when using the standalone Solocast desktop tool.	 <p>Report:</p>	Generate a comparison report from two behavior profile sets for output via the Render tool.
 <p>Report: Detail</p>	Generate a detailed report from a behavior profile set for output via the Render tool.	 <p>Report: Rank</p>	Generate a rank report from a set of behavior profiles for output via the Render tool.

Calgary





 <p>Calgary Input</p>	Input data from the Calgary database file with a query	 <p>Calgary Join</p>	Query a Calgary database dynamically based on values from an incoming data stream.
 <p>Calgary Loader</p>	Create a highly indexed and compressed Calgary database which allows for extremely fast queries.	 <p>Cross Count</p>	Find the counts of predefined sets of values that occur in a Calgary database file.
 <p>Cross Count Append</p>	Find the counts of sets of values (from the incoming data stream) that occur in a Calgary database file.		

Developer




 <p>API Output</p>	Return the results of a data stream directly to an API callback function. For use with custom application development.	 <p>Base64 Encoder</p>	The Base 64 Encoder macro issues a base 64 encode string
 <p>BlobConvert</p>	The Blob Convert tool will take different data types and either converts them to a Binary Large Object (Blob) or takes a Blob and converts it to a different data type.	 <p>BlobInput</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.

 Blob Output	<p>The Blob Output tool writes out each record into its own file</p>	 Block Until Done	<p>Stop downstream processing until the very last record has arrived, to ensure that only a single output stream processes records at one time. Or, ensure that the reading of a file will be closed before overwriting is attempted.</p>
 Detour	<p>Bypass a set of tools. Must end in an Output or Detour End tool. Generally used for authoring an Analytic App or Macro.</p>	 Detour End	<p>Ends a section of tools bypassed by a Detour. Generally used for authoring an Analytic App or Macro.</p>
 Dynamic Input	<p>Read from input files or databases at runtime using an incoming data stream to dynamically choose the data. Allows for dynamically generated queries.</p>	 Dynamic Rename	<p>Dynamically (using data from an incoming stream) rename fields. Useful when applying custom parsing to text files.</p>
 Dynamic Replace	<p>Replace data values in a series of fields (using a dynamically specified condition) with expressions or values from an incoming stream.</p>	 Dynamic Select	<p>Select or de-select fields by field type or an expression.</p>
 Field Info	<p>Output the schema (field types and names, etc.) of a data stream.</p>	 JSON Parse	<p>The JSON Parse tool separates Java Script Object Notation text into a table schema for the purpose of downstream processing.</p>
 Message	<p>Write log messages to the Output Window. Generally used in authoring macros.</p>	 R	<p>Execute an R language script and link incoming and outgoing data from Alteryx to R, an open-source tool used for statistical and predictive analysis.</p>
 Run Command	<p>Run external programs as part of an Alteryx process</p>	 Test	<p>Test assumptions in a data stream.</p>







Social Media







 DataSift	Bring in data from Datasift- twitter, Facebook, Tumblr, YouTube, Wikipedia, and much more- http://datasift.com/platform/datasources/	 Foursquare	Search Foursquare Venues by a location with an option of filtering by a search term..
 GNIP Input	Bring in data collected from twitter, YouTube, Facebook in Grip and analyze it in Alteryx	 Twitter Search	Search tweets of the last 7 days by given search terms with location and user relationship as optional properties.

Laboratory

 JSON Build	The JSON Build tool takes the table schema of the JSON Parse tool and builds it back into properly formatted Java Script Object Notation.	 Make Columns	The Make Columns tool 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.
 Throttle	The Throttle tool slows down the speed of the downstream tool by limiting the number of records that are passed through the Throttle tool.		

In-Database Tools

 Browse Data In-DB	Review your data at any point in an In-DB workflow. Note: Each In-DB Browse triggers a database query and can impact performance.	 Connect In-DB	Establish a database connection for an In-DB workflow
 Data Stream In	Bring data from a standard workflow into an In-DB workflow.	 Data Stream Out	Stream data from an In-DB workflow to a standard workflow, with an option to sort the records.
 Filter In-DB	Filter In-DB records with a Basic filter or with a Custom expression using the database's native language (e.g., SQL).	 Formula In-DB	Create or update fields in an In-DB data stream with an expression using the database's native language (e.g., SQL).

 Join In-DB	<p>Combine two In-DB data streams based on common fields by performing an inner or outer join.</p>	 Sample In-DB	<p>Limit the In-DB data stream to a number or percentage of records.</p>
 Select In-DB	<p>Select, deselect, reorder, and rename fields in an In-DB workflow.</p>	 Summarize In-DB	<p>Summarize 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>Combine 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>Use an In-DB data stream to create or update a table directly in the database.</p>