



ALTERYX DESIGNER:

# UP & RUNNING WITH ALTERYX DESIGNER

★★★★★ With Best-Selling Tableau Instructor Dustin Cabral

# Course Outline

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|          |                                   |   |
|----------|-----------------------------------|---|
| <b>1</b> | <b>Course Project &amp; Setup</b> | <i>Introduce the course project, set expectations, and download Alteryx Designer (free trial)</i> |
| <b>2</b> | <b>Intro to Alteryx Designer</b>  | <i>Review the Alteryx Designer workspace, tools and engine</i>                                    |
| <b>3</b> | <b>Data Import &amp; Export</b>   | <i>Input and output data to and from flat files, text and databases</i>                           |
| <b>4</b> | <b>Data Preparation</b>           | <i>Select, clean, classify, sort and create columns/rows</i>                                      |
| <b>5</b> | <b>Data Transformation</b>        | <i>Leverage tools to parse, join, transform and summarize data</i>                                |
| <b>6</b> | <b>Reports &amp; Visuals</b>      | <i>Create reporting outputs including tables, maps, images and emails</i>                         |
| <b>7</b> | <b>Macros &amp; Applications</b>  | <i>Develop basic macros and interactive applications</i>  |

# Course Project

## THE SITUATION

You've just been hired as a Sr. Alteryx Developer by **MavenData**, a prominent retail food and beverage data aggregator based in the United States.

## THE BRIEF

Your primary role is to **design and build Alteryx workflows for the organization**, which will involve connecting to multiple data sources, cleaning fields, creating calculations, and manipulating data structures.

All you've been given is a folder of CSV and Excel files.

## THE OBJECTIVE

Use **Alteryx Designer** to:

- Connect to multiple data sources
- Clean, prepare and shape records
- Develop reports for end users
- Create macros and applications



Maven  
Data

# Setting Expectations

## 1 This course is designed to get you up and running with **Alteryx Designer**

- Our goal is to provide a deep foundational understanding of Alteryx Designer; we won't cover every single tool, or advanced topics like predictive modelling, machine learning, computer vision, text mining, or geospatial tools

## 2 We'll be focusing specifically on **ETL workflow development**

- This course is geared towards developers and analysts creating ETL (extract, transform, load) workflows to clean, transform and share data within their organization

## 3 We won't cover **Alteryx Server** in this course

- We'll be focusing primarily on Alteryx Designer's development and ETL-based functionality, rather than scheduling and managing published flows via Alteryx Server

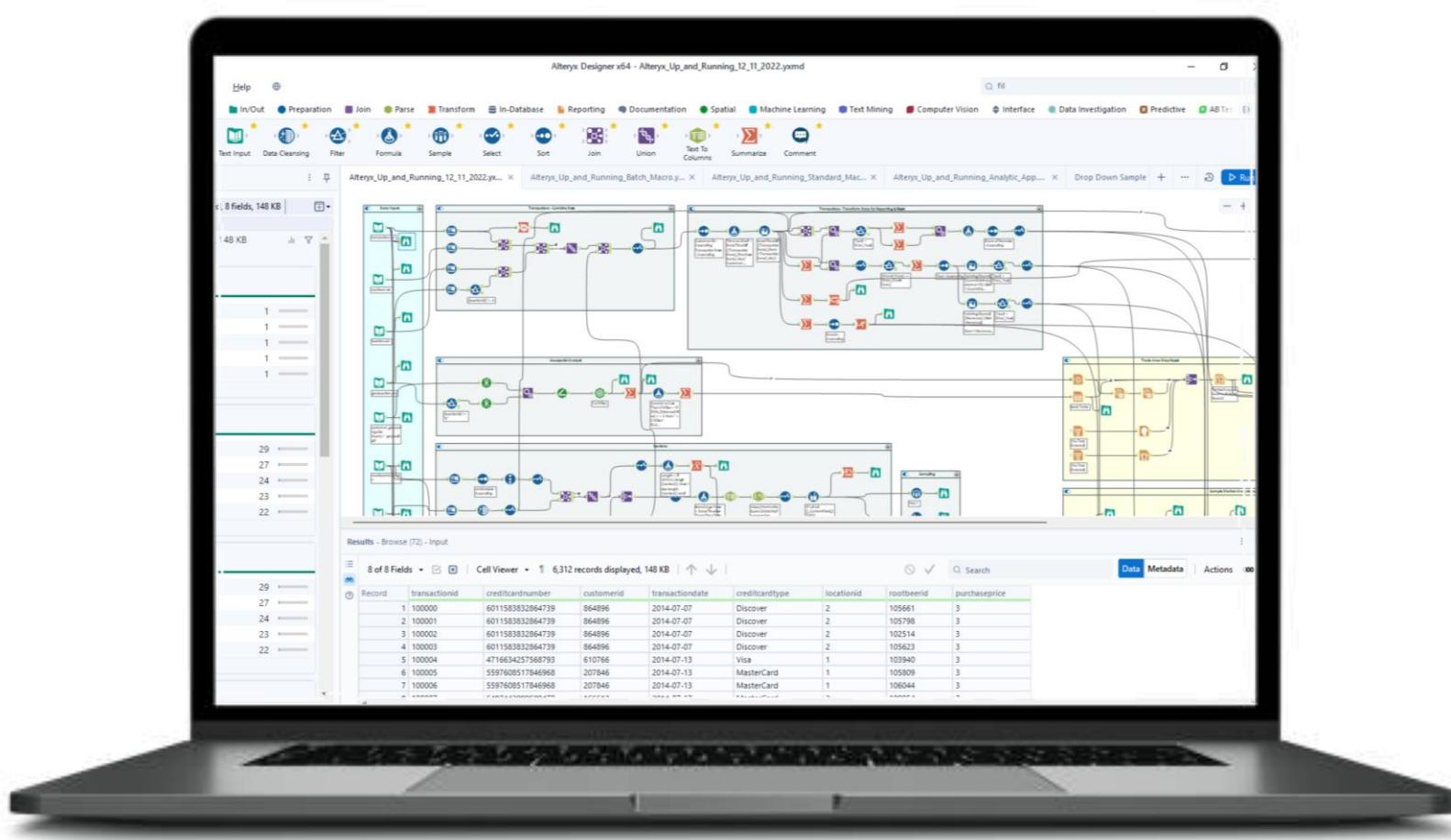
## 4 What you see on your screen **may not always match mine**

- Alteryx products update frequently, so features and functionality may change over time. We'll be using a free trial of Alteryx Designer for this course, which may look different than your own Alteryx designer deployment

# Intro to Alteryx Designer

# Meet Alteryx Designer

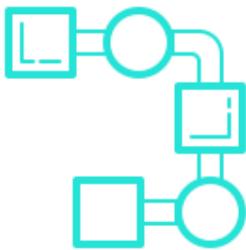
**Alteryx Designer** is a self-service data preparation program, providing users with intuitive, visual tools to automate the process of extracting, connecting, transforming and loading raw data



# Alteryx Product Suite

The **Alteryx Product Suite** includes several robust platforms and add-on tools to support collaborative data preparation, analytics, and data science/machine learning

## Alteryx Designer



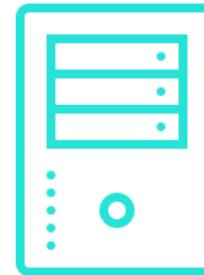
**Clean, prepare** and **automate** data flows while connecting to a myriad of data sources

## Alteryx Analytics Cloud



Leverage **data preparation** and **machine learning** tools in the **cloud** for collaborative analytics

## Alteryx Server



**Share, scale** and **automate** workflows across your entire organization

# Downloading Alteryx Designer (Free Trial)

## Start Free Trial



30 Days

### Designer Desktop Trial

- **Primary User:** Analysts
- **Primary Use Case:** Prep and Blend, Location Intelligence, Machine Learning
- **Primary Data Source(s):** Spreadsheets, Applications, Databases
- **Platform:** Windows Desktop

**Start Free Trial**



30 Days

### Designer Cloud Trial

- **Primary User:** Analysts & Data Engineers
- **Primary Use Case:** Data Preparation & Engineering, Cloud Reporting & Analytics, Cloud Data Onboarding
- **Primary Data Source(s):** Cloud Data Warehouses (Snowflake, BigQuery, S3, & more)
- **Platform:** Browser Based

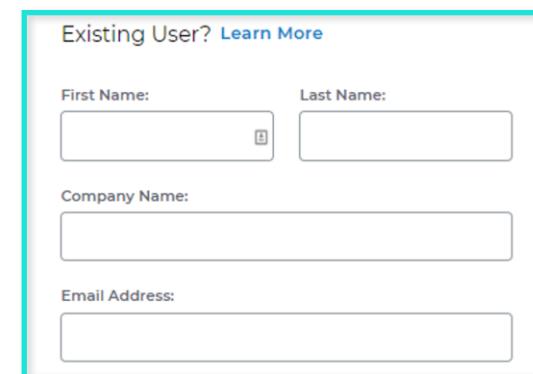
**Start Free Trial**



**IMPORTANT:** If you don't have access to Alteryx Designer, we recommend signing up for a **30-day free trial** to follow along with this course:

[alteryx.com/designer-trial/free-trial-alteryx](https://alteryx.com/designer-trial/free-trial-alteryx)

Keep in mind that you will **lose access after 30 days** unless you purchase the full version



Existing User? [Learn More](#)

First Name:  Last Name:

Company Name:

Email Address:

# Installing Alteryx Designer (Free Trial)

Installing Alteryx Designer will give you the option to activate your free trial or enter a key

The image shows two windows side-by-side. On the left is the 'alteryx | Download Manager' window. It displays the text 'Download and install one of the following:' followed by two options: 'Alteryx Designer 2022.3 x64 (typical)' (selected) and 'Alteryx Designer 2022.3 x64 with R-based Predictive Tools (advanced)'. Below these options is a 'Select a language:' dropdown menu set to 'English (United States)'. At the bottom are 'Next' and 'Cancel' buttons. A cyan arrow points from the 'Start Free Trial' button in the activation dialog to the 'Alteryx Designer 2022.3 x64 (typical)' option in the download manager. On the right is the 'Activate Alteryx Designer' dialog box. It has a title bar 'Activate Alteryx Designer' with a question mark icon and a close button. The main content area is titled 'Alteryx Designer Activation' with the sub-instruction 'Try a fully functional trial version before you purchase a license.' Below this is a 'Start Free Trial' button. Further down is a section for entering a license key, with the heading 'Already have a license key?' and a note 'Enter a license key. Don't have one yet? [Contact us.](#)'. It includes fields for 'Email' (a redacted email address) and 'License Keys' (containing 'XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXXX'). There is also a 'Privacy Policy' link and an 'Activate' button. At the bottom of the dialog is a note 'Other ways to activate: [Activate Offline](#) | [Activate by License Server](#)'.

# Alteryx Designer Workspace

The screenshot displays the Alteryx Designer workspace interface, which includes several panels:

- Plettes**: Groups of tools which have a common purpose or theme.
- Search**: Find tools, examples, and help guides.
- Configuration**: Shows options/selections available to customize a tool or workflow.
- Interface Designer**: Shows interface options/selections for analytic apps (typically hidden).
- Overview**: Zoomed out view of the entire flow and the current area of concentration.
- Tools**: Toolkit for transforming data as part of a workflow.
- Workflow Canvas**: Space where you can view and manage your data flows.
- Results**: Displays result details of data tools, notifications, and errors.

The central area of the workspace shows a complex data flow diagram (Workflow Canvas) with various tools connected by lines. The bottom panel shows the "Results" section with a list of messages and errors from the last run.

**Palettes**  
Groups of tools which have a common purpose or theme

**Search**  
Find tools, examples, and help guides

**Configuration**  
Shows options/selections available to customize a tool or workflow

**Interface Designer**  
Shows interface options/selections for analytic apps (typically hidden)

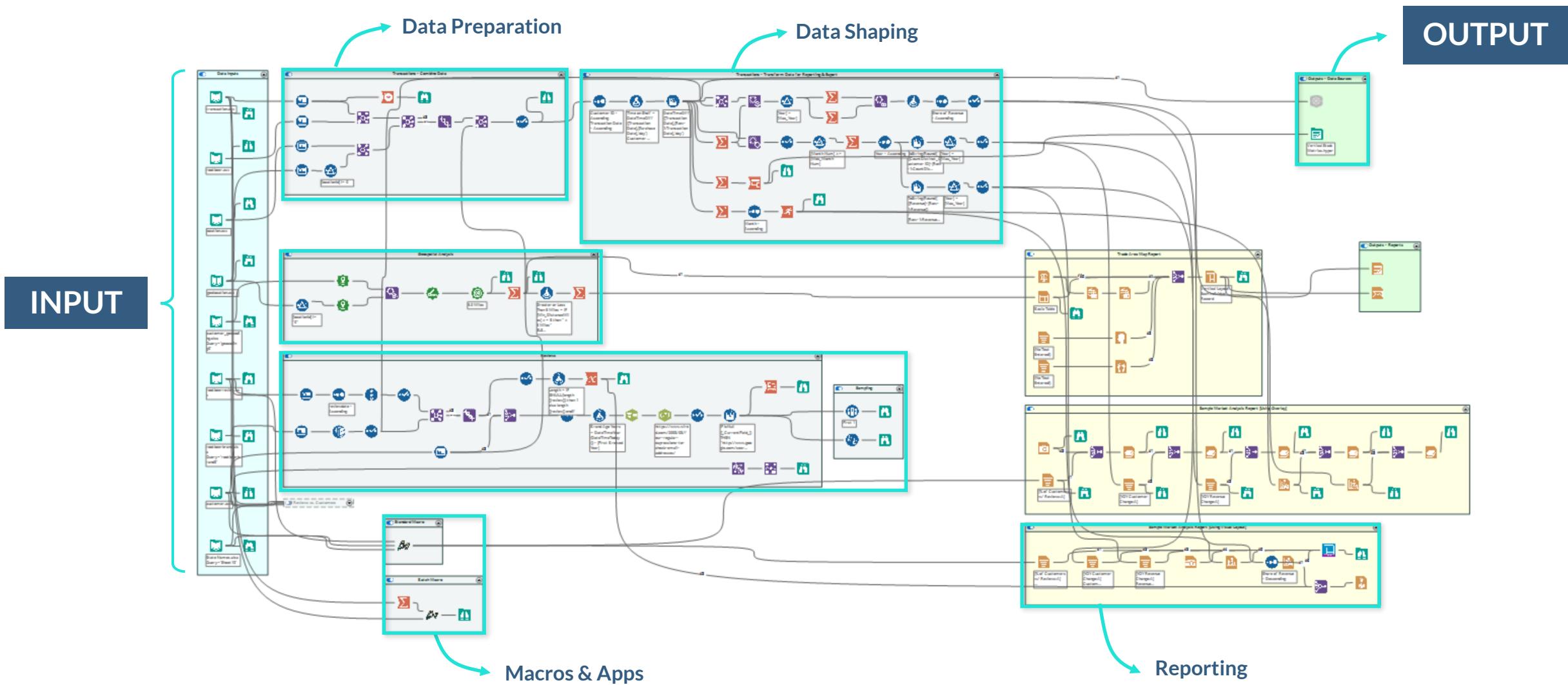
**Overview**  
Zoomed out view of the entire flow and the current area of concentration

**Tools**  
Toolkit for transforming data as part of a workflow

**Workflow Canvas**  
Space where you can view and manage your data flows

**Results**  
Displays result details of data tools, notifications, and errors

# Example Alteryx Flow



# Alteryx File Types

Alteryx leverages **several file types** to support workflows, data, special use, and license files



**YXMD** files represent repeatable **workflows**

(including inputs, outputs and tool configurations)



**YXWZ** files represent **analytic apps**

(parameter-driven workflows built for end-users)



**YXMC** files represent **macros**

(a packaged workflow used in other workflows)

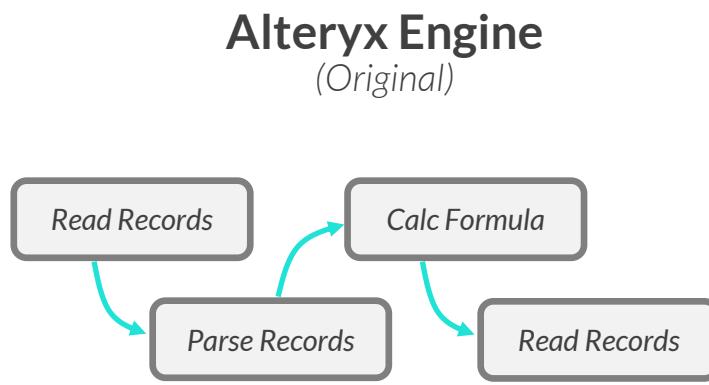


**YXDB** represents Alteryx **Database files**

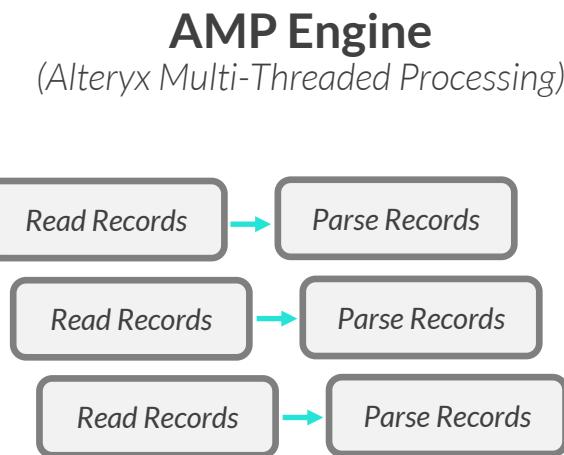
(most efficient read file for Alteryx (2GB limit))

# Alteryx Engine vs. AMP

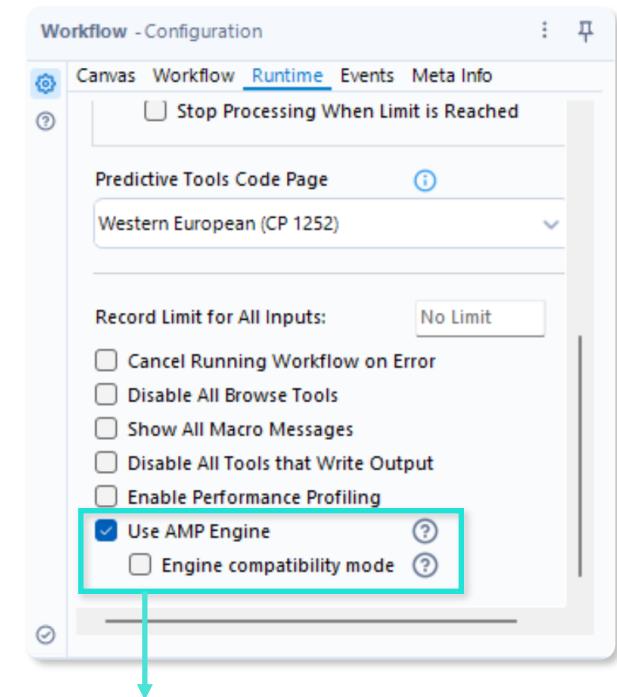
Users can leverage the default **Alteryx Engine** (single-threaded) or the **AMP Engine** (multi-threaded) to process the data each time a workflow runs



Alteryx Engine processes **each record** of a workflow via **single-threaded** processing



**Updated engine** which processes data **in parallel** through **multi-threaded** architecture



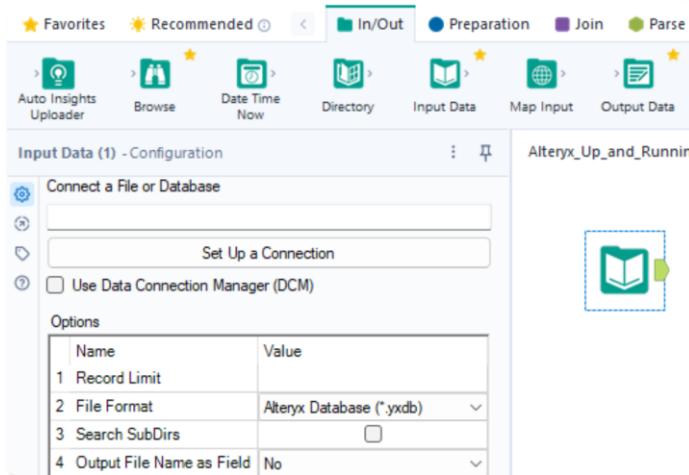
**PRO TIP:** Disable or enable AMP from the “Runtime” configuration menu

# Data Import & Export

# Data Connections

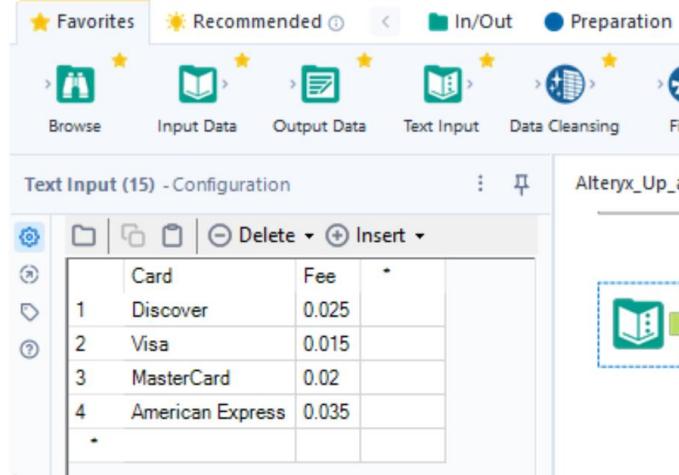
Alteryx Designer includes a range of **data connection** options for importing and exporting data

## Flat Files



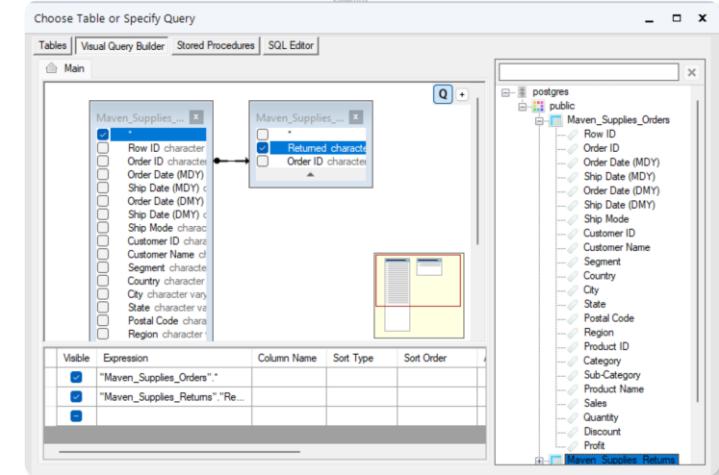
Connect to **flat files** using input and output data tools

## Text Input



Manually enter data using the **Text Input** tool or copy & paste

## Databases



Create connections to **databases** using visual queries or SQL



# Input Data – Flat Files

The **Input Data** tool enables users to bring data into a workflow from flat files or databases

- Integrate manually maintained datasets and consolidate multiple sources for reporting and analysis

The screenshot shows the Alteryx interface with two main windows. On the left, the 'Input Data - Configuration' window is open, showing the 'Set Up a Connection' tab selected. A teal arrow points from the 'Input Data' icon in the top navigation bar to this tab. Another teal arrow points from the 'File connections' section in the 'Data connections' pane on the right to the 'Select file' button. The 'Data connections' pane lists 'Recent', 'Saved', and 'Files' under 'File connections'. It also displays a 'Drag & drop' area and a 'Select file' button. Below this, a large list of 'All supported file types' is shown, including various formats like .cydb, .yxdb, .sz, .avro, .csv, .json, .dbf, .mdb, .shp, .xml, .flat, .grc, .grd, .kml, .gz, .tgz, .sav, .mif, .tab, .mdb, .accdb, .geo, .hyper, .txt, .asc, .log, .dat, and .zip.



**PRO TIP:** Drag files directly into the canvas to automatically add input data tools



# Input Data – Databases

The **Input Data** tool enables users to bring data into a workflow from flat files or databases

- Connect, model, and query data from database platforms directly in your flow and integrate with other sources

The figure consists of three side-by-side windows of the Input Data tool:

- Data connections:** Shows a list of data sources including Oracle, Microsoft SQL Server, Amazon Athena (selected and highlighted with a red box), and others like Amazon Aurora, Redshift, and S3.
- Choose Table or Specify Query:** Visual Query Builder view. It shows two tables: "Maven\_Supplies\_Orders" and "Maven\_Supplies\_Returns". A join condition "Returned = Order ID" is selected. Below the tables is a preview of the joined data and a table for defining expressions. A red arrow points from the "Amazon Athena" connection in the first window to this screen.
- Choose Table or Specify Query:** SQL Editor view. It displays a complex multi-table SQL query for selecting data from "Maven\_Supplies\_Orders" and "Maven\_Supplies\_Returns" based on the join condition. A red box highlights the "Test Query" button at the bottom of the window, and a red arrow points from the "Test Query" button in the second window to this one.



**PRO TIP:** SQL code is automatically generated from the visual query builder and can be tested from the SQL Editor window



# Text Input

The **Text Input** tool enables users to import small datasets or enter new data manually

- Create and maintain lookup tables or referential data tables (like goals or quota) for integration with larger datasets

**File Import**  
Import from a file using the folder icon (max 10,000 rows)

**Manual Entry**  
Enter data manually by selecting cells and typing

**Copy / Paste to Tool**  
Copy and paste using the paste icon in tool

**Copy / Paste to Canvas**  
Copy and paste directly into canvas

**PRO TIP:** Create example flows by selecting a tool and choosing “Open Example”

| Card               | Fee   |
|--------------------|-------|
| 1 Discover         | 0.025 |
| 2 Visa             | 0.015 |
| 3 MasterCard       | 0.02  |
| 4 American Express | 0.035 |

# PRO TIP: Adding Files from Folders



The **Directory** tool can be used with **Dynamic Input** to add multiple files from a folder

- This allows you to select multiple files based on wildcard filters, and union them based on a specified file structure

## 1 Select directory and wildcard

The screenshot shows the Alteryx Designer interface. In the top toolbar, the 'In/Out' tab is selected. On the canvas, a 'Directory' tool is connected to an 'Input Data' tool. The 'File Specification' field of the 'Directory' tool contains the wildcard filter 'google\*'. A green arrow points from this field to the text 'Wildcard Filter' below.

### Wildcard Filter

Wildcards create conditions for accessing multiple files

- \*.\* will return all file types
- \*.csv will return all csv files
- google\* will return all files beginning with "google"

## 2 Configure Dynamic Input

The screenshot shows the 'Connect a File or Database' dialog in Alteryx Designer x64. The 'File Specification' field contains the path 'i:\Documents\Maven Local Files\Alteryx - Up & Running\Datasets\Root Beer\google\_rootbeer\_2018.csv'. The 'Options' section includes settings for 'Name' (Comma Separated Value (\*.csv)), 'Delimiters' (,), 'First Row Contains Field Names' (checked), 'Field Length' (254), 'Start Data Import on Line' (3), and 'Ignore Delimiters in' (Quotes). A preview of the first 100 records is shown at the bottom.

## 3 Review Results

| Record | Week       | rootbeer: (United States) | FileName             |
|--------|------------|---------------------------|----------------------|
| 47     | 2018-11-25 | 37                        | google_rootbeer_2018 |
| 48     | 2018-12-02 | 50                        | google_rootbeer_2018 |
| 49     | 2018-12-09 | 59                        | google_rootbeer_2018 |
| 50     | 2018-12-16 | 53                        | google_rootbeer_2018 |
| 51     | 2018-12-23 | 80                        | google_rootbeer_2018 |
| 52     | 2018-12-30 | 56                        | google_rootbeer_2018 |
| 53     | 2019-01-06 | 70                        | google_rootbeer_2019 |
| 54     | 2019-01-13 | 56                        | google_rootbeer_2019 |
| 55     | 2019-01-20 | 59                        | google_rootbeer_2019 |
| 56     | 2019-01-27 | 56                        | google_rootbeer_2019 |
| 57     | 2019-02-03 | 64                        | google_rootbeer_2019 |
| 58     | 2019-02-10 | 63                        | google_rootbeer_2019 |



**PRO TIP:** Drag folders directly onto the canvas to automatically add directories

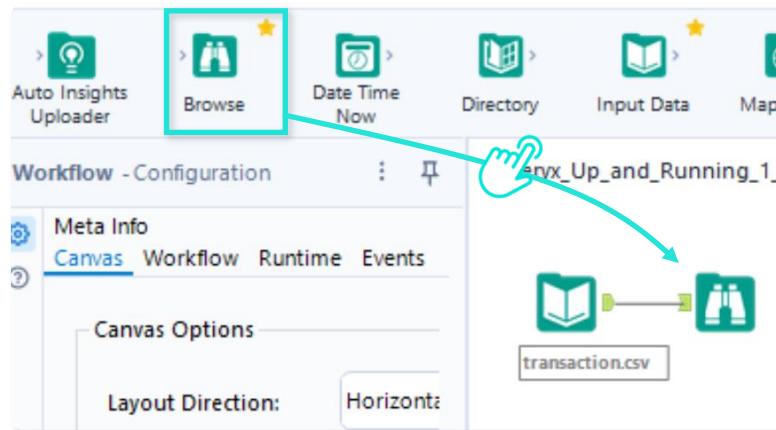


# Browse

The **Browse** tool allows users to preview and profile data from a connected source

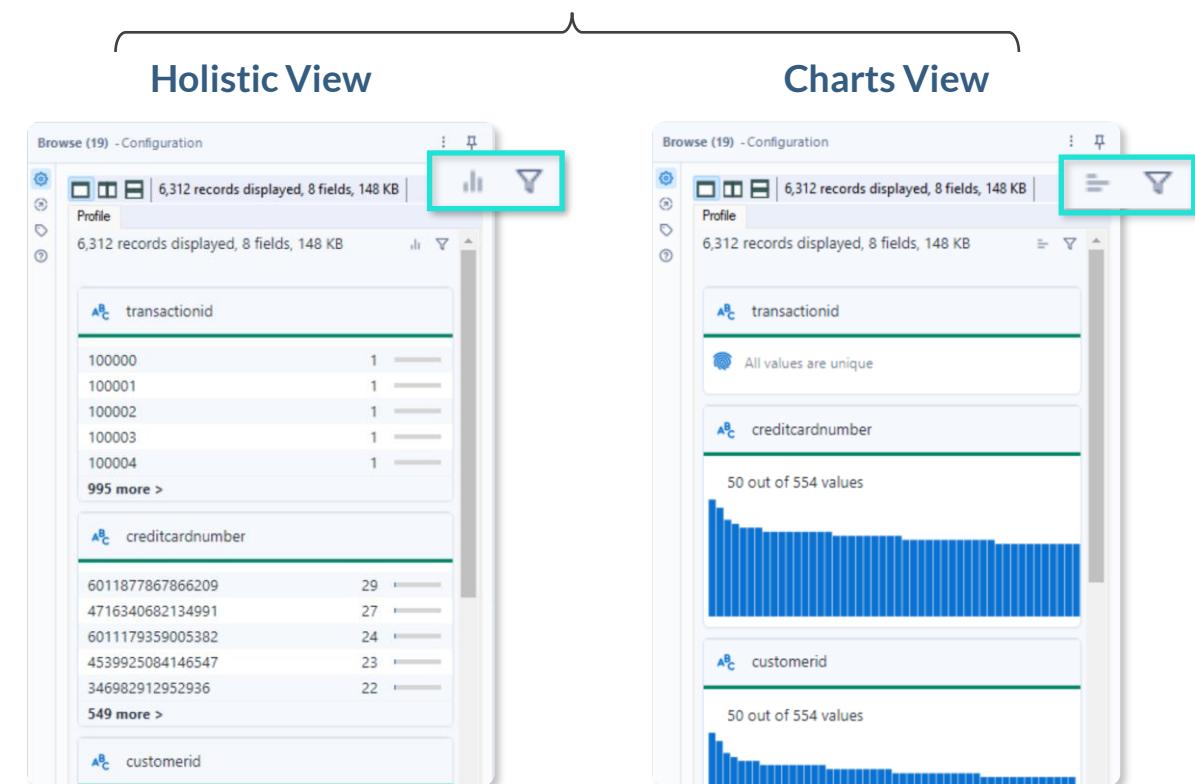
- Quickly QA and profile your data, or conduct outlier analysis or data validation as you develop your flow

## Adding a Browse Tool



**PRO TIP:** Drag the Browse tool onto the canvas or **right-click** a data source to select “Add Browse After”

## Data Profile





# Output Data | Flat Files

The **Output Data** tool enables users to write data back to flat files, databases or servers

- Write augmented and cleansed data back to flat files for reporting, data ingestion or direct analysis by end users

The screenshot shows the Alteryx interface with the 'Output Data' tool selected. The 'Output Options' section is highlighted, showing options like 'Create New Sheet' and 'Append To Existing Sheet'. A green arrow points from the 'Output Options' section to the 'Specify Output Options' section below.

## Specify Output Options

Choose to append, overwrite, or create new upon output

The screenshot shows the 'File connections' dialog box with the 'All supported file types' list. The 'Microsoft Excel .xlsx' option is highlighted with a green box and a green arrow pointing to the 'Specify Output Details' section below.

## Specify Output Details

Example: For Excel, specify a sheet or range for the output

The screenshot shows the 'Select Excel Output' dialog box. The 'Specify a sheet' section is highlighted with a green box and a green arrow pointing to the 'PRO TIP' section below. The dialog also includes options for specifying a range (cells, rows or columns) and buttons for Refresh, Help, Cancel, and OK.



**PRO TIP:** Output tools can be disabled for individual data connections or for the entire workflow (workflow > configuration runtime)



# Output Data | Databases

The **Output Data** tool enables users to write data back to flat files, databases or servers

- Write augmented and cleansed data back to databases for reporting, data ingestion or querying by end users

## Advanced Options

Field mapping, Pre/Post SQL statements, ignore errors, etc.

The screenshot shows the 'Output Data (35) - Configuration' window. It includes a 'Recent' connection named 'odbc:DSN=PostgreSQL35W;UID=postgres;PWD=\_\_EncPwd1\_\_|rootbeer\_google\_history'. Below it is a 'Set Up a Connection' button. Under 'Options', there is a table with 15 rows:

| Name                                    | Value                        |
|---|------------------------------|
| 1 Max Records Per File                  |                              |
| 2 File Format                           | ODBC Database (odbc:)        |
| 3 Passwords                             | Hide (Default)               |
| 4 Output Options                        | Create New Table             |
| 5 Append Field Map                      | By Field Name                |
| 6 Key for Update                        | Pick Key for Update Field(s) |
| 7 Pre Create SQL Statement              |                              |
| 8 Post Create SQL Statement             |                              |
| 9 Ignore Pre/Post SQL DROP TABLE Errors | <input type="checkbox"/>     |
| 10 Table/FieldName SQL Style            | Quoted                       |
| 11 Transaction Size                     | 10000                        |
| 12 Show Transaction Messages            | <input type="checkbox"/>     |
| 13 Spatial Object Field                 | None                         |
| 14 Spatial Object Field Size            | 8000                         |
| 15 Projection                           |                              |

At the bottom, there are checkboxes for 'Take File/Table Name From Field' and 'Append Suffix to File/Table Name', along with a dropdown for 'Field Containing File Name or Part of File Name' and a 'Keep Field in Output' option. A 'Disable Tool' checkbox is also present at the very bottom.

The screenshot shows the 'Data connections' panel. On the left, there are links for 'Recent', 'Saved', 'Files', 'Data sources' (which is selected and highlighted in grey), and 'Server'. To the right, under 'Frequently used data sources', are 'Microsoft SQL Server' (with 'Quick connect | ODBC | OleDB | Bulk') and 'Oracle' (with 'Quick connect | OCI | ODBC | OleDB | Bulk'). Under 'All data sources', are 'Amazon Athena' (with 'HDFS' and 'Quick connect') and 'Bulk'.

## Specify Output Options

Choose to append, overwrite, or create new tables upon output



**PRO TIP:** Connect using published Alteryx Server connections if possible to avoid configuring connection details (TBD)



# Tableau Output

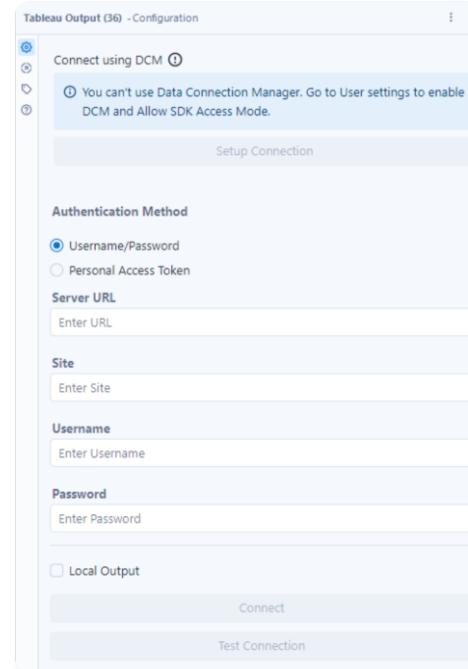
The **Tableau Output** tool enables users to publish data sources to Tableau Server/Online

## 1 Download & Install

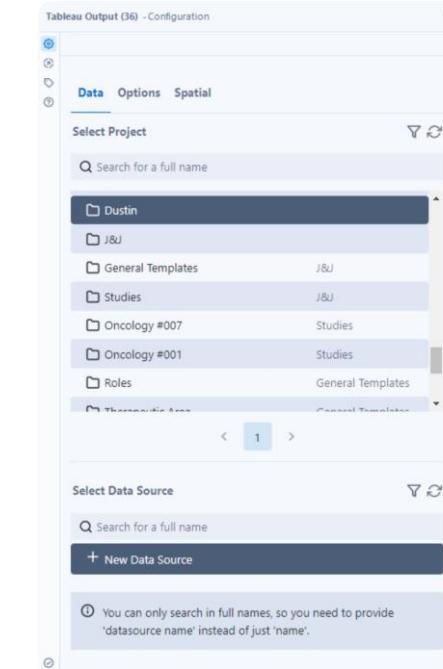


<https://community.alteryx.com/t5/Community-Gallery/Tableau-Output-Tool/ta-p/877902>

## 2 Enter Credentials



## 3 Project & Source



## 4 Output Options

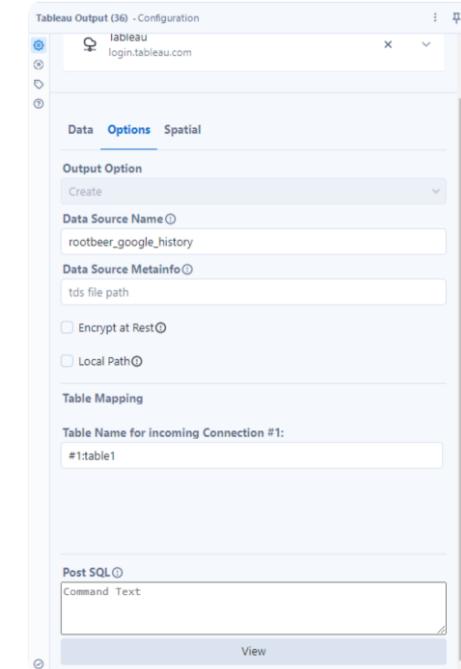


Tableau Output does not automatically come with Alteryx Designer, so users need to **download, install** and **configure** the tool (**NOTE:** Permission to publish to Tableau Server depends on your Tableau permissions)



# Date Time Now

The **Date Time Now** tool returns a single record representing the date and time a flow was run

- Leverage Date Time Now to timestamp database updates, document data freshness or write time-based expressions

The screenshot shows the Alteryx interface with the 'Date Time Now' tool selected. The configuration pane displays two dropdown menus: 'Specify your DateTime Language' set to 'English' and 'Output Format' set to 'HH:mm:ss'. Arrows point from both dropdowns to their respective language and format selection boxes on the right.

**Specify Language**  
Choose the language for your datetime output

**Output Format**  
Choose the date time formatting for your output

| Language  |
|-----------|
| English   |
| 简体中文      |
| Français  |
| Deutsch   |
| Italiano  |
| 日本語       |
| Português |
| Español   |

| Format              |
|---------------------|
| HH:mm:ss            |
| HHmmss              |
| day, dd Month, yyyy |
| dd-MM-yy            |
| dd-MM-yyyy          |
| dd-Mon-yy           |
| dd Month, yyyy      |
| dd/MM/yy            |
| dd/MM/yyyy          |
| dy, Month dd, yyyy  |
| dd/MM/yy            |



**PRO TIP:** Records created by the Date Time Now tool can be used to identify when data was updated or added, and can be used to populate "Last Updated" timestamps within Alteryx reports

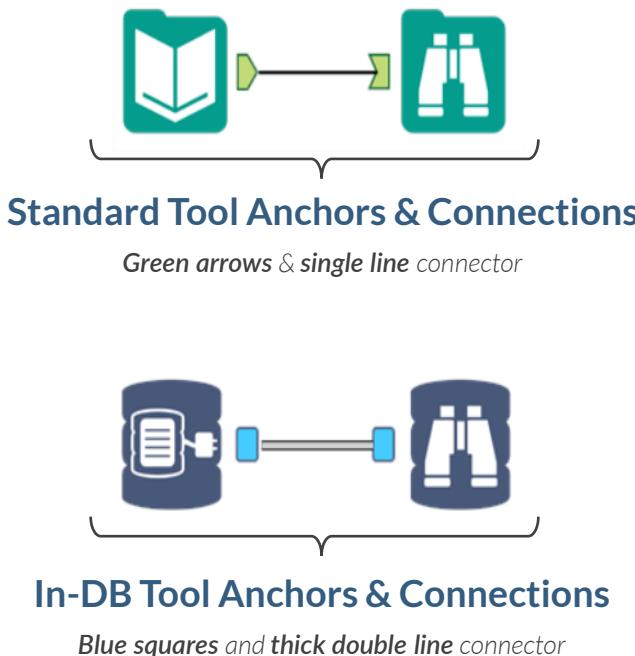


# PRO TIP: In-Database Tools

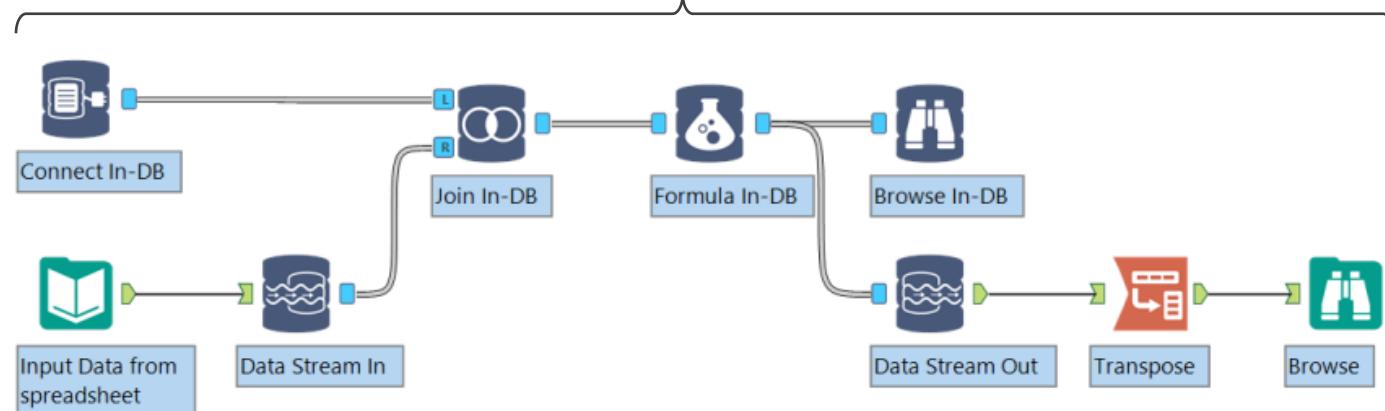
**In-Database** tools leverage the data source's resources to process data, rather than your machine

- Use In-DB tools for a speed & performance boost when connecting to large datasets (Snowflake, Databricks, etc.)

## In-DB vs. Standard Tools



## Example Flow Using In-DB



**PRO TIP:** Right-click on a standard tool and click “choose tool version” to convert it to an in-db tool

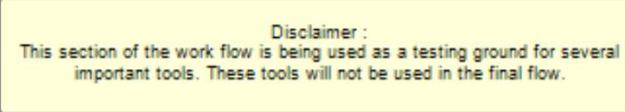


# PRO TIP: Comment

The **Comment** tool allows users to add annotations for clarification or documentation

- Leverage commentary tools to add detail or documentation for end users or other Alteryx developers

## Custom Text



**Comment text** provides excellent documentation of processes and technical details

## Images



**Comment images** allow for custom brands, diagrams, or technical imagery integration

## Shapes & Color



**Comment shapes** can be used for process flow diagrams and visual aids



# PRO TIP: Tool Container

The **Tool Container** enables you to organize and control workflow behavior and format

- Organize and group your tools for documentation, flow segmentation and process mapping

The image shows a screenshot of the 'Tool Container (301) - Configuration' dialog box on the left and a 'Transactions - Combiner' workflow on the right.

**Formatting**  
Format text, fill, border, transparency and margin of the container from the configuration menu

**Caption**  
Add container titles

**Disable Container**  
Turn off all tools within a container via the configuration menu or toggle

**Collapse**  
Containers can be collapsed by selecting the toggle on the top right corner (this saves space when a container is disabled)

**Tool Container (301) - Configuration**

- Caption:** A text input field where 'Caption' is highlighted with a red box.
- Data Inputs:** A section containing:
  - ID:** Set to 301.
  - Reset to Defaults** button.
  - Text Color:** Hex code R=49, G=76, B=74.
  - Fill Color:** Hex code R=223, G=255, B=255.
  - Border Color:** Hex code R=49, G=76, B=74.
  - Transparency:** Set to 25.
  - Margin:** Set to Small.
- Disabled:** A checkbox labeled 'Disabled' is checked.

**Transactions - Combiner**

This diagram illustrates a data processing workflow. It starts with two CSV inputs: 'transaction.csv' and 'rootbeer.csv'. These feed into a series of operations: a 'Data Inputs' step, followed by four 'Table' steps, each connected to a 'Join' step. The 'Join' steps then connect to a 'Transactions - Combiner' step, which finally outputs to a 'Binoculars' step. A condition '[locationid] != 0' is applied to one of the 'Join' steps. The 'Data Inputs' step has its 'Disabled' checkbox checked, demonstrating how a container can be disabled.



# PRO TIP: Explorer Box

The **Explorer Box** enables users to display a web page, file directory or file in your workflow

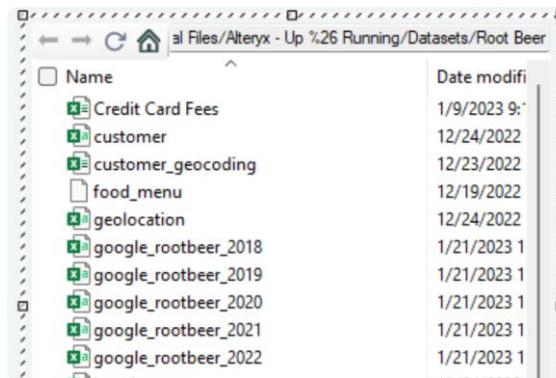
- Include supplemental information to your flow or add drag & drop directory access for easy flat file integration

Web Page



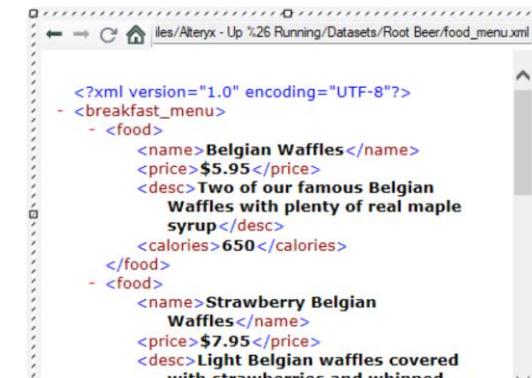
<http://community.alteryx.com>

Directory



C:\Program Files\Alteryx\File\

Files



C:\Program Files\Alteryx\File\text.html



**PRO TIP:** You can drag files from the explorer box into your flow when pointed to a directory

# Key Takeaways

---

-  **Input tools** allow users to connect to data stored in flat files or databases, or create new data manually (via text)
-  **Output tools** enable writeback from Alteryx flows to various data sources, including flat files, databases or servers
-  **In-Database tools** can be used to run workflow processes on database platforms rather than local machines
-  **Documentation tools** like comments, explorer boxes and containers can help users organize and document Alteryx workflows

# Data Preparation

# Data Preparation

**Data Preparation** tools allow users to organize, clean and modify data within a workflow

## Organize



Record ID



Multi-Field Binning\*



Select



Sort



Select Records

## Clean



Data Cleansing



Auto Field



Filter



Unique



Imputation

## Modify



Formula



Multi-Field Formula



Multi-Row Formula



Sample



Generate Rows\*



# Select

The **Select** tool modifies column properties and metadata within an Alteryx workflow

- Standardizing data types and naming conventions is particularly important if you plan to join or combine data sources

| Field  | Type                               | Size   | Rename          | Description                                       |
|--|------------------------------------|--|-----------------|---|
| Represents the base column coming into the select tool | Modify the data type of the column | Adjust size of the column (typically dictated by type) | Rename a column | Leave notes/ documentation related to each column |

**Options** Apply further customization

**Select/De-Select** De-select to exclude a column from the flow

**Search** Search for text contained within the Field, Rename, or Description fields

| Field            | Type     | Size | Rename | Description           |
|------------------|----------|------|--------|-----------------------|
| transactionid    | V_String | 254  |        |                       |
| creditcardnumber | V_String | 254  |        |                       |
| customerid       | V_String | 254  |        |                       |
| transactiondate  | V_String | 254  |        |                       |
| creditcardtype   | V_String | 254  |        |                       |
| locationid       | V_String | 254  |        |                       |
| rootbeerid       | V_String | 254  |        |                       |
| purchaseprice    | V_String | 254  |        |                       |
| *Unknown         | Unknown  | 0    |        | Dynamic or Unknown... |



**PRO TIP:** Use the **[data type: Forced]** option to ensure that a column always contains the expected data type



# Sort

The **Sort** tool arranges records within a table in alphanumeric order based on field values

- Sorting helps to prepare your data for position-based calculations, additional transformations, reports and visuals, etc.

**Dictionary Order**  
Checks the sort against a set of language dictionaries

**Language**  
Choose between English, French, German, Italian, Portuguese, and Spanish

**Sort (61) - Configuration**

Use Dictionary Order

English (United States)

**Fields**

| Name       | Order     |
|------------|-----------|
| reviewdate | Ascending |
| *          |           |

Up and Down arrows for nested sorting

**Alteryx\_Up\_and\_Running\_1\_Connecti**

customer\_geocodi  
ng.xlsx  
Query='geocodin  
g\$'

rootbeerreview

**Name**  
Choose the field you'd like to sort records by

**Order**  
Choose ascending or descending sort order

**Nested Sort Order**  
For multi-field sorting, arrange the fields using the up/down arrows to order sort logic

# Record ID

The **Record ID** tool creates a new unique identifier or index column to a dataset in the flow

- Create indices to identify specific records or generate primary keys for relational data modeling

The screenshot shows the Alteryx interface with two main components: the 'Record ID (62) - Configuration' dialog box on the left and a workflow canvas on the right.

**Record ID (62) - Configuration:**

- Name:** Enter a name for the new unique record ID column. The input field contains "RecordID".
- Type:** Choose a data type for the record id. The dropdown menu shows "Int32".
- Options:**
  - Position:** Choose first or last column. The dropdown menu shows "First Column".
  - Size:** If string type is selected, choose a size for the record id. The input field contains "6".
- Starting Value:** Enter a starting value for the first record (increases sequentially for each new record). The input field contains "1".

**Workflow Canvas:**

- A workflow is shown with three inputs: "customer\_geocoding.xlsx" (Query='geocoding\$'), "rootbeerreview.csv" (reviewdate - Ascending), and "rootbeerbrand.xlsx" (Query='rootbeerb').
- The "customer\_geocoding.xlsx" and "rootbeerreview.csv" inputs are connected to a "Record ID" tool.
- The output of the "Record ID" tool is connected to the "rootbeerbrand.xlsx" input.
- The "Record ID" tool has a green border and a cyan arrow points to its "Starting Value" input field.

**Annotations:**

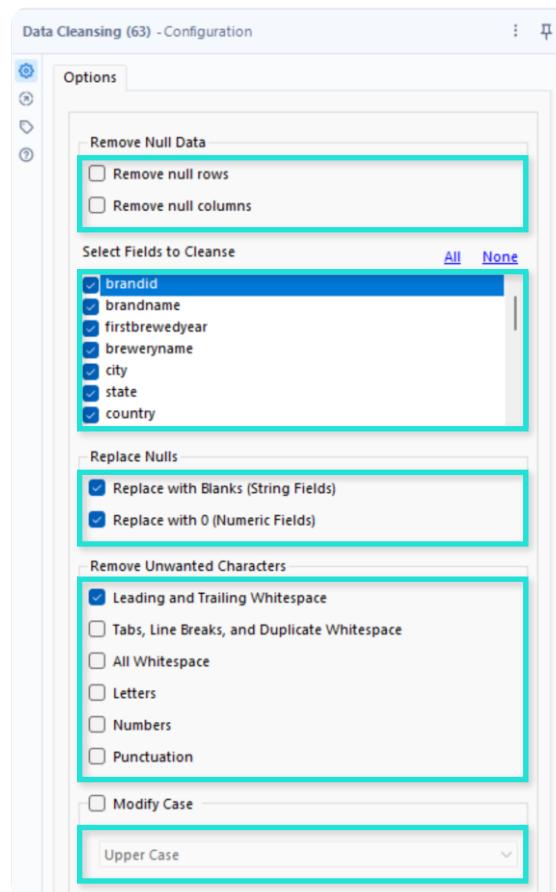
- Name:** Points to the "Name" input field in the configuration dialog.
- Type:** Points to the "Type" dropdown in the configuration dialog.
- Position:** Points to the "Position" dropdown in the configuration dialog.
- Size:** Points to the "Size" input field in the configuration dialog.
- Starting Value:** Points to the "Starting Value" input field in the configuration dialog.



# Data Cleansing

The **Data Cleansing** tool fixes common data quality issues like null values, whitespace and more

- Addressing common QA issues is a critical step to prepare data for transformation and analysis



## Remove Null Data

Remove either null rows or null columns from the data stream

## Select Fields to Cleanse

Choose which fields will be impacted by the cleanse functions

## Replace Nulls

Replace nulls with blanks for strings or 0 for numeric fields (both can be selected)

## Remove Unwanted Characters

Choose between several types of unwanted characters to remove

## Modify Case

Choose between Upper, Lower and Title case for string fields



# Auto Field

The **Auto Field** tool sets field types to their smallest possible size based on the data they contain

- Optimize flow processing and data storage by minimizing field size and establishing best-fit data types early in your flow

Auto Field (64) - Configuration

Select String Fields to Auto Change Field Type

- Credit Card Number
- Credit Card Type
- Customer ID
- Location ID
- Purchase Price
- Rootbeer ID
- Transaction ID
- Dynamic or Unknown Fields

**Select Fields**

Choose the string fields you'd like to auto change

**Before**

|   | Field            | Type     | Size | Rename             |
|---|------------------|----------|------|--------------------|
| ▶ | creditcardnumber | V_String | 254  | Credit Card Number |
| ▶ | creditcardtype   | V_String | 254  | Credit Card Type   |
| ▶ | customerid       | V_String | 254  | Customer ID        |
| ▶ | locationid       | V_String | 254  | Location ID        |
| ▶ | purchaseprice    | V_String | 254  | Purchase Price     |
| ▶ | rootbeerid       | V_String | 254  | Rootbeer ID        |
| ▶ | transactiondate  | Date     | 10   | Transaction Date   |
| ▶ | transactionid    | V_String | 254  | Transaction ID     |

**After**

|   | Field              | Type     | Size | Rename |
|---|--------------------|----------|------|--------|
| ▶ | Credit Card Number | Int64    | 8    |        |
| ▶ | Credit Card Type   | V_String | 16   |        |
| ▶ | Customer ID        | Int32    | 4    |        |
| ▶ | Location ID        | Byte     | 1    |        |
| ▶ | Purchase Price     | Byte     | 1    |        |
| ▶ | Rootbeer ID        | Int32    | 4    |        |
| ▶ | Transaction Date   | Date     | 10   |        |
| ▶ | Transaction ID     | Int32    | 4    |        |



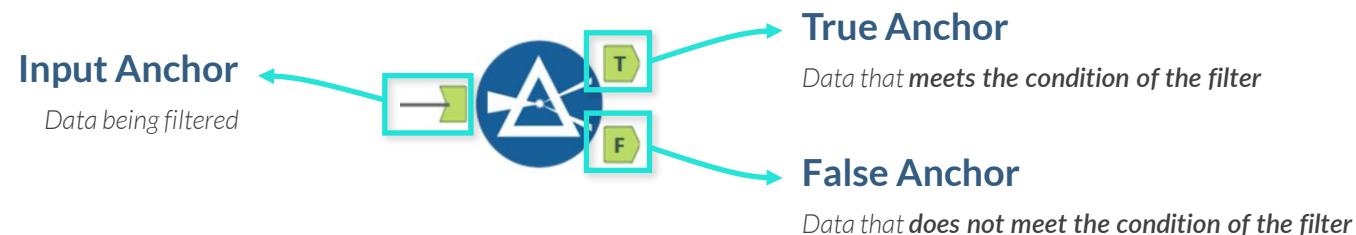
**PRO TIP:** Run Auto Field prior to creating downstream tools to avoid data type errors later!



# Filter

The **Filter** tool filters data using conditions and splits it into two output anchors: **True** or **False**

- Use Basic filters for single-criteria logic, or Custom filters for more complex, multi-criteria logic



## fx Functions

View the list of available functions

- > Conditional
- > Conversion
- > DateTime
- > File
- > Finance
- > Math

## x Columns

View existing columns

- Existing Columns
  - locationid
  - locationname
  - streetaddress
  - city
  - state
  - zipcode

## Expressions

View recent or saved expressions

- Recent Expressions
  - [locationid] != "0"
  - [reviewdate] > 2013-01-01 AND [starrating] <= 3
  - IF IsNull([\_CurrentField\_]) THEN "http://www.google.com/search?q="...
  - [creditcardtype] = "Visa"
  - [Fee]

## Save Expression

Save expression for later use

Save Expression

Save Cancel

## Basic Filter

Filter (70) - Configuration

Select Basic or Custom Filter

Basic filter

locationid Does not equal 0

Custom filter

`fx [locationid] != "0"`

## Custom Filter

Filter (71) - Configuration

Select Basic or Custom Filter

Basic filter

Select column... =

Custom filter

`fx [reviewdate] > '2013-01-01'`

`X [starrating] <= 3`



# Formula

The **Formula** tool creates new columns or updates existing ones using calculated expressions

- Derive new measures, dimensional groupings or logical flags to enhance and improve your dataset

**Output Column**  
Modify an existing column or create new

**Re-Order Tool**  
Moves sequential order of output columns

**Collapse Button**  
Hides expression box detail

**Data Preview**  
Example output from column expression

**Expression Box**  
Workspace for writing formula and function-based expressions

**fx Functions**  
View the list of available functions

- Conditional
- Conversion
- DateTime
- File
- Finance
- Math

**Expressions**  
View recent or saved expressions

- [locationid] != "0"
- [reviewdate] > '2013-01-01' AND [starring] <= 3
- IF IsNull([\_CurrentField\_]) THEN "http://www.qooqle.com/search?q="...
- [creditcardtype] = "Visa"
- [Fee]

**x Columns**  
View existing columns

- Existing Columns
- locationid
- locationname
- streetaddress
- city
- state
- zipcode

**Save Expression**  
Save expression for later use

Save Expression

Save Cancel



# Multi-Field Formula

The **Multi-Field Formula** tool creates multiple new columns or updates multiple existing columns

- Save time by applying the same logical expressions against like-fields in your dataset

**Select Type**  
Choose field type to filter field selection list

**Select Fields**  
Choose fields to impact

**Copy Output Fields and Add**  
If selected, new fields will be created with prefix or suffix appended

**Change Output Type To**  
If selected, field types of output fields will be modified

**Variables**  
Choose from current fields, original fields or constants to bring into your expression

**Functions**  
List of functions available to use in your expression

**Saved Expressions**  
List of saved expressions available to use in your expression

**Expression Box**  
Workspace for writing formula and function-based expressions

```
IF IsNull([_CurrentField_])
THEN "http://www.google.com/search?q=" + [brandname]
ELSE [_CurrentField_]
ENDIF
```



# Multi-Row Formula

The **Multi-Row Formula** tool can be used to reference data relative to the current row

- Create table-based calculations such as running totals, cagr functions, weighted averages, etc.

## Update Existing or Create New Field

Choose new or existing field and select a name and data type

## Num Rows & Values for Rows

Choose how far to offset and how to handle non-existent rows

## Group by

Determine the grouping/partitioning logic for your formula

## Variables

List of variables to use in your expression

## Functions

List of functions available to use in your expression

## Saved Expressions

List of saved expressions available to use in your expression

## Expression Box

Workspace for writing formula and function-based expressions

Multi-Row Formula (76) - Configuration

Update Existing Field  
Create New Field

Type: Int32 Size: 4

Num Rows: 1 Values for Rows that don't Exist: 0 or Empty

Group By (Optional): Customer ID

Variables: Row -1, Row +0 - Active Row, Row +1, Constants

Functions:

Saved Expressions:

Expression: DateTimeDiff([Transaction Date],[Row-1:Transaction Date],'day')

## Example Expression Path

| Customer ID | Transaction Date | Days Since Last Purchase |
|-------------|------------------|--------------------------|
| 249779      | 2015-11-12       | 0                        |
| 249779      | 2016-01-21       | 70                       |
| 249779      | 2016-01-21       | 0                        |
| 249779      | 2016-03-09       | 48                       |
| 249779      | 2016-07-03       | 116                      |
| 111991      | 2015-01-27       | [Null]                   |
| 111991      | 2015-01-27       | 0                        |
| 111991      | 2015-01-27       | 0                        |
| 111991      | 2015-03-08       | 40                       |
| 111991      | 2015-09-13       | 189                      |
| 111991      | 2016-02-24       | 164                      |
| 111991      | 2016-03-01       | 6                        |
| 111991      | 2016-03-01       | 0                        |

## Group by = "Customer ID"

Note that the calculation **only applies to records within a specific group/partition** (in this case each value in the Customer ID field)



# Unique

The **Unique** tool determines whether records are unique or duplicates based on column groupings

- Generate unique dimensional lists, deduplicate records, or segment repeated records for further QA/processing

Unique (77) - Configuration

Select columns to find unique values from:

Column Names

- customerid
- brandid
- starrating
- reviewdate
- review

Select All

Results - Unique (77) - Input

5 of 5 Fields | Cell Viewer | 714 records displayed

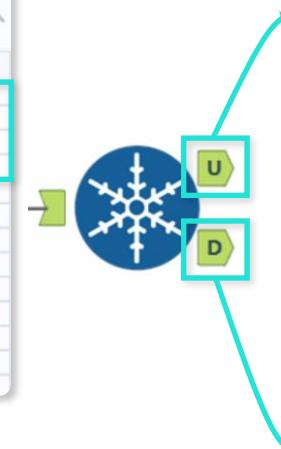
| Record | customerid | brandid | starrating | reviewdate |
|--------|------------|---------|------------|------------|
| 1      | 101811     | 10012   | 5          | 2013-07-15 |
| 2      | 101811     | 10014   | 1          | 2013-07-08 |
| 3      | 101811     | 10015   | 3          | 2013-07-25 |
| 4      | 101811     | 10021   | 2          | 2013-11-15 |
| 5      | 105549     | 10015   | 2          | 2013-08-11 |
| 6      | 105549     | 10020   | 1          | 2013-10-09 |
| 7      | 105771     | 10003   | 3          | 2013-09-10 |
| 8      | 105771     | 10018   | 3          | 2014-03-18 |
| 9      | 108708     | 10010   | 3          | 2012-11-18 |
| 10     | 109251     | 10005   | 3          | 2013-04-14 |
| 11     | 110363     | 10018   | 3          | 2013-11-15 |
| 12     | 110363     | 10019   | 5          | 2013-12-27 |
| 13     | 111486     | 10009   | 3          | 2013-06-03 |

## Column Names

Select columns you want to determine unique records by



**PRO TIP:** Sort your data first to ensure that you get expected results



Results - Unique (77) - Out - Unique

5 of 5 Fields | Cell Viewer | 362 records displayed

| Record | customerid | brandid | starrating | reviewdate |
|--------|------------|---------|------------|------------|
| 1      | 101811     | 10012   | 5          | 2013-07-15 |
| 2      | 105549     | 10015   | 2          | 2013-08-11 |
| 3      | 105771     | 10003   | 3          | 2013-09-10 |
| 4      | 108708     | 10010   | 3          | 2012-11-18 |
| 5      | 109251     | 10005   | 3          | 2013-04-14 |

## Unique Anchor

Contains **first non-duplicate record** based on selected columns

Results - Unique (77) - Out - Duplicates

5 of 5 Fields | Cell Viewer | 352 records displayed

| Record | customerid | brandid | starrating | reviewdate |
|--------|------------|---------|------------|------------|
| 1      | 101811     | 10014   | 1          | 2013-07-08 |
| 2      | 101811     | 10015   | 3          | 2013-07-25 |
| 3      | 101811     | 10021   | 2          | 2013-11-15 |
| 4      | 105549     | 10020   | 1          | 2013-10-09 |
| 5      | 105771     | 10018   | 3          | 2014-03-18 |
| 6      | 110363     | 10019   | 5          | 2013-12-27 |

## Duplicate Anchor

Contains **only the duplicate records** based on selected columns



# Sample

The **Sample** tool limits data to a specified number of records based on all or select columns

- Create data samples for building and running statistical models or machine learning algorithms

The screenshot shows the 'Sample (79) - Configuration' dialog box. It has three main sections:

- Select Sample Type:** A list of sampling methods:
  - First N rows
  - Last N rows
  - Skip 1st N rows
  - 1 of every N rows
  - 1 in N chance to include each row
  - First N% of rows
- N Value:** A numeric input field set to '1' with up and down arrows.
- Group by column (optional):** A list of columns with checkboxes:
  - customerid
  - brandid
  - starrating
  - reviewdate
  - reviewA 'Select all' button is at the top right of this list.

Annotations on the right side explain the sections:

- Select Sample Type**: Choose a method for sampling the dataset:
  - *First N Rows*
  - *Last N Rows*
  - *Skip 1<sup>st</sup> N Rows*
  - *1 of every N Rows*
  - *1 in N Chance to Include Each Row*
  - *First N% of Rows*
- N Value**: Specify value for "N" for select sample type
- Group by Column**: Optional grouping by selected columns: N records returned **per group**



# Select Records

The **Select Records** tool can be used to return specified records for troubleshooting or sampling

- Isolate records to create test and training datasets, or extract samples for further testing or diagnostics

**Select Records (1) - Configuration**

**Questions**

**Range Examples:**

- 2
- 3
- 17-20
- 50+

Enter the numeric ranges of records to return:

1-10  
20-24

A cyan box highlights the 'Enter the numeric ranges of records to return:' input field, and a cyan arrow points from this box to the 'Numeric Ranges' section below.

## Numeric Ranges

Varying numeric ranges can be listed to pull records from an input dataset

| Record | ROWID  | customerid | brandid | starring   | reviewdate                          | review |
|--------|--------|------------|---------|------------|-------------------------------------|--------|
| 1 1    | 101811 | 10012      | 5       | 2013-07-15 | [Null]                              |        |
| 2 2    | 101811 | 10014      | 1       | 2013-07-08 | [Null]                              |        |
| 3 3    | 101811 | 10015      | 3       | 2013-07-25 | [Null]                              |        |
| 4 4    | 101811 | 10021      | 2       | 2013-11-15 | [Null]                              |        |
| 5 5    | 105549 | 10015      | 2       | 2013-08-11 | [Null]                              |        |
| 6 6    | 105549 | 10020      | 1       | 2013-10-09 | [Null]                              |        |
| 7 7    | 105771 | 10003      | 3       | 2013-09-10 | [Null]                              |        |
| 8 8    | 105771 | 10018      | 3       | 2014-03-18 | You could have done better Sactown. |        |
| 9 9    | 108708 | 10010      | 3       | 2012-11-18 | [Null]                              |        |
| 10 10  | 109251 | 10005      | 3       | 2013-04-14 | [Null]                              |        |
| 11 11  | 110363 | 10018      | 3       | 2013-11-15 | [Null]                              |        |
| 12 12  | 110363 | 10019      | 5       | 2013-12-27 | [Null]                              |        |
| 13 13  | 111486 | 10009      | 3       | 2013-06-03 | [Null]                              |        |
| 14 14  | 111486 | 10010      | 5       | 2013-09-14 | [Null]                              |        |
| 15 15  | 111486 | 10013      | 4       | 2013-07-09 | [Null]                              |        |

## Before

| Record | ROWID  | customerid | brandid | starring   | reviewdate                          | review |
|--------|--------|------------|---------|------------|-------------------------------------|--------|
| 1 1    | 101811 | 10012      | 5       | 2013-07-15 | [Null]                              |        |
| 2 2    | 101811 | 10014      | 1       | 2013-07-08 | [Null]                              |        |
| 3 3    | 101811 | 10015      | 3       | 2013-07-25 | [Null]                              |        |
| 4 4    | 101811 | 10021      | 2       | 2013-11-15 | [Null]                              |        |
| 5 5    | 105549 | 10015      | 2       | 2013-08-11 | [Null]                              |        |
| 6 6    | 105549 | 10020      | 1       | 2013-10-09 | [Null]                              |        |
| 7 7    | 105771 | 10003      | 3       | 2013-09-10 | [Null]                              |        |
| 8 8    | 105771 | 10018      | 3       | 2014-03-18 | You could have done better Sactown. |        |
| 9 9    | 108708 | 10010      | 3       | 2012-11-18 | [Null]                              |        |
| 10 10  | 109251 | 10005      | 3       | 2013-04-14 | [Null]                              |        |
| 11 20  | 116690 | 10022      | 1       | 2014-05-07 | [Null]                              |        |
| 12 21  | 116934 | 10016      | 2       | 2012-12-15 | [Null]                              |        |
| 13 22  | 119406 | 10014      | 3       | 2013-09-08 | [Null]                              |        |
| 14 23  | 121639 | 10015      | 5       | 2013-05-24 | [Null]                              |        |
| 15 24  | 122818 | 10004      | 1       | 2013-03-13 | Too much bite, not enough barg.     |        |

## After



# Imputation

The **Imputation** tool replaces specified numeric field values with user defined values

- Replace null or incorrect values to ensure proper data processing and expression validity in calculations

**Fields to Impute**  
Select which fields you want to update

**Incoming Value to Replace**  
Replace Null or specific value

**Replace With Value**  
Select value to use as replacement (avg, median, mode, or specified value)

**Include Imputed Value Ind.**  
Add indicator field to identify imputed records

**Output Imputed Values Field**  
Add imputed value field next to original field

A vertical bracket on the left side groups the five sections above, pointing to the **Imputation Options** configuration window.

**Imputation Options**

- Fields to impute:** Days Since Last Purchase (selected)
- Incoming value to replace:** Null()
- Replace with value:** User specified value... (selected), 0.00000
- Output imputed values field:** Output imputed values as a separate field (unchecked)

**Before**

| Month Num | Year | Days Since Last Purchase |
|-----------|------|--------------------------|
| 8         | 2015 | [Null]                   |
| 7         | 2015 | [Null]                   |
| 6         | 2015 | [Null]                   |
| 1         | 2015 | [Null]                   |
| 4         | 2015 | [Null]                   |
| 10        | 2014 | [Null]                   |
| 9         | 2015 | [Null]                   |
| 3         | 2015 | [Null]                   |
| 3         | 2015 | [Null]                   |
| 6         | 2015 | [Null]                   |
| 4         | 2015 | [Null]                   |
| 8         | 2015 | [Null]                   |
| 4         | 2015 | [Null]                   |

**After**

| Year | Days Since Last Purchase |
|------|--------------------------|
| 2015 | 0                        |
| 2015 | 0                        |
| 2016 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2016 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2016 | 0                        |
| 2016 | 0                        |
| 2015 | 0                        |
| 2016 | 0                        |
| 2016 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |
| 2015 | 0                        |

# Key Takeaways

---

- ✓ **Auto Field** and **Data Cleansing** tools can be used to optimize field types and address common data issues like null values or unwanted characters
- ✓ **Formulas** (including **Multi-Row** and **Multi-Field** formulas) can modify existing fields or create new ones based on calculated expressions
- ✓ **Select**, **Filter** and **Sort** tools are commonly used to prepare and organize raw data for further analysis
- ✓ Data prep tools like **Unique**, **Sample** and **Imputation** are often used to create cuts of data for specialized purposes (machine learning, reference tables, reporting, etc.)

# Data Transformation

# Data Transformation

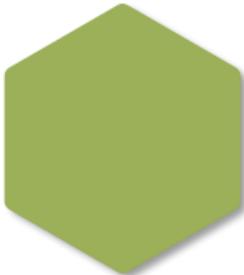
Transform data in Alteryx Designer using **Join**, **Parse**, **Spatial** and **Transpose** tools

## Join



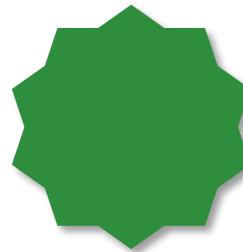
**Combine** data by joining, unioning or appending data streams together

## Parse



**Manipulate** string data with tools like regex, text to columns, datetime, etc.

## Spatial



**Map** geospatial data, calculate distances, configure trade areas, etc.

## Transpose



**Rearrange** columns and rows, count values, summarize data, etc.



# Join

The **Join** tool combines two data inputs to create a new, combined output

- Joins are commonly used to combine related tables together based on primary & foreign keys

## Join by Record Position

Join inputs together using record/row position

## Join by Specific Fields

Join records together using matching fields / keys

## Input

Which input source each field is derived from

## Field

Represents the base column coming into the join tool

## Type

Modify the data type of the column

## Size

Adjust size of the column (typically dictated by type)

## Rename / Description

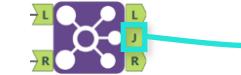
Rename a column or add notes/documentation

## Join Types



### Left

Unmatched values from the left source



### Inner

Matched values from both sources



### Right

Unmatched values from the right source



**IMPORTANT:** Left and right anchors show **unmatched values**; to create a proper left or right outer join, you need to combine with the **union tool**

# Join



The **Join** tool combines two data inputs to create a new, combined output

- Joins are commonly used to combine related tables together based on primary & foreign keys

## Join by Record Position

Join inputs together using record/row position

## Join by Specific Fields

Join records together using matching fields / keys

## Input

Which input source each field is derived from

## Field

Represents the base column coming into the join tool

## Type

Modify the data type of the column

## Size

Adjust size of the column (typically dictated by type)

## Rename / Description

Rename a column or add notes/documentation

Join (83) - Configuration

Join by Record Position

Join by Specific Fields

| Input | Field                    | Type      | Size   | Rename | Description    |
|-------|--------------------------|-----------|--------|--------|----------------|
| Left  | Credit Card Number       | Int64     | 8      |        |                |
| Left  | Credit Card Type         | V_String  | 16     |        |                |
| Left  | Customer ID              | Int32     | 4      |        |                |
| Left  | Location ID              | Byte      | 1      |        |                |
| Left  | Purchase Price           | Byte      | 1      |        |                |
| Left  | Rootbeer ID              | Int32     | 4      |        |                |
| Left  | Transaction Date         | Date      | 10     |        |                |
| Left  | Transaction ID           | Int32     | 4      |        |                |
| Left  | Month                    | V_WString | 107... |        |                |
| Left  | Month Num                | V_WString | 107... |        |                |
| Left  | Year                     | V_WString | 107... |        |                |
| Left  | Days Since Last Purchase | Int32     | 4      |        |                |
| Right | rootbeerid               | Int32     | 4      |        |                |
| Right | brandid                  | Int16     | 2      |        |                |
| Right | containertype            | String    | 6      |        |                |
| Right | locationid               | Byte      | 1      |        |                |
| Right | purchasedate             | Date      | 10     |        |                |
| Right | "Unknown"                | Unknown   | 0      |        | Dynamic or ... |

## Join Types

### Left



Unmatched values from the left source

### Inner



Matched values from both sources

### Right



Unmatched values from the right source

### Left Outer



All left source data and matching from right

### Right Outer



All right source data and matching from left

### Full Outer

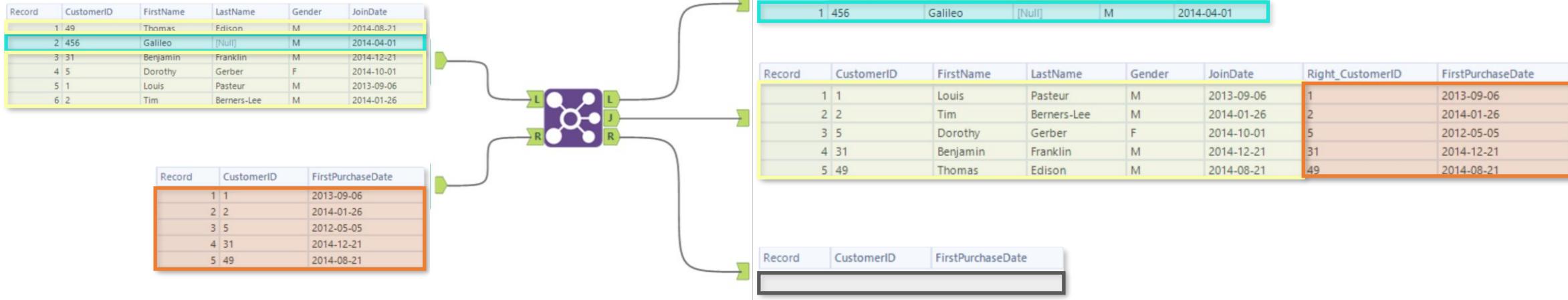


All data from both sources, nulls for non-matches

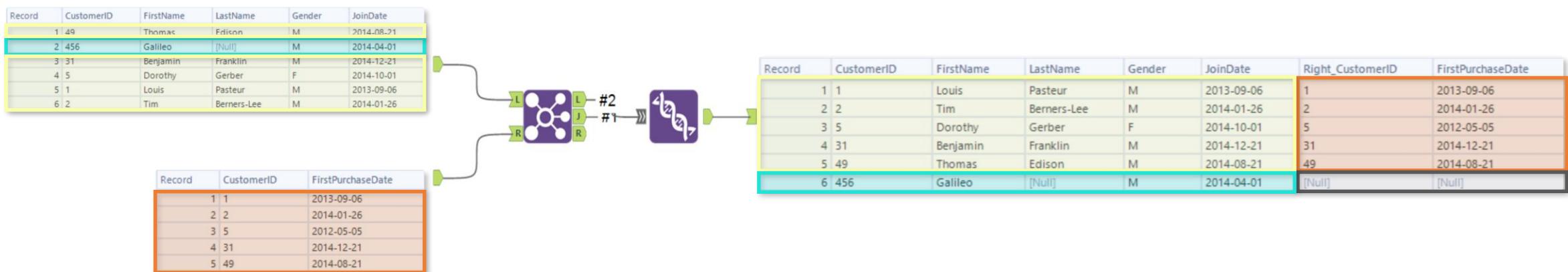


# Join Example

## Example - Inner Join



## Example - Left Outer Join





# Join Multiple

The **Join Multiple** tool combines two or more inputs and outputs the data as a full outer join

- Use Join Multiple for tables with identical join criteria or when combining Alteryx report objects into a single report

**Join by Record Position**  
Join inputs together using record position

**Join by Specific Fields**  
Join records together using defined field record's match

**Input**  
Which input source each field is derived from

**Field**  
Represents the base column coming into the join tool

**Type**  
Modify the data type of the column

**Size**  
Adjust size of the column (typically dictated by type)

**Rename / Description**  
Rename a column or add notes/documentation

**Cartesian Joins**  
Choose how to handle cartesian joins – **Allow all**, **Warn**, or **Error**

**Output Records that Join from All Inputs**  
Select this option to output an **inner join** rather than a **full outer join**

| Input    | Field              | Type      | Size | Rename           | Description |
|----------|--------------------|-----------|------|------------------|-------------|
| Input_#1 | currentretailprice | Double    | 8    |                  |             |
| Input_#1 | New_website        | V_WString | 263  |                  |             |
| Input_#1 | New_facebookpage   | V_WString | 263  |                  |             |
| Input_#1 | New_twitter        | V_WString | 263  |                  |             |
| Input_#2 | customerid         | Int32     | 4    | Input_#2_c...    |             |
| Input_#2 | firstname          | V_String  | 254  | cust_firstr...   |             |
| Input_#2 | lastname           | V_String  | 254  | cust_lastname    |             |
| Input_#2 | fullname           | V_String  | 254  | cust_fullname    |             |
| Input_#2 | streetaddress      | V_String  | 254  | cust_streeta...  |             |
| Input_#2 | city               | V_String  | 254  | cust_city        |             |
| Input_#2 | state              | V_String  | 254  | cust_state       |             |
| Input_#2 | zipcode            | V_String  | 254  | cust_zipcode     |             |
| Input_#2 | email              | V_String  | 254  | cust_email       |             |
| Input_#2 | phononenumber      | V_String  | 254  | cust_phone...    |             |
| Input_#2 | firstpurchasedate  | V_String  | 254  | cust_firstpur... |             |



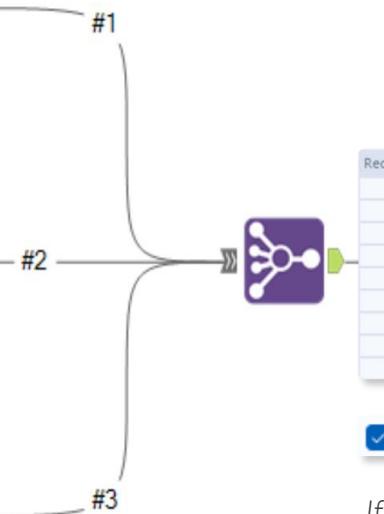
# Join Multiple Example

## Example – Join Multiple

| Record | Name               | Age | Number of years of education (starting at 1st gr... |
|--------|--------------------|-----|---|
| 1      | Ronald Dryer       | 43  | 16  |
| 2      | Angelina Prissant  | 33  | 18  |
| 3      | Tara Jackson       | 28  | 12  |
| 4      | Keith Jacobs       | 56  | 14  |
| 5      | Terrence McKinley  | 26  | 18  |
| 6      | Wilma Holmes       | 63  | 16  |
| 7      | Mark Hodges        | 46  | 12  |
| 8      | Danielle Rodriguez | 29  | 22  |
| 9      | Michael Lawrence   | 53  | 16  |
| 10     | Christina Kim      | 32  | 16  |

| Record | Name               | Number of years in current position | Salary |
|--------|--------------------|-------------------------------------|--------|
| 1      | Ronald Dryer       | 5                                   | 83000  |
| 2      | Angelina Prissant  | 4                                   | 87000  |
| 3      | Tara Jackson       | 6                                   | 35000  |
| 4      | Keith Jacobs       | 8                                   | 63000  |
| 5      | Terrence McKinley  | 2                                   | 80000  |
| 6      | Wilma Holmes       | 12                                  | 77000  |
| 7      | Mark Hodges        | 2                                   | 34500  |
| 8      | Danielle Rodriguez | 1                                   | 108000 |
| 9      | Michael Lawrence   | 7                                   | 93000  |
| 10     | Christina Kom      | 4                                   | 88000  |

| Record | Name               | Position Title           | Manager          |
|--------|--------------------|--------------------------|------------------|
| 1      | Ronald Dryer       | Scrum Master             | LaShaunda Davis  |
| 2      | Angelina Prissant  | Senior Developer         | Lyle Cook        |
| 3      | Tara Jackson       | Office Manager           | Andrew Sherman   |
| 4      | Keith Jacobs       | Junior Analyst           | Penelope Munoz   |
| 5      | Terrence McKinley  | Data Scientist           | Pierre Toussaint |
| 6      | Wilma Holmes       | Junior Developer         | Jean Tower       |
| 7      | Mark Hodges        | Administrative Assistant | Eliana Lockman   |
| 8      | Danielle Rodriguez | Sales Engineer           | Nancy Myers      |
| 9      | Michael Lawrence   | Senior Developer         | Ursula Maxwell   |
| 10     | Christina Kim      | UX Developer             | Max Remington    |



| Record | Input_#3_Name      | Position Title           | Manager          | Name               | Age | Number of y... | Input_#2_Name      | Number of year... | Salary |
|--------|--------------------|--------------------------|------------------|--------------------|-----|----------------|--------------------|-------------------|--------|
| 1      | Angelina Prissant  | Senior Developer         | Lyle Cook        | Angelina Prissant  | 33  | 18             | Angelina Prissant  | 4                 | 87000  |
| 2      | Danielle Rodriguez | Sales Engineer           | Nancy Myers      | Danielle Rodriguez | 29  | 22             | Danielle Rodriguez | 1                 | 108000 |
| 3      | Keith Jacobs       | Junior Analyst           | Penelope Munoz   | Keith Jacobs       | 56  | 14             | Keith Jacobs       | 8                 | 63000  |
| 4      | Mark Hodges        | Administrative Assistant | Eliana Lockman   | Mark Hodges        | 46  | 12             | Mark Hodges        | 2                 | 34500  |
| 5      | Michael Lawrence   | Senior Developer         | Ursula Maxwell   | Michael Lawrence   | 53  | 16             | Michael Lawrence   | 7                 | 93000  |
| 6      | Ronald Dryer       | Scrum Master             | LaShaunda Davis  | Ronald Dryer       | 43  | 16             | Ronald Dryer       | 5                 | 83000  |
| 7      | Tara Jackson       | Office Manager           | Andrew Sherman   | Tara Jackson       | 28  | 12             | Tara Jackson       | 6                 | 35000  |
| 8      | Terrence McKinley  | Data Scientist           | Pierre Toussaint | Terrence McKinley  | 26  | 18             | Terrence McKinley  | 2                 | 80000  |
| 9      | Wilma Holmes       | Junior Developer         | Jean Tower       | Wilma Holmes       | 63  | 16             | Wilma Holmes       | 12                | 77000  |

Only Output Records that Join from All Inputs

If we select “Only Output Records that Join from All Inputs”, **record #10 (Christina Kim / Christina Kom) is excluded from the output table**



# Union

The **Union** tool combines two or more inputs based on column names or positions

- Unions are often used to create historical data tables for reporting or analysis, which grow as new data becomes available

## Auto Configure

The screenshot shows the 'Union (99) - Configuration' window. It includes sections for 'Properties' (highlighted with a teal border), 'When Fields Differ' (highlighted with a teal border), and 'Output Order' (highlighted with a teal border). The 'Properties' section contains dropdowns for 'Auto Config by Name' (set to 'Warning - Continue Processing Records') and 'Output All Fields'. The 'When Fields Differ' section has dropdowns for 'Error', 'Warning', and 'Ignore'. The 'Output Order' section has a checkbox for 'Set a Specific Output Order' and a list of columns '#1', '#2', and '#3'.

### Configuration Type

- Auto Configure by Name
- Auto Configure by Position
- Manually Configure Columns

### When Fields Differ

- **Error** – Stop Processing Records
- **Warning** – Continue Processing Records
- **Ignore** – Continue Processing Records
- Output **All Fields**
- Output **Common Subset** of Fields

### Output Order

Set a specific output column order

## Manually Configure

The screenshot shows the 'Union (96) - Configuration' window. It includes sections for 'Properties' (highlighted with a teal border), 'Output Columns' (highlighted with a teal border), and 'Output Order' (highlighted with a teal border). The 'Properties' section has a 'Reset' button. The 'Output Columns' section shows a grid of columns from Col15 to Col20, grouped into two sets: #1 (city, county, state, state\_code, country, country\_coc) and #2 (city, state, country). A warning message at the bottom states: 'Non Blocking - Metainfo Will Not Change' and 'Warning: Column #1 has an unassigned field' and 'Warning: Column #2 has an unassigned field'. The 'Output Order' section has a checkbox for 'Set a Specific Output Order' and a list of columns '#1' and '#2'.

### Reset

Reset the movement of columns to original order

### Move Arrows

Repositions columns manually left or right

### Non Blocking

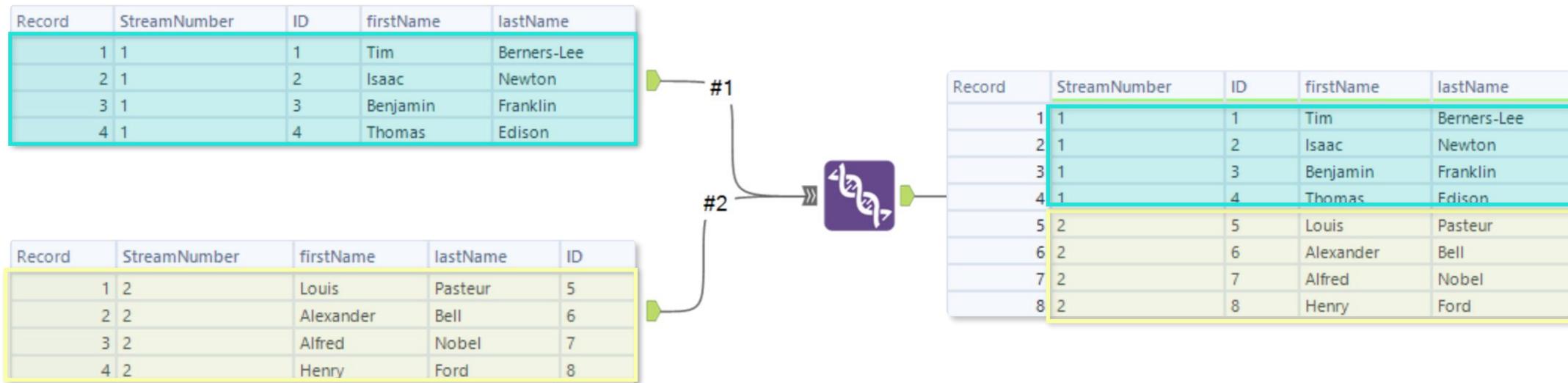
Pass data downstream without waiting for all inputs

### Output Order

Choose a source order for the data based on input number



# Union Example





# Append Fields

The **Append Fields** tool creates a cartesian join between a source and target input

- This returns all rows from both tables, by pairing each row in the source table with each row in the target table

Append Fields (97) - Configuration

Options | Search

| Input  | Field                  | Type     | Size | Rename | Description |
|--------|------------------------|----------|------|--------|-------------|
| Target | original_customerid    | Double   | 8    |        |             |
| Target | original_streetaddress | V_String | 255  |        |             |
| Target | original_city          | V_String | 255  |        |             |
| Target | original_state         | V_String | 255  |        |             |
| Target | original_zipcode       | Double   | 8    |        |             |
| Target | lat                    | Double   | 8    |        |             |
| Target | lon                    | Double   | 8    |        |             |
| Target | formatted              | V_String | 255  |        |             |
| Target | housenumber            | Double   | 8    |        |             |
| Target | name                   | V_String | 255  |        |             |
| Target | street                 | V_String | 255  |        |             |
| Target | postcode               | V_String | 255  |        |             |
| Target | district               | V_String | 255  |        |             |
| Target | suburb                 | V_String | 255  |        |             |
| Target | city                   | V_String | 255  |        |             |
| Target | county                 | V_String | 255  |        |             |
| Target | state                  | V_String | 255  |        |             |
| Target | state_code             | V_String | 255  |        |             |

Warn/Error on Too Many Records Being Generated  
Error on appends of more than 16 Records

## Input

The input source that each field is derived from (**Target / Source**)

## Field

Represents the base column coming into the join tool

## Type

Modify the data type of the column

## Size

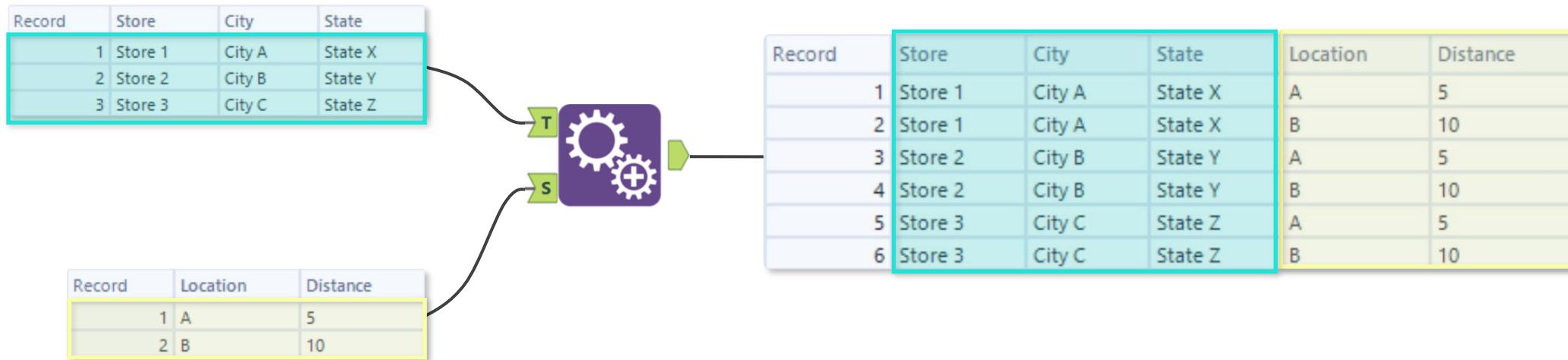
Adjust size of the column (typically dictated by type)

## Rename / Description

Rename a column or add notes/documentation



# Append Fields Example





# Find & Replace

**Find & Replace** locates a string in one column and replaces it with another column's value

- This is commonly used to remove incorrect text, update customer hierarchies, find key data points, etc.

**Find Type**  
Choose how to find the string (*Beginning, Any, Entire*)

**Find Within Field**  
Select the field in the table to be replaced

**Find Value**  
Select the matching field in the reference table

**Case Insensitive Find**  
Ignore text case when searching

**Match Whole Word Only**  
Strings are only matched with leading/trailing spaces

**Replace Found Text With Value**  
Select a field to update from the original table

**Replace Multiple Found Items**  
Used if you choose "*any part of field*" as find type

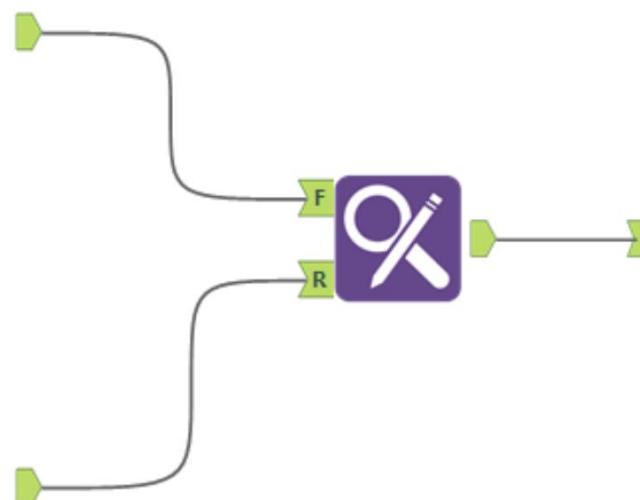
**Append Field(s) to Record**  
Append a column with reference table data when matches are found



# Find & Replace Example

| Record | transaction_id | trans_dt   | acct_holder                               | amt   |
|--------|----------------|------------|---|-------|
| 1      | 205160         | 2015-03-10 | GLEN & ALLENS HARDWARE CO                 | 12056 |
| 2      | 205161         | 2015-03-10 | BROWNSVILLE DEPT OF REVENUE               | 554   |
| 3      | 205162         | 2015-03-10 | WOLFMAN CO                                | 300   |
| 4      | 205163         | 2015-03-11 | THE WOLFMAN CMPY                          | 302   |
| 5      | 205164         | 2015-03-11 | CANDLEWICK RESEARCH DEPT                  | 1810  |
| 6      | 205165         | 2015-03-12 | CO TEXTILE AND VARNISH                    | 890   |
| 7      | 205166         | 2015-03-12 | WOLFMAN CO LLC                            | 63    |
| 8      | 205167         | 2015-03-12 | GLEN AND ALLENS HARDWARE CMPY             | 8227  |
| 9      | 205168         | 2015-03-12 | BUNDICK LUMBER LIQUIDATORS LLC            | 16471 |
| 10     | 205169         | 2015-03-13 | TARLEY MAST BUILDERS INC                  | 2406  |
| 11     | 205170         | 2015-03-14 | BROWNSVILLE DEPARTMENT OF REVENUE         | 648   |
| 12     | 205171         | 2015-03-14 | SMOKIN CHARLIES TRANSPORT CO              | 4205  |
| 13     | 205172         | 2015-03-15 | BROWNSVILLE DEPARTMENT OF TRANSPORTATI... | 21    |
| 14     | 205173         | 2015-03-15 | COLORADO TEXTILE AND VARNISH              | 192   |
| 15     | 205174         | 2015-03-16 | COLORADO DEPT OF THE TREASURY             | 500   |

| Record | word | replacement  |
|--------|------|--------------|
| 1      | &    | AND          |
| 2      | CO   | COMPANY      |
| 3      | CMPY | COMPANY      |
| 4      | DEPT | DEPARTMENT   |
| 5      | INC  | INCORPORATED |



| Record | transaction_id | trans_dt   | acct_holder                               | amt   |
|--------|----------------|------------|---|-------|
| 1      | 205160         | 2015-03-10 | GLEN AND ALLENS HARDWARE COMPANY          | 12056 |
| 2      | 205161         | 2015-03-10 | BROWNSVILLE DEPARTMENT OF REVENUE         | 554   |
| 3      | 205162         | 2015-03-10 | WOLFMAN COMPANY                           | 300   |
| 4      | 205163         | 2015-03-11 | THE WOLFMAN COMPANY                       | 302   |
| 5      | 205164         | 2015-03-11 | CANDLEWICK RESEARCH DEPARTMENT            | 1810  |
| 6      | 205165         | 2015-03-12 | COMPANY TEXTILE AND VARNISH               | 890   |
| 7      | 205166         | 2015-03-12 | WOLFMAN COMPANY LLC                       | 63    |
| 8      | 205167         | 2015-03-12 | GLEN AND ALLENS HARDWARE COMPANY          | 8227  |
| 9      | 205168         | 2015-03-12 | BUNDICK LUMBER LIQUIDATORS LLC            | 16471 |
| 10     | 205169         | 2015-03-13 | TARLEY MAST BUILDERS INCORPORATED         | 2406  |
| 11     | 205170         | 2015-03-14 | BROWNSVILLE DEPARTMENT OF REVENUE         | 648   |
| 12     | 205171         | 2015-03-14 | SMOKIN CHARLIES TRANSPORT COMPANY         | 4205  |
| 13     | 205172         | 2015-03-15 | BROWNSVILLE DEPARTMENT OF TRANSPORTATI... | 21    |
| 14     | 205173         | 2015-03-15 | COLORADO TEXTILE AND VARNISH              | 192   |
| 15     | 205174         | 2015-03-16 | COLORADO DEPARTMENT OF THE TREAS...       | 500   |

Match Whole Word Only

Use **Match Whole Word Only** to avoid accidentally replacing characters within another word (like "Co" within "Colorado")



# Text To Columns

The **Text to Columns** tool splits a text string based on specified delimiters into new columns

- Commonly used to clean data from raw csv files or split date or time parts into individual fields

**Column to Split**  
Choose a string field to split

**Delimiters**  
Select delimiter to split with  
(\t=tab, \n=new line, \s=space, etc.)

**Advanced Options**  
Special tools to [ignore delimiters](#) or [skip empty rows](#)

**Text To Columns (100) - Configuration**

**Select Column to Split**

**Column to split:** reviewdate

**Delimiters:** -

**Split to columns:** Number of columns: 3

**Extra characters:** Leave extra in last column

**Output root name:** reviewdate

**Advanced options:**

- Ignore delimiters in quotes
- Ignore delimiters in single quotes
- Ignore delimiters in parentheses
- Ignore delimiters in brackets
- Skip empty columns

**Before**

| Record | reviewdate |
|--------|------------|
| 1      | 2013-10-28 |
| 2      | 2013-12-11 |
| 3      | 2013-12-21 |
| 4      | 2013-08-25 |
| 5      | 2014-01-04 |
| 6      | 2014-06-06 |
| 7      | 2014-09-03 |
| 8      | 2013-09-07 |

**Split to Columns / Rows**  
Split data into columns or rows

**Number of Columns**  
Number of columns to split your data into

**Extra Characters**  
Decide what to do with extract characters after the columns are split

**Output Root Name**  
Choose a base name for output columns

**After**

| Year | Month | Day |
|------|-------|-----|
| 2013 | 10    | 28  |
| 2013 | 12    | 11  |
| 2013 | 12    | 21  |
| 2013 | 08    | 25  |
| 2014 | 01    | 04  |
| 2014 | 06    | 06  |
| 2014 | 09    | 03  |
| 2013 | 09    | 07  |



# DateTime

The **DateTime** tool transforms date fields into human or expression-friendly formats

- Convert strings into date formats for use in datetime expressions, or reformat dates for export or reporting

The screenshot shows the 'DateTime (103) - Configuration' screen. It includes sections for selecting the format to convert (Date/Time format to string or String to Date/Time), specifying the string field to convert (e.g., 'cust\_firstpurchasedate'), naming the new column ('First Purchase Date'), choosing the date-time language (English), and selecting the format that matches the incoming string field (a dropdown menu with many options like 'yyyy-MM-dd hh:mm:ss', 'MM/dd/yyyy hh:mm:ss', etc.). At the bottom, there's a preview section with 'Example' and 'Output' fields.

## Select the format to convert

Date/Time to String or String to Date/Time

## Select the string/date field to convert

Choose a field to convert

## Specify the new column name

Choose name for your new column

## Specify your DateTime Language

Choose a datetime language (dates differ by language)

## Select the format that matches incoming string field

Select the format of the current field (new format of date is automatic)

## Example & Output for Custom format

See an example output for **custom** date formats

## Expression-Friendly Format

yyyy-mm-dd HH:MM:SS

## Human-Friendly Format

day, dd Month, yyyy  
dd-MM-yy  
dd-MM-yyyy  
dd-MM.-yy  
dd Month, yyyy  
dd/MM/yy  
dd/MM/yyyy  
and more....

# RegEx

The **RegEx** tool uses regular expression syntax to parse, match or replace data

- Find and extract text from busy/messy string data such as JSON, HTML and more

RegEx (104) - Configuration

Build an expression to parse, match, or replace data.

**Column to Parse:** description

**Format to Convert:** Regular Expression: [^ ~-]

**Case Sensitive:** Case Insensitive (checked)

**Output Method:** Replace

**Replacement Text:**

**Copy Unmatched Text to Output:** checked

## Column to Parse

Choose field which regex will be applied to

## Format to Convert

Add regular expression syntax (+ for examples)

## Case Sensitive

Enable case-sensitive regular expressions

## Output Method

- Replace:** Substitute searched expression for another
- Tokenize:** Split data into rows/columns
- Parse:** Split data & control new field name/size/format
- Match:** Check for expression match (1=match, 0=no match)

## Replacement Text

Text used to replace expression matching text

## Copy Unmatched Text to Output

Keep unmatched text in the output

## Example Regex: Removing ASCII Characters

[^ ~-]

### Before

| description   |
|---|
| This Truly Old Fashioned Soda Has The Rich, Crea... |
| Made For Ice Cream!! The Best On The River! Riv...  |
| The Frostie Beverage Company Began Itâ€™s Da...     |
| Aj Stephans Company Makes                           |
| Virgilâ€™s Is A Gourmet Root Beer. Weâ€™re Wh...    |
| Made For Ice Cream!! The Best On The River! Riv...  |
| Virgilâ€™s Is A Gourmet Root Beer. Weâ€™re Wh...    |
| Made In Maine Sweetened With Natural Cane An...     |
| The Frostie Beverage Company Began Itâ€™s Da...     |
| Made For Ice Cream!! The Best On The River! Riv...  |
| Abita Root Beer Is Made With A Hot Mix Process...   |
| This American Recipe Was Originally Made By M...    |

### After

| description   |
|---|
| This Truly Old Fashioned Soda Has The Rich, Crea... |
| Made For Ice Cream!! The Best On The River! Riv...  |
| The Frostie Beverage Company Began Its Days In...   |
| Aj Stephans Company Makes The Finest Elixirs A...   |
| Virgil's Is A Gourmet Root Beer. Were What Ben A... |
| Made For Ice Cream!! The Best On The River! Riv...  |
| Virgil's Is A Gourmet Root Beer. Were What Ben A... |
| Made In Maine Sweetened With Natural Cane An...     |
| The Frostie Beverage Company Began Its Days In...   |
| Made For Ice Cream!! The Best On The River! Riv...  |
| Abita Root Beer Is Made With A Hot Mix Process...   |
| This American Recipe Was Originally Made By M...    |



Regex expressions are out of scope for this course, but you can learn more at [RegexOne](https://regexone.com) or [regexr.com](https://regexr.com)



# Create Points

The **Create Points** tool creates point-type spatial objects from latitude and longitude data

- Spatial points are commonly used to support mapping, distance calculations, drive time analytics, etc.

## X Field (Longitude) & Y Field (Latitude)

Choose the *latitude* and *longitude* fields from your input

### Fields are Lat/Long Floating Point

Identify lat/long field types as *decimal*

### Fields are Lat/Long Integers (x 1,000,000)

Identify lat/long field types as *integers*

### Fields are Projected Floating Points

Identify lat/long field types as *geographic projections*

Create Points (106) - Configuration

X Field (Longitude): longitude    Y Field (Latitude): latitude

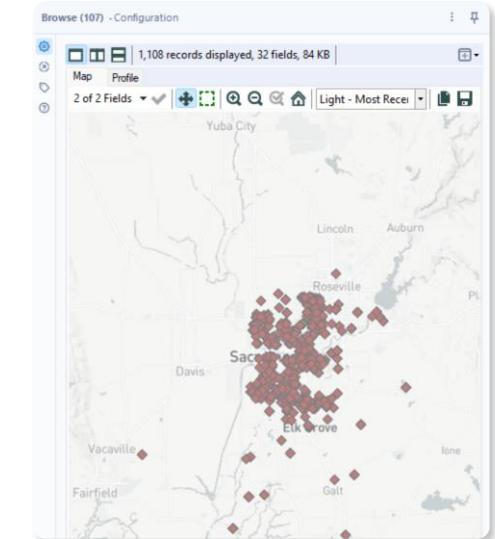
Fields are Lat/Long Floating Point

Fields are Lat/Long Integers (x 1,000,000)

Fields are Projected Floating Points

[WGS84]

## Browse Map



Spatial fields generated in Alteryx **will not be recognized by output file types such as .dbf, .csv, or .xlsx**. Use the Select tool to choose only fields appropriate for export, depending on the output file type.



# Distance

The **Distance** tool calculates distances between two sets of spatial objects (point, line, polygon)

- This can be used to optimize shipping routes, analyze supply chain data, calculate cost per mile, etc.

**Spatial Object Fields**  
Choose the source (**point** or **centroid**) and destination (**point**, **line**, or **polygon**)

**Output Drivetime & Distance**  
Choose this option to output drivetime and distance

**Dataset**  
Choose a drivetime dataset to use for your analysis

**Route Optimized by**  
Optimize by Time or Distance

**Output Cardinal Direction / Degrees**  
Formats output as cardinal direction (N, NE, SW, etc.) or degrees

The screenshot shows the 'Distance (108) - Configuration' dialog box. It includes sections for 'Spatial Object Fields' (Point or Centroid Source: Customer Centroid, Point, Line or Polygon Destination: Store Centroid), 'Output Distance' (checkbox checked, options: Create Nearest Interior Point Inside of the Polygon, When a point is inside a polygon: Return a distance of 0 (radio button selected), Return the distance to the nearest edge), 'Output Drivetime & Distance to Destination Centroid' (checkbox unchecked, Dataset: No valid datasets found, Route optimized by: Time, Maximum: 30 Minutes, Allow Reversed Routing for Optimum Speed), and 'Output Cardinal Direction' (checkbox checked, Options: Output Direction in Degrees, Units: Miles).

**Output Distance**  
Choose this option to output distance only

**Create Nearest Interior Point Inside of the Polygon**  
Creates a point inside a polygon during point-polygon distance calculations

**Return a distance of 0**  
Returns a distance of 0 if a point is inside a polygon

**Return the distance to the nearest edge**  
Returns a distance to the nearest edge of a polygon to the point of comparison

**PRO TIP:** Optimize speed by choosing your *larger* spatial object as the destination



# Trade Area

The **Trade Area** tool creates regions around spatial points using a distance or drivetime radius

- This can be used for analyzing customer overlap, identifying shipping zones, mapping competitor footprint, etc.

**Trade Area (252) - Configuration**

**SpatialObject Field of Point Source**  
Store Centroid  Include in Output

**Radius, Doughnuts or Drivetime**  
 Specific Value: 5.0  
 From Field: original\_customer

**Units**  
 Radius (Miles)  
 Radius (Kilometers)  
 Drivetime Minutes  
Dataset:  
No valid datasets found

Eliminate Overlap  
(available for Specific Value Radius only)

## SpatialObject Field of Point Source

Choose field which trade area is based around

## Radius, Doughnuts or Drivetime

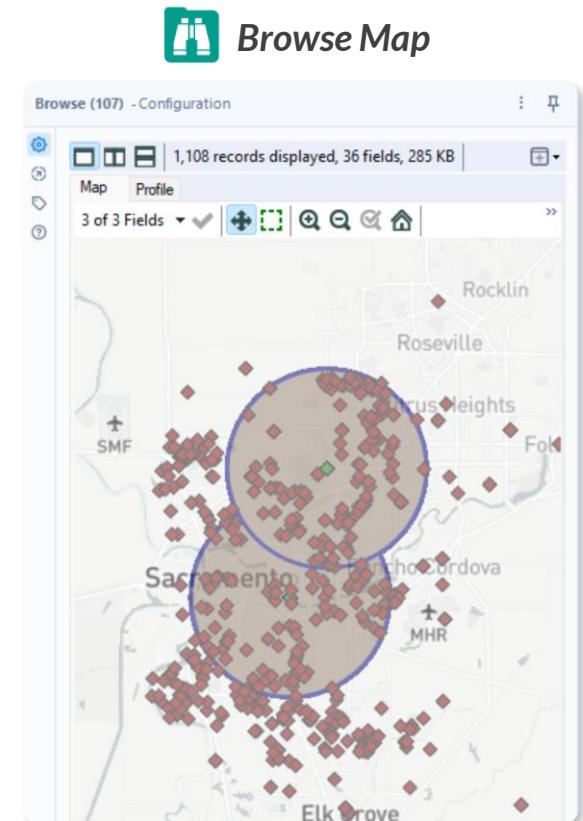
Define a specific, hard-coded value or input field

## Units

Choose radius in **miles**, **kilometers** or **drivetime minutes**

## Eliminate Overlap

Remove trade area overlap by keeping each segment separate



# Summarize

The **Summarize** tool groups and aggregates data based on specified calculations

- Commonly used for creating dimensional lists, aggregating data to a higher grain, calculating summarized metrics, etc.

The screenshot shows the 'Summarize (183) - Configuration' window. In the 'Fields' section, a table lists various fields like Transaction ID, Credit Card Number, and Customer ID with their types. A green arrow points to the 'Select' dropdown menu. In the 'Actions' section, another table defines actions such as 'Group By' for Transaction Date and 'Sum' for Purchase Price. A green arrow points to the 'Add' dropdown menu.

## Select

Select multiple fields (**All**, **None**, **Numeric**, **String**, **Spatial**)

## Fields

Highlight fields which action will be performed against

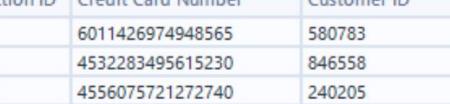
## Add

Choose your action (**Group by**, **Finance**, **Numeric**, etc.)

## Actions

Organize fields, modify actions and rename outputs

| Transaction ID | Credit Card Number | Customer ID |
|----------------|--------------------|-------------|
| 105544         | 6011426974948565   | 580783      |
| 105482         | 4532283495615230   | 846558      |
| 104807         | 4556075721272740   | 240205      |



## Σ Summarize

The screenshot shows the 'Summarize (250) - Configuration' window with the 'Output' section expanded. It displays a table with columns Record, Brand, and Revenue, containing data for Bulldog, Sprecher, and Diet Stewarts.

## Output (brand-level)

| Record | Brand         | Revenue |
|--------|---------------|---------|
| 1      | Bulldog       | 255     |
| 2      | Sprecher      | 9       |
| 3      | Diet Stewarts | 3       |



**PRO TIP:** Use the **Group By** action on a field to get a unique list of values



# Crosstab

The **Crosstab** tool transforms data by pivoting rows into columns and aggregating values

- Commonly used to create calculated summary tables based on row- or column-level calculations (% row, % column, etc.)

The screenshot shows the 'Cross Tab (138) - Configuration' window. It includes sections for 'Group data by these values', 'Change Column Headers', 'Values for New Columns', and 'Method for Aggregating Values'. Each section has a descriptive label and a corresponding configuration area.

- Group Data by These Values:** Choose the field(s) to group or aggregate the data by. A list of fields is shown with 'brandname' checked.
- Change Column Headers:** Select a field to produce a new column per unique value. 'starrating' is selected.
- Values for New Columns:** Select values to populate the new columns. 'Review ID' is selected.
- Method for Aggregating Values:** Select aggregation for the values of the new columns. 'Percent Row' is checked.

**Group Data by These Values**  
Choose the field(s) to group or aggregate the data by

**Change Column Headers**  
Select a field to produce a new column per unique value

**Values for New Columns**  
Select values to populate the new columns

**Method for Aggregating Values**  
Select aggregation for the values of the new columns

**Data Input**

| Review ID | customerid | brandid | starrating |
|-----------|------------|---------|------------|
| 347       | 826590     | 10020   | 5          |
| 395       | 955591     | 10018   | 4          |
| 406       | 249779     | 10019   | 1          |
| 246       | 249779     | 10002   | 2          |
| 426       | 111991     | 10022   | 2          |
| 592       | 283158     | 10018   | 2          |

**Crosstab**

| brandname        | XRow_1    | XRow_2    | XRow_3    | XRow_4    | XRow_5    |
|------------------|-----------|-----------|-----------|-----------|-----------|
| Bulldog          | 16.966019 | 17.694175 | 1.941748  | 41.432039 | 21.966019 |
| Sprecher         | 16.126525 | 17.766379 | 20.179529 | 25.281728 | 20.645838 |
| A.J. Stephens    | [Null]    | 36.574871 | 31.640849 | 13.425129 | 18.359151 |
| Henry Weinhard's | 17.405935 | 30.406852 | 7.586418  | 28.846742 | 15.754053 |
| Barq's           | 6.235642  | 41.778799 | 11.322612 | 33.86938  | 6.793567  |

\*Count of **Review IDs** for each **star rating** divided by total reviews, grouped by **brand name**



# Transpose

The **Transpose** tool transforms data by pivoting columns into rows (opposite of crosstab)

- Commonly used to reshape column-heavy data (like survey responses) into a format more suitable for analysis

Transpose (139) - Configuration

Select data to transform.

**Key Columns**

Choose the field(s) to include as columns in your output

| Transaction Date | locationname                       | containertype | Rootbeer ID |
|------------------|------------------------------------|---------------|-------------|
| 2015-01-15       | Sac State American River Courtyard | Bottle        | 101589      |
| 2015-09-28       | Sac State American River Courtyard | Bottle        | 101193      |
| 2015-06-08       | Sac State American River Courtyard | Can           | 100817      |
| 2015-10-01       | Sacramento McClellan Airport       | Bottle        | 102811      |
| 2016-08-21       | Sac State American River Courtyard | Bottle        | 105249      |
| 2016-08-01       | Sac State American River Courtyard | Can           | 101747      |

**Data Columns**

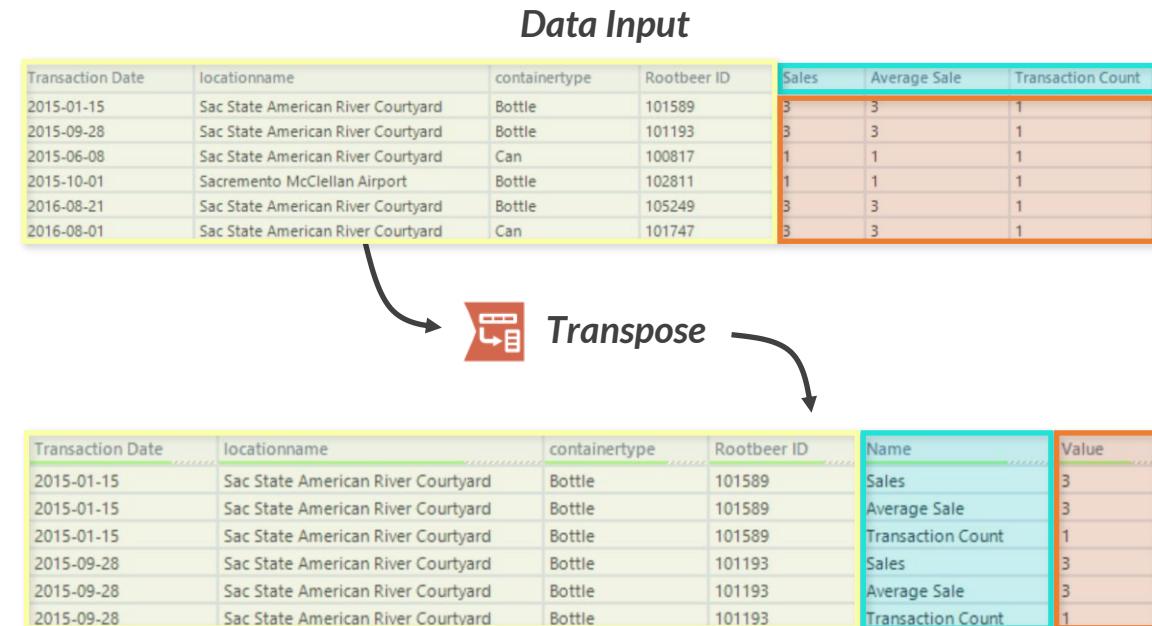
Choose numerical columns to pivot into rows

| Sales | Average Sale | Transaction Count |
|-------|--------------|-------------------|
| 3     | 3            | 1                 |
| 3     | 3            | 1                 |
| 1     | 1            | 1                 |
| 1     | 1            | 1                 |
| 3     | 3            | 1                 |
| 3     | 3            | 1                 |

**Missing Columns**

Select action for missing columns (Error, Warn, Ignore)

Error    Warn    Ignore





# Running Total

The **Running Total** tool calculates the cumulative sum of a numeric field

- Running totals are often used for calculating growth over time or visualizing cumulative distribution with pareto charts

**Running Total (141) - Configuration**

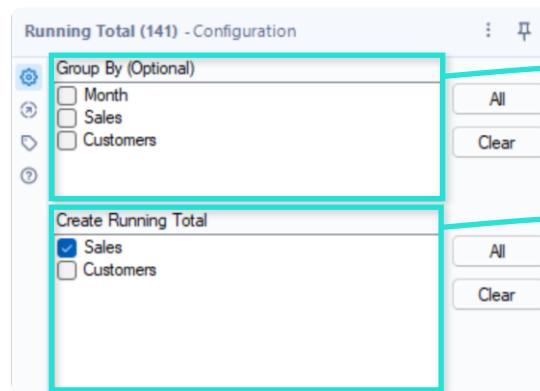
**Group By (Optional)**

Choose which field(s) to group by

**Create Running Total**

Sales  
 Customers

All  
Clear



## Group by (Optional)

Choose which field(s) to group by

## Data Columns

Select fields to apply running total aggregation



**PRO TIP:** Sort your data prior to using Running Total to ensure that data aggregates in the proper sequential order

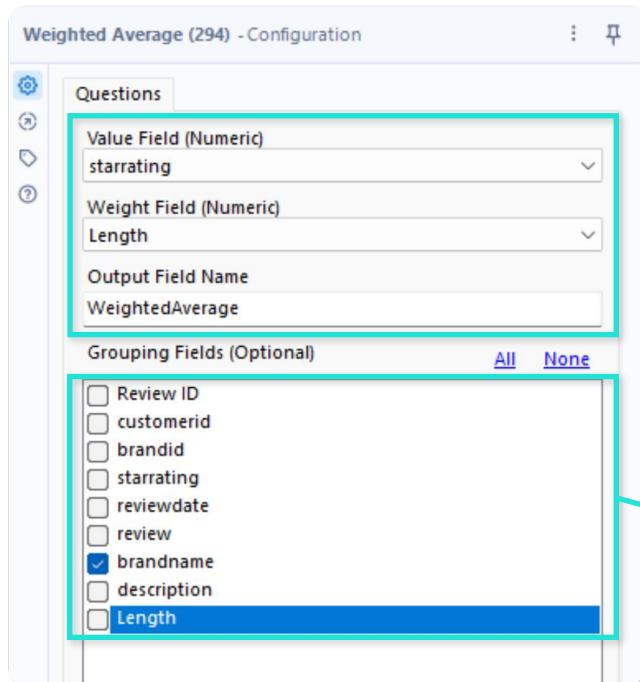
## Example Data Output

| Record | Month               | Sales | RunTot_Sales |
|--------|---------------------|-------|--------------|
| 1      | 2014-07-01 00:00:00 | 39    | 39           |
| 2      | 2014-08-01 00:00:00 | 69    | 108          |
| 3      | 2014-09-01 00:00:00 | 93    | 201          |
| 4      | 2014-10-01 00:00:00 | 233   | 434          |
| 5      | 2014-11-01 00:00:00 | 274   | 708          |
| 6      | 2014-12-01 00:00:00 | 370   | 1078         |
| 7      | 2015-01-01 00:00:00 | 374   | 1452         |
| 8      | 2015-02-01 00:00:00 | 523   | 1975         |
| 9      | 2015-03-01 00:00:00 | 717   | 2692         |
| 10     | 2015-04-01 00:00:00 | 782   | 3474         |
| 11     | 2015-05-01 00:00:00 | 1082  | 4556         |
| 12     | 2015-06-01 00:00:00 | 971   | 5527         |
| 13     | 2015-07-01 00:00:00 | 1679  | 7206         |
| 14     | 2015-08-01 00:00:00 | 1914  | 9120         |
| 15     | 2015-09-01 00:00:00 | 2580  | 11700        |
| 16     | 2015-10-01 00:00:00 | 714   | 12414        |

# Weighted Average

The **Weighted Average** tool calculates the mean, weighted against a specified numeric field

- Commonly used for calculating weighted metrics or scores based on factors with varying levels of importance



The screenshot shows the 'Weighted Average (294) - Configuration' screen. It has sections for 'Value Field (Numeric)', 'Weight Field (Numeric)', 'Output Field Name', and 'Grouping Fields (Optional)'. The 'Value Field (Numeric)' section contains dropdowns for 'starrating' and 'Length'. The 'Output Field Name' is set to 'WeightedAverage'. The 'Grouping Fields (Optional)' section lists various fields like 'Review ID', 'customerid', 'brandid', etc., with 'brandname' checked.

## Value Field (Numeric)

Select the base field for the average

## Weighted Field (Numeric)

Select the field to use as a weight for the average

## Output Field Name

Name your weighted average output field

## Grouping Fields (Optional)

Choose the field(s) to group by

## Before

| Record | Review ID | brandname | starrating | Length |
|--------|-----------|-----------|------------|--------|
| 690    | 00000186  | Bulldog   | 4          | 1      |
| 691    | 00000198  | Bulldog   | 1          | 1      |
| 692    | 00000210  | Bulldog   | 5          | 14     |
| 693    | 00000212  | Bulldog   | 4          | 1      |
| 694    | 00000255  | Bulldog   | 4          | 1      |
| 695    | 00000299  | Bulldog   | 1          | 1      |
| 696    | 00000522  | Bulldog   | 4          | 1      |
| 697    | 00000695  | Bulldog   | 5          | 1      |
| 698    | 00000004  | Mug       | 3          | 1      |

## After

| brandname        | Weighted Average |
|------------------|------------------|
| Bulldog          | 3.684211         |
| Sprecher         | 3.708333         |
| A.J. Stephans    | 3.2              |
| Henry Weinhard's | 3.111111         |
| Barq's           | 1.612245         |
| Frostie          | 3.034884         |
| IBC              | 3.09375          |
| Abita            | 2.833333         |

# Key Takeaways

---

- ✓ Joining tools like **Join**, **Join Multiple**, **Union**, and **Append** can be used to combine data from multiple streams into a single output
- ✓ Parsing tools like **Regex**, **Text to Columns** and **Datetime** are commonly used to find and modify text or extract specific values from strings
- ✓ Spatial tools like **Create Points**, **Distance** and **Trade Area** are used for geospatial mapping and calculations
- ✓ Transpose tools like **Summarize**, **Crosstab** and **Running Total** can be used to aggregate, transform and reshape data into different formats

# Reports & Visuals

# Reports & Visuals

**Reporting & Visual** tools in Alteryx allow users to customize objects, formats and layouts

## Objects



Report Text



Interactive Chart



Report Map



Table



Image

## Format



Map Legend Builder



Map Legend Splitter



Report Header



Report Footer

## Layout & Distribution



Layout



Overlay



Render



Insights



Email



**IMPORTANT:** Before applying reporting and visualization tools, make sure that your data is **cleaned, structured, and formatted properly!**



# Report Text

The **Report Text** tool creates new text elements, entered manually or sourced from the data flow

- This is commonly used to add report headers, chart labels, disclaimers or KPI values to Alteryx reports

The screenshot shows the 'Report Text (159) - Configuration' window. In the 'Text Mode' section, the 'Create new field for this text' option is selected, with a field name of '% of Customers w/ Reviews\_Label'. Below it, 'Expert Mode: Treat text as Raw PCXML' is also selected, with a checkbox for 'Validate PCXML'. The 'Text Data' section includes a toolbar for bold, italic, underline, etc., and a preview area showing the text '65.3% % Customers w/ Reviews'. A bracket on the right side groups the 'Formatting Bar', 'Available Fields', and 'Special Tags' sections.

**Create new field / Attach Text**  
Generate a new column, or combine text with an existing one

**Expert Mode: Treat text as raw PCXML**  
Write custom PCXML code to create text object

**Formatting Bar**  
Adjust alignment, text format, font type, color and more

**Available Fields**  
Insert available columns from input dataset

**Special Tags**  
More custom formatting options (lines, page breaks, etc.)

The screenshot shows the 'Browse (163) - Configuration' window. It displays a single record with 4 fields, containing the text '65.3% % Customers w/ Reviews'. The text is styled with a large bold font and a percentage sign.

**Browse Text**

**Browse (163) - Configuration**

1 record displayed, 4 fields, 921 bytes

Report Profile

1 of 1 Fields

Record % of Customers w/ Reviews\_Label  
1 65.3% % Customers w/ Reviews



# Table

The **Table** tool creates a data or pivot table for output in reports (via the Rendering tool)

- Create reference tables, detailed legends, or text tables for emailed reports

The screenshot shows the configuration interface for a table. It includes sections for Table Mode (Basic or Pivot), Group by fields (Greater or Less Than 5 Miles, Customers), Table Configuration (Width: Percentage, 100%), Pivot Style (Bar Graph, Customers), and Per Column Configuration (checkboxes for Greater or Less Than 5 Miles, Customers, Dynamic or Unknown Fields, with width, alignment, borders, and decimal places settings). Buttons at the bottom include Default Table Settings... and Create Row Rule... .

## Table Mode

Choose **basic** or **pivot** (use with Crosstab)

## Group by

Select fields to group by (separate tables per field)

## Table Width

Automatic, percentage, or fixed width

## Pivot Style

Choose style for data coming from crosstab tool

## Bar Graph

Choose measure field for bar chart in table

## Per Column Configuration

Select fields, sort order, width, format and more

**Before**

| Record | Greater or Less Than 5 Miles | Customers |
|--------|------------------------------|-----------|
| 1      | < 5 Miles                    | 244       |
| 2      | > 5 Miles                    | 310       |

**After**

**Browse (171) - Configuration**

1 record displayed, 1 field, 1,190 bytes |

Report Profile

1 of 1 Fields | Records 1 to 1 |

| Record | Table | Greater or Less Than 5 Miles | Customers | 240 | 313 |
|--------|-------|------------------------------|-----------|-----|-----|
| 1      |       | < 5 Miles                    | 244       | 244 |     |
|        |       | > 5 Miles                    | 310       | 310 |     |



# Interactive Chart

The **Interactive Chart** tool creates data visualizations including charts, graphs and plots

- Visualize data with histograms, bar & column charts, sparklines and more

The screenshot illustrates the workflow for creating an interactive chart. It starts with a 'Configure Chart' dialog box, which has a red arrow pointing to the main 'Interactive Chart' interface. The main interface shows a 'CREATE' sidebar with options like Layer, Template, Transforms, Style, and Batch. A large bracket on the right groups these into five categories: **Layer**, **Template**, **Transforms**, **Style**, and **Batch**. Below the interface are two examples of the output:

**Before**: A table showing monthly sales data.

| Month               | Sales | Customers | RunTot_Sales |
|---------------------|-------|-----------|--------------|
| 2014-07-01 00:00:00 | 39    | 7         | 39           |
| 2014-08-01 00:00:00 | 69    | 13        | 108          |
| 2014-09-01 00:00:00 | 93    | 16        | 201          |
| 2014-10-01 00:00:00 | 233   | 39        | 434          |
| 2014-11-01 00:00:00 | 274   | 45        | 708          |
| 2014-12-01 00:00:00 | 370   | 56        | 1078         |
| 2015-01-01 00:00:00 | 374   | 63        | 1452         |
| 2015-02-01 00:00:00 | 523   | 82        | 1975         |

**After**: An interactive chart titled 'Record Chart' showing Sales over time with a running total line.

Record Chart

Legend: Running Total Sales (Line), Sales (Bar)

Y-axis: Sales (0 to 2500)

X-axis: Month (Jul 2014 to Jul 2016)

Annotations: 1, 2500, 2000, 1500, 1000, 500, 0, 15k, 10k, 5k, 0



# Report Map

The **Report Map** tool creates map images based on spatial data inputs

- Create fully customizable maps for geospatial analysis or reporting

**Map Preview** ←

**Map Size**  
Specify the size of the map in inches

**Resolution**  
Select resolution (**high** - for print, **low** - for monitors)

**Scale**  
Select a scale for the map (miles, feet, meters, etc.)

**Reference Base Map**  
Specify base layers for the map

**Background Color**  
Color picker tool for the background color of map

**Expand Extent**  
Expand or contract the zoom level of the map

The central panel shows a preview map with red and blue dots, and a legend at the bottom. To the left, there are several configuration sections with labels and arrows pointing to specific fields in the preview panel.

**Data**

**Layers**

**Legend**



# Map Legend Splitter & Builder

The **Map Legend Splitter & Builder** allow users to customize map objects and legends

- Commonly used to add custom colors, text and shapes to default map legends

## Configure Splitter

### Legend Field

Select Legend field from Map Input

## Browse Splitter

## Configure Builder

### Text Field

Choose the text to display in the legend

### Image Field

Choose a report object for the legend image

### Text / Image Style

Choose text or image styling elements

## Browse Builder



# Report Header & Footer

The **Report Header & Footer** tools allow you to add custom text or images to reports

- Commonly used to add titles, company logos, copyright information or confidentiality notices to reports

## Configure Header

Report Title

Report Date  
 Include the date in your report header.  
Specify your DateTime Language: English  
Output Format: dd-MM-yy

Report Image  
 Include an image (logo) on your header.  
 Use the Alteryx logo  
 Specify custom image:  
Browse to the image to use in the report header: C:\Users\dusti\Documents\Maven Data Logo.png  
The size of the Alteryx logo is 150 by 55 (W x H) pixels. If you use an image of a different size or ratio, you may encounter layout issues. You may need to resize your image outside of Alteryx.

### Report Title

Enter the title for your report

### Report Date Options

Choose DateTime language and output format

### Image Selection

Choose Alteryx logo or upload your own

#### Example:

Report Profile  
2 of 2 Fields | Records 1 to 1 |

| Record | Text                                 | Header     |
|--------|--------------------------------------|------------|
| 1      | Root Beer Trade Area Map<br>22-02-23 | Maven Data |

## Configure Footer

Report Footer (187) - Configuration

Configuration  
The Report Footer macro will append the created footer to your supplied data, this new field can then be used in a Render tool as a Footer for your report.

Copyright text:

Using the [CurrentYear] tag in the copyright text box will put the current year into your copyright.

Information text: (Will be shown on the bottom line of the footer, left aligned.)

Include page numbers. (Will be shown on the bottom line)

#### Example:

Report Profile  
2 of 2 Fields | Records 1 to 1 |

| Record | Text | Footer   |
|--------|------|--|
| 1      |      | © 2023 Maven Analytics, inc.<br>www.mavenanalytics.io<br>Page 000 of 000 |

### Copyright Text

Add custom copyright text to the footer

### Information Text

Add additional informational text (website, URL, etc.)

### Include Page Numbers

Select if page numbers should be included in report footer



# Image

The **Image** tool allows users to add static or dynamic data-responsive images to reports

- Add custom images or design your own layouts or background templates for reports

**Retrieve Image From Disk**  
Pull image from defined path at runtime

**Store Static Image in Workflow**  
Keeps a copy of the image within the packaged flow

**Get Image From Binary Data**  
Pulls image from a blob field data type

The dialog box has three main sections:

- Retrieve Image From Disk At Runtime:** Includes a checkbox for "Modify filename for each record" which is highlighted with a red box and an arrow pointing to the "Modify filename for each record" section below.
- Store Static Image In Workflow:** Shows image info: 850 x 114 pixels (W x H), PNG format (lossless), 39 KB in workflow. A thumbnail image of a document titled "Root Beer Market Review" is shown.
- Get Image From Binary Data In Field:** Shows an "Image Field (Blob):" dropdown set to "[No Valid Fields]".

**Modify filename for each record**  
Choose different images dynamically based on incoming data

| Type             | Image Name   | Image File Name | Append File Name | Replaced Path             |
|------------------|--------------|-----------------|------------------|---------------------------|
| Append           | Cat          | image.jpg       | imageCat.jpg     |                           |
| Prepend          | Cat          | Image.jpg       | Catimage.jpg     |                           |
| Replace Filename | Catimage.jpg |                 |                  | \data\images\Catimage.jpg |
| Replace Path     |              |                 |                  | \data\images\Catimage.jpg |

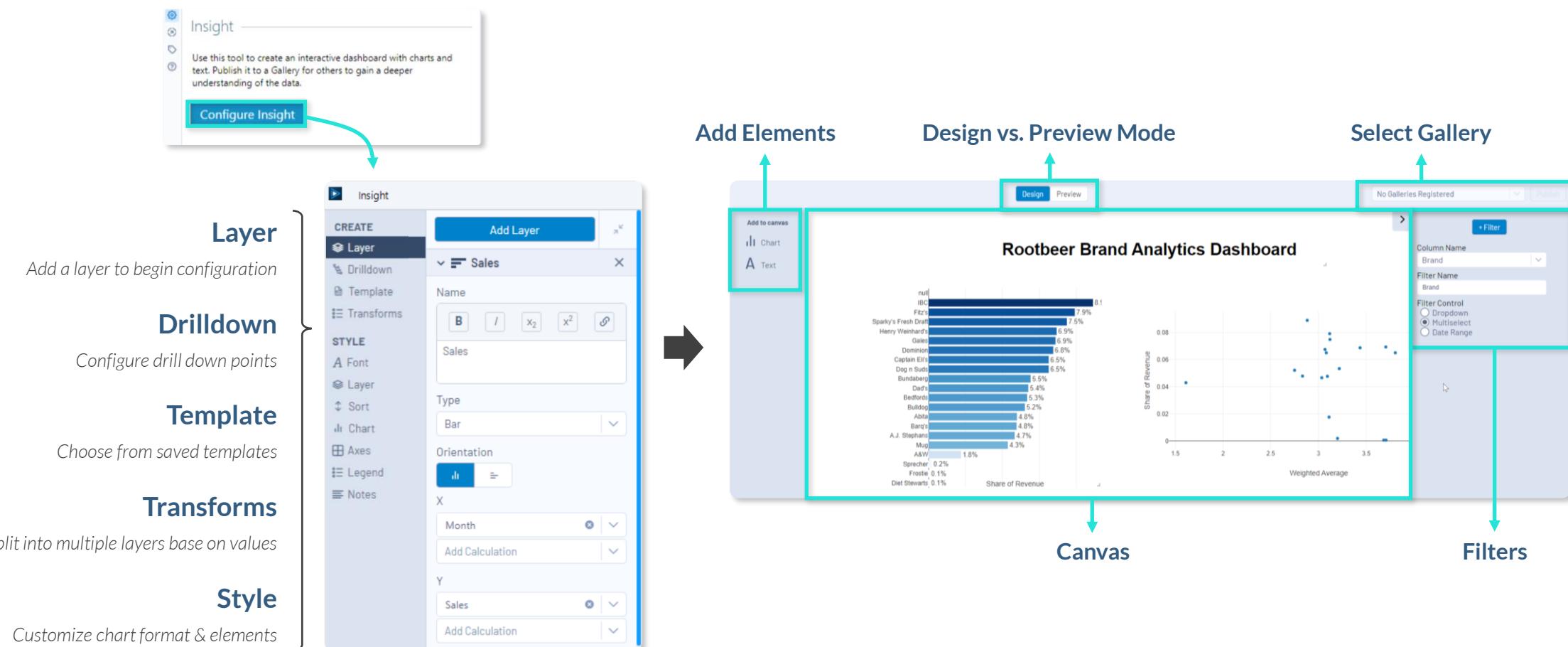
**PRO TIP:** Tools like **PowerPoint** and **Figma** are great for creating custom report layouts and backgrounds!



# Insight

The **Insight** tool allows users to create and publish interactive dashboards

- Publish reports to the **Alteryx Gallery**, where they can be embedded or shared to the public





# Overlay

The **Overlay** tool layers report objects over one another (including maps, images, text, etc.)

- Layer custom legends over charts, combine charts with background images, or create nested visualizations

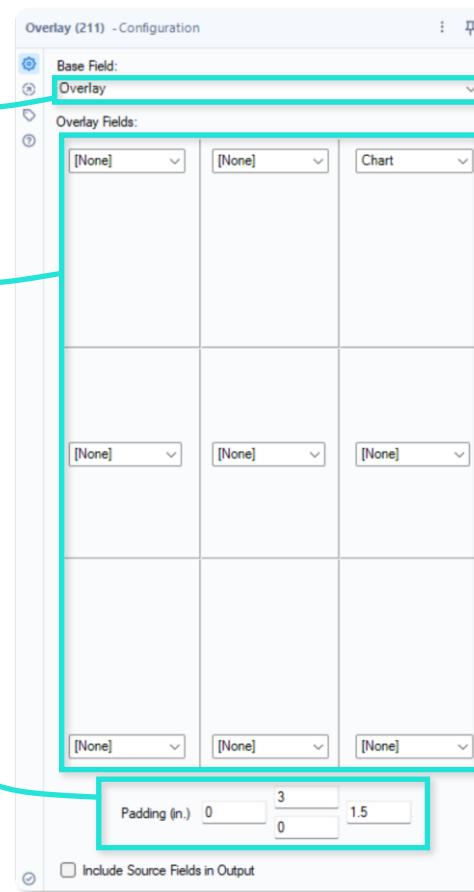
**Base Field** ←  
Report object which other fields will be layered on top of

**Overlay Fields** ←  
Report objects that will be layered on top of the base field

**Padding** ←  
Add padding (in.) to overlays (top, bottom, left, right)

Padding (in.) 0 3 0 1.5

Include Source Fields in Output

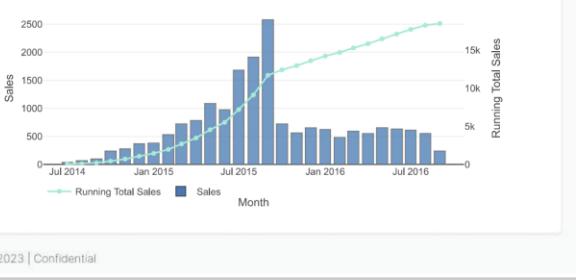


**Root Beer Market Review**  
Sample Analytic Report 

**Brand Share of Revenue**

| Brand                | Share of Revenue |
|----------------------|------------------|
| IBC                  | 8.1%             |
| Fitz's               | 7.9%             |
| Sparky's Fresh Draft | 7.5%             |
| Henry Weinhard's     | 6.9%             |
| Gales                | 6.9%             |
| Dominion             | 6.8%             |
| Captain Elf's        | 6.5%             |
| Dog n Suds           | 6.5%             |
| Bundaberg            | 5.5%             |
| Dad's                | 5.4%             |
| Bedfords             | 5.3%             |
| Bulldog              | 5.2%             |
| Abita                | 4.8%             |
| Barq's               | 4.8%             |
| A.J. Stephans        | 4.7%             |
| Mug                  | 4.3%             |
| Sprecher             | 0.2%             |
| Frostie              | 0.1%             |
| Diet Stewarts        | 0.1%             |

**Monthly Revenue & Customer Trend**



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# Layout

The **Layout** tool allows users to organize and configure reports for final rendering

- Consolidate multiple reports or report objects together into a single view for rendering

## Layout Configuration

Configure formatting options:

- Orientation
- Layout Width
- Layout Height
- Border
- Separator
- Cell Padding

The screenshot shows the 'Layout (214) - Configuration' dialog. It has three main sections:

- Layout Mode:** A dropdown set to 'Each Individual Record'. This section also includes 'Group By:' fields and checkboxes for 'Include Source Fields in Output'.
- Layout Configuration:** Includes 'Orientation' (Vertical), 'Layout Width' (Percentage, 100%), 'Layout Height' (Automatic), 'Border' checkbox, 'Separator' checkbox, and 'Cell Padding' (0 pixels).
- Per Row Configuration:** Shows a list of objects: Header, Map, Legend, Table, Footer, Input\_#2\_Legend, Text, and Input\_#5\_Text. It includes 'Height' (Automatic), 'Alignment (V)' (Middle), 'Alignment (H)' (Center), and a 'Fill Color' checkbox.

## Layout Mode

Select *individual*, *group*, or *all records*

## Group by

If *group* layout mode selected, select fields

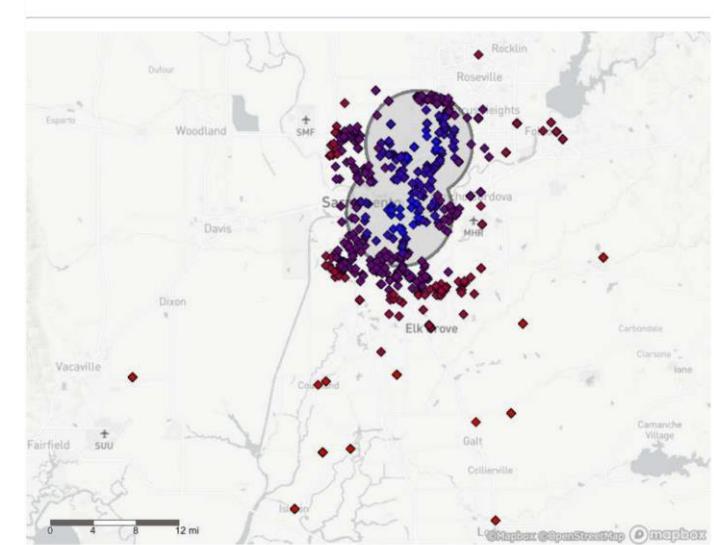
## Per Row Configuration

Configure object order & format:

- Height
- Alignment (V)
- Alignment (H)
- Fill Color

## Root Beer Trade Area Map

25-02-23



| Greater or Less Than 5 Miles | Customers |
|------------------------------|-----------|
| < 5 Miles                    | 240       |
| > 5 Miles                    | 310       |

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# Visual Layout

The **Visual Layout** tool allows users to configure reports using a drag-and-drop interface

- Create multi-layer reports and dashboards that combine multiple elements into a single page

The screenshot illustrates the Visual Layout tool's interface, divided into three main sections:

- Report Elements** (left): A sidebar titled "Elements" containing a list of report components: Chart(2), Chart #5, Chart #6, Image(1), Legend(0), Map(0), Table(0), and Text(3). A teal arrow points from the text "Charts, images, tables, etc." to this section.
- Canvas** (center): The main workspace where a dashboard is being built. The dashboard title is "Root Beer Market Review" and subtitle is "Sample Analytic Report". It features three key metrics: "65.3% % Customers w/ Reviews", "-10.3% Customer Growth Year-Over-Year", and "-54% Revenue Growth Year-Over-Year". Below these is a chart titled "Monthly Revenue & Customer Trend" showing monthly sales and running total sales from July 2014 to July 2016. A teal arrow points from the text "Arrange elements on a snap-to-grid canvas" to this section.
- Page Setup** (right): A panel for configuring report settings. It includes fields for "REPORT TYPE" (PDF), "PAPER SIZE" (Letter (8.5in x 11in)), "WIDTH" (8.5 in), "HEIGHT" (11 in), "MARGINS" (0.5in), and "ORIENTATION" (Portrait). A teal arrow points from the text "Configure report type and page dimensions" to this section.

A yellow warning message at the top of the canvas area states: "Elements Do Not Fit on Page" and "Report elements do not fit on the page and data may be truncated. Adjust the layout or modify the page size."



# Render

The **Render** tool produces a static file for report sharing and distribution

- Commonly used to produce easily sharable report images for distribution via email

The screenshot shows the 'Render (218) - Configuration' dialog box. It includes sections for 'Output Mode' (set to 'Choose a Specific Output File'), 'Report Data' (Data Field: 'Layout', Separator: 'No Spacing Between Records'), 'Header & Footer' (Header: 'Input\_#2\_Legend', Footer: 'Input\_#2\_Legend', Edge distance: 0), and 'Report Style' (Paper Size: 'Letter (8.5" x 11")', Orientation: 'Portrait', Margins: '0.5 inch Margins'). A large bracket on the left groups the 'Report Data' and 'Header & Footer' sections under the heading 'Data Field & Separator'. Another bracket groups the 'Report Style' section under the heading 'Report Style'.

**Data Field**  
Select field containing report data

**Separator**  
Select a separator type (not required)

**Header & Footer**  
Select header/footer (not required)

**Report Style**  
Page size, orientation & margins

**Output Mode**  
Choose temporary file type or specific output file

**Output File**  
If specific output chosen, select a location for file

**Group Data into Separate Reports**  
Choose field to group on and field to modify file name by

**PNG Options:**

|                       |  |
|-----------------------|--|
| Resolution            | 1x (96 dpi)                                |
| If Content Too Large  | Warn with the following behavior           |
| Behavior if Too Large | Shrink Content to Fit Paper Height         |
| Background            | <input type="checkbox"/> Transparent White |

**PRO TIP:** Change the default report directory in **Options > User Settings > Edit User Settings**



# Email

The **Email** tool distributes reports using SMTP configuration via the data connection manager

- Create metric threshold notifications, distribute scheduled reports, or configure data quality alert emails

*Setup SMTP*

**Connection Manager**

**Data Sources**

**Filtered to Email Tool**

**+ Add Data Source**

| Name  | Technology | Connections | Last Updated           |
|-------|------------|-------------|------------------------|
| Gmail | Email SMTP | 1           | Jan 03, 2023, 01:37 PM |
| Email | Email SMTP | 1           | Jan 02, 2023, 08:00 PM |

**Gmail**

Data Source Name: Gmail  
Technology: Email SMTP  
SMTP Server: smtp.gmail.com:465  
Port: 465  
Encryption: SSL/TLS

**Connections**

Username and password: Gmail | Username and password

**Connect Credential**

**Connect**

*Configure Email*

**Email (314) - Configuration**

Enabled  
Connection Name: dcm: Gmail - Gmail  
[Set Up a Connection](#)  
 Use Data Connection Manager (DCM)

**From:**  Use Field   
**To:**  Use Field   
**Cc:**  Use Field   
**Bcc:**  Use Field   
**Subject:**  Use Field   
**Attachments:**

**Body:**  Use Field

## Connection

Set up SMTP via the data connection manager

## Email Recipients

Choose email recipients manually or via data input

## Attachments

Add attachments to your email

## Body

Add text or embed reports into the email body



**IMPORTANT:** Different configurations may be required to start sending email depending on the SMTP; refer to Alteryx support for more information

# Key Takeaways

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-  Create report objects using **Table**, **Image**, **Text** and **Interactive Chart** tools
-  Customize reports and add context using **Headers**, **Footers** and **Legends**
-  Combine objects using **Layout** tools to create centralized reports
-  Use the **Insight** tool to create and publish interactive dashboards to Alteryx galleries
-  Distribute and share static reports with end users via **Render** and **Email** tools

# Macros & Applications

# Macros & Applications

**Macros & Applications** can be used for advanced automation or custom, user-driven workflows

## Macros



**Macros** group tools together into a single tool that can be used within another workflow

## Analytic Applications



**Analytic Applications** are workflows built with a user interface for self-service analytics

# Macro Types

Alteryx Designer supports several **macro types**, including standard, batch and iterative macros

## Standard



**Standard** macros package workflows as a single tool to be used in other workflows

## Batch



**Batch** macros run multiple times in a workflow and generate a result after each run

## Iterative

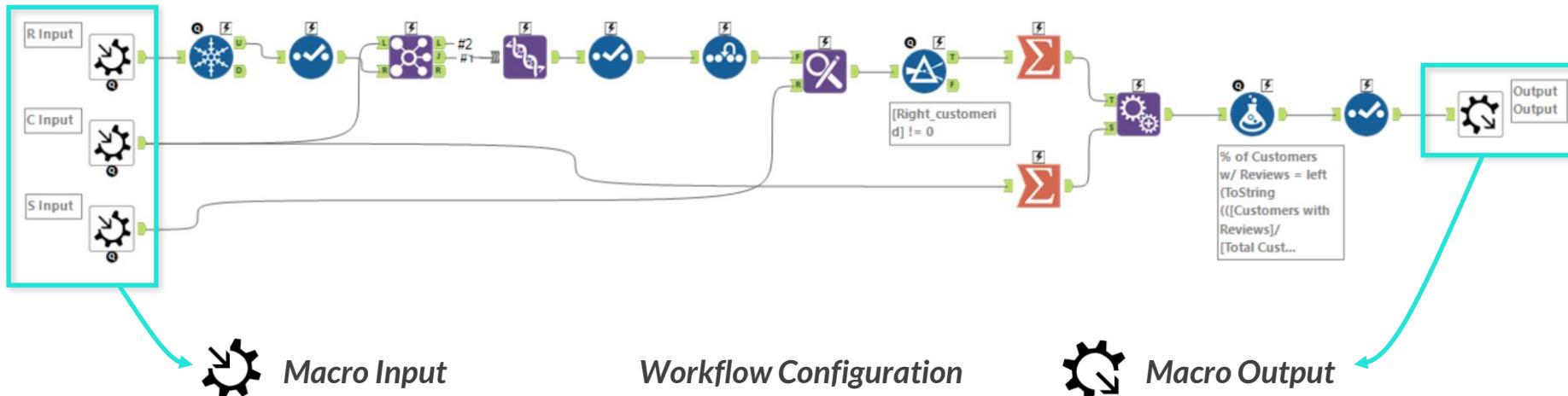


**Iterative** macros run a set number of times in a workflow or until a specified condition is met



# Standard Macro

**Standard macros** package an existing workflow as a single tool that can be used in other flows



**Text / File Input**  
Text or file-based data template

**Input Name**

**Anchor Abbreviation**  
Abbreviation for input anchor

Macro Input (20) - Configuration

|  |
|--|
| Template Input (For Test as a Standard Workflow)                                       |
| <input type="radio"/> Text Input<br>Edit Data... [No Data]                             |
| <input checked="" type="radio"/> File Input<br>Configure... C:\Users\dusti\Documents\N |
| Input Name:<br>Reviews   |
| Anchor Abbreviation:<br>R  |
| <input type="checkbox"/> Show Field Map  |
| <input type="checkbox"/> Optional Incoming Connection                                  |

Workflow - Configuration

|  |   |   |
|--|---|---|
| Path: C:\Users\dusti\Documents\Maven Local Files\Alt |   |   |
| Type:  | <input type="radio"/> Standard Workflow         | <input type="radio"/> Analytic App                          |
| Macro:   | <input checked="" type="radio"/> Standard Macro | Standard Macro  |
| Constants:   | Type  | Name  |
| Engine   | TempFile  | 2022.3.1.395  |
| Engine   | Version   | C:\Users\dusti\Documents\Maven Local Files\Alt\2022.3.1.395 |
| Engine   | WorkflowDirectory                               | Local Files\Alteryx   |
| Engine   | WorkflowFileName                                | Alteryx_Up_   |
| Engine   | GuiInteraction                                  | True  |

Macro Output (22) - Configuration

|                          |
|--------------------------|
| Output Name:<br>Output   |
| Anchor Abbreviation:<br> |

**Output Name**

**Anchor Abbreviation**  
Abbreviation for output anchor



# Batch Macro

**Batch macros** run multiple times in a workflow and generate a result after each run

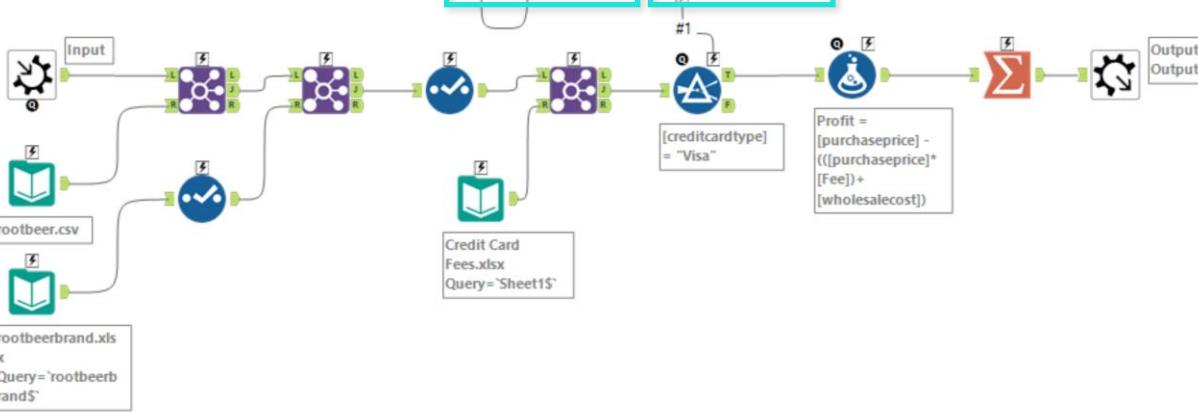
## Control Parameter

Control Parameter (15) - Configuration

Enter a label for the Control Parameter:  
Choose a Card Type

#1 Control Parameter (15) Choose a Card Type

Update Value Update Value



## Action Tool

Action (16) - Configuration

Select an action type:  
Update Value (Default)

Value or Attribute to Update:

Filter (3)

- Mode - value="Simple"
- Simple
  - Operator - value="="
  - Field - value="creditcardtype"
  - Operands
    - IgnoreTimeInDateTime - value="True"
    - DateType - value="fixed"
    - PeriodDate - value="2023-01-09 21:21:31"
    - PeriodType
    - PeriodCount - value="0"
    - Operand - value="Visa"
    - StartDate - value="2023-01-09 21:21:31"
    - EndDate - value="2023-01-09 21:21:31"

Action Type

Choose action (i.e. "update value")

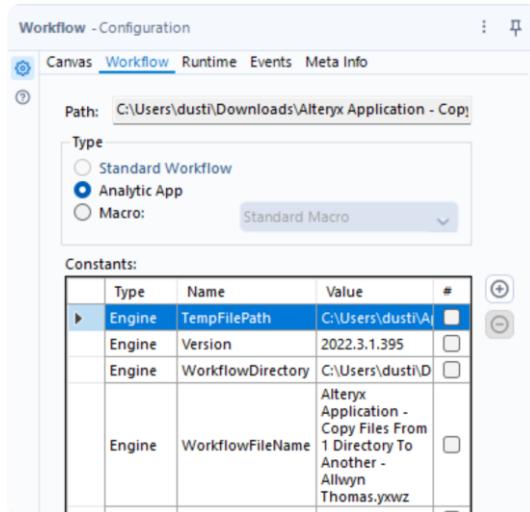
Value/Attribute to Update

Select which field the action will modify

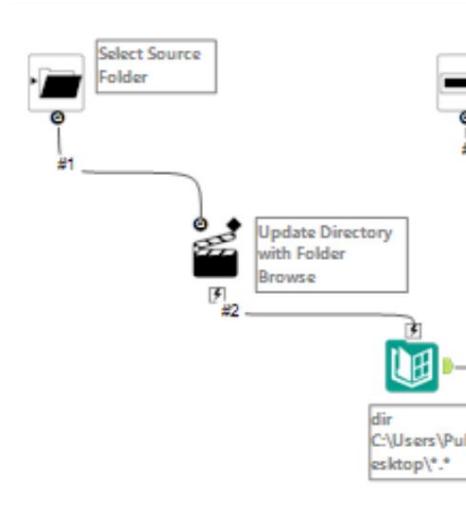
# Analytic Apps

**Analytic Apps** are self-contained workflows designed to fulfill specific tasks for users

## 1 Type: Analytic App



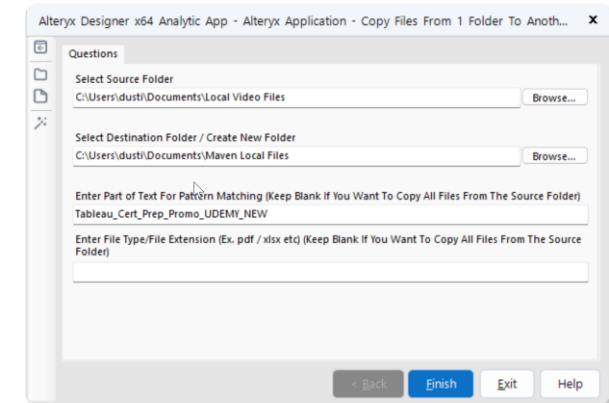
## 2 Interface Tools



## 3 Save as .YXWZ



## 4 Run App!



**IMPORTANT:** Make sure to review the Alteryx app guidelines to ensure that your apps are built with best practices and compliance measures in mind

# Key Takeaways

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**Standard macros** package workflows as a single tool to be used in other flows



**Batch macros** run multiple times and generate a result after each run based on user-defined inputs



**Iterative macros** run a set number of times in a workflow or until a specified condition is met



**Analytic apps** execute self-contained workflows based on user inputs