

# Spotfire Bootcamp

Advanced Data Visualisation

Day 1 & Day 2

# Objectives

Spotfire User Interface

Data access

Spotfire data canvas and transformation

Filters Panel

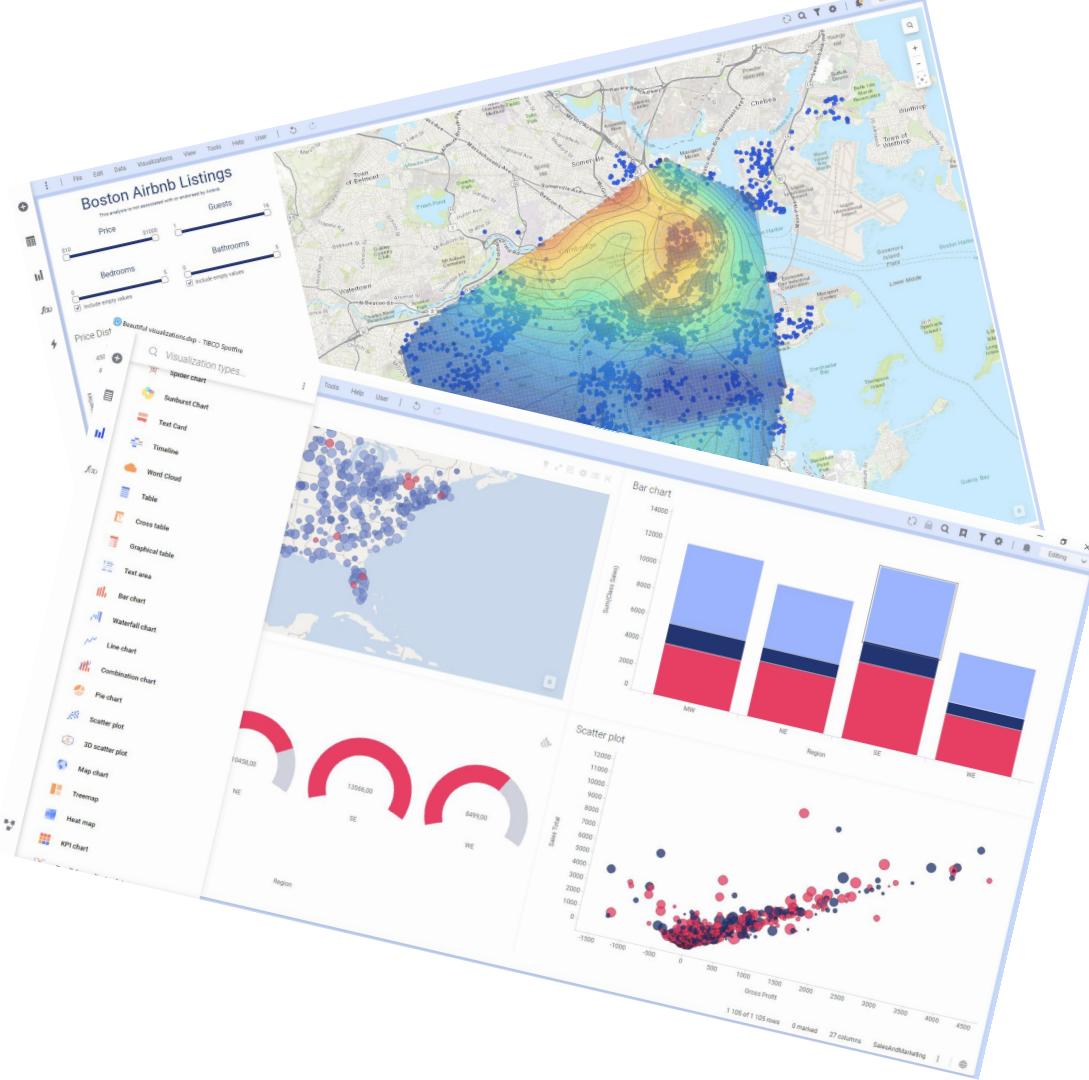
Bookmarks

Scripting intro

# Spotfire User Interface

# Spotfire Analyst

- Windows based fully featured client for creating simple to complex analysis
- Installed on user's machine



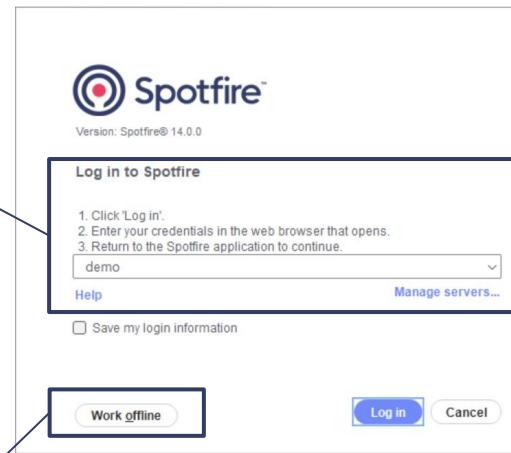
# Spotfire Analyst Modes

- Online Mode

- Access server library
- Get software updates from server
- Access information links
- Connect to multiple servers

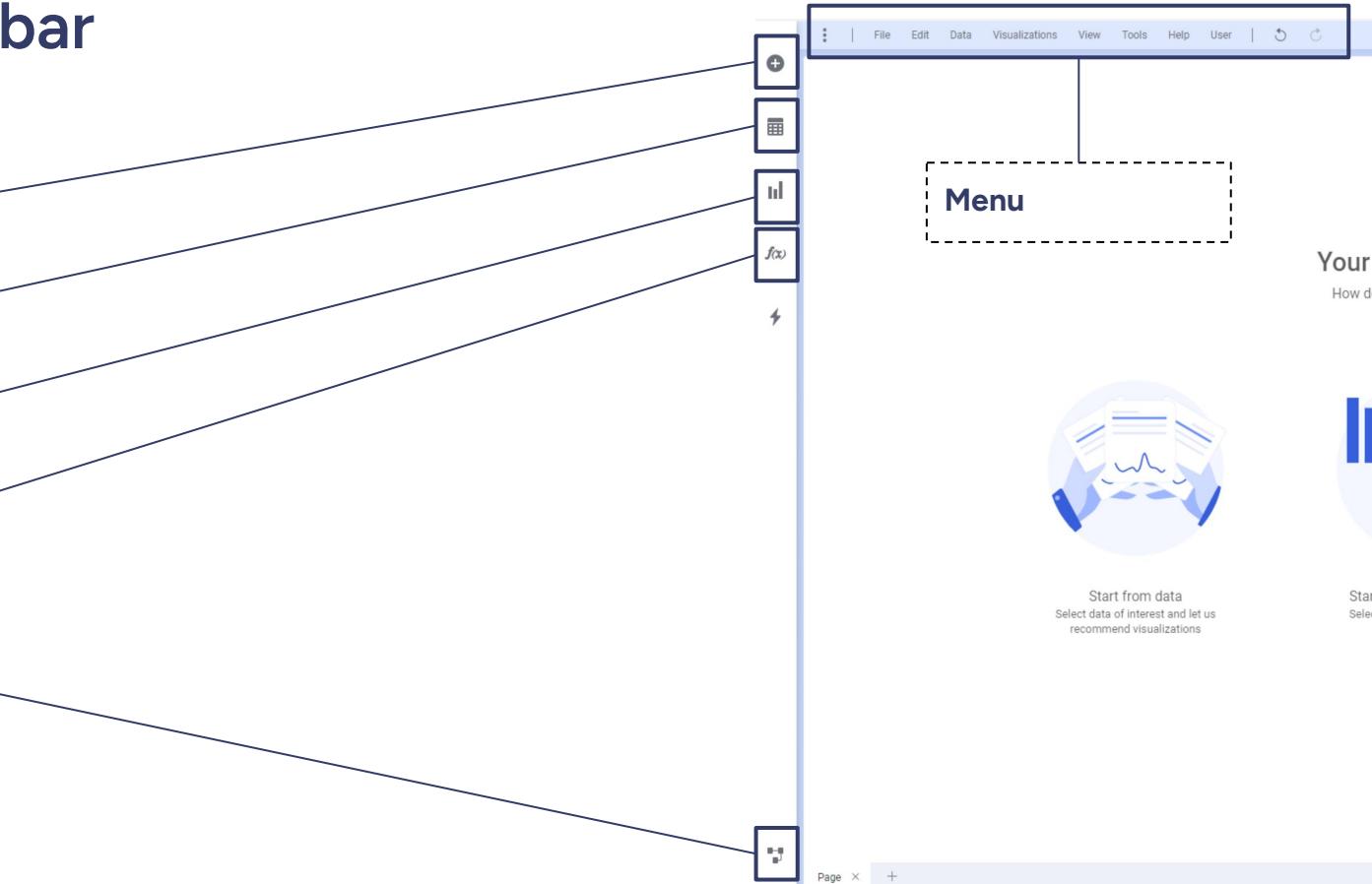
- Offline Mode

- Work with local storage only
- Convenient on the go

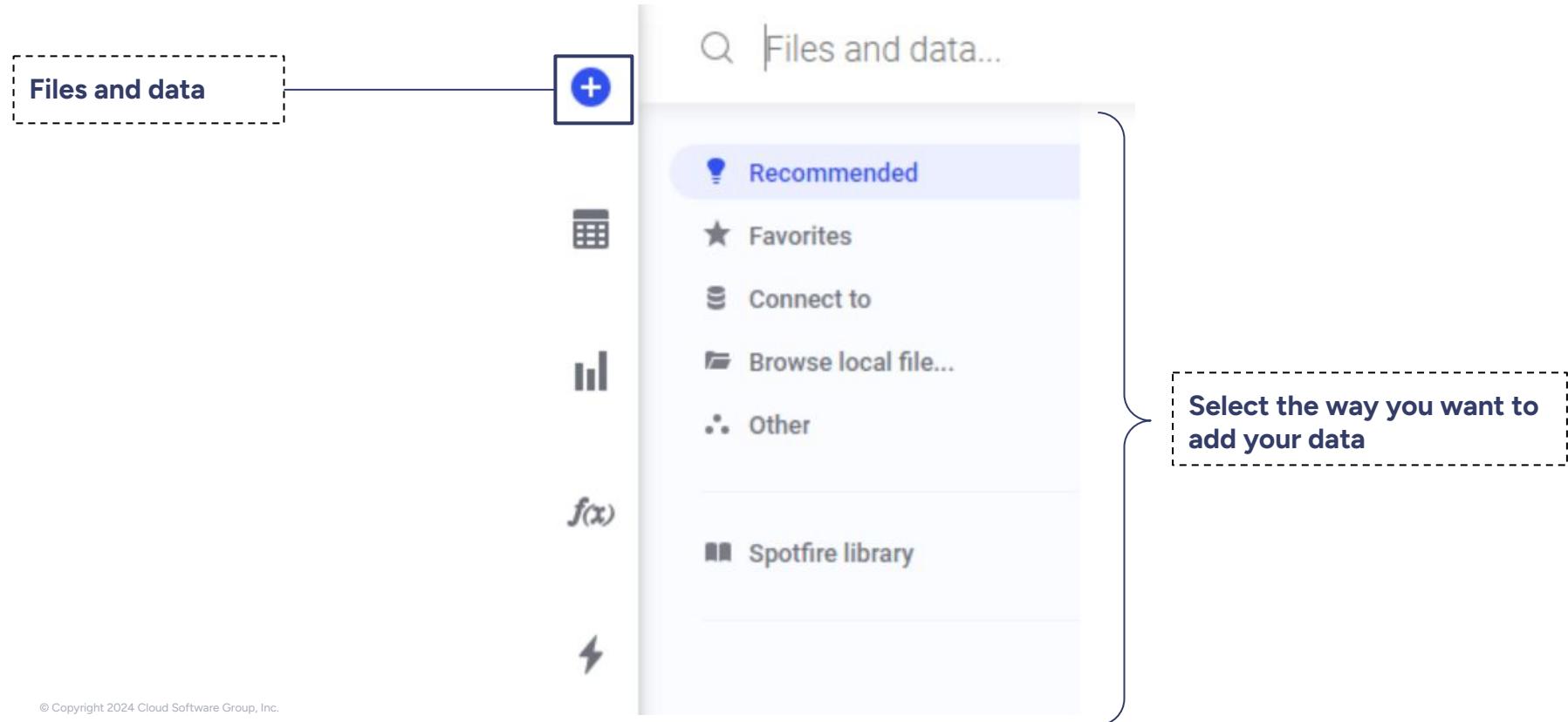


# Authoring bar

- Files and data
- Data in analysis
- Visualization type
- f(x) - analytic tool
- Data Canvas



# Load data



# Analyze data

The screenshot illustrates a data analysis interface with the following components:

- Data in analysis:** A dashed box highlights the main workspace where a search bar ("Data in analysis...") and a list of columns from "OrderDetails - Sheet1" are visible.
- Column Selection:** A blue box highlights the "SHIPMENT DATE" column in the list, which is currently selected (indicated by a checked checkbox).
- Column Details View:** A detailed view of the "SHIPMENT DATE" column settings is shown on the right. It includes:
  - SHIPMENT DATE:** The selected column name.
  - No description added:** A note indicating no description has been added.
  - Min:** 19/01/2017
  - Max:** 16/01/2018
  - Time Series Chart:** A blue bar chart visualizing the data over time.
  - Categorize column as:** Set to "Time".
  - Data type:** Set to "Date".
  - Formatting:** Set to "Date".
  - Display values:** Set to "(Default)".
  - Geocoding:** Set to "Not configured".
  - Sort Options:** Buttons for "ALL" and "UNIQUE", with "ALL" being selected.
  - Click to sort:** Buttons for "30/01/2017" and "27/01/2017".
- Details on selected column:** A dashed box highlights the "SHIPMENT DATE" column settings area on the right.

# Visualize data

The screenshot illustrates a data visualization interface with the following components:

- Data in analysis flyout:** A dashed box highlights the top-level navigation area containing a search bar ("Data in analysis..."), a plus sign icon, and a calculator icon.
- Select the data columns of interest:** A dashed box highlights the "Variables" section of the flyout, which lists "Variable 1", "Variable 2" (selected), "Variable 3" (selected), and "Variable 4".
- Visualization Options:** Two cards are shown on the right:
  - Create scatter plot:** View Variable 3 vs. Variable 2. This card displays a scatter plot of blue dots and a "MORE LIKE THIS" button.
  - Create density plot:** View distribution of binned Variable 2 per binned Variable 3. This card displays a scatter plot with green and blue points.
- Instructional Callout:** A bracket on the right side groups the two visualization cards and points to a dashed box containing the text: "Click, or drag, the visualization type you want".

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# Visualize data

Visualisation types flyout

Q Visualization types...

Tools Help User | ⌂ ⌂ ⌂

Table

Cross table

Graphical table

Text area

Bar chart

Waterfall chart

Line chart

Combination chart

Pie chart

Scatter plot

3D scatter plot

Click, or drag, the visualization type you want



Your data is ready!

How do you want to continue?

# Visualize data

Click Find and type what you are looking for in your data

The screenshot shows a software interface for visualizing data. At the top is a navigation bar with File, Edit, Data, Visualizations, View, Tools, Help, and User tabs. To the right of the tabs are several icons: a magnifying glass for search, a speech bubble for comments, a star for bookmarks, a funnel for filters, and a gear for settings. A dashed box highlights the search icon.

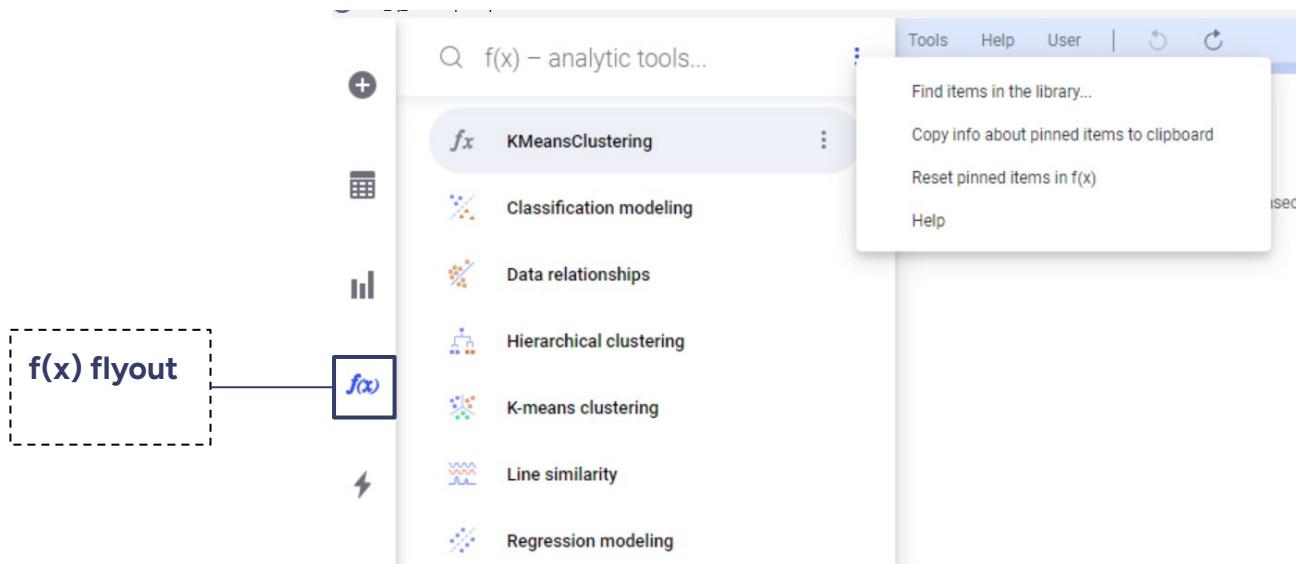
The main area features a table titled "Sales Data" with columns: Year, Type, Sales, and Month. The first few rows of data are:

| Year | Type     | Sales | Month    |
|------|----------|-------|----------|
| 2016 | Apples   | 12    | January  |
| 2016 | Pears    | 21    | January  |
| 2016 | Bananas  | 29    | January  |
| 2016 | Cucumber | 9     | January  |
| 2016 | Tomatoes | 13    | January  |
| 2016 | Lettuce  | 22    | January  |
| 2016 | Apples   | 11    | February |
| 2016 | Pears    | 21    | February |
| 2016 | Bananas  | 31    | February |
| 2016 | Cucumber | 8     | February |
| 2016 | Tomatoes | 12    | February |
| 2016 | Lettuce  | 20    | February |
| 2016 | Apples   | 9     | March    |
| 2016 | Pears    | 19    | March    |
| 2016 | Bananas  | 32    | March    |
| 2016 | Cucumber | 8     | March    |
| 2016 | Tomatoes | 11    | March    |
| 2016 | Lettuce  | 21    | March    |
| 2016 | Apples   | 9     | April    |
| 2016 | Pears    | 18    | April    |
| 2016 | Bananas  | 32    | April    |
| 2016 | Cucumber | 10    | April    |
| 2016 | Tomatoes | 12    | April    |
| 2016 | Lettuce  | 21    | April    |

To the right of the table, a search bar contains the query "Sales per Year". Below the search bar are four card-like boxes, each representing a different chart type:

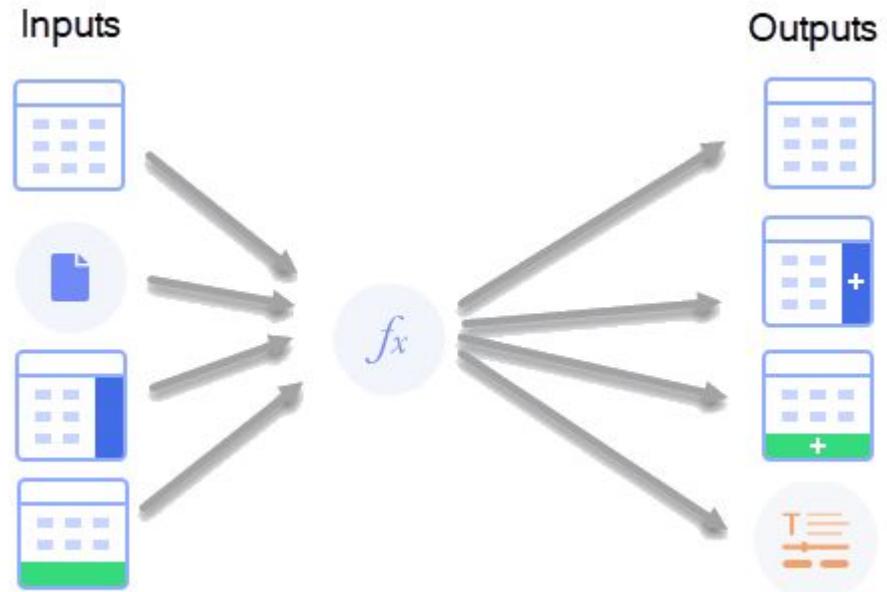
- Create line chart**: View Sales over Year. (Shows a blue line graph)
- Create bar chart**: View Sales over Year. (Shows three red bars)
- Create treemap**: View Sales per Year. (Shows a blue and light blue treemap)
- Create pie chart**: Compare Sales per Year. (Shows a pie chart with yellow and blue segments)

# f(x) - analytics tools flyout



# Data functions

- Complex calculations
- Versatile applications
- Inputs and outputs
- Library and Reusability



# Data Canvas

The screenshot shows the TIBCO Data Canvas interface. On the left, a dashed box labeled "Data Canvas" contains a small icon of a document with a blue square. A line connects this icon to the main canvas area. The main canvas has a light gray dotted grid background. At the top, there's a toolbar with icons for file operations (File, Edit, Data, Visualizations, View, Tools, Help, User) and a search bar. Below the toolbar, a sidebar on the left lists "Data tables" and shows a preview of "3-The-5-Sheet-Book - TIBCO Me...". The main workspace shows a data flow: a blue folder icon (representing a file source) is connected by a line to a blue database icon (representing a destination or analysis table). The database icon has a tooltip: "This is the data table used in the analysis." At the bottom, a table titled "3-The-5-Sheet-Book.xls - TIBCO Mega Mart" shows the loaded data from the source. The table has four tabs: INFORMATION, DATA, COLUMN PROPERTIES (which is selected), and DATA TABLE PROPERTIES. The "COLUMN PROPERTIES" tab displays the following data:

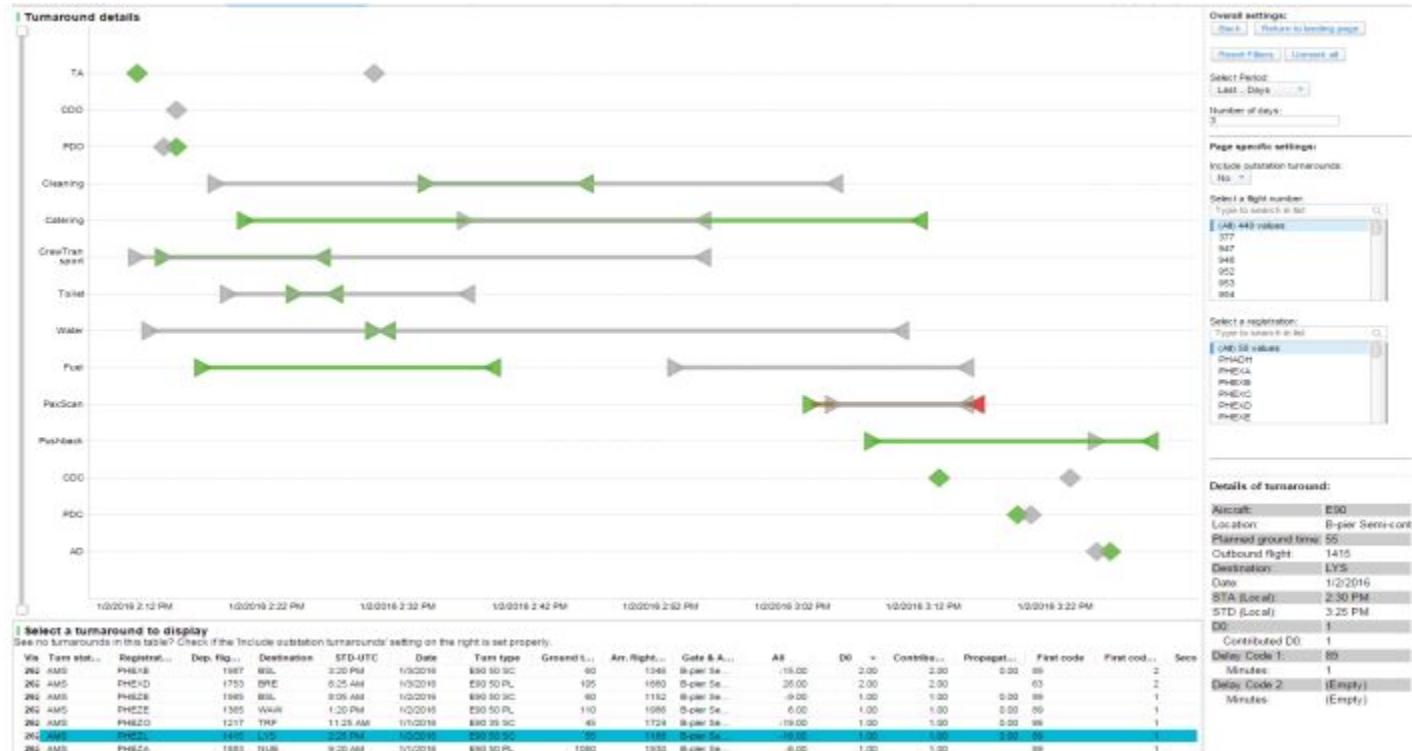
| Name           | ColumnType | DataType | ExternalName   | ExternalId | IsValid | Expression |
|----------------|------------|----------|----------------|------------|---------|------------|
| Store Locat... | Imported   | String   | Store Locat... |            | True    |            |
| Store Number   | Imported   | Integer  | Store Number   |            | True    |            |
| Customer ID    | Imported   | String   | Customer ID    |            | True    |            |
| Customer a...  | Imported   | Integer  | Customer a...  |            | True    |            |
| Gender         | Imported   | String   | Gender         |            | True    |            |
| Date Joined    | Imported   | Date     | Date Joined    |            | True    |            |
| Most Rece...   | Imported   | Date     | Most Rece...   |            | True    |            |
| Electronics    | Imported   | Integer  | Electronics    |            | True    |            |
| Furniture      | Imported   | Integer  | Furniture      |            | True    |            |
| Garden         | Imported   | Integer  | Garden         |            | True    |            |

# Spotfire Data Visualization inspiration

## Gate Performance



# Turn around times - Gantt chart



# Spotfire community demo - Airport visitor ratings



[Open demo](#)

# Engineering & Maintenance example



# Map charts demo

## Wind Energy root cause failure demo

The demo shows data from Wind Turbines in the Netherlands.

The goal of this demo, is to find any anomalies in the data. And if there are any anomalies to be found, what can be done to:

- find the root cause of these anomalies;
- mitigate or prevent these anomalies.

Start the demo by clicking this link: [Wind Turbine Overview](#)

This demo requires a TERR package. See [here](#) for more information.



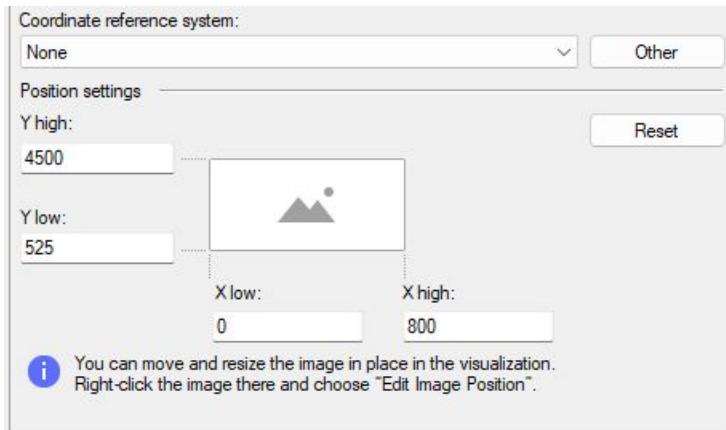
184 of 1,598 rows 0 marked 19 columns WindTurbineDataFailures ⋮

[Open Demo](#)

# Visualizations - Exercise

Demo of the vending machine analysis

1. What use case can be derived of this analysis?
2. Create a similar analysis with the provided seat plan image and dataset.
  - a. Use these settings for the image position:



# Spotfire Advanced Visualizations

# Picking the right tool for each message



# Visualizations: When to use which one?

| Type              | Purpose                                     |
|-------------------|---|
| Bar Chart         | Aggregate Measures                          |
|                   | Histograms                                  |
| Line Chart        | Trends/Patters                              |
|                   | Categorical variables                       |
|                   | Color/Trellis                               |
| Graphical Table   | Categorical items                           |
| Combination Chart | Compare patterns line/bars                  |
| Scatter Plots     | Correlations/relations (curves/lines)       |
|                   | Clustering                                  |
|                   | Outliers                                    |
|                   | Density plots                               |
| Pie Chart         | Relative comparison                         |
|                   | Color by / Sector by / Size by              |
| Tables            | Tables/Summary/Crosstable                   |
|                   | Details on demand                           |
|                   | Summary Table: Aggregation by category      |
|                   | CrossTable: category (pivot) and color/mark |

| Type                     | Purpose   |
|--------------------------|---|
| Treemap                  | Hierarchically organized  |
|                          | 1-2 continuous variables  |
| Box Plots                | Data distributions  |
|                          | Box edges 25% <----> 75%  |
|                          | Line ends: upper/lower quartiles  |
| Map Chart                | Outliers  |
|                          | Comparison circles (overlapping: groupings are not significantly different) |
|                          | Coordinates   |
|                          | Geocoding   |
| 3D Scatter Plot          | Layers  |
|                          | Images  |
|                          | 3 Dimensions of data  |
|                          | Identifying outliers or clusters  |
| Parallel Coordinate Plot | >3 Dimensions (multivariate)  |
|                          | Normalized data (%)   |
|                          | Compare measures  |
|                          | Heat Map  |
| Heat Map                 | View data in color  |
|                          | Large data sets: easier to understand than PCP                              |
|                          | Multivariate data   |

# Advanced Visualizations: Can you guess them?

1. KPI Chart
2. Parallel Coordinate Plot (PCP)
3. Box Plot
4. Combination Chart
5. Pie Chart

# Community & Spotfire Mods

# Spotfire Community

<https://community.spotfire.com>

# Spotfire community

The screenshot shows the homepage of the Spotfire Community website at [community.spotfire.com](https://community.spotfire.com). The page features a large search bar at the top center. Below it, three main calls-to-action are displayed: "Explore the forums", "Experience events", and "Discover the exchange". Each action has a corresponding icon and a "Visit" button. A prominent announcement banner at the bottom left encourages users to "Complete My Profile". The "Most Viewed Articles" section includes links to "IronPython Scripting in Spotfire® - Overview" and "Spotfire Copilot™". On the right side, there's an "ANNOUNCEMENTS" section with links to "Welcome to the Spotfire community!", "Join our Community Newsletter!", and "Spotfire 14.6 LTS is available!". The navigation bar at the top includes links for Forums, Events, Exchange, Industries, Articles, Training, Dr. Spotfire, and user profile information for David Boot-Olazabal.

community.spotfire.com

Forums Events Exchange Industries Articles Training Dr. Spotfire

Welcome to the Spotfire community!

Explore, share, and discover new ideas

Explore the forums

Get involved in forums for insight and discussion.

Visit

Experience events

Join local and global events - real and virtual.

Visit

Discover the exchange

Explore our latest products and innovations.

Visit

Next Step: Complete Profile

Your profile is not yet complete!

Complete My Profile Dismiss

Most Viewed Articles

IronPython Scripting in Spotfire® - Overview

Article 15, 2025 | developers & api | scripting | (and 1 more) ▾

57,231 views

Spotfire Copilot™

27,985 views

ANNOUNCEMENTS

Welcome to the Spotfire community! ▾

Join our Community Newsletter! ▾

Spotfire 14.6 LTS is available! ▾

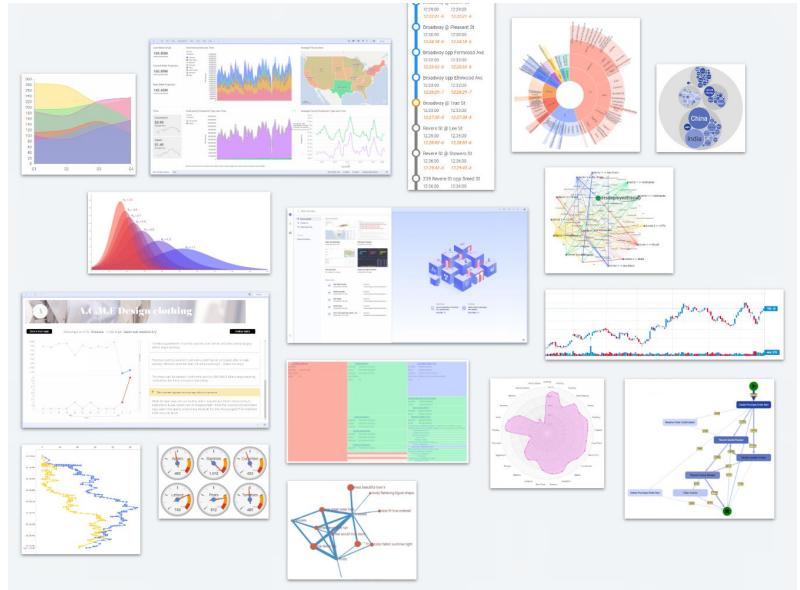
# **Spotfire Mods**

# Spotfire Mods

Spotfire mods is a lightweight, cloud-ready extension framework

First release of mods, build visualization mods

Useful for different roles like analyst, report developers and web developers

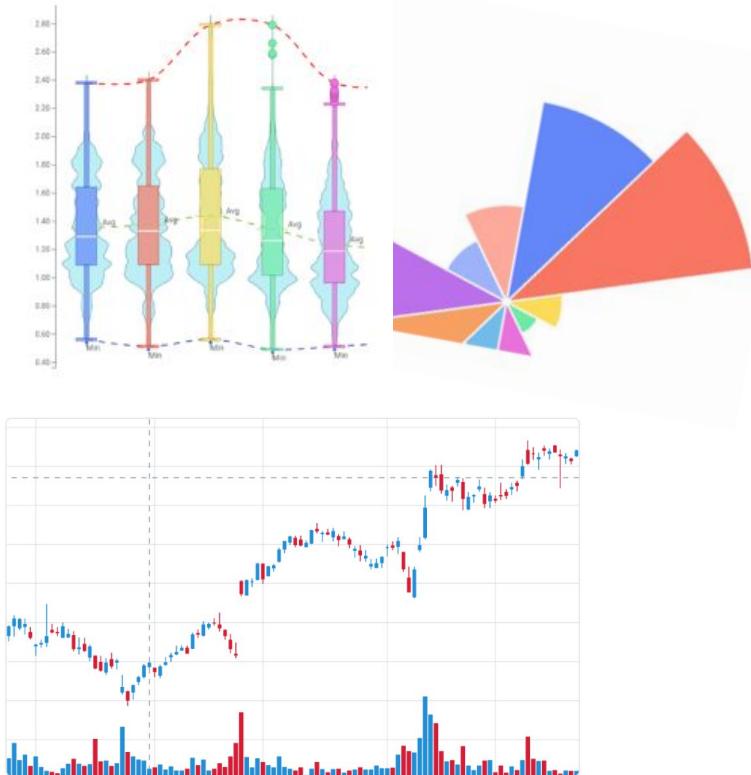


# What are Visualization Mods

Seamless integration with native visualizations for a consistent user experience

Fully customizable design with Spotfire powerful data handling

Compatible with all Spotfire data sources, including streaming and on-demand



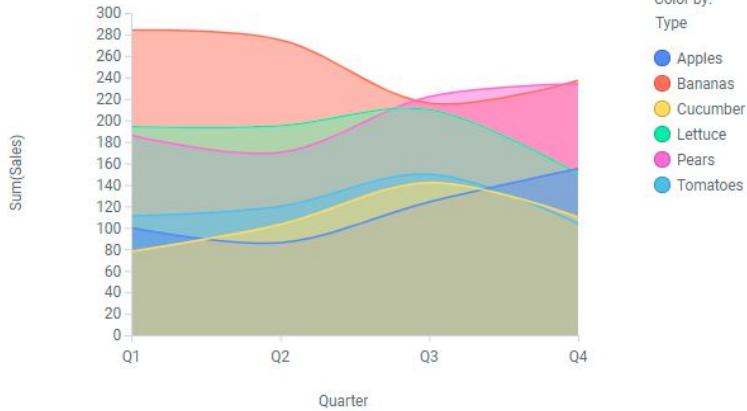
# Visualization Mods

A lightweight, shareable and reusable visualization component to add new visualization types

Built with web technologies such as JavaScript and HTML to integrate third-party JavaScript visualizations

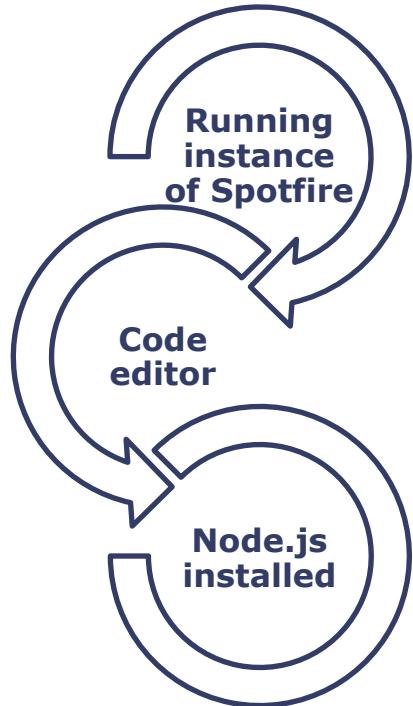
It can be based on any Spotfire supported data sources i.e. in-memory, in-database etc.

Area Chart



# Develop Visualization Mods

## Prerequisites to build a mod



## Getting started

Create an empty visualization mod in Spotfire

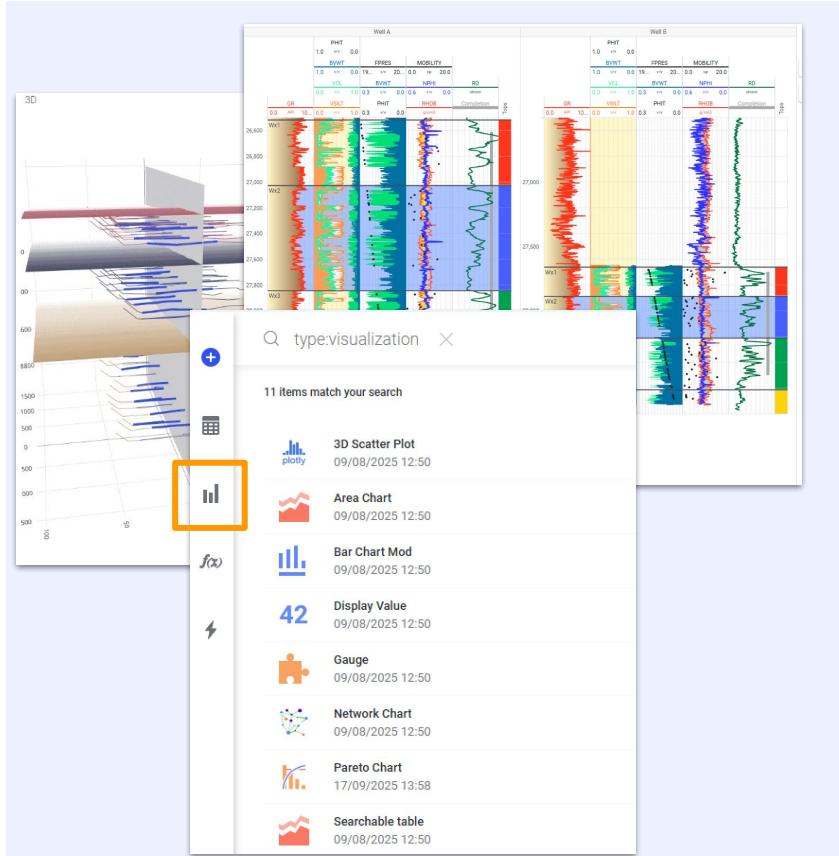
Start from a mod example

Start local development server

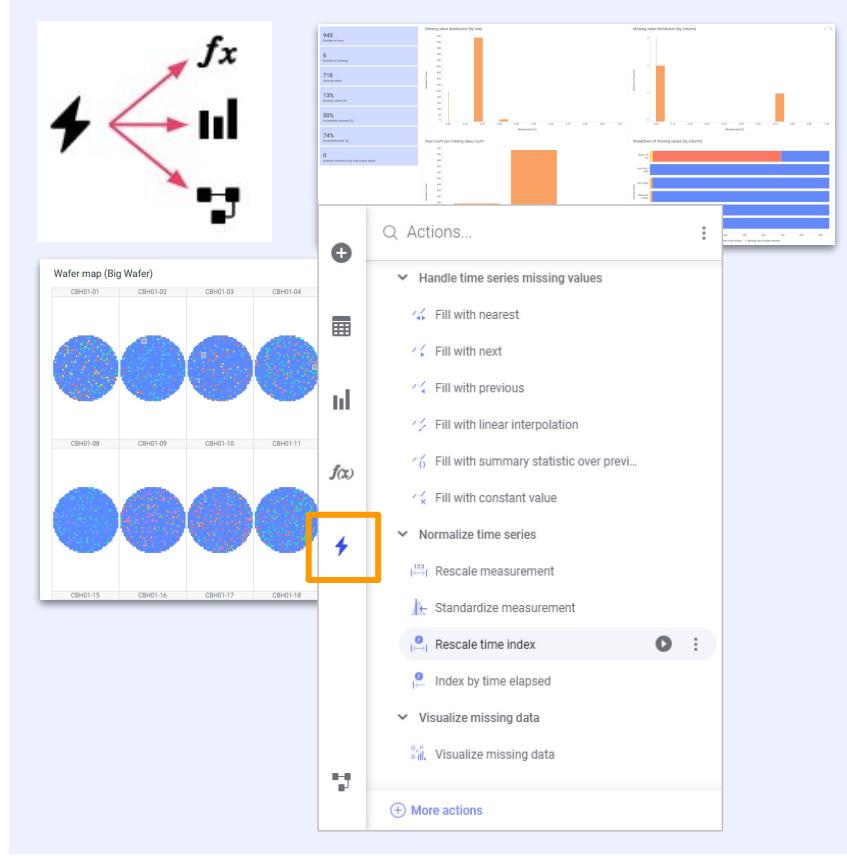
Connect Spotfire to the development server

Start editing the example

# Visualization Mods

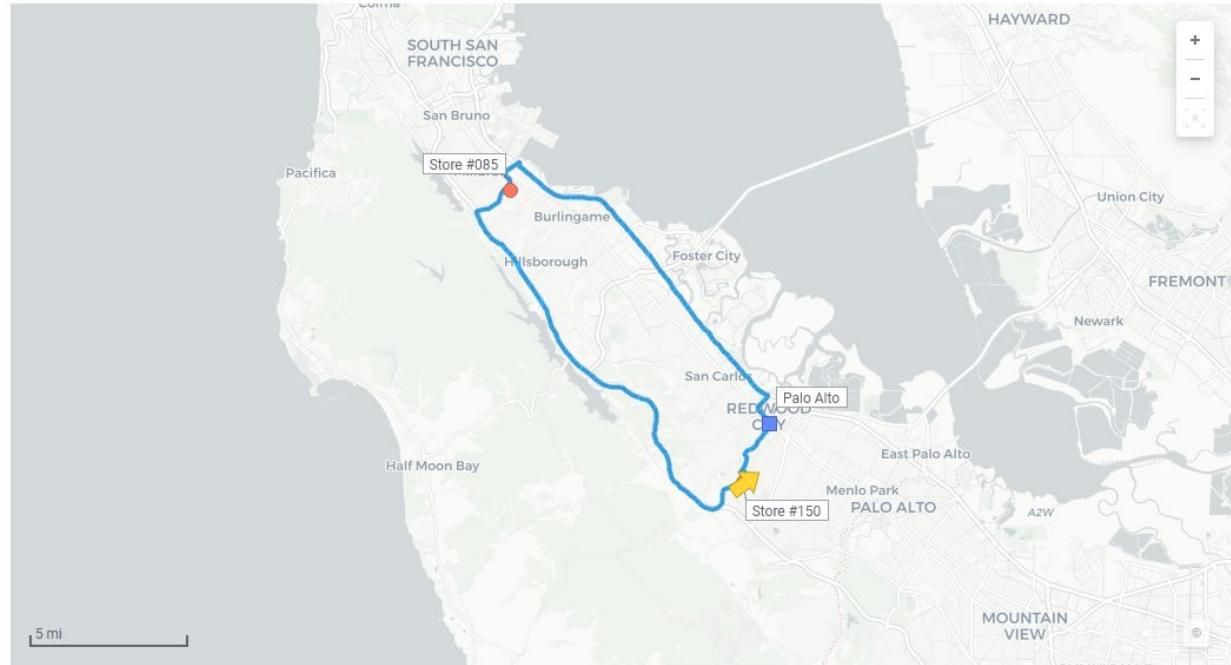


# Action Mods



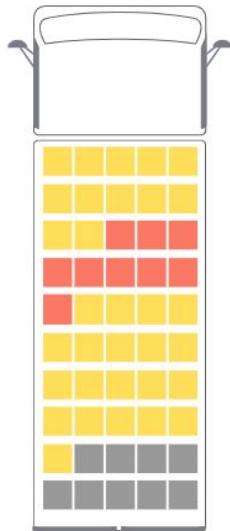
# Visualization Mods for transportation

Stop Times



# Visualization Mods for transportation

Vehicle Loading



Data limiting:

Marking

Data table:

OrderStore

Consignment Units:

Sum(Shipped Units)

Vehicle Capacity:

500

Cab Open:

SKU

Cargo Open:

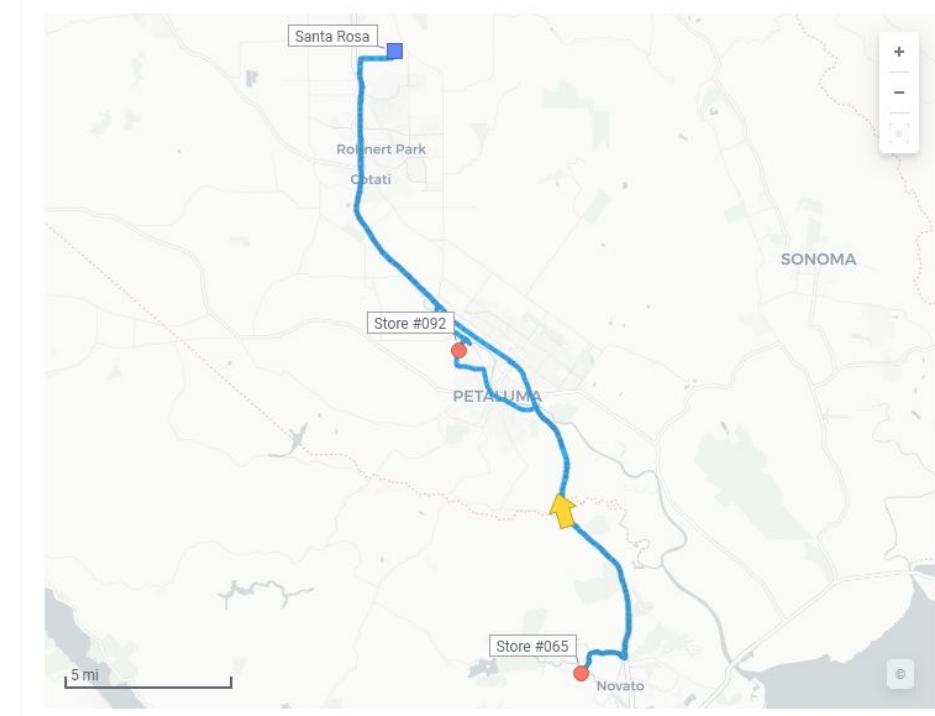
Center Name

Color by:

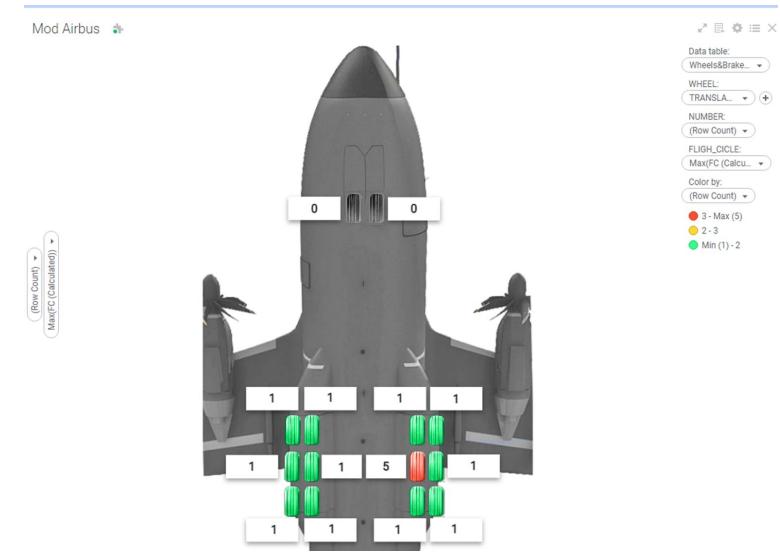
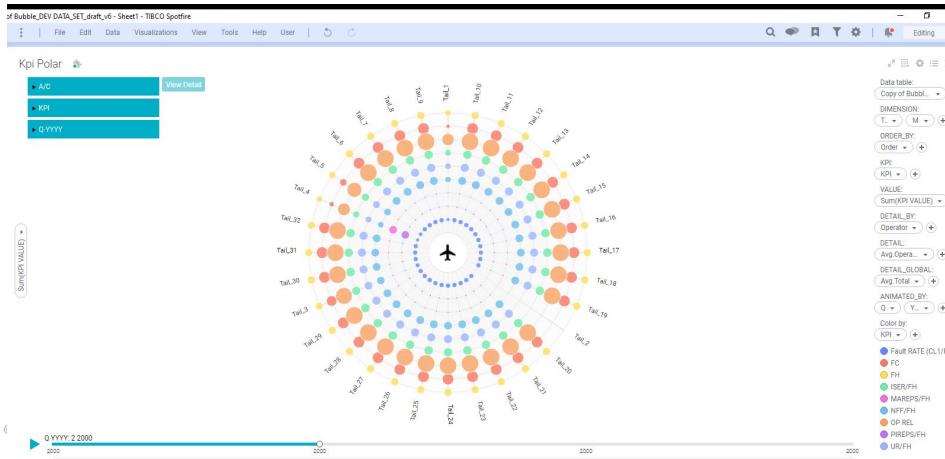
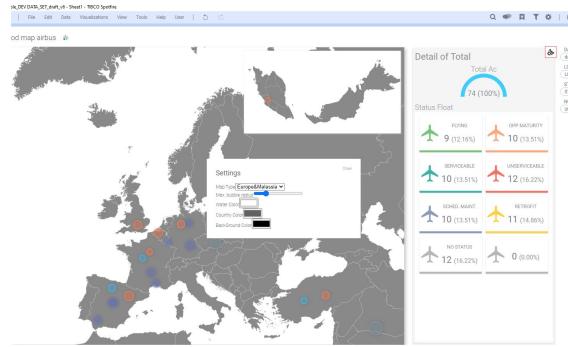
Status

● Delivered

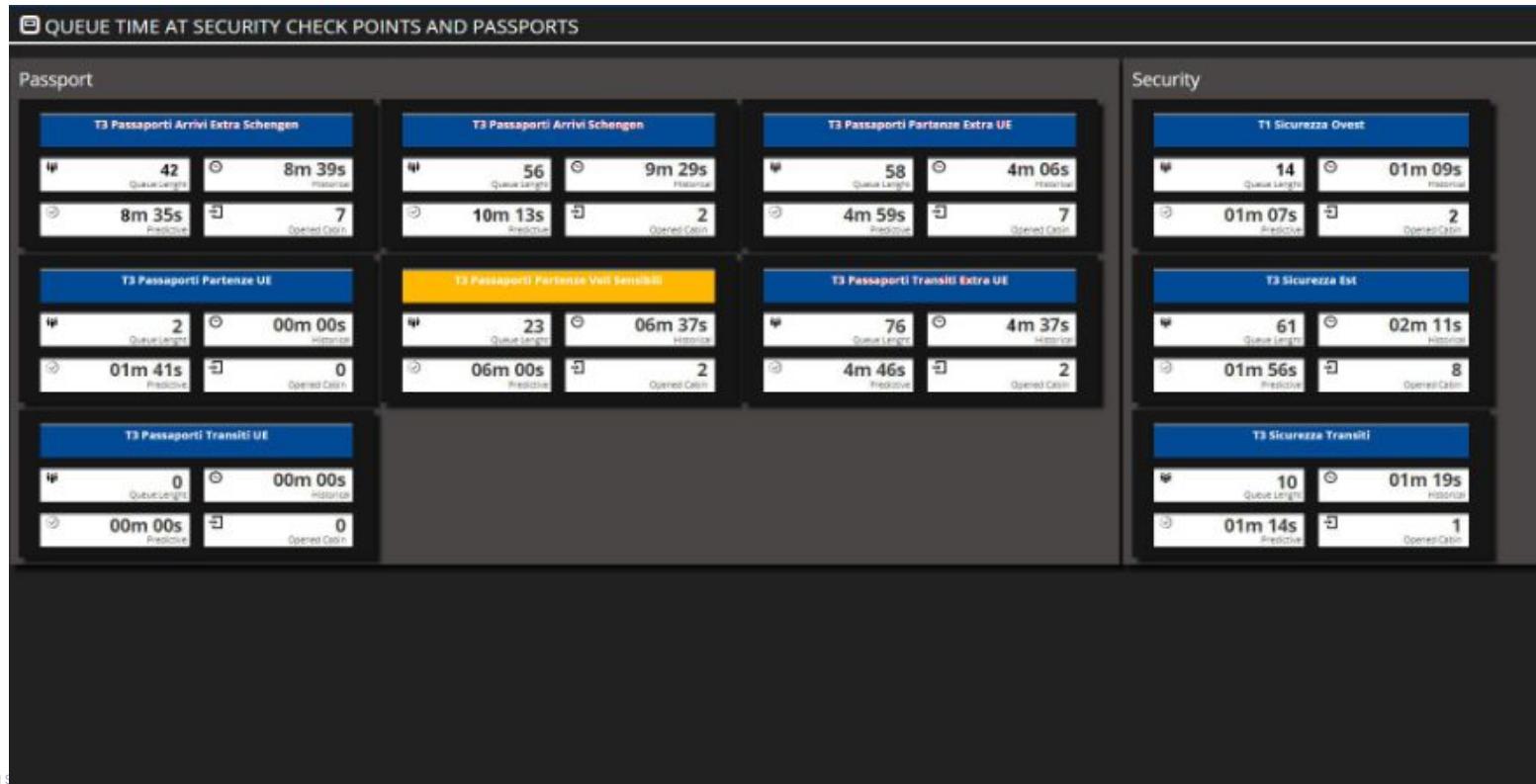
■ Shipped



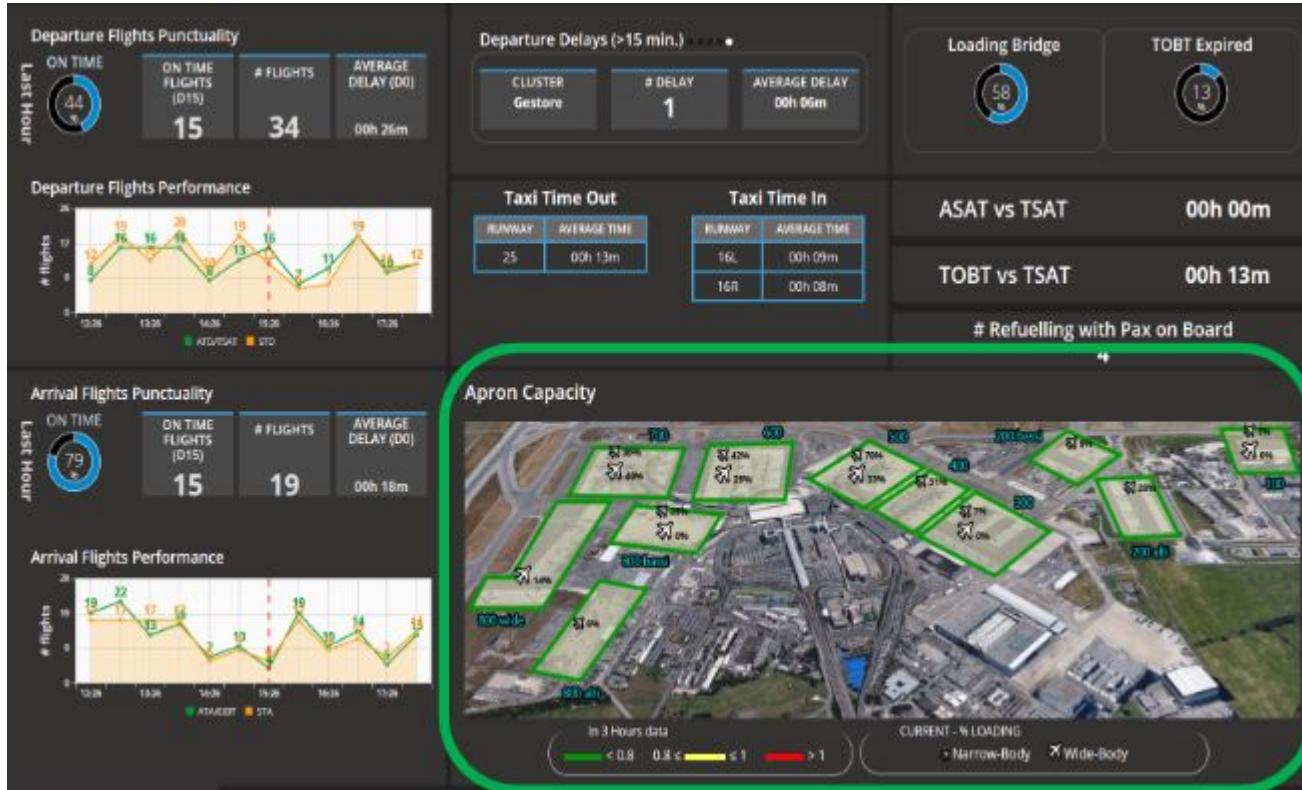
# Visualization Mods for transportation



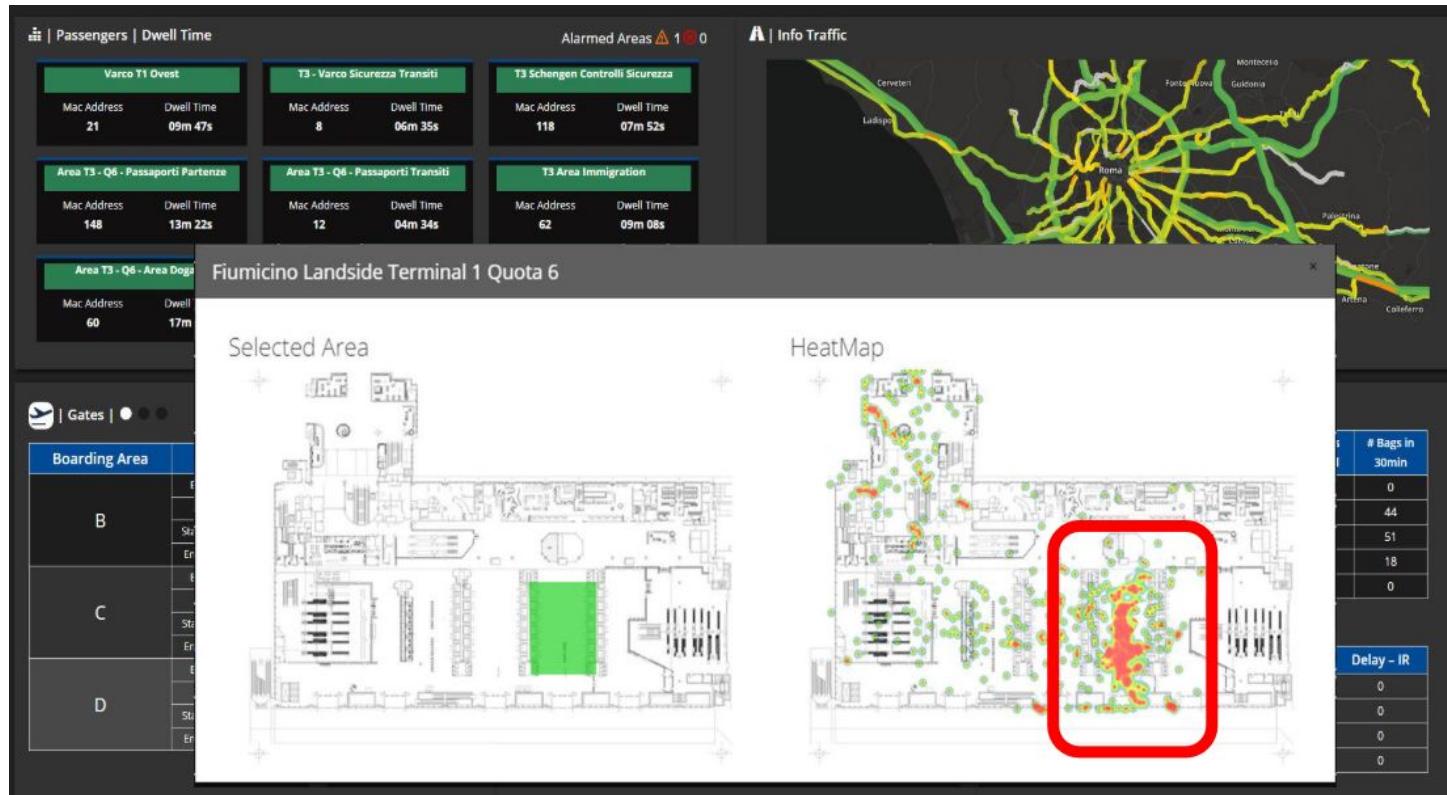
# Visualization Mods for transportation



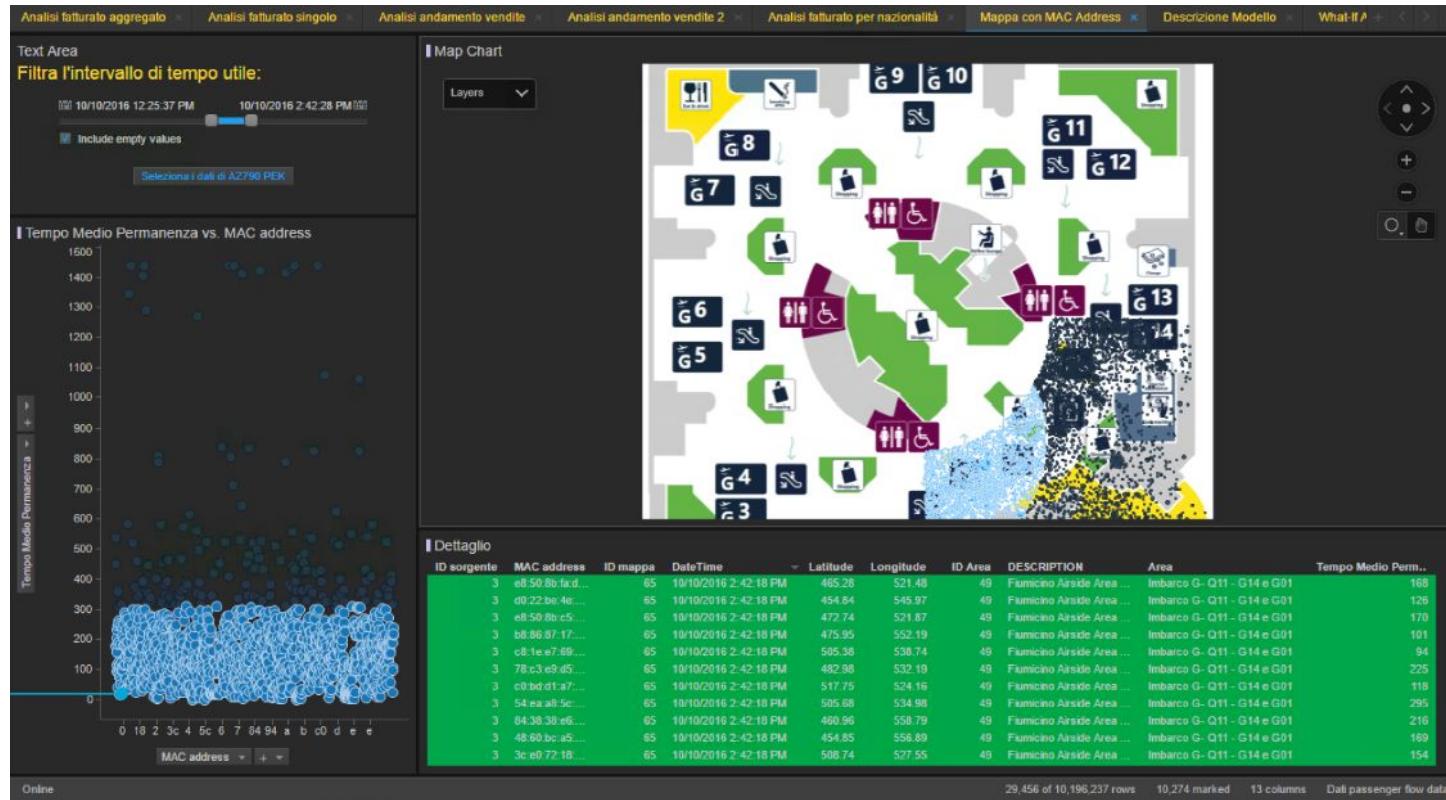
# Visualization Mods for transportation



# Visualization Mods for transportation

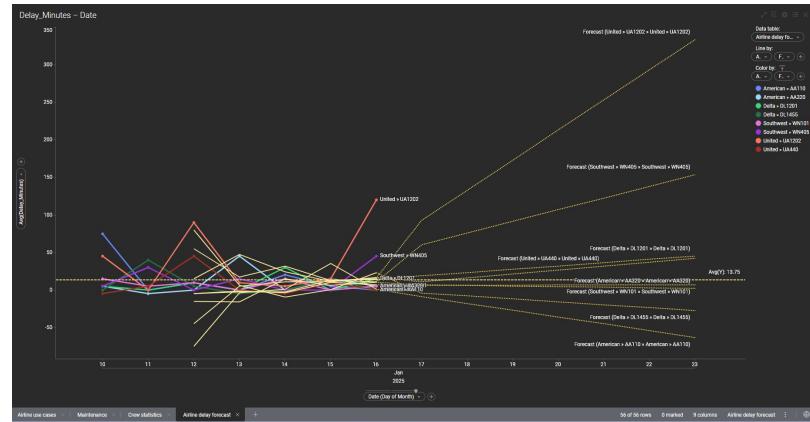
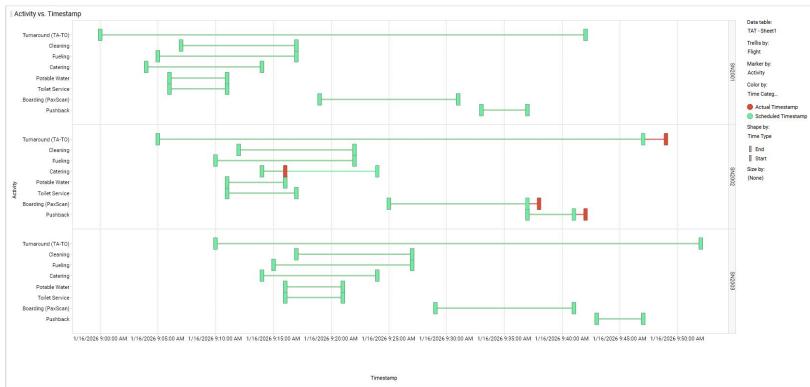


# Visualization Mods for transportation



# Visualizations - Exercise

1. Create a Turn around Time visualization
    - a. Use the TAT.xlsx dataset.
    - b. Create a scatter plot
    - c. Set colors, size and shape
    - d. Add a line connection, Trellis and Marker By
  2. Create a line chart and use it to create a Forecast
    - a. Use the Airline Delay forecast.txt data set.
    - b. Create a line chart, with date on the Y-axis and date on the x-axis.
    - c. Add a line by and color by using the same two columns.
    - d. Add a Forecast line via a right click on the line chart.
    - e. Verify what happened in the Lines and Curves section of the Line chart properties.



# **Spotfire data canvas and transformation**

# Import Multiple Data Tables

The screenshot illustrates the process of importing multiple data tables into a TIBCO Data Canvas analysis.

**Top Navigation:** The menu bar includes **Data**, **Visualizations**, **View**, and **Tools**. The **Data** tab is selected.

**Left Sidebar:** A vertical list of data management options:

- Add data...
- Add calculated column...
- Add binned column...
- Add predicted columns...
- Add hierarchy...
- Transform data...
- Reload linked data
- Reload all data
- Data canvas
- Data connection properties
- Data table properties
- Column properties
- Data function properties
- Manage data connections

**Central Panel:** A modal window titled "New data table: 3-The-5-Sheet-Book - Item-Category" is open, showing the "Import" section. It contains three options:

- Add as new data table**: The data becomes a separate data table within the analysis.
- Add as rows to**: The data is added to another data table as new rows. Used if most columns are available in two data sources and you want to use summarized values from both sources.
- Add as columns to**: The data is added to another data table as new columns. Used to enhance an existing data table with more information when a good row identifier is available.

**Bottom Panel:** The Data Canvas workspace shows a data connection icon ("3-The-5-Sheet-Book.xls - TIBCO") connected to a data table icon ("3-The-5-Sheet-Book - TIBCO Mega ..."). A callout box labeled "Data Canvas" points to the workspace area. A context menu is open over the data table icon, with the "Add columns" option highlighted.

**Callout Box:** A dashed box labeled "Data Canvas" points to the workspace area.

**Context Menu:** Open over the data table icon, showing options: Add rows, Add columns, Add transformation, and Add columns (highlighted).

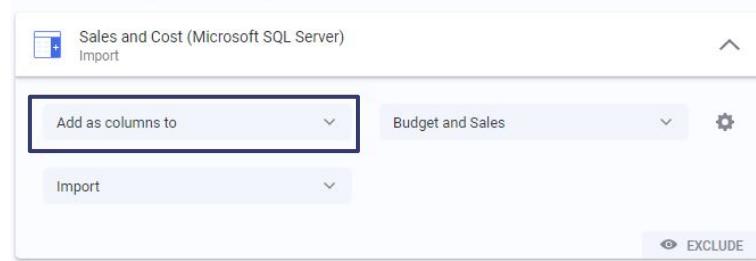
**Page Footer:** © Copyright 2024 Cloud Software Group, Inc.

# Add New Columns

Data Inserted from:

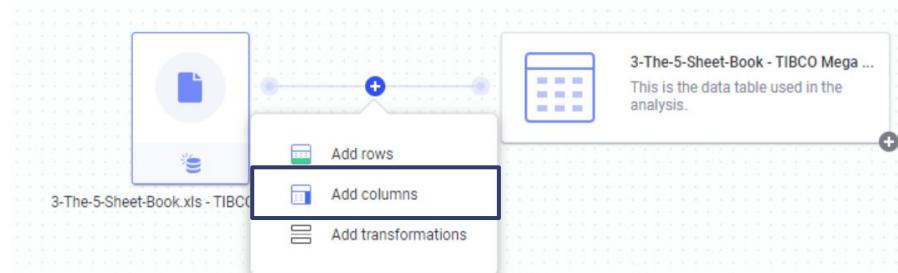
- Local file
- Library file
- Information link
- Data connection
- Clipboard etc.

Add data to existing data table: Budget and Sales



Add columns from:

- Files and Data Flyout
- Data Canvas Flyout



# Match Column Dialog

Column match suggested by recommendation engine

You can ADD, REMOVE and EDIT matches

Column match suggested by recommendation engine

Add columns – match columns

Match columns  
Defined matches: 1

Type to search in list

From original data      From new data

Identifier (String)      Identifier (String)  
Item 001, Item 002, Item 003      Item 001, Item 002, Item 003 X

+ Add match

Preview of result (sample rows)

| Variable 1 | Variable 2 | Variable 3 | Variable 4 | Categorical ... | Identifier | Measure X | Measure Y |
|------------|------------|------------|------------|-----------------|------------|-----------|-----------|
| Real       | Real       | Integer    | Real       | String          | String     | Integer   | Integer   |
| 86.40      | 318.54     | 96         | 30.40      | Category 6      | Item 001   | 22350     | 37200     |
| 75.60      | 795.01     | 91         | 133.80     | Category 2      | Item 002   | 17050     | 17950     |
| 43.60      | 336.22     | 17         | 24.70      | Category 3      | Item 003   | 16050     | 14350     |
| 35.70      | 413.73     | 84         | 182.80     | Category 6      | Item 004   | 34250     | 51900     |
| 62.50      | 112.47     | 83         | 32.10      | Category 4      | Item 005   | 29650     | 27300     |
| 64.30      | 825.95     |            | 200.10     | Category 2      | Item 006   | 21250     | 22700     |
| 2.40       | 27.13      | 34         | 84.20      | Category 6      | Item 007   | 34650     | 49000     |
| 44.90      | 140.22     | 89         | 75.80      | Category 6      | Item 008   | 18100     | 18350     |
| 35.10      | 242.70     | 56         | 136.20     | Category 6      | Item 009   | 30200     | 46800     |
| 76.40      | 931.46     | 97         | 151.40     | Category 2      | Item 010   | 2750      | 4850      |
| 10.90      | 457.59     | 21         | 79.70      | Category 5      | Item 011   | 33450     | 42550     |
| 27.20      | 308.31     | 72         | 25.60      | Category 6      | Item 012   | 26950     | 42600     |
| 46.80      | 354.46     | 58         | 29.20      | Category 3      | Item 013   | 27050     | 25550     |
| 57.30      | 111.59     | 91         | 28.20      | Category 4      | Item 014   | 15        | 20        |
| 60.30      | 540.02     | 64         | 1.10       | Category 3      | Item 015   | 35000     | 37400     |
| 35.80      | 193.14     | 61         | 59.10      | Category 5      | Item 016   | 34950     | 44950     |
| 59.40      | 166.18     | 81         | 17.90      | Category 4      | Item 017   | 2335      | 3250      |
| 35.70      | 382.48     | 30         | 99.10      | Category 5      | Item 018   | 38350     | 42200     |
| 49.20      | 165.69     | 84         | 61.60      | Category 6      | Item 019   | 45100     | 44600     |
| 61.90      | 656.44     | 75         | 213.70     | Category 2      | Item 020   | 3450      | 3300      |
| 72.80      | 618.90     | 86         | 113.00     | Category 2      | Item 021   | 7650      | 9900      |
| 29.70      | 290.80     | 45         | 89.70      | Category 5      | Item 022   | 14200     | 19650     |
| 82.40      | 719.73     | 9          | 61.30      | Category 6      | Item 023   | 24600     | 36800     |
| 47.50      | 176.40     | 81         | 73.90      | Category 6      | Item 024   | 29450     | 31700     |
| 77.90      | 710.92     | 90         | 157.10     | Category 2      | Item 025   | 27050     | 29300     |

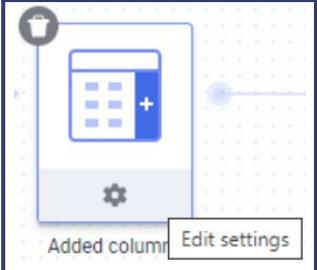
Number of input rows 1000 Apply

Original data      Matched data      New data

OK Cancel

# Join Settings

Select Join Method



Added column Edit settings

Add columns – match columns

Match columns  
Defined matches: 1

Columns from new data  
2 of 2 columns included

Join settings  
Left outer join; no match on empty values

Left outer join  
 Left single match join  
 Full outer join  
 Inner join  
 Right outer join  
 Right single match join

Treat empty values as equal

Join example (Left outer join; no match on empty values)

|   |   |
|---|---|
| A | B |
| a | 1 |
| b | 2 |
| c | 3 |
| c | 4 |
| c | 5 |

|   |    |
|---|----|
| A | C  |
| a | 6  |
| c | 8  |
| c | 9  |
| d | 10 |
|   | 11 |

|   |   |   |
|---|---|---|
| A | B | C |
| a | 1 | 6 |
| b | 2 |   |
| c | 3 | 8 |
| c | 3 | 9 |
| c | 4 | 8 |
| c | 4 | 9 |
|   | 5 |   |

Hover with the mouse pointer over rows to see how the selected join type works.

Preview of result (sample rows)

| Variable 1 | Variable 2 | Variable 3 | Variable 4 | Categorical ... | Identifier | Measure X | Measure Y |
|------------|------------|------------|------------|-----------------|------------|-----------|-----------|
| Real       | Real       | Integer    | Real       | String          | String     | Integer   | Integer   |
| 86.40      | 318.54     | 96         | 30.40      | Category 6      | Item 001   | 22350     | 37200     |
| 75.60      | 795.01     | 91         | 133.80     | Category 2      | Item 002   | 17050     | 17950     |
| 43.60      | 336.22     | 17         | 24.70      | Category 3      | Item 003   | 16050     | 14350     |
| 35.70      | 413.73     | 84         | 182.80     | Category 6      | Item 004   | 34250     | 51900     |
| 62.50      | 112.47     | 83         | 32.10      | Category 4      | Item 005   | 29650     | 27300     |
| 64.30      | 825.95     |            | 200.10     | Category 2      | Item 006   | 21250     | 22700     |
| 2.40       | 27.13      | 34         | 84.20      | Category 6      | Item 007   | 34650     | 49000     |
| 44.90      | 140.22     | 89         | 75.80      | Category 6      | Item 008   | 18100     | 18350     |
| 35.10      | 242.70     | 56         | 136.20     | Category 6      | Item 009   | 30200     | 46800     |
| 76.40      | 931.46     | 97         | 151.40     | Category 2      | Item 010   | 2750      | 4850      |
| 10.90      | 457.59     | 21         | 79.70      | Category 5      | Item 011   | 33450     | 42550     |
| 27.20      | 308.31     | 72         | 25.60      | Category 6      | Item 012   | 26950     | 42600     |
| 46.80      | 354.46     | 58         | 29.20      | Category 3      | Item 013   | 27050     | 25550     |
| 57.30      | 111.59     | 91         | 28.20      | Category 4      | Item 014   | 15        | 20        |
| 60.30      | 540.02     | 64         | 1.10       | Category 3      | Item 015   | 35000     | 37400     |
| 35.80      | 193.14     | 61         | 59.10      | Category 5      | Item 016   | 34950     | 44950     |
| 59.40      | 166.18     | 81         | 17.90      | Category 4      | Item 017   | 2335      | 3250      |
| 35.70      | 382.48     | 30         | 99.10      | Category 5      | Item 018   | 38350     | 42200     |
| 49.20      | 165.69     | 84         | 61.60      | Category 6      | Item 019   | 45100     | 44600     |
| 61.90      | 656.44     | 75         | 213.70     | Category 2      | Item 020   | 3450      | 3300      |
| 72.80      | 618.90     | 86         | 113.00     | Category 2      | Item 021   | 7650      | 9900      |
| 29.70      | 290.80     | 45         | 89.70      | Category 5      | Item 022   | 14200     | 19650     |
| 82.40      | 719.73     | 9          | 61.30      | Category 6      | Item 023   | 24600     | 36800     |
| 47.50      | 176.40     | 81         | 73.90      | Category 6      | Item 024   | 29450     | 31700     |
| 77.90      | 710.92     | 90         | 157.10     | Category 2      | Item 025   | 27050     | 29300     |

Original data   Matched data   New data

Number of input rows: 1000   Apply   OK   Cancel

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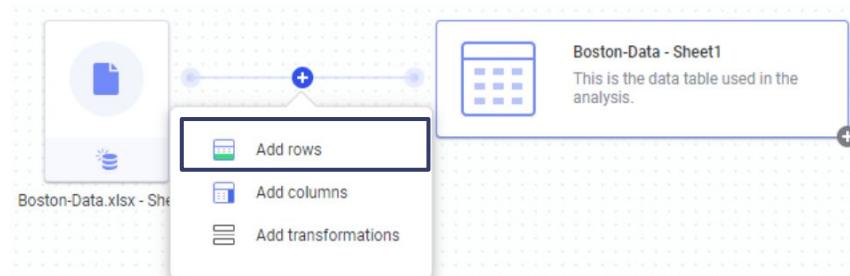
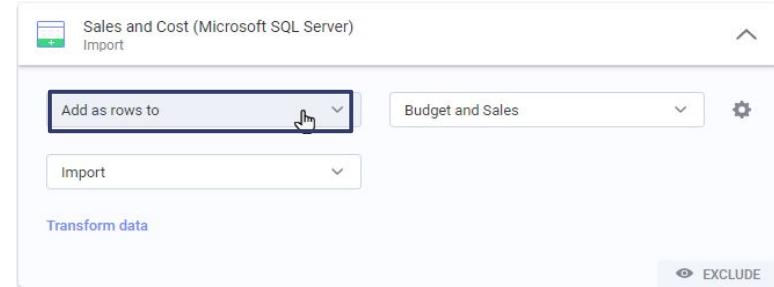
# Add New Rows

Data Inserted from:

- Local file
- Library file
- Information link
- Data connection
- Clipboard etc.

Add rows from:

- Files and Data Flyout
- Data Canvas Flyout



# Add rows - Match Column Dialog

Column match suggested by recommendation engine

You can ADD, REMOVE and EDIT matches

To identify origin of rows, add a new column:  
Provide column name  
Define original and new values  
Or use existing column

Add rows – match columns

Match columns  
15 of 15 columns matched

Include additional columns from new data  
No additional columns available.

Identify origin of rows  
New column created: Origin of data

Do not identify origin  
 Create new column

Column name  
Origin of data

Value for original rows  
Boston-Data - Sheet1

Value for new rows  
Seattle-Data.xlsx - Sheet1

Use existing column

Use auto-match i

Preview of result (sample rows)

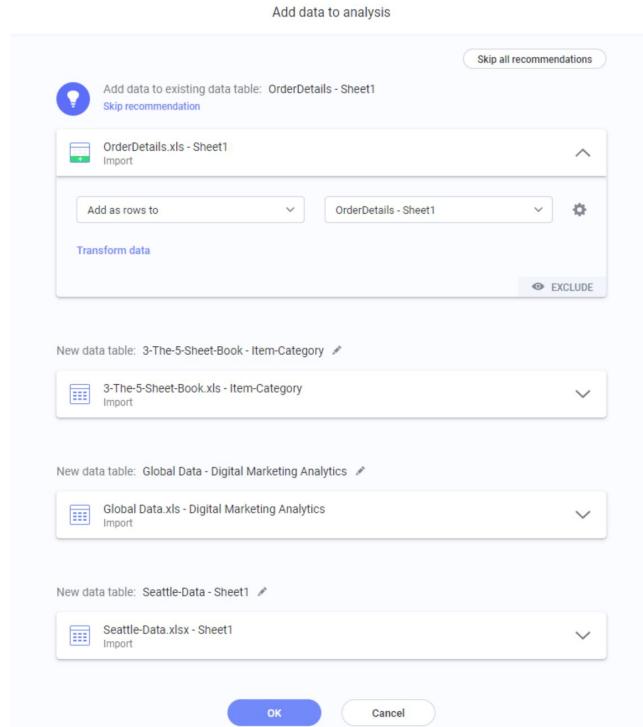
| ID | Most Recent... | Electronics | Furniture | Garden | Groceries | Clothing | Toys | Depa |
|----|----------------|-------------|-----------|--------|-----------|----------|------|------|
| 3  | 26/07/2015     | 942         | 0         | 0      | 0         | 0        | 0    | 0    |
| 5  | 01/08/2015     | 0           | 323       | 0      | 0         | 0        | 0    | 0    |
| 3  | 07/08/2015     | 0           | 0         | 5014   | 219       | 80       | 0    | 0    |
| 5  | 29/08/2015     | 527         | 0         | 91     | 719       | 56       | 0    | 0    |
| 3  | 03/11/2015     | 0           | 0         | 938    | 0         | 0        | 0    | 0    |
| 3  | 12/12/2015     | 700         | 0         | 1092   | 0         | 0        | 0    | 0    |
| 3  | 15/12/2015     | 0           | 0         | 1252   | 0         | 0        | 0    | 0    |
| 3  | 16/01/2016     | 0           | 1821      | 0      | 0         | 0        | 0    | 0    |
| 5  | 30/01/2016     | 467         | 0         | 0      | 0         | 0        | 0    | 0    |
| 3  | 01/02/2016     | 364         | 0         | 5096   | 942       | 291      | 0    | 0    |
| 4  | 25/02/2016     | 0           | 775       | 1249   | 18        | 1        | 0    | 0    |
| 4  | 04/03/2016     | 0           | 323       | 2194   | 160       | 76       | 0    | 0    |
| 5  | 07/03/2016     | 1252        | 794       | 499    | 78        | 4        | 687  | 0    |
| 4  | 15/03/2016     | 0           | 0         | 938    | 0         | 0        | 106  | 0    |
| 3  | 16/03/2016     | 841         | 172       | 1089   | 1023      | 110      | 0    | 0    |
| 3  | 22/08/2015     | 0           | 0         | 0      | 351       | 106      | 0    | 0    |
| 5  | 24/08/2015     | 527         | 0         | 0      | 0         | 0        | 216  | 0    |
| 3  | 02/09/2015     | 0           | 0         | 153    | 0         | 0        | 0    | 0    |
| 3  | 07/10/2015     | 0           | 0         | 0      | 213       | 98       | 0    | 0    |
| 5  | 14/10/2015     | 0           | 0         | 0      | 0         | 0        | 405  | 0    |
| 5  | 15/10/2015     | 0           | 0         | 0      | 737       | 13       | 0    | 0    |
| 3  | 21/10/2015     | 0           | 938       | 0      | 163       | 69       | 0    | 0    |
| 3  | 21/10/2015     | 0           | 0         | 1723   | 0         | 0        | 1249 | 0    |
| 5  | 31/10/2015     | 0           | 91        | 0      | 0         | 0        | 0    | 0    |
| 3  | 05/11/2015     | 188         | 310       | 310    | 0         | 0        | 0    | 0    |

Original data      New data

OK      Cancel

# Import Multiple Data Tables

- Using Files and Data Flyout
- Import settings dialog is provided separately for each table
- Add data to analysis allows you to select how to add data for each table



# Column matches and Table relations

In TIBCO Spotfire, both **Table Relations** and **Column Matches** are used to link separate data tables, but they serve two very different functional purposes.

The simplest way to distinguish them is: **Relations** link user actions (filtering/marketing) between visualizations, while **Matches** link the data itself within a single visualization.

## At a Glance: Key Differences

| Feature                | Table Relations  | Column Matches   |
|------------------------|--|--|
| <b>Primary Purpose</b> | <b>Interactivity:</b> Propagate marking and filtering across different visualizations. | <b>Visualization:</b> Combine data from multiple tables in a single chart.       |
| <b>Creation</b>        | Must be created <b>manually</b> by the user.   | Often created <b>automatically</b> by Spotfire (if names/types match).           |
| <b>Use Case</b>        | Clicking a bar in Table A highlights corresponding rows in Table B.                    | A Bar Chart showing Sales from Table A and Budget from Table B on the same axis. |
| <b>Calculations</b>    | Cannot be used to calculate across tables directly.                                    | Allows <b>Custom Expressions</b> that reference columns from multiple tables.    |

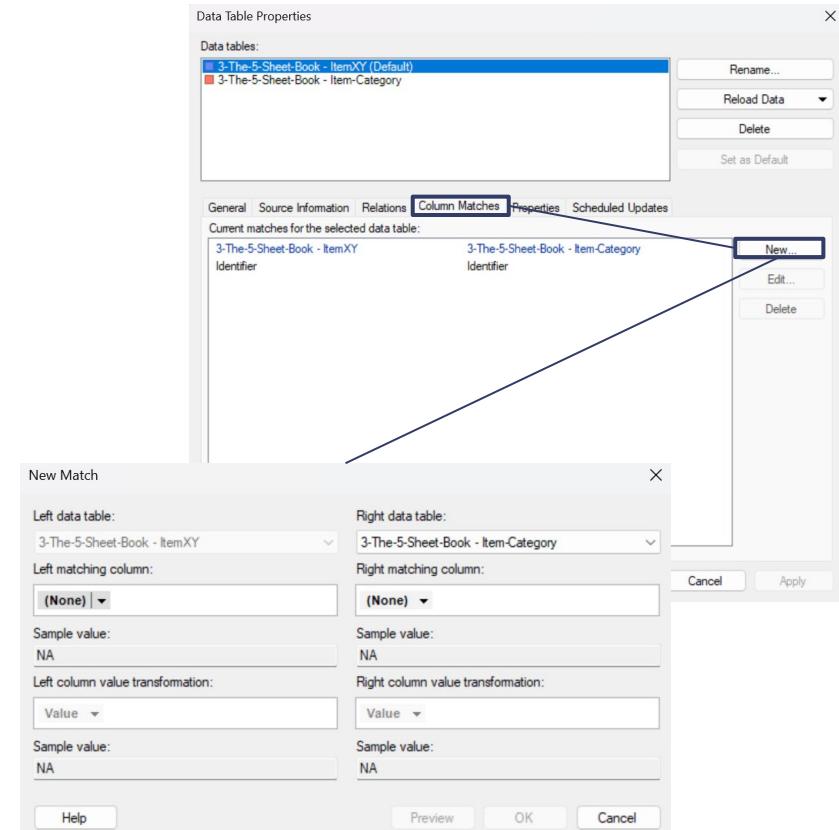
# Column Matching

## Automatic column matching

- Match with same name and data type

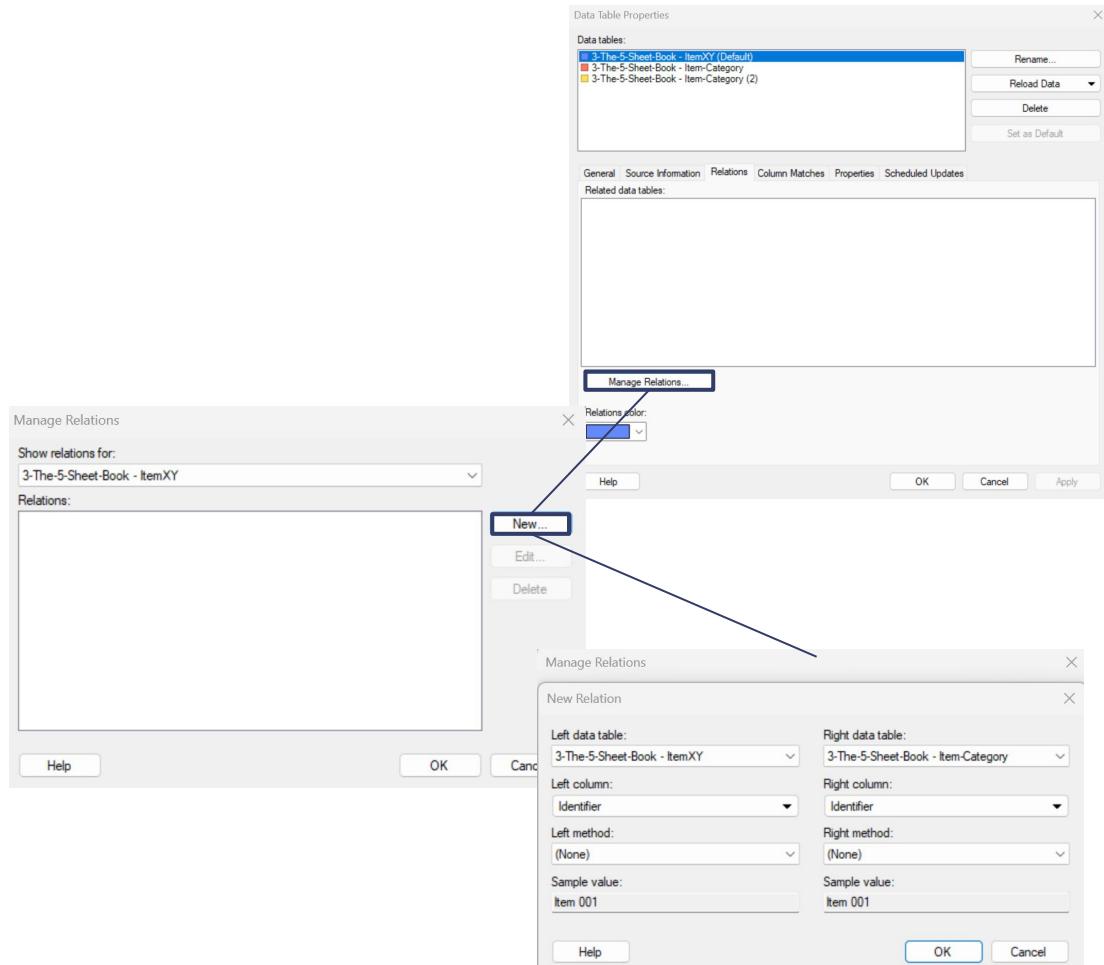
## Manual column matching

- Data->Data Table Properties



# Table Relations

- Data->Data Table Properties
- Select Left/Right Data table
- Columns
- Methods
- Related tables share the same colour
- Colour is displayed in visualisation title and filters panel



# Table Relations

Data tables overview

Data tables summary   **Relations**   Data table properties   Column properties

Search for data tables or columns by name

Add relation   ?

Existing relations

There are no existing relations for this data table.

When data tables are related, marking is carried over from one data table to another and filtering can be configured to be carried over if desired.

A relation is needed if you want to create a details visualization based on one data table that reacts on marked data from another data table in a different visualization.

(+) Add relation   Go to data table

Help

Add relation

Data table: 3-The-5-Sheet-Book - ItemXY

Column or expression: Identifier

Sample: Item 001, Item 002, Item 003

Data table: 3-The-5-Sheet-Book - Item-Category

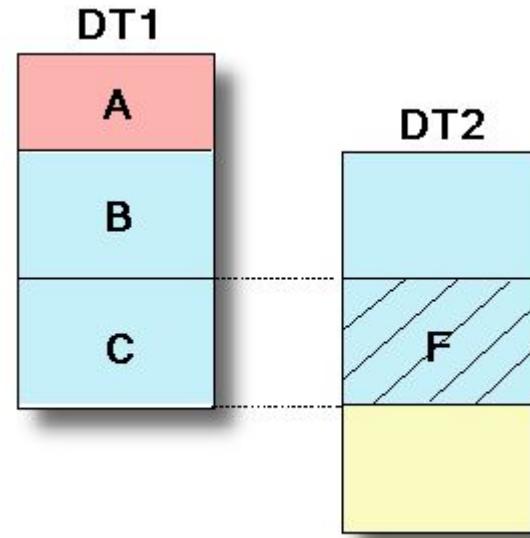
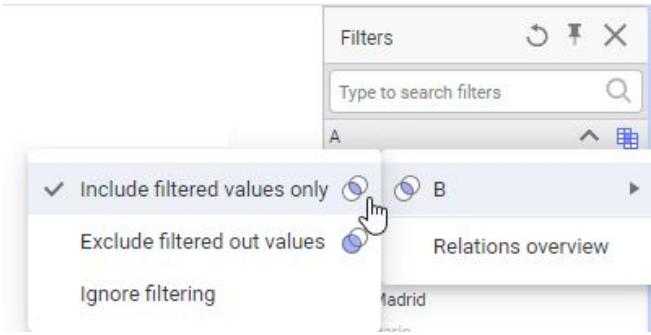
Column or expression: Identifier

Sample: Item 001, Item 002, Item 003

+ Add column pair

OK   Cancel

# Effect on Marking and Filtering



# Add data - Exercise

1. Load the different data sets into an analysis.
2. Combine the different data sets. If possible:
  - a. Add columns
  - b. Add rows
  - c. Match and Relate data tables
3. Create visualizations on top of the combined data set.
4. Ensure that marking and filtering is working dynamically on the visualizations.

# Custom expressions, Calculated columns, transformations

## 1. Custom Expressions (Dynamic & Visual)

Custom expressions are written directly on the axes of a visualization (e.g., the Y-axis of a bar chart).

- **When they calculate:** Every time you change a filter, mark a data point, or change the zoom. They are **highly dynamic**.
- **Scope:** They only calculate based on the **filtered** data currently visible in the chart.
- **Key Advantage:** You can use "Axis Navigation" (like **Parent**, **All**, or **Previous**) to compare data points (e.g., Year-over-Year growth).
- **Best For:** Aggregations like `Sum([Sales])` or complex metrics that must change as the user explores the data.

## 2. Calculated Columns (Static & Row-Level)

These create a new, permanent column in your data table.

- **When they calculate:** Only when the data is first loaded or manually refreshed. They are **static**.
- **Scope:** They calculate across the **entire** data table. They **do not** react to filters.
- **Key Advantage:** The result is available as a filter. If you create a column `[Sales] > 1000` as "High Value", you can then use a checkbox filter to hide/show those rows.
- **Best For:** Grouping data, creating flags, or performing row-by-row math (e.g., `[Price] * [Quantity]`).

## 3. Transformations (Structural & Sequential)

Transformations are "upstream" calculations. They happen while the data is being pulled into Spotfire's memory.

- **When they calculate:** During the data loading process in the **Data Canvas**.
- **Scope:** They become part of the table's "source" structure.
- **Key Advantage:** Unlike standard calculated columns, a column created via transformation **can be used for Column Matching** or joining to other tables. They also follow a strict order; Transformation #2 can see the result of Transformation #1.
- **Best For:** Data cleaning, fixing data types before joining, or preparing columns that will link multiple tables together.

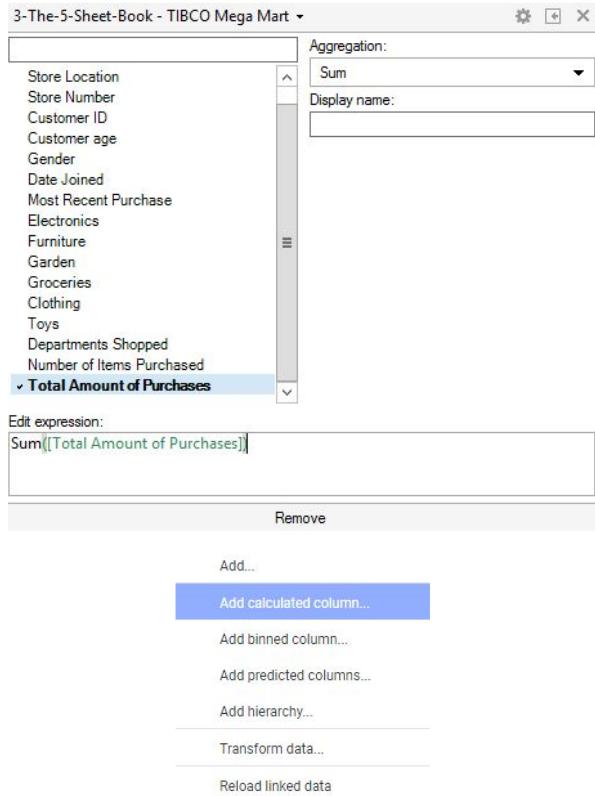
# Custom Expressions Overview

Powerful feature of Spotfire

Allows to create custom aggregation methods for visualizations

Insert custom expressions

- Custom expression
  - Modify existing column
- Calculated column
  - Create new column



# Create Custom Expressions

## Column selector - Expanded mode

- Type in directly
- No autofill
- For experienced users

## Custom expression

- Right click on column selector
- Autofill provided

The screenshot shows two windows related to creating custom expressions.

**Top Window: Column Selector**

This window displays a list of available columns from a data source. The column 'Total Amount of Purchases' is selected and highlighted in blue. The 'Edit expression:' field contains the formula `Sum([Total Amount of Purchases])`.

| Name                             | Data Type |
|----------------------------------|-----------|
| Store Location                   | String    |
| Store Number                     | Integer   |
| Customer ID                      | String    |
| Customer age                     | Integer   |
| Gender                           | String    |
| Date Joined                      | Date      |
| Most Recent Purchase             | Date      |
| Electronics                      | Integer   |
| Furniture                        | Integer   |
| Garden                           | Integer   |
| Clothing                         | String    |
| Toys                             | String    |
| Departments Shopped              | String    |
| Number of Items Purchased        | Integer   |
| <b>Total Amount of Purchases</b> | String    |

**Bottom Window: Custom Expression**

This window is a dialog for building custom expressions. It includes sections for Available columns, Available properties for column, Functions, and Expression builder.

**Available columns:**

| Name                             | Data Type |
|----------------------------------|-----------|
| Store Location                   | String    |
| Store Number                     | Integer   |
| Customer ID                      | String    |
| Customer age                     | Integer   |
| Gender                           | String    |
| Date Joined                      | Date      |
| Most Recent Purchase             | Date      |
| Electronics                      | Integer   |
| Furniture                        | Integer   |
| Garden                           | Integer   |
| Clothing                         | String    |
| Toys                             | String    |
| Departments Shopped              | String    |
| Number of Items Purchased        | Integer   |
| <b>Total Amount of Purchases</b> | String    |

**Available properties for column:**

| Name                     | Data Type | Property Type | Value                   |
|--------------------------|-----------|---------------|-------------------------|
| Axis Title               | String    | Document      | \$[Axis Y ShortDisplay] |
| Axis Color DisplayName   | String    | Document      | Gender                  |
| Axis Color Expression    | String    | Document      | <{Gender}>              |
| Axis Color ShortDisp...  | String    | Document      | Gender                  |
| Axis Columns Display...  | String    | Document      |                         |
| Axis Columns Express...  | String    | Document      |                         |
| Axis Columns ShortDis... | String    | Document      |                         |
| Axis Pages DisplayName   | String    | Document      |                         |
| Axis Pages Expression    | String    | Document      |                         |

**Functions:**

- Category: All functions
- Function: Sum

**Expression:**

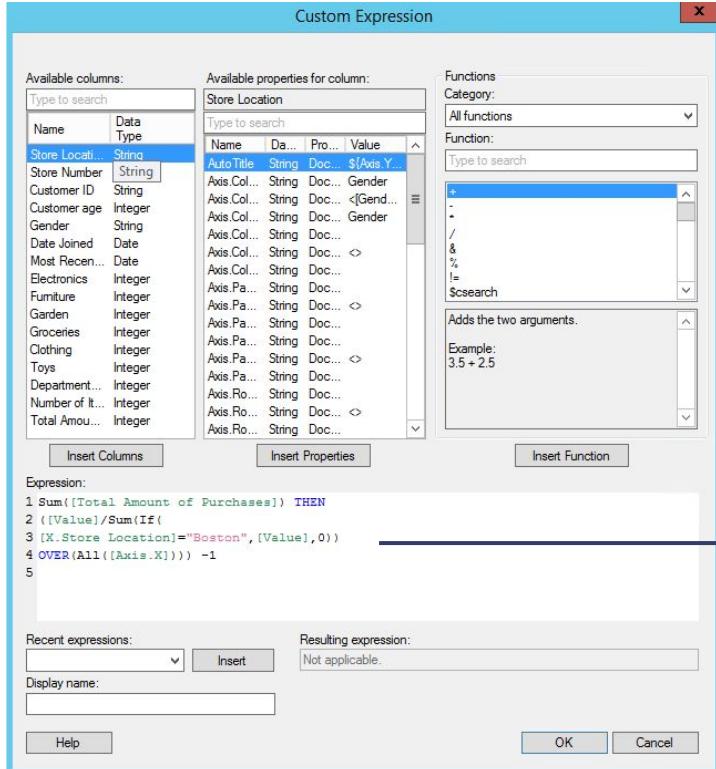
```
1 Sum([t1])
```

**Resulting expression:**

```
Not applicable
```

**Buttons:** Insert Properties, Insert, OK, Cancel

# Expression Builder Details



[Total Amount of Purchases]

Errors

\$(Axis.Color.DisplayName)

\${property}

THEN

Keywords

"Boston",

Text

[Value]

[Column Name]

AutoBinNumeric([Electronics],37)

Syntax Check

!

Match parentheses shading

Expression:

```
1 Sum([Total Amount of Purchases]) THEN
2 ([Value]/Sum(If(
3 [X.Store Location]="Boston",[Value],0))
4 OVER(All([Axis.X]))) -1
5
```

Line Numbering

# Calculated Columns

Creates a new column in the data table

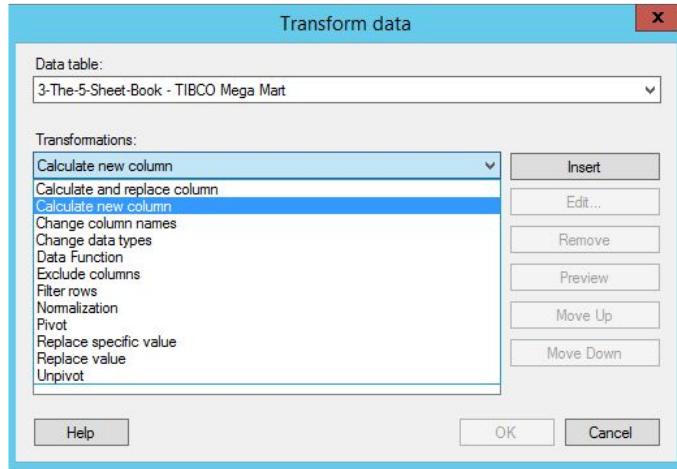
Computed from existing columns

- Using mathematical or logical expressions

Data -> Add calculated column

Features

- It can be treated like any other column
  - Use in filters/axes
  - Apply aggregations
- Static content



Add...

**Add calculated column...**

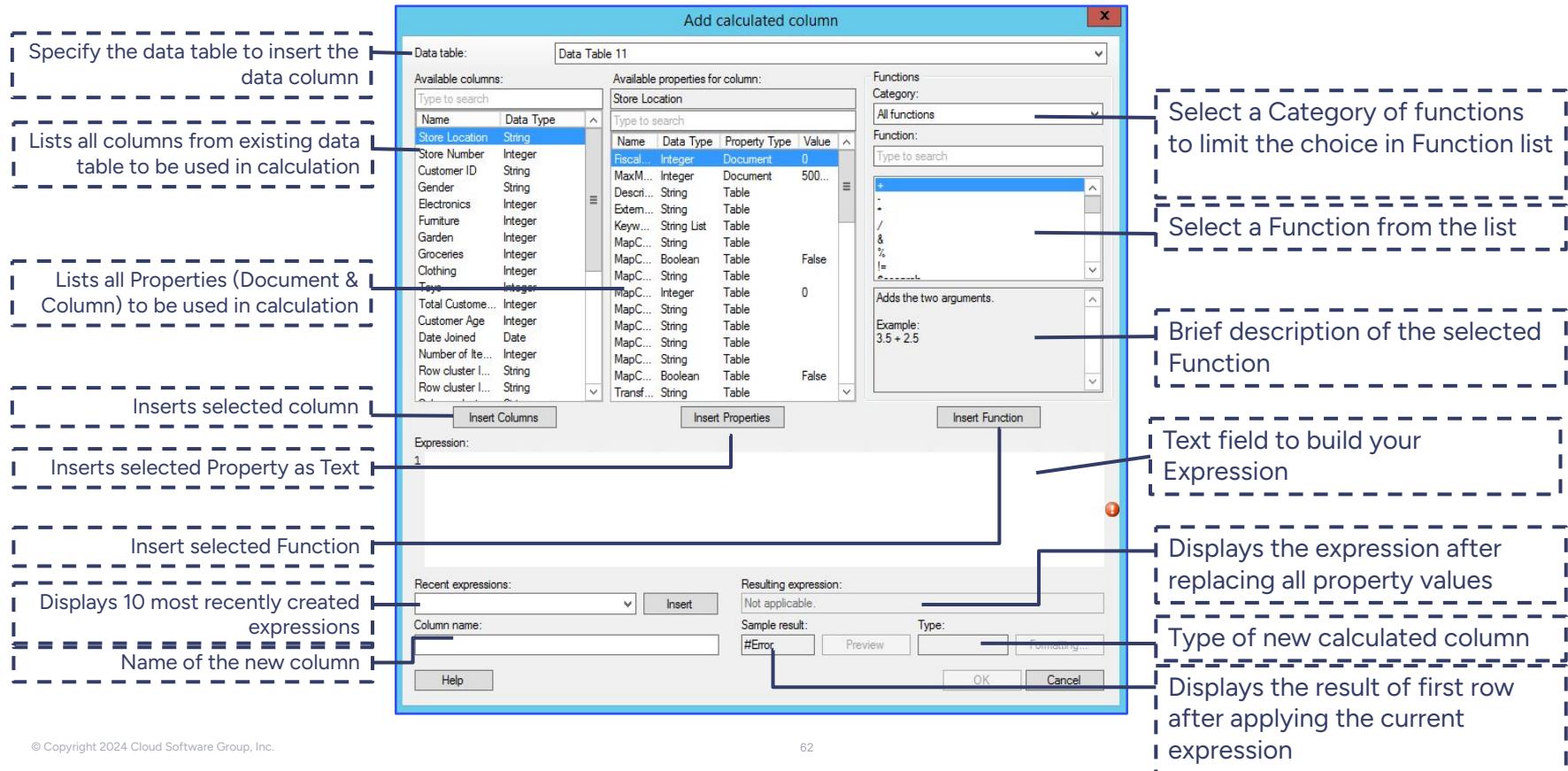
Add binned column...

Add predicted columns...

Add hierarchy...

Transform data...

# Add Calculated Column Details



# Use of Properties in Expressions

## Property

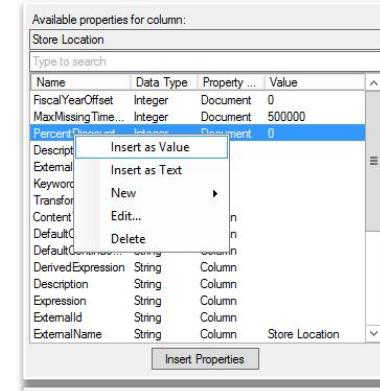
- Changeable settings in visualizations, data tables or documents or customized

## Types

- Document properties
- Data table properties
- Column properties

## Inserted in expressions as

- Actual values
  - Insert as value; PropertyType("PropertyName")
- Text values
  - Insert as text; \${PropertyName}



Expression:  
1 [Total Amount of Purchases] \* (1 - DocumentProperty("PercentDiscount") / 100)

Expression:  
1 Sum(If([Store Location] = \${LocationDiscount}, ([Total Amount of Purchases] \*  
2 (1 - DocumentProperty("PercentDiscount") / 100)), [Total Amount of Purchases]))

# Use of Functions in Expressions

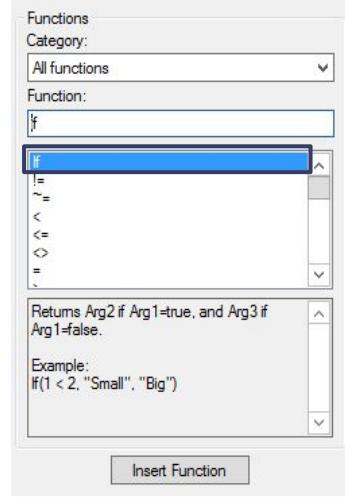
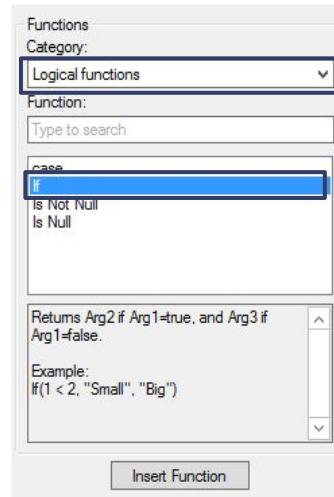
Grouped by category

Insert function in expression field

- Select function from the list or type a search string
- Click Insert Function or double click on function name

Arguments passed

- Columns
- Properties
- Numbers
- Text values



# Create expressions - Exercise

1. Use your analysis file created in the previous exercise.
2. Create a Cross table
3. On the Cross table, create an expression on the Cell values axis
4. Create a calculated column.
5. Add a transformation and create a new column via the Data Canvas.
6. Observe the differences between these 3 types of expressions in terms of:
  - a. Reusability
  - b. Ease of use (edit your expression/calculated column).

# Explore Details Visualization and Filtering Scheme

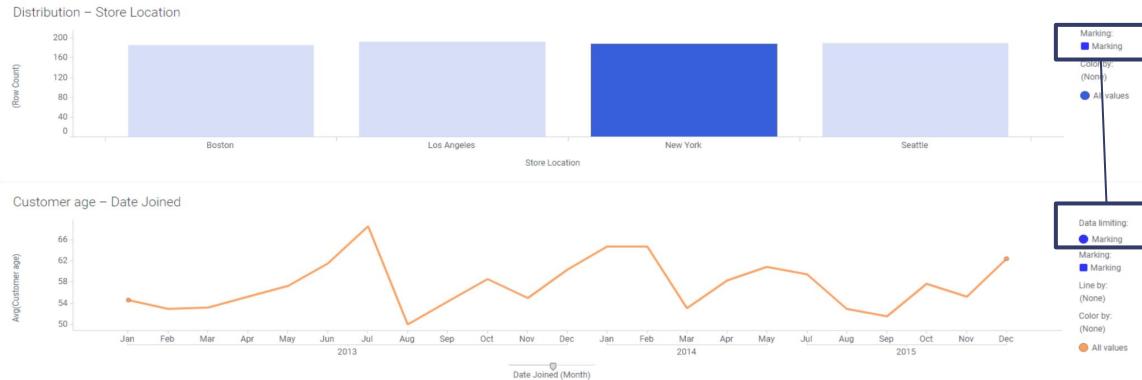
# Explain Analyze Marked Data

- Marking captures particularly interesting data in visualisation
- Explore marked data in different perspective like:
  - View details using details on demand
  - Drill down using details visualisation
  - Analyze marked data



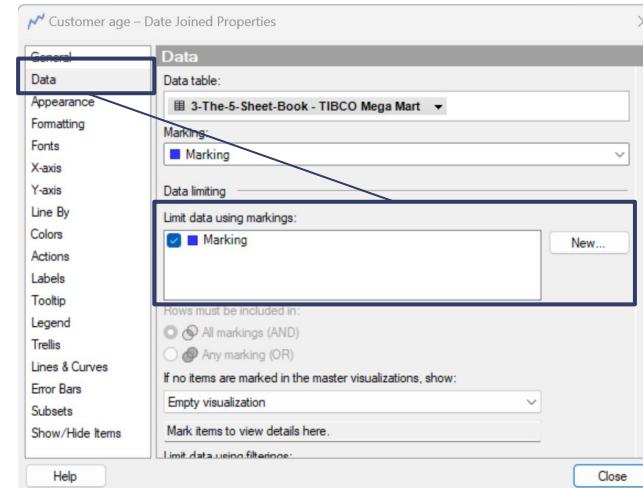
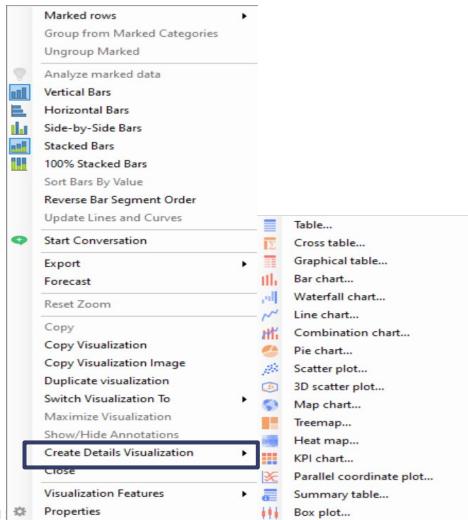
# Explore Details Visualisation

- Depends on marking of master visualisation
- Drill data in multiple steps
- Any visualization can be a detailed visualisation



# Create Details Visualisation

- Right click on master visualization
- Create Details Visualization
- Configure Visualization as desired
- Open Visualization Properties
- Data->Data Limiting
- Limit data using markings



# Explain Limit Data Using Multiple Markings

The screenshot shows the 'Furniture vs. Electronics Properties' dialog box with the 'Data' tab selected. A callout from a dashed box on the left points to the 'Limit data using markings' section, which contains two checked checkboxes: 'Marking' (blue) and 'Marking (2)' (red). Another callout from the same dashed box points to the 'Rows must be included in:' section, where the 'All markings (AND)' radio button is selected. The 'Limit data using filterings:' section at the bottom has the 'Use the current filtering from the page (Default)' checkbox checked.

Multiple Markings selected

Use join methods AND or OR to display results in the details visualisation

Furniture vs. Electronics Properties

General Data Appearance Formatting Fonts X-axis Y-axis Colors Actions Size Shape Rotation Drawing Order Labels Tooltip Legend Trellis Line Connection Marker By Lines & Curves Error Bars Subsets Show/Hide Items

Data

Data table: 3-The-5-Sheet-Book - TIBCO Mega Mart

Marking: Marking

Limit data using markings:

Marking

Marking (2)

Rows must be included in:

All markings (AND)

Any marking (OR)

If no items are marked in the master visualizations, show:

All data

Limit data using filterings:

Use the current filtering from the page (Default)

Filtering scheme (Currently used)

Help Close

# Explain Limit Data Using Expressions

The screenshot shows the Tableau Data pane on the left and the 'Limit Data Using Expression' dialog on the right.

**Data Pane (Left):**

- General:** A sidebar with various settings like General, Data, Appearance, etc.
- Data:** Shows a connection to "3-The-3-Sheet-Book - TIBCO Mega Mart".
- Marking:** Set to "Marking".
- Data limiting:**
  - Limit data using markings:** Has checkboxes for "Marking" and "Marking (2)".
  - Rows must be included in:** Radio buttons for "All markings (AND)" and "Any marking (OR)".
  - If no items are marked in the master visualizations, show:** Set to "Empty visualization".
  - Mark items to view details here:** A dropdown menu.
  - Unit data using filterings:** Has checkboxes for "Use the current filtering from the page (Default)" and "Filtering scheme (Currently used)".
  - Limit data using expression:** A text input field with a blue border and an "Edit..." button. A callout arrow points from this field to the 'Expression:' field in the dialog.

**Limit Data Using Expression Dialog (Right):**

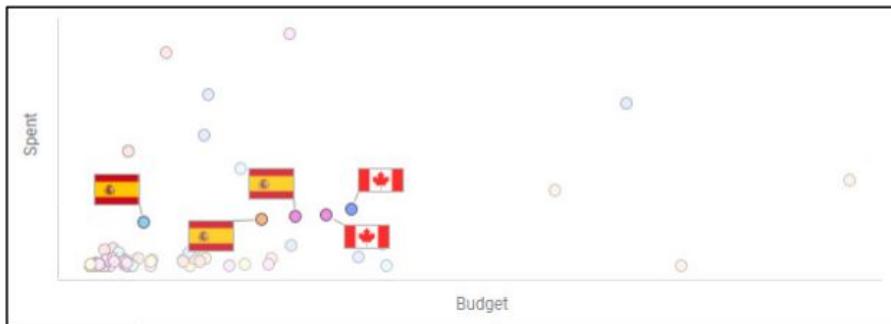
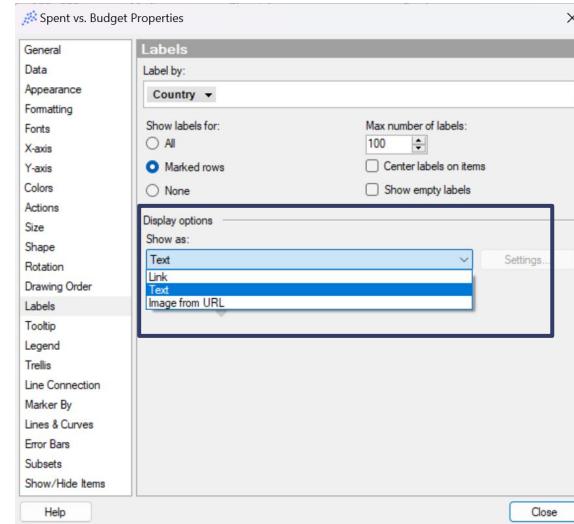
- Available columns:** A table of columns with their names and data types:

| Name         | Data Type |
|--------------|-----------|
| FiscalY...   | Integer   |
| Store Loc... | String    |
| Store Num... | Integer   |
| Customer ID  | String    |
| Customer ... | Integer   |
| Gender       | String    |
| Date Joined  | Date      |
| Most Rec...  | Date      |
| Electronics  | Integer   |
| Furniture    | Integer   |
| Garden       | Integer   |
| Groceries    | Integer   |
| Clothing     | Integer   |
| Toys         | Integer   |
| Decorations  | Integer   |
- Available properties for column:** A table for the selected "Electronics" column:

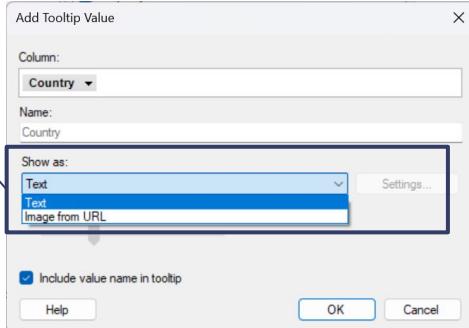
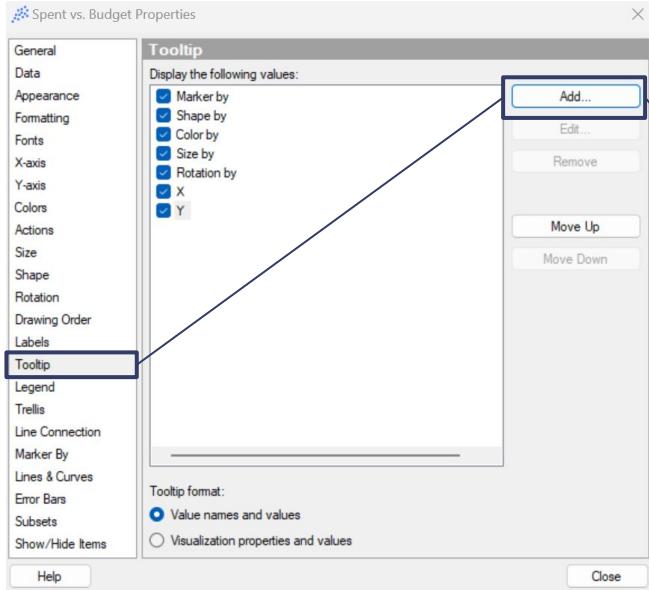
| Name        | Data Type | Properties | Value  |
|-------------|-----------|------------|--------|
| Electronics | Integer   | MinValue   | 0      |
| MaxValue    | Integer   | DocCount   | 500000 |
| Description | String    | Table      |        |
| ExternalID  | String    | Table      |        |
| Keywords    | String    | Table      |        |
| Transform   | String    | Table      |        |
| Content     | String    | Col...     |        |
| Default     | String    | Col...     |        |
| Derived     | String    | Col...     |        |
| Descript    | String    | Col...     |        |
| Expressi... | String    | Col...     |        |
| ExternalID  | String    | Col...     |        |
- Functions Category:** Set to "All functions".
- Function:** A dropdown menu with operators (+, -, \*, /, &, %).
- Type to search:** A text input field.
- Example:** Shows "3.5 + 2.5".
- Insert Function:** A button.
- Expression:** The text input field contains the expression: `1 [Electronics] >= 10000`.
- Recent expressions:** Shows "Lower([Column 3])".
- Resulting expression:** Shows "Not applicable."
- Buttons:** "Help", "OK", and "Cancel".

# Labels

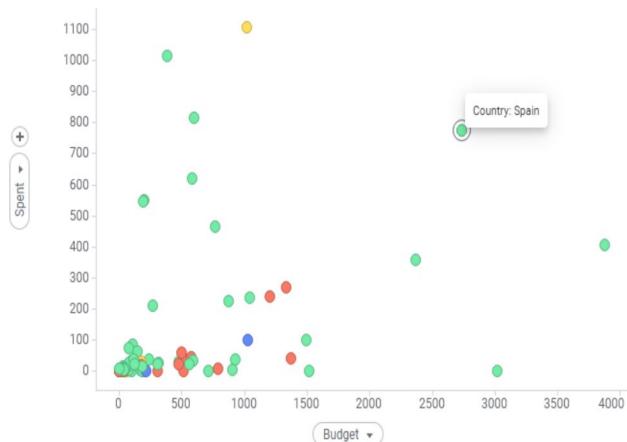
- Display information for all or marked values
- Set label by variable
- Display label as link, text or image as URL



# Tooltip



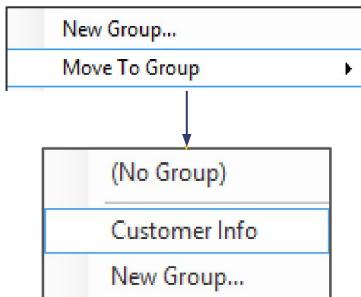
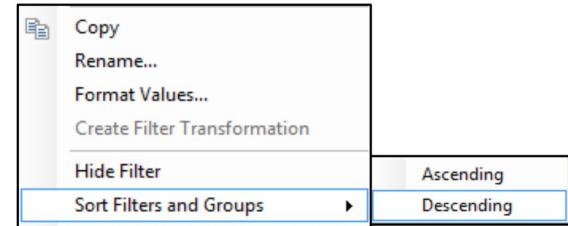
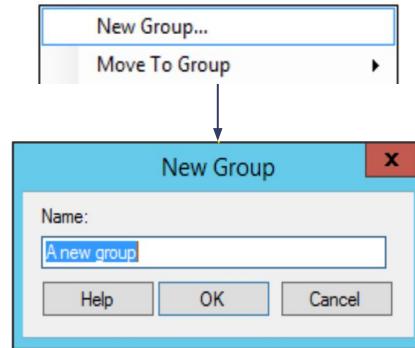
- Hover over information for data points
- Add values to display as text or image



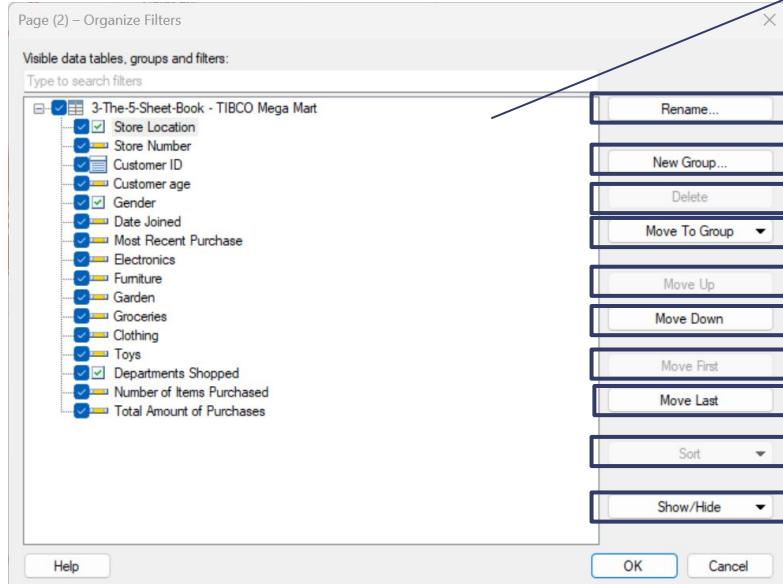
# Sort and Group Filters

## Move/Sort Filters

- Drag and Drop to the desired position in the panel
- Use sorting:  
ascending/descending



# Organize filters



List all filters, groups and data tables in the document

Rename a filter, column or group

Create a new group

Delete a group

Move a filter to a specific group

Move a filter, group or a data table up in the list

Move a filter, group or a data table down in the list

Move a filter, group or a data table first in the list

Move a filter, group or a data table to the bottom of the list

Sort all items in the list

Show/hide filters/ groups or data table in the filters panel

# Explain Filtering Schemes

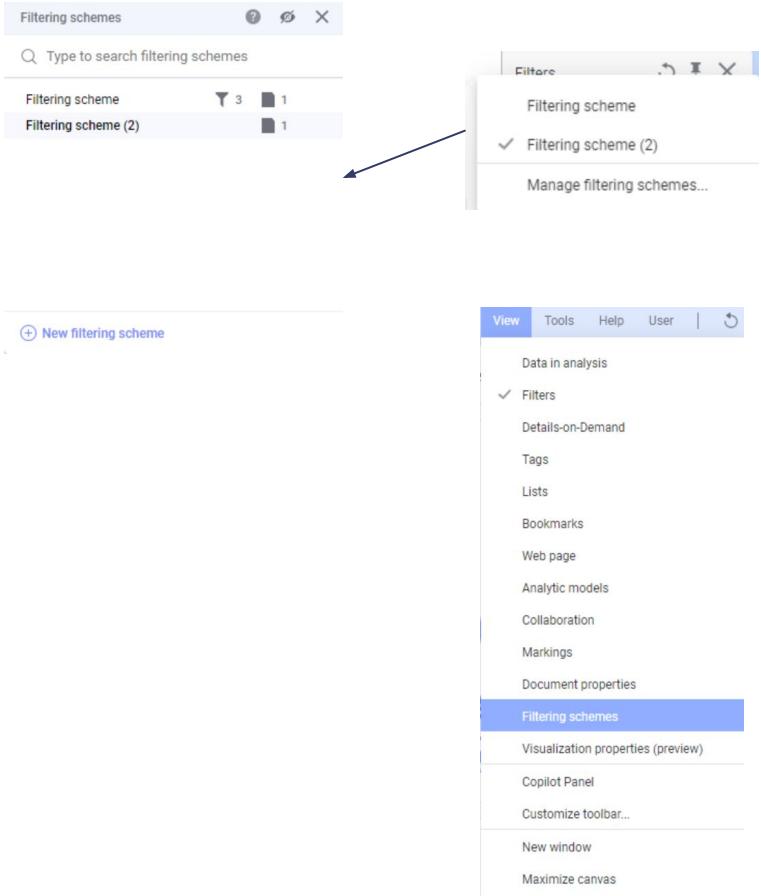
Applied per page or per visualisation

Comprises of

- Filters applied
- Filter types
- Sorting, grouping, show/hide filters

Create and manage filtering schemes

- File->Document Properties
- View->Filterings Schemes



# Apply Filtering Schemes to Drill Down

## Limit Data using filtering

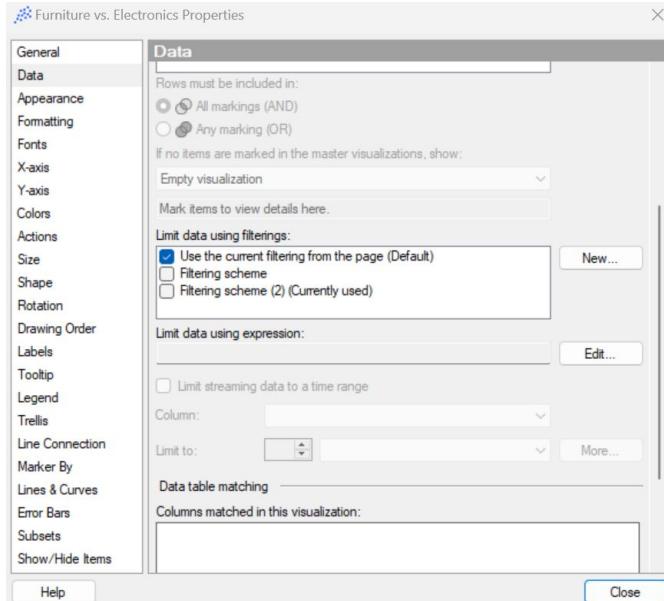
- Defines how filtering should affect visualisation

## Options

- Use current filtering from the page
  - Filtering scheme changes with the change in page
- Specific filtering scheme
  - Remains the same irrespective of the visualisation location

## When selecting more than one

- Intersection of the filtering is used



# Filtering scheme - Exercise

1. Open your analysis file
2. Add a second Filtering scheme
3. Apply the second Filtering scheme to a visualization
4. Observe what happens when you filter on Filtering scheme 1 (and vice versa)
5. 'Join' Filters from multiple tables so they influence each other

# Bookmarks

# Bookmarks

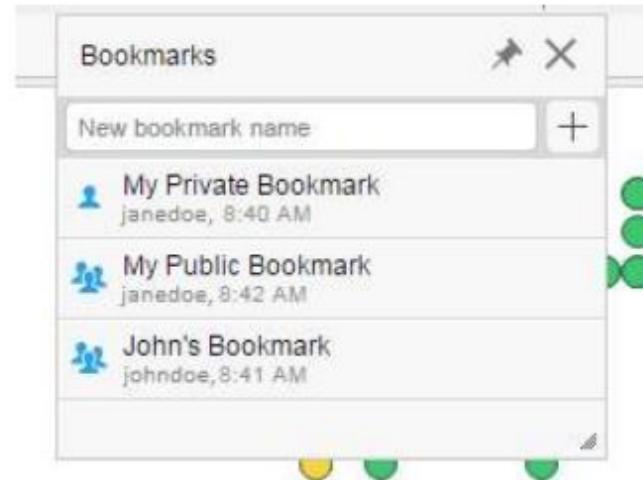
Bookmarks are snapshots of the state of an analysis.

A bookmark to your analysis allows you to return to a state where you found something interesting when you marked or filtered out certain items.

A bookmark can be applied at any time

Share insights with others by making your bookmarks available to other users, or by sending links to the bookmarks.

One of the most important uses of bookmarks is that they can be included as links in a text area. (create guided analyses).

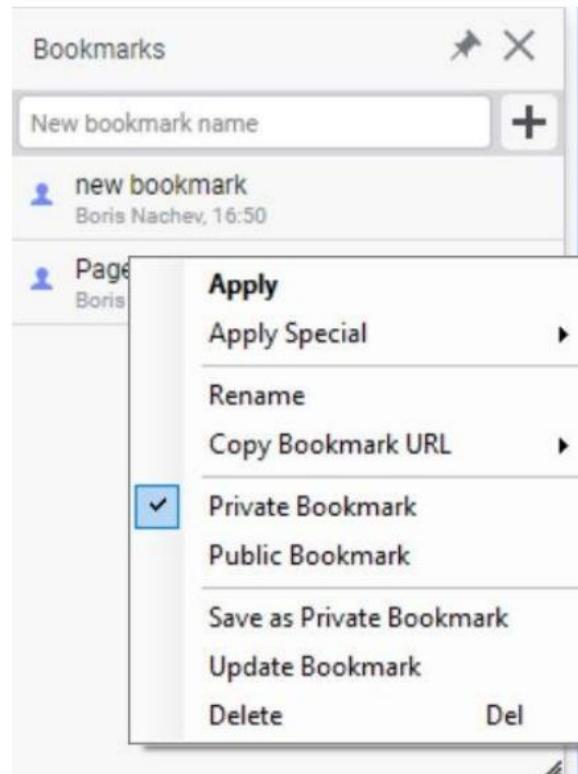


# Bookmarks

You can view and manage bookmarks in a popover or in a docked panel.

To open Bookmarks, select View > Bookmarks on the menu bar.

The Bookmarks panel or popover will open in the mode it was opened the last time you had it open.



# Bookmarks - Private and Public

Bookmarks can be either private or public.

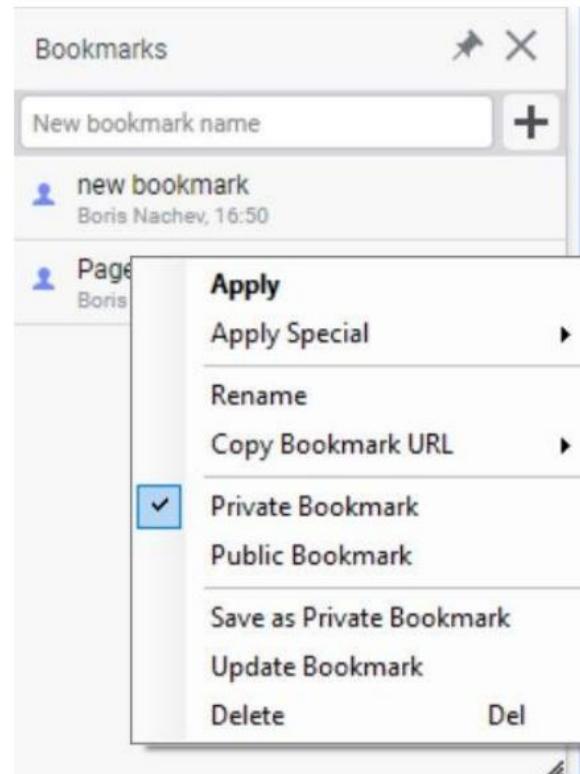
Private: Only you can see your private bookmarks

Public: visible to all users of the analysis.

When adding a new bookmark, it is private by default.  
Right-click on the bookmark and select Public Bookmark from the menu.

Private bookmarks are listed before public bookmarks.  
The bookmarks are also sorted in chronological order  
with the bookmark that was last  
updated at the top of the list.

You can copy URLs pointing to analysis views that are  
captured in bookmarks and then share them  
with others, if the analysis is saved in the library.



# Bookmarks - Exercise

1. Open your analysis file
2. Set specific markings
3. Set specific filters
4. Create a public bookmark
5. Save the analysis
6. Re-open the analysis
7. Once the data is loaded, observe the presentation of the visualizations
8. Now activate the bookmark and notice the differences

# Scripting

# Scripting - IronPython

With IronPython scripts it is possible to configure and automate a lot of different aspects of a Spotfire® analysis and add behaviors to it without creating and deploying extensions.

IronPython scripts can access the capabilities available in the Spotfire Analyst API.

IronPython scripts can be added to several places in a Spotfire analysis. Scripts can be executed from action controls in the Text Area, from the Graphical Table or the KPI Chart or be triggered by Document Property changes.

To create an analyses containing IronPython scripts, the analyst needs the [Author Scripts license function](#). Scripts in analysis files that are shared via the library by licensed script authors are considered as trusted. For security reasons you should always examine and approve a script that is not listed as trusted before executing it

[Community snippets](#)

# Scripting - Exercise

1. Open your analysis file
2. Use any of the scripts from the Spotfire community article.
3. Add the script to your analysis file and execute the script