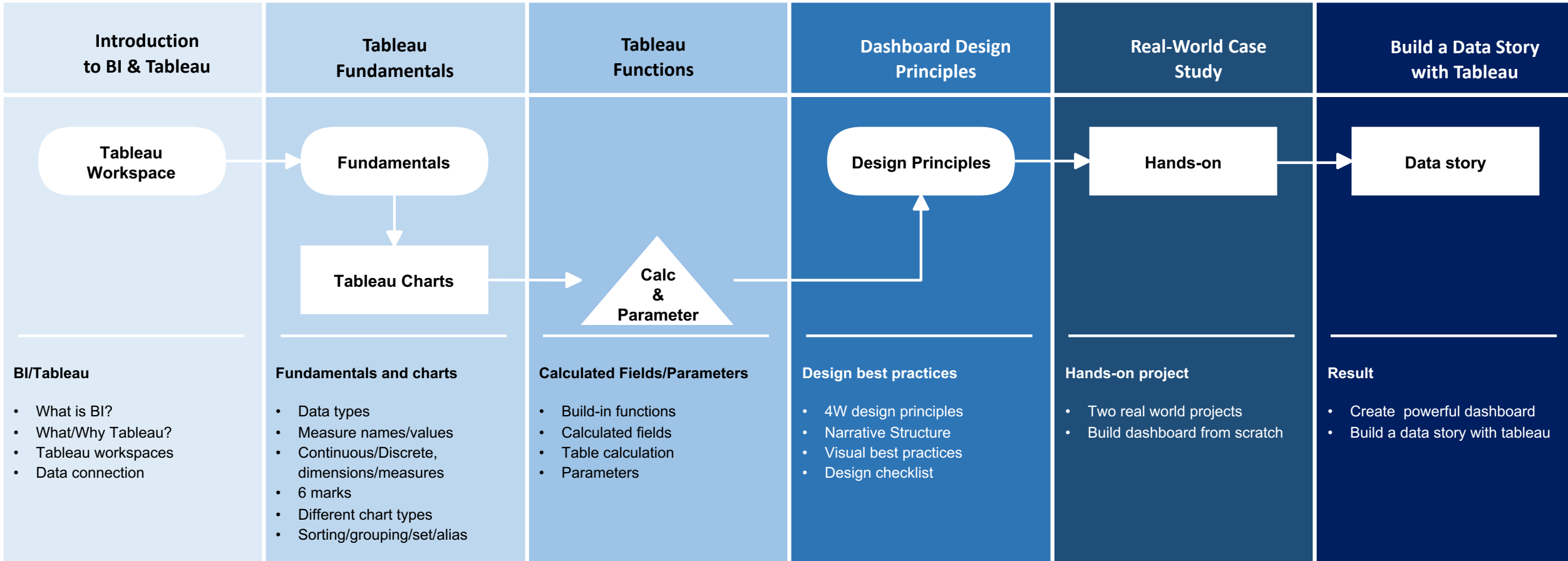




Data Visualization and Analytics with Tableau

COURSE AGENDA



Goals

- ✓ **Learn Tableau functionality** to analyze data sets efficiently
- ✓ **Understand design principles** to create effective artistic dashboard
- ✓ **Build dashboards with powerful insights** to address business questions



Data Visualization and Analytics with Tableau

PART 1: Introduction

What is BI?

Business intelligence (BI) combines business analytics, data mining, **data visualization**, data tools and infrastructure, and best practices to help organizations to make more data-driven decisions.

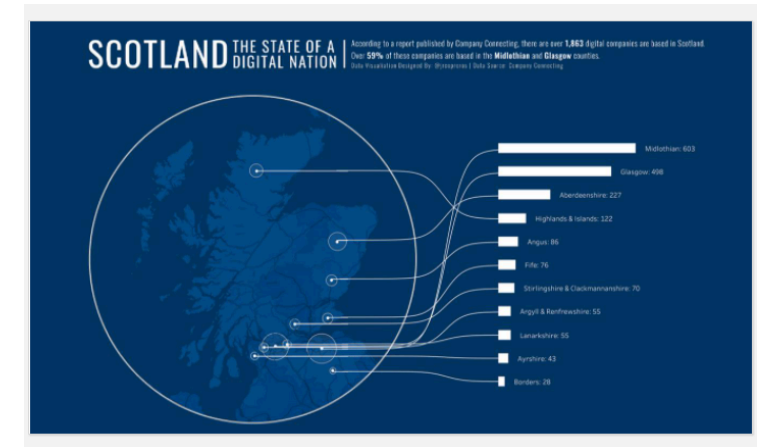
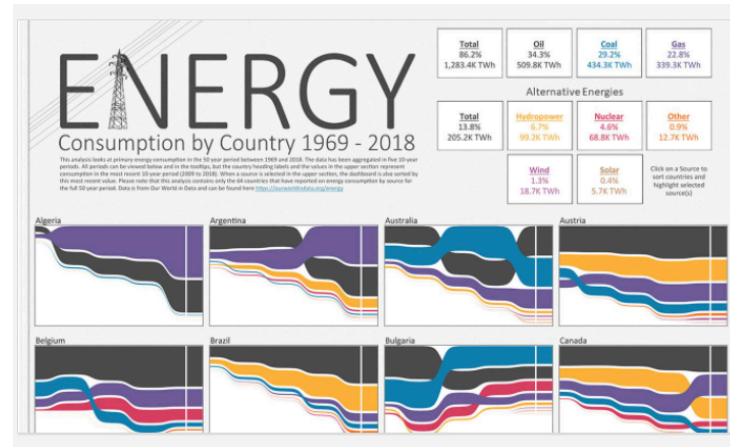
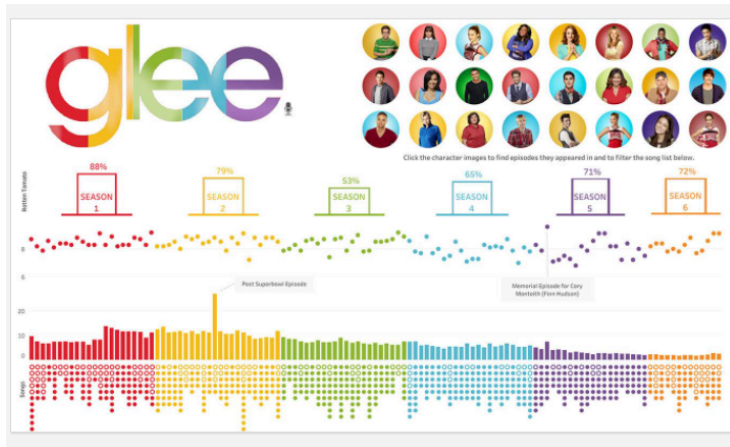
Business intelligence has evolved to include more processes and activities to help improve performance. These processes include:

- **Data mining:** Using databases, statistics and machine learning to uncover trends in large datasets.
- **Reporting:** Sharing data analysis to stakeholders so they can draw conclusions and make decisions.
- **Performance metrics and benchmarking:** Comparing current performance data to historical data to track performance against goals, typically using customized dashboards.
- **Descriptive analytics:** Using preliminary data analysis to find out what happened.
- **Querying:** Asking the data specific questions, BI pulling the answers from the datasets.
- **Statistical Analysis:** Taking the results from descriptive analytics and further exploring the data using statistics such as how this trend happened and why.
- **Data visualization:** Turning data analysis into visual representations such as charts, graphs, and histograms to more easily consume data.
- **Visual analytics:** Exploring data through visual storytelling to communicate insights on the fly and stay in the flow of analysis.

PART 1: Introduction

What is Tableau?

Tableau is an **interactive visualization software**, designed for the individual but scaled for the enterprise. From connection through collaboration, Tableau provides secure and flexible end-to-end analytics platform.



PART 1: Introduction

Why Tableau?

1

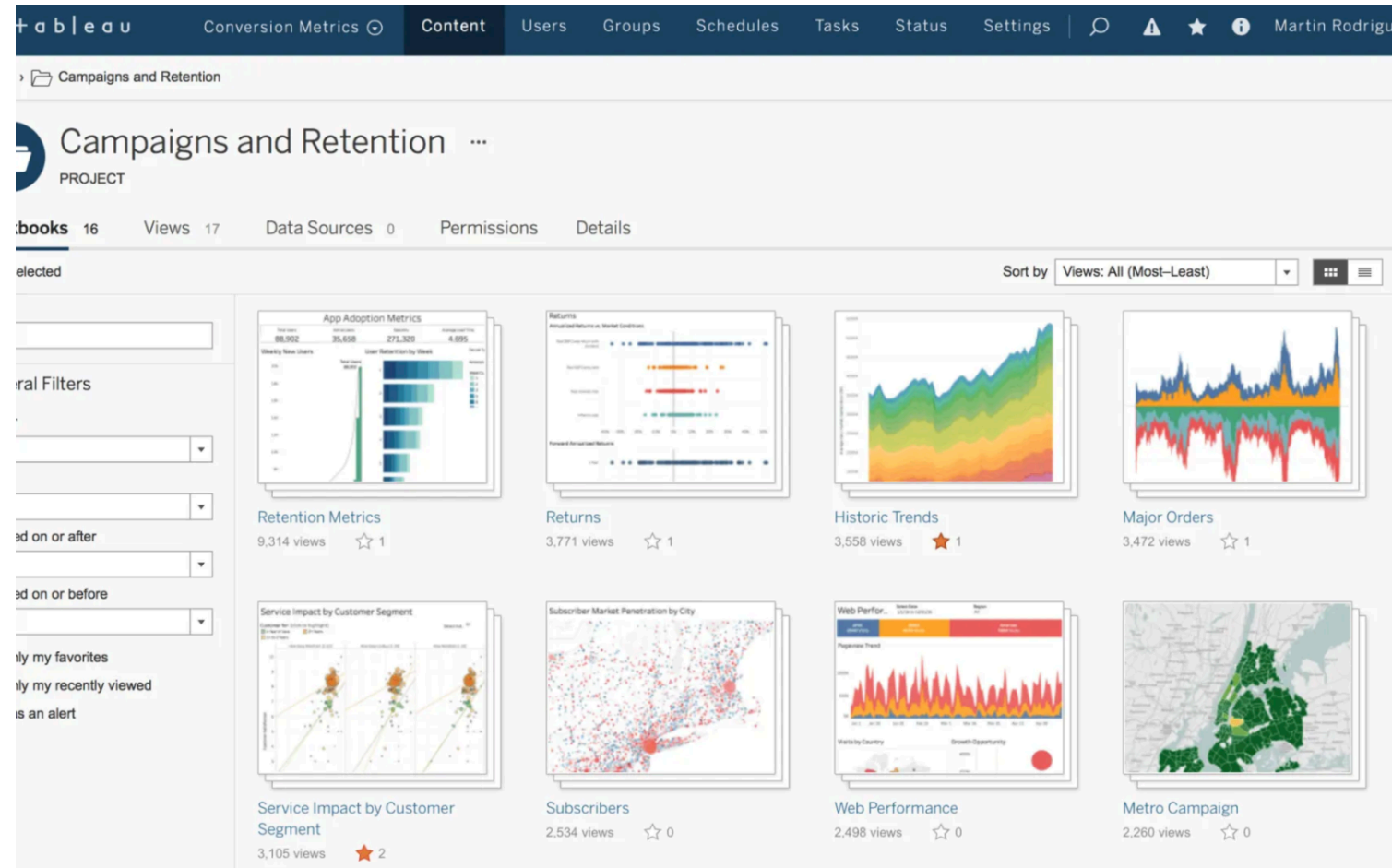
Intuitive User Experience

2

Powerful Analytics

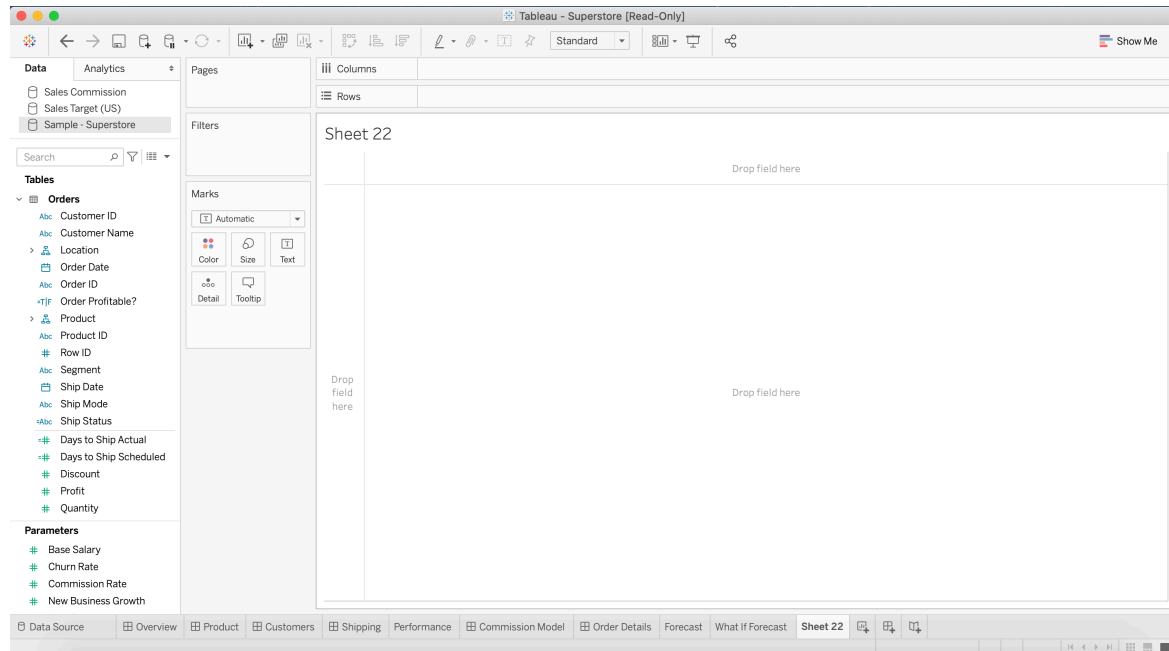
3

Collaboration



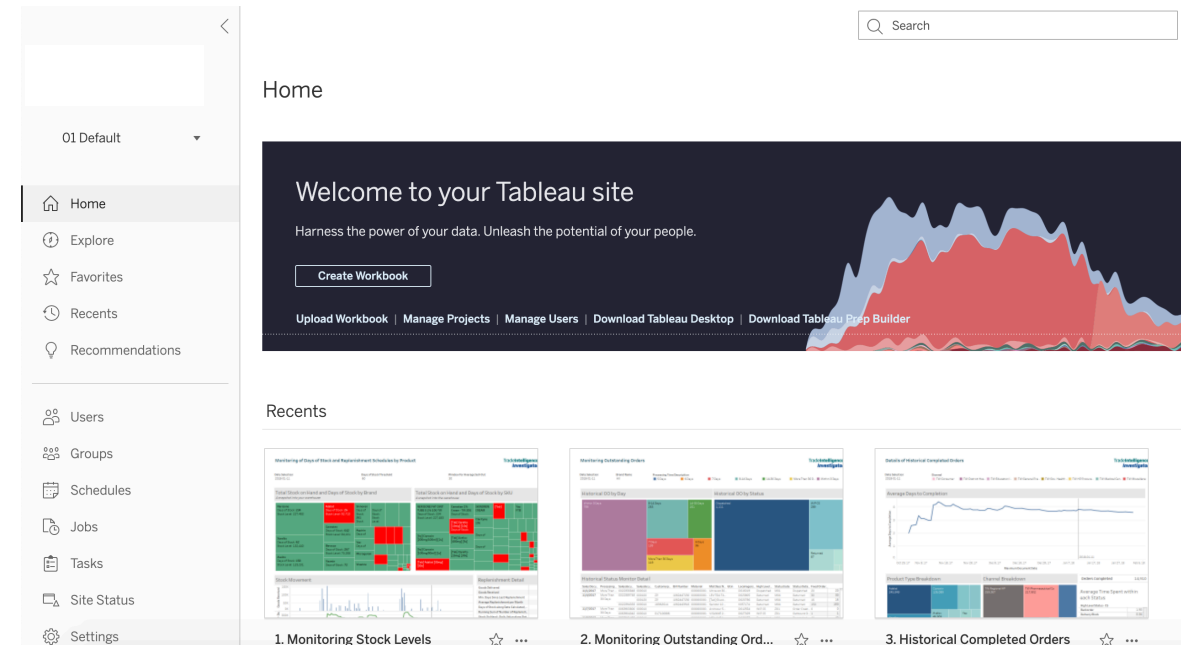
PART 1: Installation

Tableau Desktop



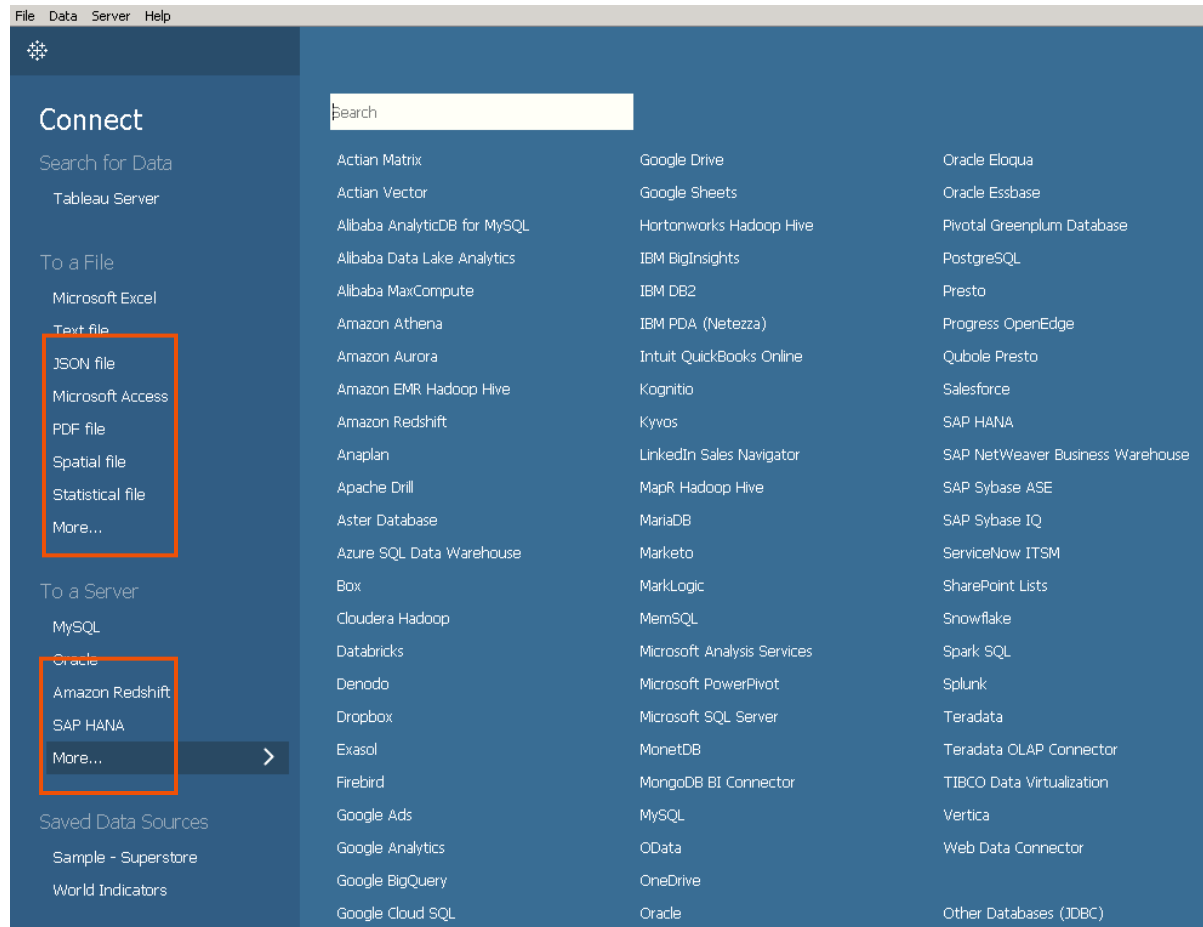
- + Create worksheets, dashboards
- + Share work locally

Tableau Server



- + Share dashboards across organization
- + Publish dashboards
- + Collaborate with others

PART 1: Data Connection



Flat Files



Excel



Text



JSON

Database



MSSQL



MySQL



SAP HANA



PostgreSQL

Tableau Server



PART 1: Connection – Flat File

Canvas: Display information about how the selected data source is set up and options for combining the data

Filter: Add filter at data source

Drop-down arrow to hide/rename/create aliases etc.

Data Type: Display the data type for each field. User can edit the data type.

Data Grid: Displays first few rows of data in the data source.

Tableau - Book2
File Data Server Window Help

Connect
To a File
Microsoft Excel
Text file
JSON file
Microsoft Access
PDF file
Spatial file
Statistical file
More...

Connections
Add
Quarterly Sales
Excel

Sheets
Quarterly Sales
New Union

Quarterly Sales
Connection
Live Extract
Filters
0 Add

Quarterly Sales

Sort fields Data source order Show alias

Quarterly Sales
Category Q1 Q2 Q3 Q4

Appliances 13,130 38,266 15,543 64,655
Binders and Binder A... 85,668 47,569 51,891 78,370
Bookcases 17,061 22,741 14,490 36,947
Chairs & Chairmats 66,384 48,000 89,280 164,776
Computer Peripherals 17,979 36,158 31,308 69,716
Copiers and Fax 40,452 30,203 19,398 88,565
Envelopes 4,298 17,730 9,621 25,429

Number (decimal)
Number (whole)
Date & Time
Date
String
Boolean
Default
Geographic Role

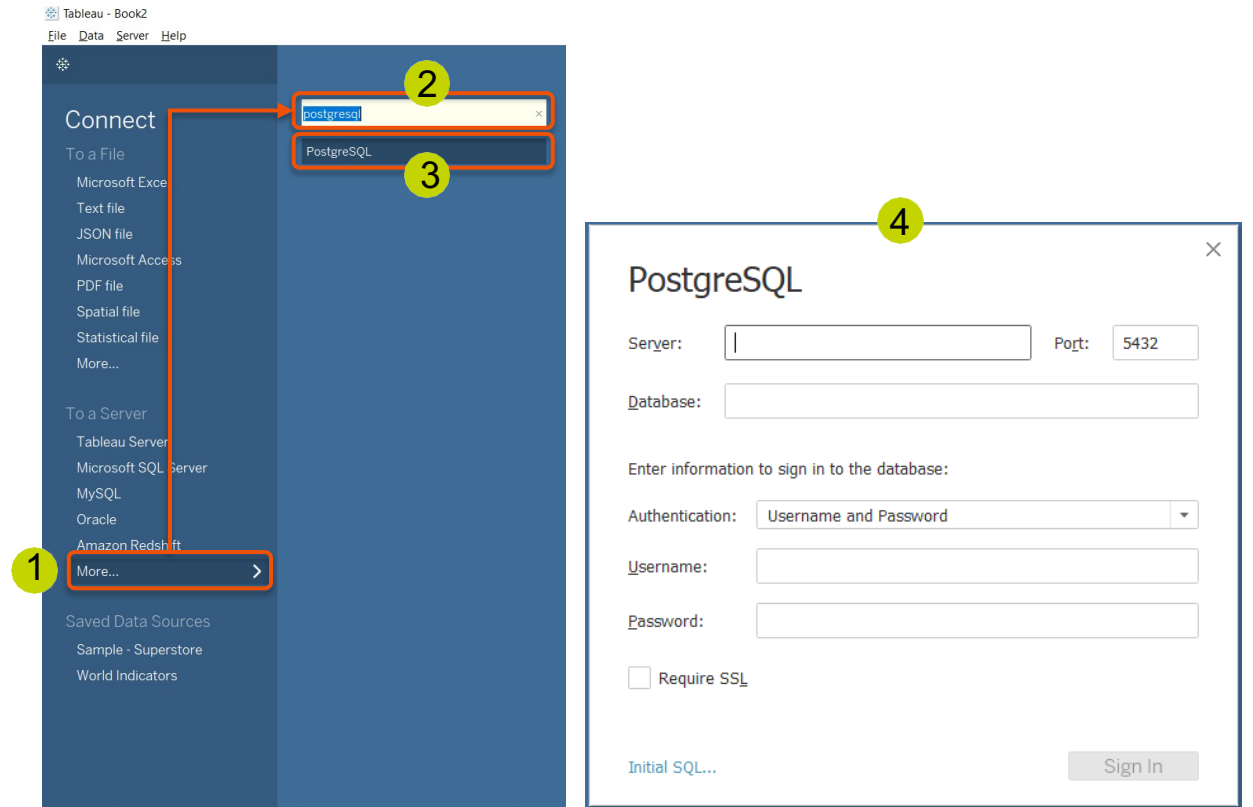
17 rows

Data Source Sheet 1 Henry Wilson

Category	Q1	Q2	Q3	Q4
Appliances	13,130	38,266	15,543	64,655
Binders and Binder A...	85,668	47,569	51,891	78,370
Bookcases	17,061	22,741	14,490	36,947
Chairs & Chairmats	66,384	48,000	89,280	164,776
Computer Peripherals	17,979	36,158	31,308	69,716
Copiers and Fax	40,452	30,203	19,398	88,565
Envelopes	4,298	17,730	9,621	25,429

PART 1: Connection – Database



1. Click on **More**
2. Search **PostgreSQL/SAP HANA/Presto...**
3. Click on **PostgreSQL**
4. Input the log-in credentials
 - Server Host, Port
 - Database Name
 - Authentication method: Integrated Authentication or Username and password
5. Select Schema
6. Select Table or Add New Custom SQL



PART 1: Extract vs Live



- TWBX: tableau packaged workbook**
- Package of files “compressed” together, which include a data source file, TWB and any other file used to produce the workbook (including images).
 - **This format is intended for sharing as it does not link to the original file source, instead contains a copy of the data that was obtained when the file was created.**
 - TWBX files usually used as reports and can be viewed as Tableau viewer
 - This is good if your dataset is using flat files (CSV / Excel) that is relatively small in size (<1Gb)

	 Extract	 Live Connection
ADVANTAGE (+)	<ul style="list-style-type: none">• Extracts are snapshots of data optimized for aggregation and loaded into system memory to be quickly recalled for visualization.• Tend to be faster, especially in more complex visualizations with large data sets, filters, calculations, etc.	<ul style="list-style-type: none">• Convenience of updates, with and changes to the data source reflected in the Tableau whenever there's an update in the worksheet.
DISADVANTAGE (-)	<ul style="list-style-type: none">• Extract needs to be refresh to receive updates from the original data source, whether local or online server data	<ul style="list-style-type: none">• Database not always optimized for fast performance as only as fast as the database itself.• Every time a new field is used, it takes a while to pull the data, especially if the data base is big.



- TWB: tableau workbook file**
- Contains information about your sheets, dashboards and stories.
 - This references a data source file such as excel, and when you save the TWB file, it is linked to the source.
 - **TWB file do not contain any data, hence if users want to share the workbook, the TWB file and the data source file must both be sent together.**
 - This is good if you are using a *live* connection to a shared database that you and your colleagues have access to.

PART 1: Create Extract

1. Select File > **Save As** > Specify File name > Select (under Save as type) Tableau Packaged Workbooks(.twbx) > Click **Save**
2. Following which, go back to data source page, Click **Extract**, then click the **Edit** link to open the Extract Data dialog box.
3. When finished, click OK. Clicking the sheet tab initiates the creating of the extract.
4. Save again

1 Tableau - Book2
File Data Worksheet Dashboard Story Analysis
New Ctrl+N
Open... Ctrl+O
Close
Save Ctrl+S
Save As...
Revert to Saved F12
Export As Version...
Export Packaged Workbook...
Export As PowerPoint...

2 Documents library
Workbooks
Name
Coffee Analysis.twb 2/
High Value Customers.twb 2/
File name: GDP Data
Save as type: Tableau Workbook (*.twb)
Tableau Workbook (*.twb)
Tableau Packaged Workbook (*.twbx)
save Cancel

3 Tableau - Book2
File Data Worksheet Dashboard Story Analysis
New Ctrl+N
Open... Ctrl+O
Close
Save Ctrl+S
Save As...
Revert to Saved F12
Export As Version...
Export Packaged Workbook...
Export As PowerPoint...

4 Extract Data
Specify how to store data in the extract:
Data Storage
Single table Multiple tables
Store data in your extract together using a single table. [Learn more](#)
Use this option if you need to use extract filters, aggregation, top N, etc.
Specify how much data to extract:
Filters (optional)
Filter Details
Add... Edit... Remove
Aggregation
Aggregate data for visible dimensions
Roll up dates to Year
Number of Rows
All rows
Incremental refresh
Top: rows
Sample: rows
History... Hide All Unused Fields Extract Cancel

PART 1: Tableau Workspace

Start Page

Where users can start to connect to a data source

Sidebar – Data

Displays the current data source(s)

Sidebar Contains the data grouped into dimensions and measures based on the data type.

Parameters are created using the data.

All fields here are available throughout the workbook

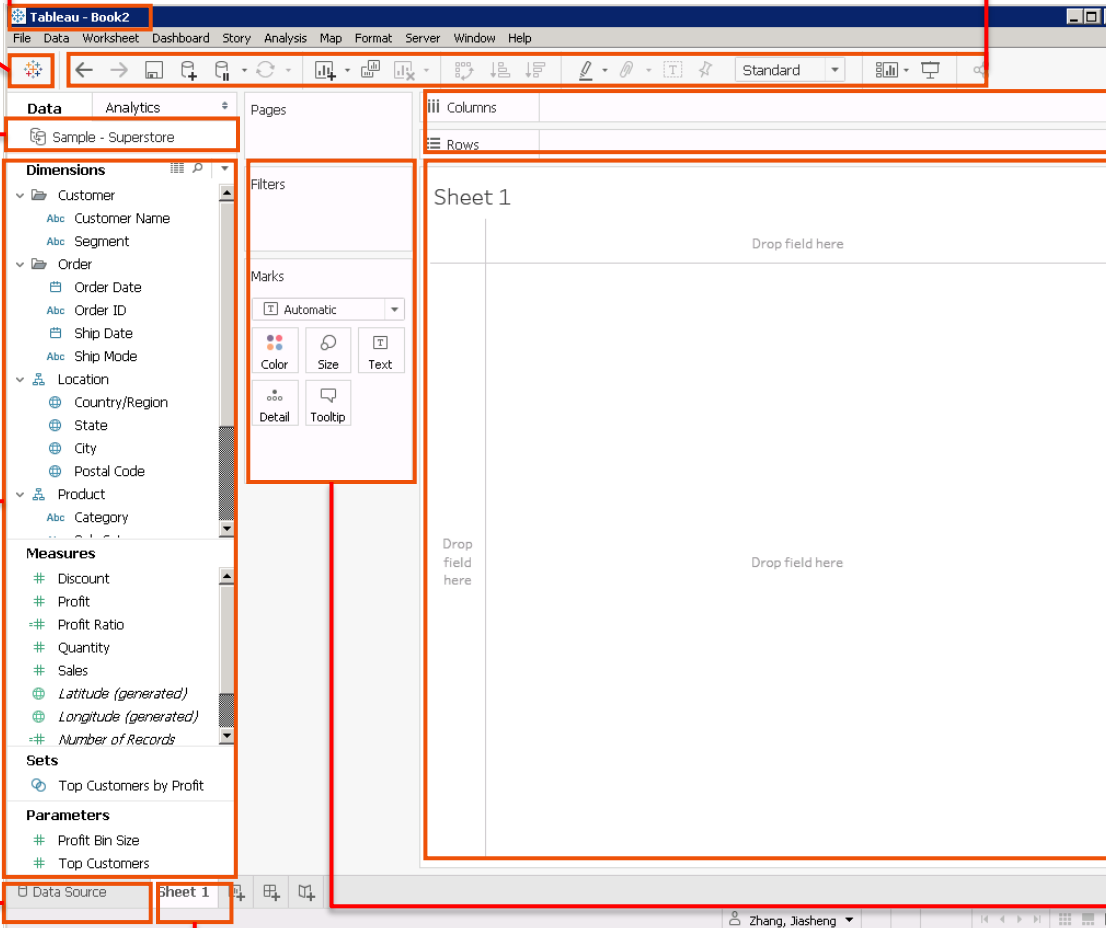
Data source This is to view your data or change or include a new data source.

Workbook name

A workbook contains sheets, which can be a worksheet, dashboard or story..

Toolbar

Use the toolbar to access commands and analysis and navigation tools.



Cards / Shelves Drag fields to these areas to add data to your

View

This is the canvas in the workplace where you can create a visualization.

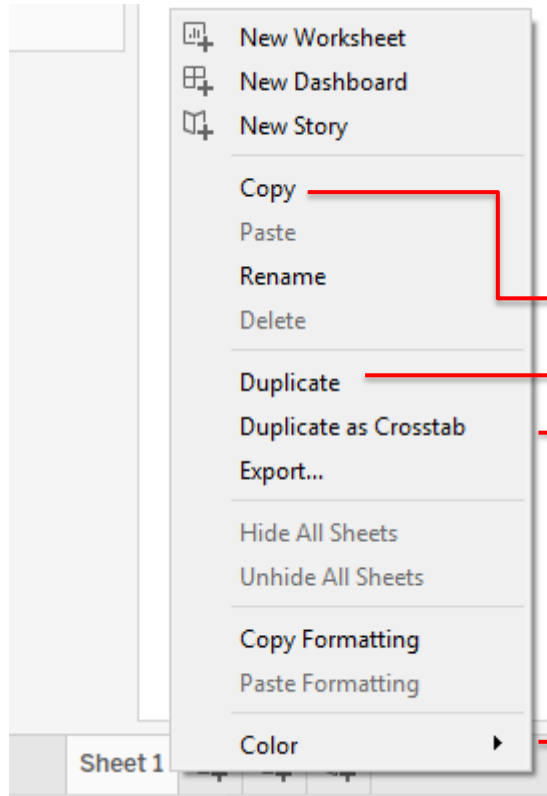
Filters and Marks

Marks card allows users to add different properties such as context and details. Filter shelf allows specification of data to include and exclude.

Sheet Tabs Tabs represent each sheet.

PART 1: Tableau Workspace

Tableau Sheet Bar



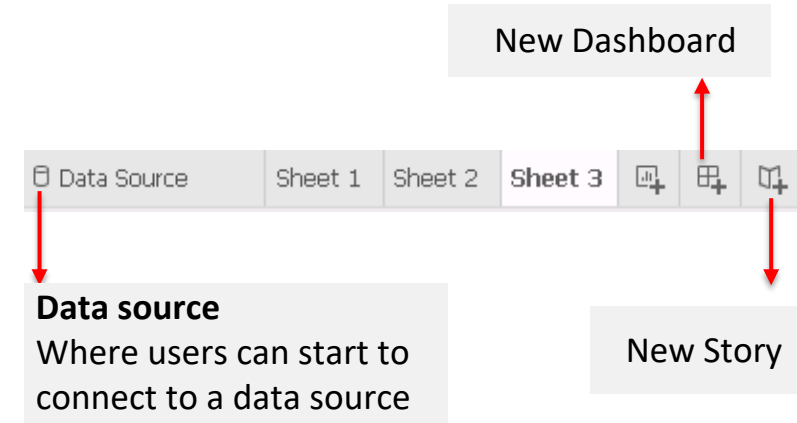
Most of the options are self-explanatory. Here is some additional info that might be useful for you

Copy: To Copy the worksheet, including all the calculations, parameters, and data source that is related to that sheet if pasted to a different workbook

Duplicate: Create a new worksheet with exact same settings on the same workbook. Very useful to do some debugging without ruining an existing chart

Duplicate as Crosstab: Sometimes the original chart is non-tabular, and it will be easier to debug if we see it in a tabular format. This option allows to copy the chart onto tabular format.

Color is useful to identify worksheets that are in a same group



PART 1: Tableau Workspace

Tableau Dashboard

Dashboard Display Mode

Users are able to select the type of dashboard to craft the dashboard such as: Default (computer screen), Phone, Tablet

Screen Size

Changing the resolution size of the desktop when default is selected as the dashboard display mode.

Sheet Pane

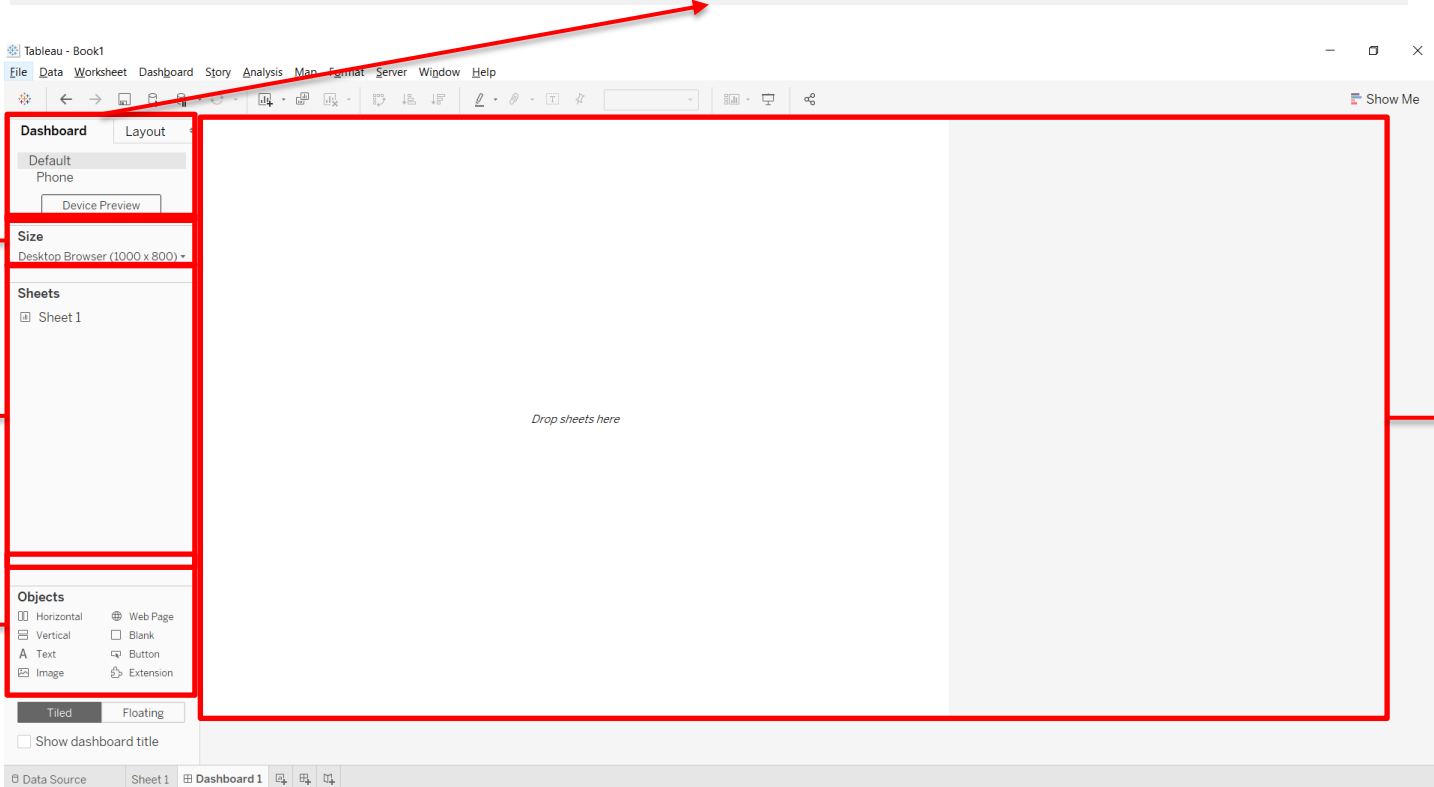
Displays the existing sheets created to be added and combine in the dashboard

Objects Pane

Options of adding different objects into the dashboard to add more interactivity.

Display pane

Sheets can be dropped here and where editing and preview of the layout of the dashboard is done, including formatting, structuring and addition of objects located in the objects pane.



The screenshot shows the Tableau workspace interface. A red box highlights the left-hand panes: the 'Dashboard' pane (containing 'Default' and 'Phone' display mode options and a 'Device Preview' button), the 'Size' pane (showing 'Desktop Browser (1000 x 800)'), the 'Sheets' pane (showing 'Sheet 1'), and the 'Objects' pane (containing options like 'Horizontal', 'Vertical', 'Text', 'Image', 'Web Page', 'Blank', 'Button', and 'Extension'). Red arrows point from the descriptive text boxes on the left to these panes. A large red box outlines the central 'Display pane', which contains the text 'Drop sheets here'. A red arrow points from the 'Display pane' description box on the right to this central area. At the top, a grey box titled 'Dashboard Display Mode' explains the selection of dashboard types, with a red arrow pointing to the 'Default' and 'Phone' options in the 'Dashboard' pane.