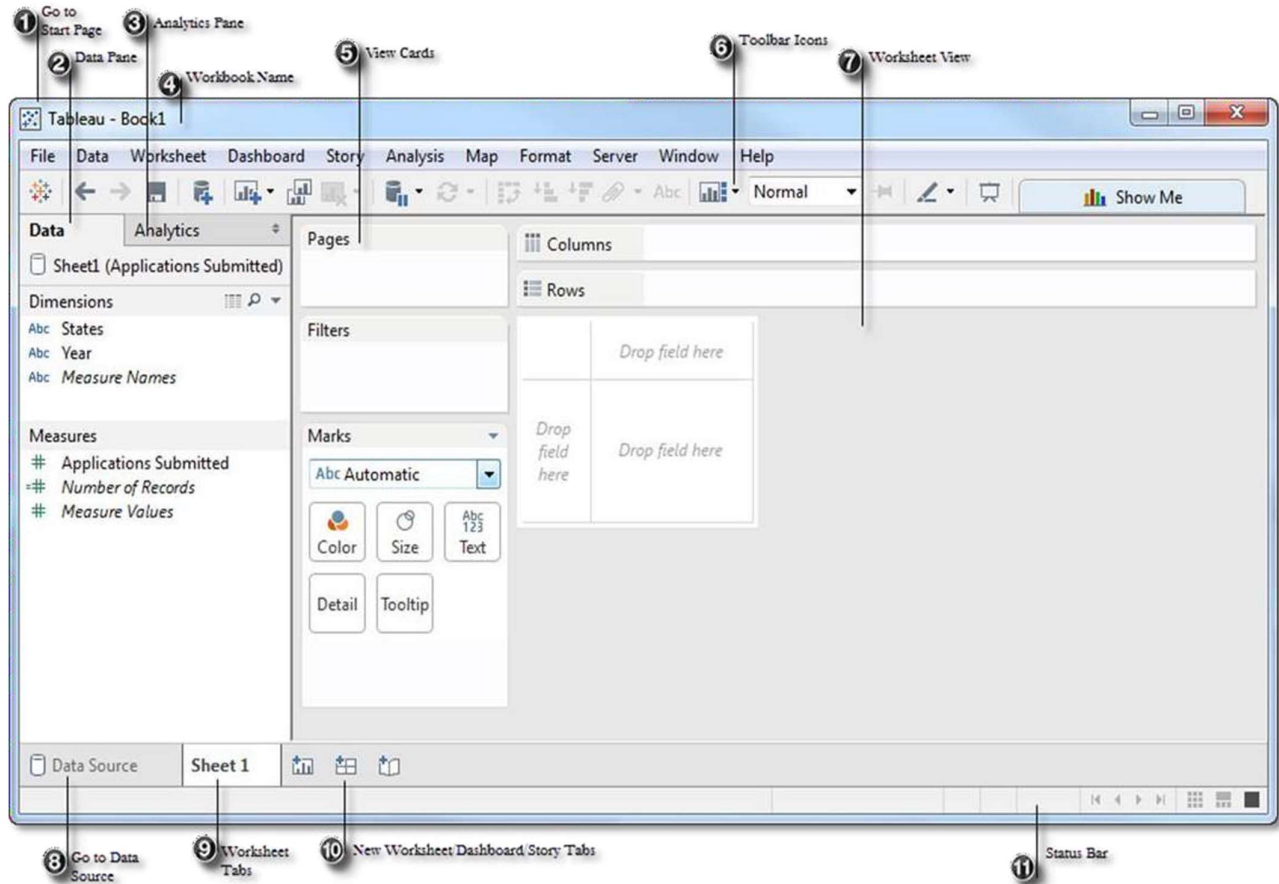


## PROGRAM 1: Getting Started - Tableau Workspace, Tableau terminologies, Basic functionalities.

Working with Tableau that focuses on understanding the Tableau Workspace, Tableau terminologies, and basic functionalities.

Dataset used: [vgsales.csv](#)

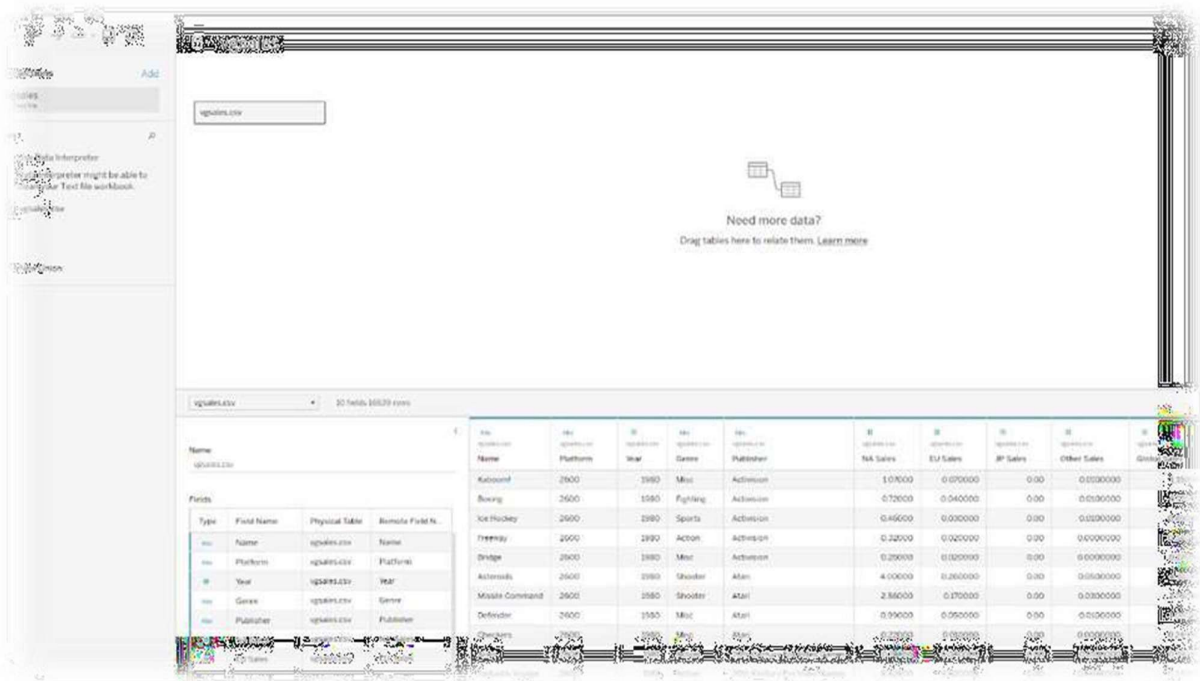


1. Go to Start Page: Toggle between the active sheet and the Desktop Start Page.
2. Data Pane: Includes dimensions and measures, populated from your selected data source. May also include calculated fields, parameters, or sets.
3. Analytics Pane: Includes options you can use to apply reference lines, forecasts, trend lines, to add totals to crosstabs, and to build boxplots.
4. Workbook Name: The file name of our workbook.
5. View Cards: Used for modifying the worksheet.
6. Toolbar Icons: Icons are available for quick access to popular features.
7. Worksheet/View: Workspace for building your visualizations.
8. Go to Data Source: Returns you to the data source specification page.
9. Worksheet Tabs: Click to view a specific worksheet, dashboard, or story
10. New Worksheet, Dashboard, and Story tabs: Click to create a new Worksheet, Dashboard, or Story.
11. Status Bar: Displays data about the fields and marks included in the view.

## Tableau Workspace Setup:

### Steps:

- **Connect to Data:**
  - Open Tableau, and on the "Start Page," select Connect -> To a File -> Text File.
  - Browse to the location of vgsales.csv and open it.
- **Data Preview:**
  - After loading, Tableau will show a preview of the data. You can rename columns if necessary.
  - Click on the "Sheet 1" tab at the bottom to go to your first worksheet.



### Tableau Terminologies:

- **Dimensions:** These are qualitative fields. In vgsales.csv, examples include Platform, Genre and Publisher.
- **Measures:** These are quantitative fields used for calculations. Examples are Global\_Sales, NA\_Sales, and Year.
- **Rows and Columns Shelf:** Drag dimensions and measures to the Rows or Columns shelves to build the structure of your visualization.
- **Marks:** Controls the appearance of the data. You can set marks to be circles, bars, or other shapes and control size, color, and label.
- **Filters:** Used to limit the data displayed in the view.
- **Pages Shelf:** Used for creating animations or segmenting your view by categories.

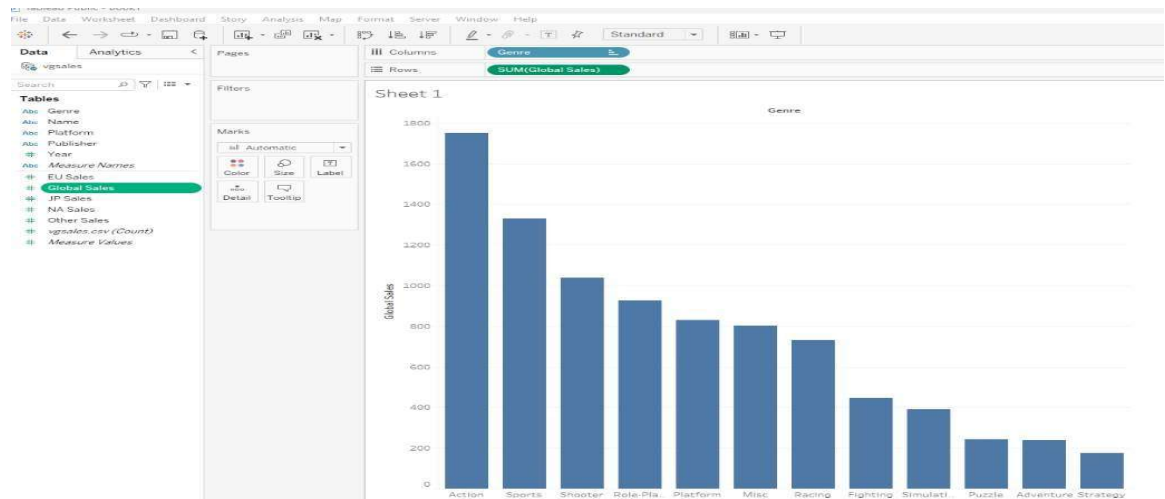
## 2. Basic Functionalities:

### a. Basic Visualization (Bar Chart of Global Sales by Genre):

- In your worksheet, drag Genre to the Columns shelf.
- Drag Global\_Sales to the Rows shelf.
- You should see a bar chart. If the data isn't aggregating correctly, check if the aggregation is set to SUM by right-clicking Global\_Sales -> Measure -> Sum.

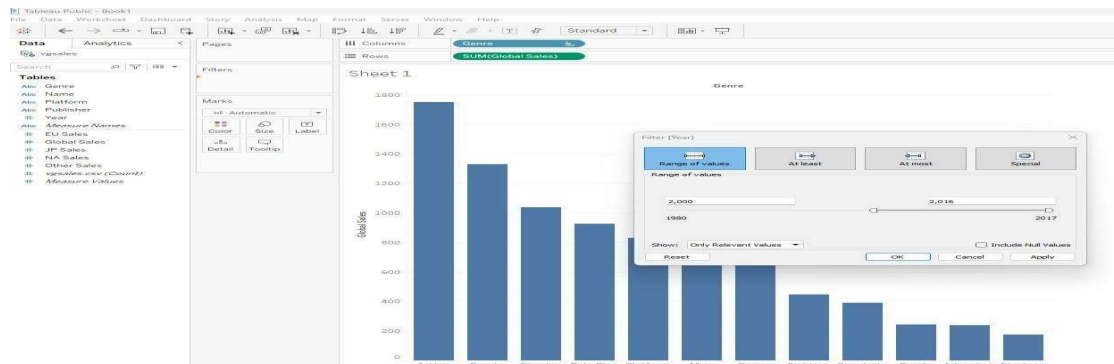
### b. Sorting:

- Click on the Global\_Sales axis and sort descending to show the genres with the most sales first.



### c. Filtering:

- Drag Year to the Filters shelf.
- Choose the range of years you want to display (e.g., 2000-2016).
- Add Year to the Pages shelf to create a dynamic view of how sales changed over time

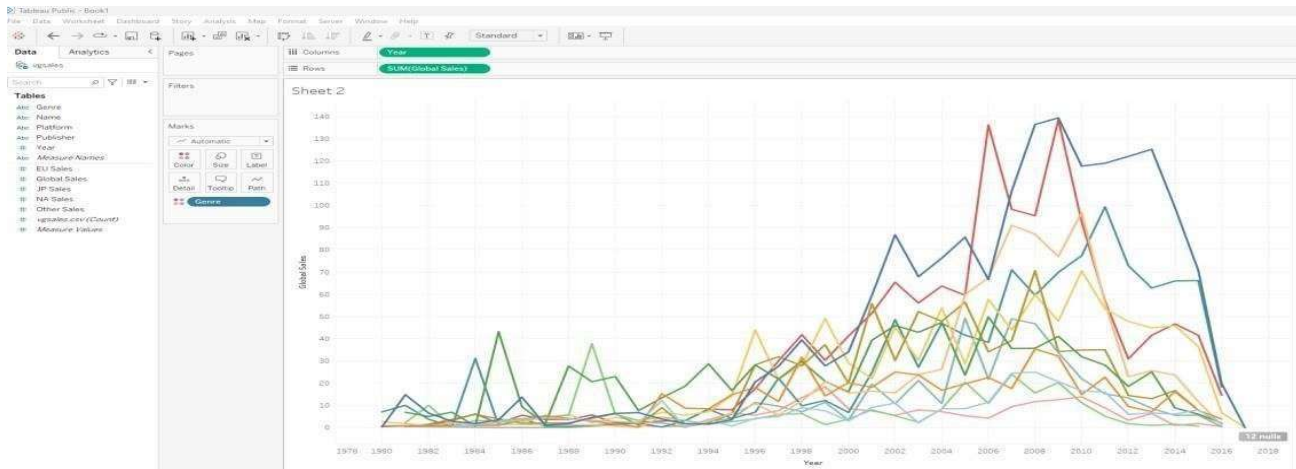


#### 4. Additional Functionalities:

**Dashboards:** Combine different sheets to create a comprehensive dashboard. Go to the Dashboard tab, drag your created sheets to the layout, and arrange them accordingly.

##### a. Add one more worksheet - Global Sales Trend by Year

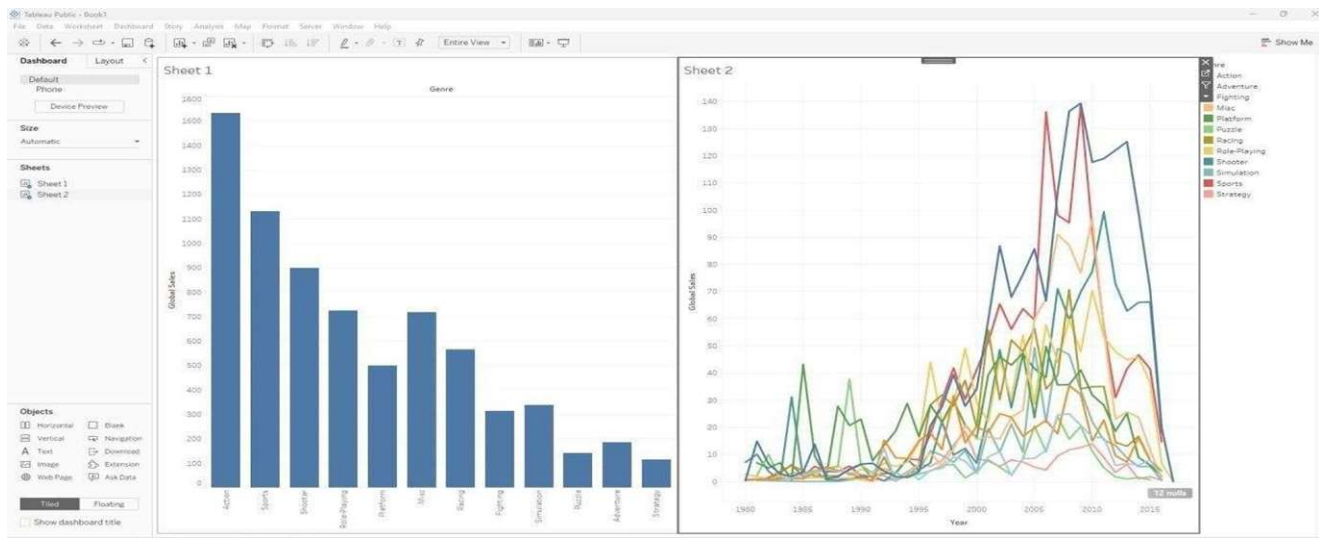
- Drag Year to the Columns.
- Drag Global\_Sales to the Rows.
- Create a line chart to show how global sales have trended over time.
- Add Genre to the Marks
- Apply color to Genre



b. Go to the Dashboard tab in Tableau.

c. Add multiple visualizations to a single dashboard. (To increase dashboard size - select size-Automatic)

d. Arrange charts (e.g., a line chart for yearly sales, a bar chart for top genres, etc.).



## PROGRAM 2 : Connecting to Data Source – Connecting to Database, Different types of Tableau Joins.

Dataset used: Tableau Joins File: Contains 3 sheets : Demographics, Salary, Job Title

### 1. Connecting to Excel Files in Tableau:

- Open Tableau and click on **Connect** in the left pane.
- Under **To a File**, choose **Microsoft Excel**.
- Browse and select your Excel file (Tableau Joins File.xlsx).
- Tableau will display the sheets from the Excel file in the Data Source tab.
- Drag the relevant sheets to the workspace.

### 2. Tableau Joins File.xlsx Dataset: has three Excel sheets

- **Demographics:**

- EmployeeID
- Name of Employee
- Employee Age
- Employee Gender

- **Salary:**

- EmployeeID
- Employee Salary

These sheets have a relationship based on the EmployeeID, and you can join them using this field.

Drag and drop Demographics table- Right click-select open- that allows you to do following types of joins.

Now Drag and drop Salary table - That allows you to do join of your choice.

### 3. Types of Joins in Tableau:

Once both tables are in the Data Source tab, Tableau automatically suggests an inner join, but you can modify the type of join depending on the scenario.

#### a. Inner Join:

- **Description:** Returns only records where there is a match in both tables.

- **How to Create in Tableau:**

- Drag Demographics and Salary sheets into the canvas.
  - Tableau automatically detects the common field (EmployeeID). If not, manually select it.
  - Choose **Inner Join** in the **Join Type** options.
  - Result: You will see only employees whose employee id matches in both Demographics and salary table
-

**Demographics+ (Tableau Joins File)**

Demographics is made of 2 tables. ①

Join settings window:

- Inner
- Left**
- Right
- Full Outer

Data Source: Employee ID = EmployeeID (Salary)

Resulting Data Table (6 fields, 7 rows):

Demographics Employee ID	Demographics Name of Employee	Demographics Employee Age	Demographics Employee Gender	Salary EmployeeID (Salary)	Salary Employee Salary
1001	Jim Halpert	35	Male	1001	45,000
1002	Pam Beasley	35	Female	1002	35,000
1003	Dwight Schrute	37	Male	1003	65,000
1004	Toby Flenderson	38	Male	1004	38,500
1005	Angela Martin	34	Female	1005	45,000
1006	Michael Scott	40	Male	1006	70,000
1007	Meredith Palmer	43	Female	1007	40,000

## b. Left Join:

- Description:** Returns all records from the left table (Demographics), and matched records from the right table (salary). If there's no match, NULL values are returned for fields from the right table.

### How to Create in Tableau:

- In the join settings, select **Left Join**.
- Result: All employees will be returned, even if data missing in Salary. Salary information will be NULL for those without a match.

**Demographics+ (Tableau Joins File)**

Demographics is made of 2 tables. ①

Join settings window:

- Inner
- Left**
- Right
- Full Outer

Data Source: Employee ID = EmployeeID (Salary)

Resulting Data Table (6 fields, 8 rows):

Demographics Employee ID	Demographics Name of Employee	Demographics Employee Age	Demographics Employee Gender	Salary EmployeeID (Salary)	Salary Employee Salary
1001	Jim Halpert	35	Male	1001	45,000
1002	Pam Beasley	35	Female	1002	35,000
1003	Dwight Schrute	37	Male	1003	65,000
1004	Toby Flenderson	38	Male	1004	38,500
1005	Angela Martin	34	Female	1005	45,000
1006	Michael Scott	40	Male	1006	70,000
1007	Meredith Palmer	43	Female	1007	40,000
1008	Shirley Hudson	49	Male	NULL	NULL
1009	Ryan Howard	31	Male	NULL	NULL



### c. Right Join:

- **Description:** Returns all records from the right table (Salary), and matched records from the left table (Demographics). If there's no match, NULL values are returned for fields from the left table.
- **How to Create in Tableau:**
  - Select **Right Join**.

Result: You will see all salary, even if they don't

Demographics+ (Tableau Joins File)

Demographics is made of 2 tables: Demographics, Salary

Join: Inner, Left, Right, Full Outer

Data Source: EmployeeID (Salary)

EmployeeID (Salary)

Demographics: 6 fields 8 rows

Name	Demographics
EmployeeID	Demographics EmployeeID
Name of Employee	Demographics Name of Employee
Employee Age	Demographics Employee Age
Employee Gender	Demographics Employee Gender
EmployeeID (Salary)	Salary EmployeeID (Salary)
Employee Salary	Salary Employee Salary

Demographics EmployeeID	Demographics Name of Employee	Demographics Employee Age	Demographics Employee Gender	Salary EmployeeID (Salary)	Salary Employee Salary
1001	Jim Halpert	35	Male	1001	45,000
1002	Pam Beasley	35	Female	1002	35,000
1003	Dwight Schrute	37	Male	1003	65,000
1004	Toby Flenderson	38	Male	1004	38,000
1005	Angela Martin	34	Female	1005	45,000
1006	Michael Scott	40	Male	1006	70,000
1007	Meredith Palmer	43	Female	1007	40,000
null	null	null	null	1010	25,000

### d. Full Outer Join:

- **Description:** Returns all records when there is a match in either the left (Demographics) or right (JobTitle) table. If there's no match, NULL values are returned for the missing side.
- **How to Create in Tableau:**
  - Select **Full Outer Join**.
  - Result: You will see all employees and all salary, even if they don't have a match in the other table. NULL values will appear where there's no corresponding record.

Demographics+ (Tableau Joins File)

Demographics is made of 2 tables: Demographics, Salary

Join: Inner, Left, Right, Full Outer

Data Source: EmployeeID (Salary)

EmployeeID (Salary)

Demographics: 6 fields 11 rows

Name	Demographics
EmployeeID	Demographics EmployeeID
Name of Employee	Demographics Name of Employee
Employee Age	Demographics Employee Age
Employee Gender	Demographics Employee Gender
EmployeeID (Salary)	Salary EmployeeID (Salary)
Employee Salary	Salary Employee Salary

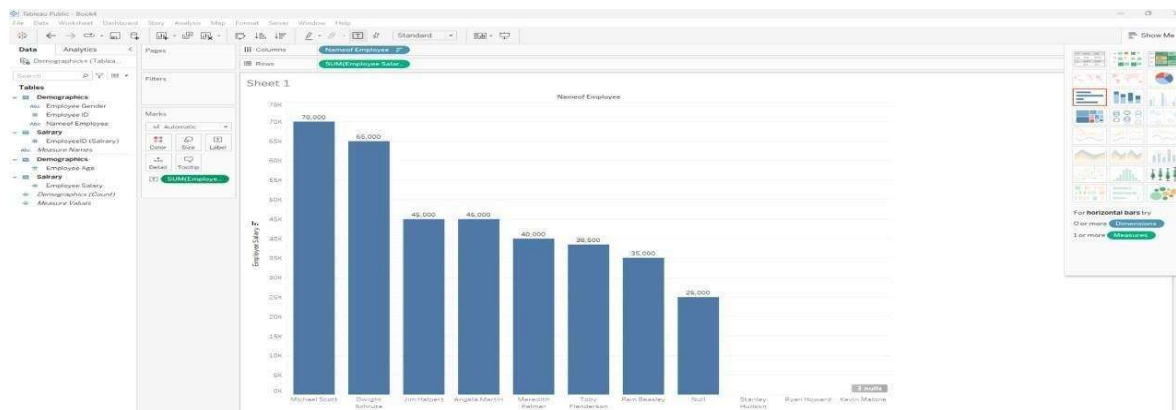
Demographics EmployeeID	Demographics Name of Employee	Demographics Employee Age	Demographics Employee Gender	Salary EmployeeID (Salary)	Salary Employee Salary
1001	Jim Halpert	35	Male	1001	45,000
1002	Pam Beasley	35	Female	1002	35,000
1003	Dwight Schrute	37	Male	1003	65,000
1004	Toby Flenderson	38	Male	1004	38,000
1005	Angela Martin	34	Female	1005	45,000
1006	Michael Scott	40	Male	1006	70,000
1007	Meredith Palmer	43	Female	1007	40,000
1008	Stanley Hudson	45	Male	null	null
1009	Karen Maloney	37	Male	null	null
1010	Ryan Howard	31	Male	null	null
null	null	null	null	1010	25,000

#### 4. Creating a Visualization Based on Joins:

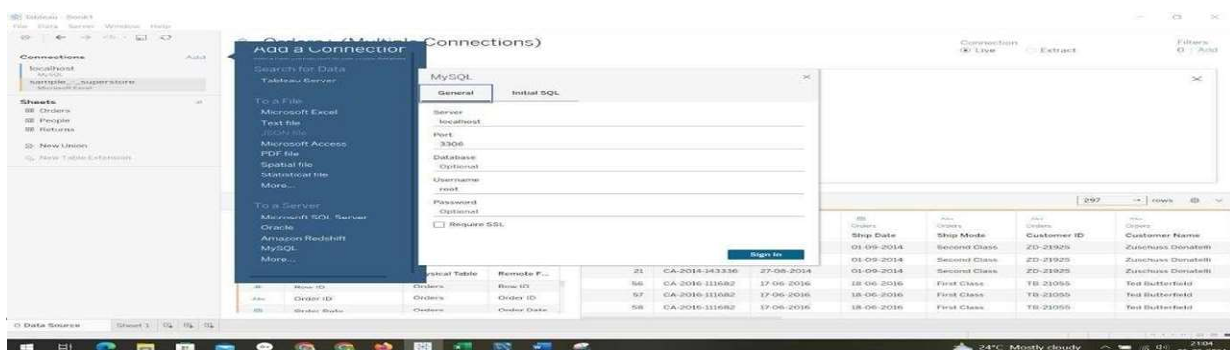
After performing the joins, you can build different visualizations. Press on Sheet 1:

For example,

- **Bar Chart:** Number of employees and their salary.
- Drag Name of Employee to **Columns**.
- Drag Employee Salary to **Rows**.
- This chart will display the number of employees and their salary based on the type of join.
- Sort it in descending
- Drag Employee Salary to Marks - Select color Color, Label.



- After installing it we have to connect to Mysql





## PROGRAM 3: Creating a View – formatting charts, adding filters, creating calculated fields and defining parameters.

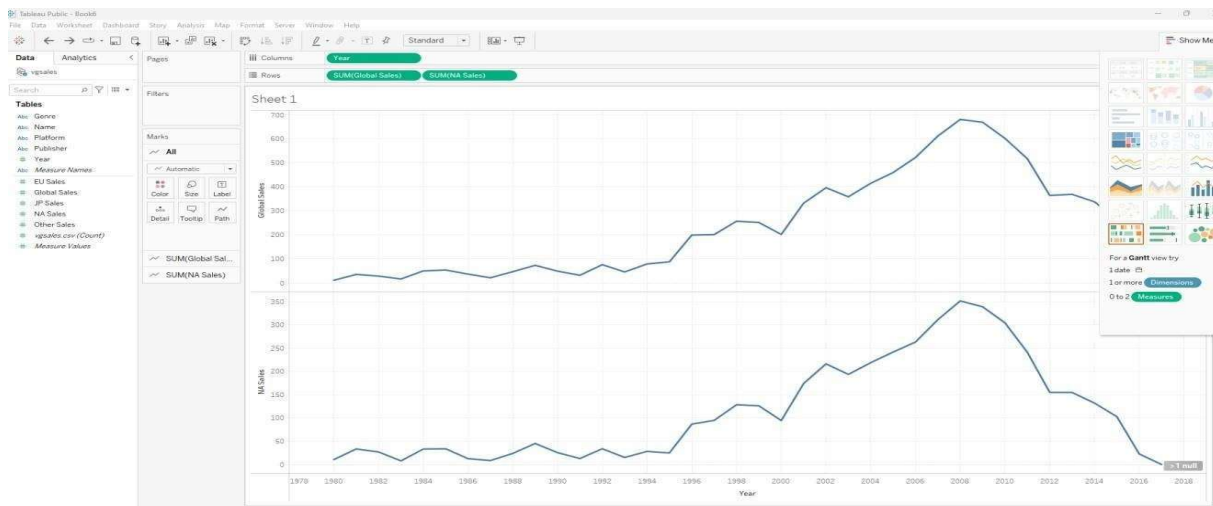
### Step 1: Connect to Data

1. Open Tableau Desktop.2
2. **Connect to Your Data Source:**
  - a. Click on Connect on the left sidebar.
  - b. Choose your data source by selecting text file and load your vgsales dataset into Tableau.

### Step 2: Create a Basic Visualization

- **Create a New Worksheet:**
  - a) Click on the Sheet tab at the bottom of the screen.
- **Drag Fields to Shelves:**
  - a) Drag Year to the Columns shelf.
  - b) Drag Global Sales to the Rows shelf.
  - c) Drag EU Sales to the Rows shelf.

That gives the line graph



### 2. Connect to Your Data Source:

- a) Click on Connect on the left sidebar.



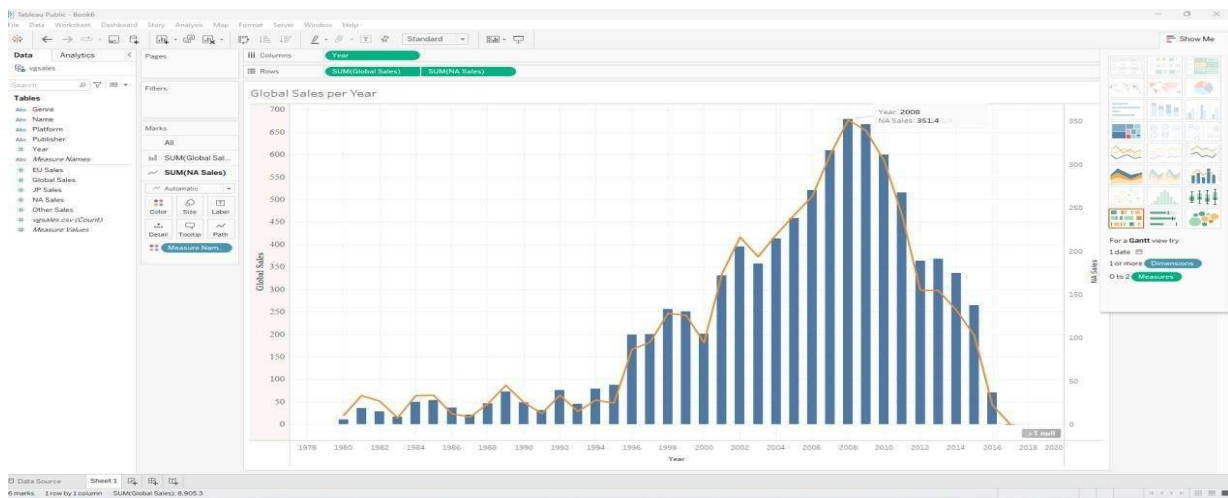
### Step 3: Format the Chart

- **Format Axes:**

- a) Right-click on the Global Sales axis and select Format.
- b) In the Format pane, adjust the font style & size as needed.

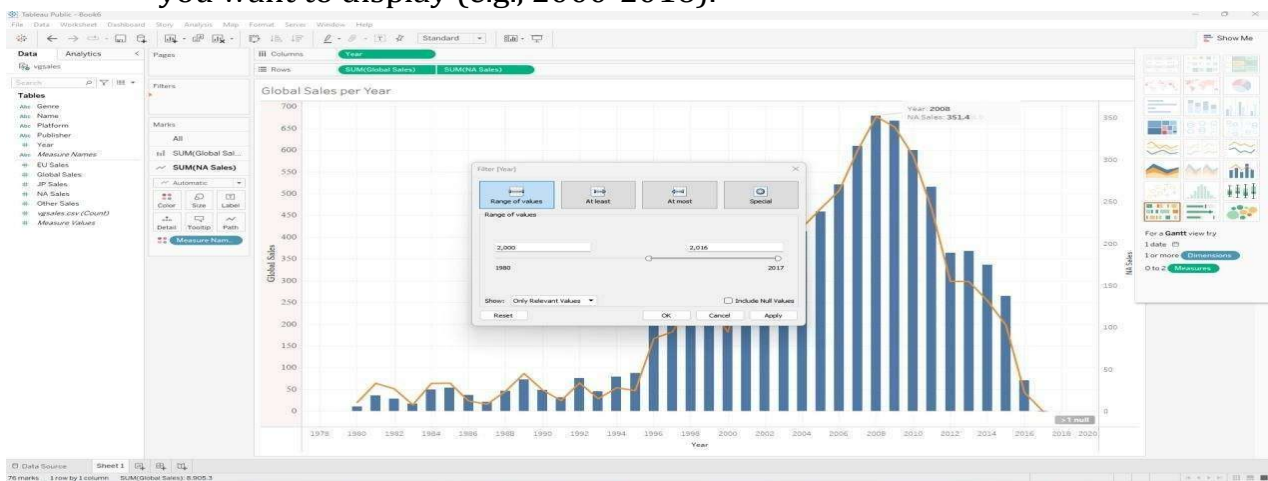
- **Add Titles and Annotations:**

- a) Click on the chart title area and enter a descriptive title - Global Sales by Year.
- b) Add annotations if needed to highlight specific data points – Right click the on the chart which you want to highlight - Select Annotate - Select Mark - Press Ok.



### Step 4: Add Filters

**Add a Filter for Year:** Drag Year to the Filters shelf. Choose the range of years you want to display (e.g., 2000-2016).



## Step 5: Create Calculated Fields

### Create a Calculated Field for Sales Category:

- Right-click on Global Sales - Select Create - Calculated Field.
- Give name to your calculations as Global Sales - EU Sales
- Do calculations as per your need - [Global Sales] - [EU Sales]
- Press Ok

### Add Calculated Fields to Visualization:

- Drag Global Sales-EU Sales to the Rows shelf to show Global Sales over Year with GlobalSales-EU Sales over Year.

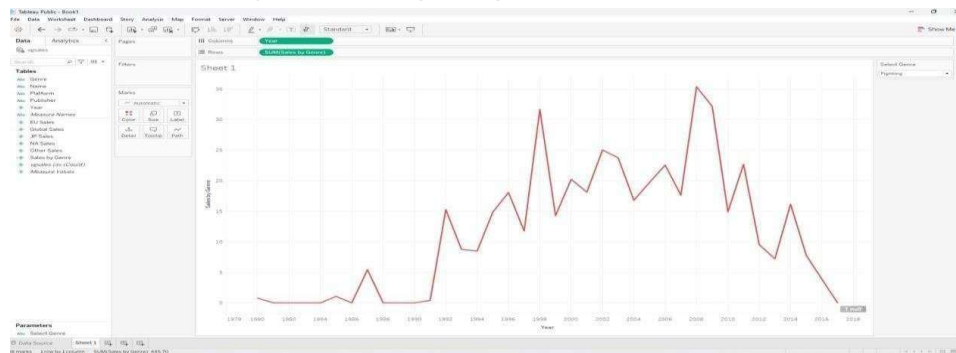
## Step 6: Create a Parameter:

### Name: "Select Genre"

- Data Type:** String
- Values:** List (e.g., "Action", "Adventure", "Shooter") or Add values from Genre.
  - Create a Calculated Field:
- Name:** "Sales by Genre"
- Formula:**
- IF [Genre] = [Select Genre] THEN [Global Sales] ELSE 0 END

### Build the Visualization:

- Columns:** Drag "Year".
- Rows:** Drag "Sales by Genre".
- At the right side of your sheet you can select required Genre and can see different Visualization
- Visualization by Genre: Fighting



Visualization by Genre: Puzzle



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## PROGRAM 4 : Dashboard Design and Storytelling – Components of Dashboard, Understanding how to place worksheets in Containers, Action filters and its types.

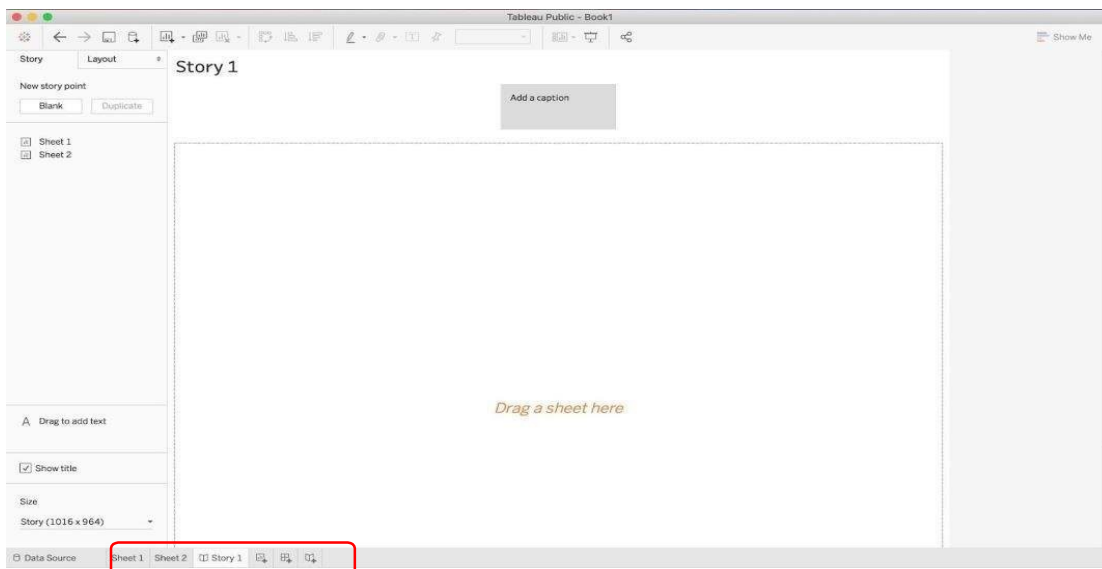
### CREATING A STORY WITH TABLEAU PUBLIC

With Tableau public, you are able to organize your data in order to tell a meaningful story. This is beneficial when you are doing a presentation, creating an article, or uploading to a website, as it helps your audience understand your data.

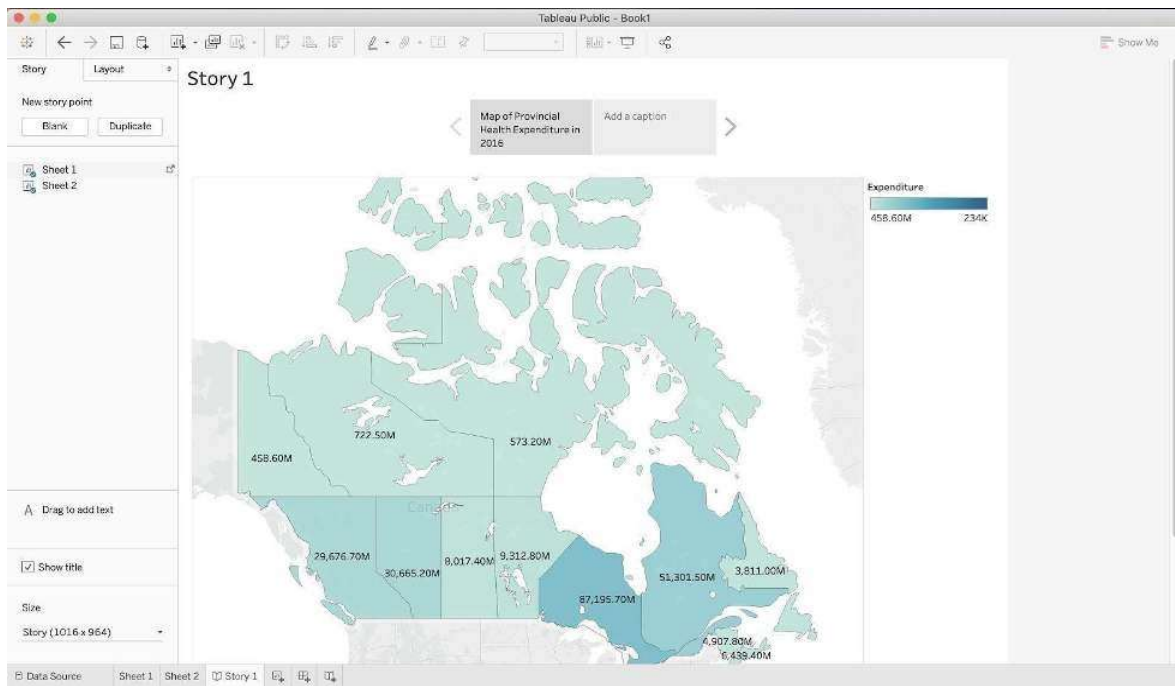
Stories are created through assembling the different worksheets and dashboards. We can highlight important data points, add text box and pictures to help convey our story. However, there are many different ways to tell a story. For example, one technique is called “tailoring in” where the story starts with a big picture view and zooms in on a specific detail.

In contrast, a story can also be told by starting with a case and zooming out to that big picture view. We are going to return to our health expenditure worksheets to create a tailoring in story and illustrate the changes in Canada’s spending in a meaningful way.

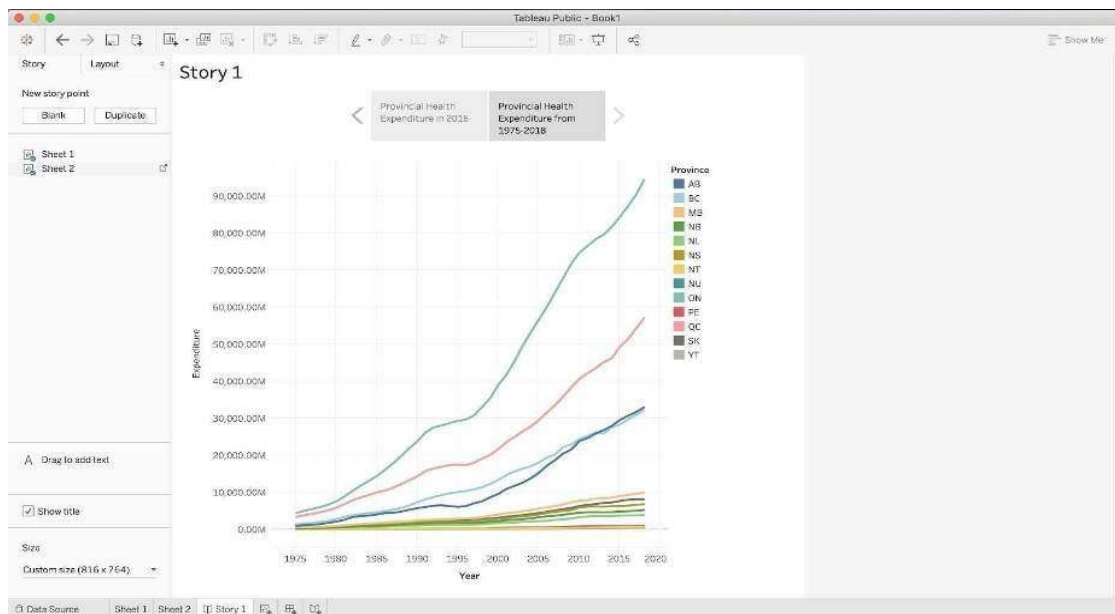
To begin, select “New Story” at the bottom right of your screen.



Drag “Sheet 1” and “Sheet 2” on to “Drag a sheet here”. We can rename each story board by clicking “Add a caption”. Rename Sheet 1 to “Provincial Health Expenditure in 2016”.

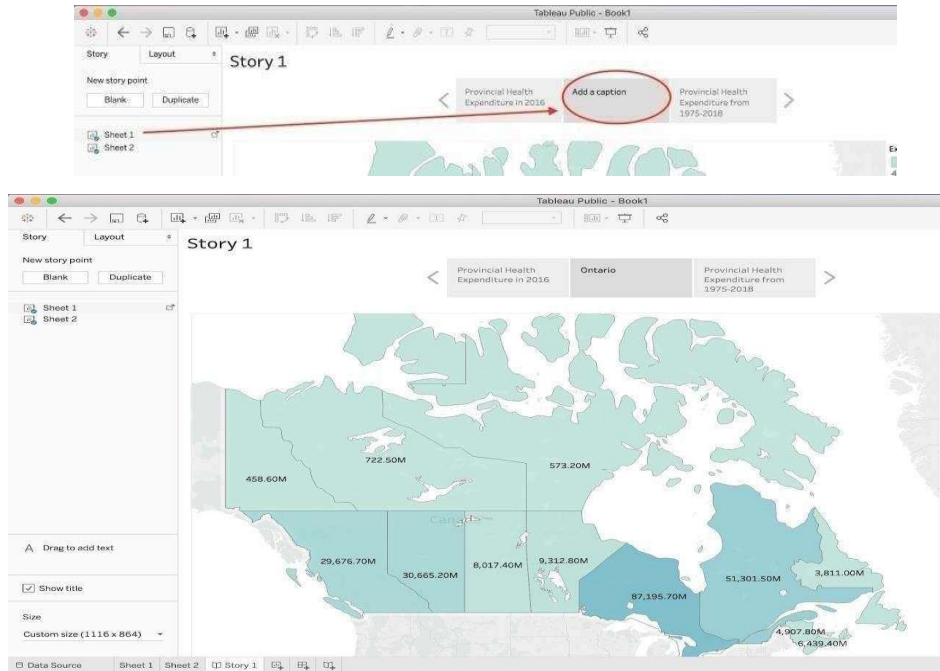


Use the arrows located on the side of the caption field to navigate to Sheet 2. Click on “Add a caption” and rename Sheet 2 to “Provincial Health Expenditure from 1975-2018”.

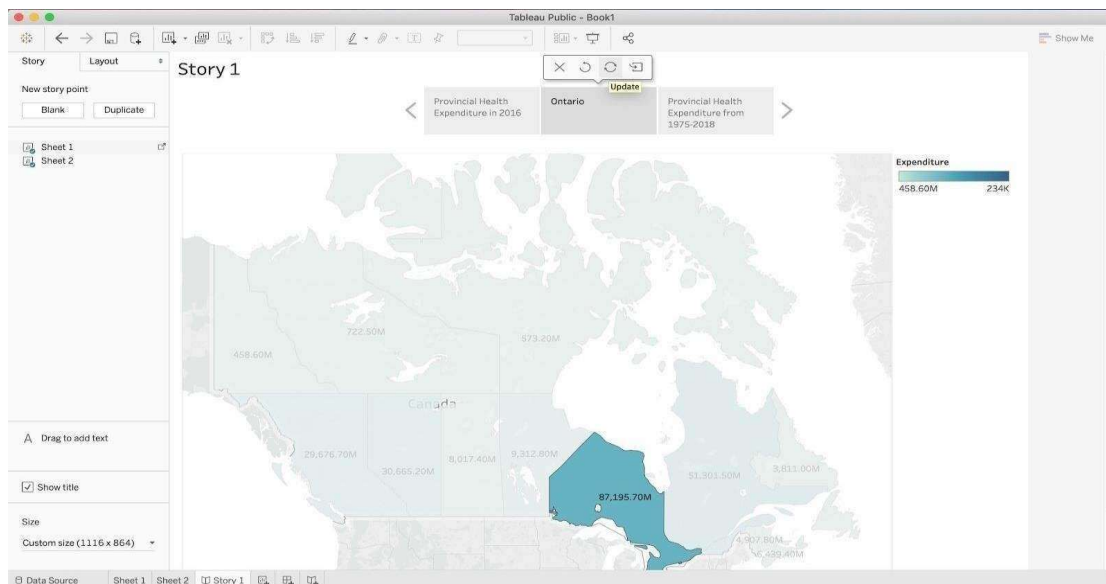




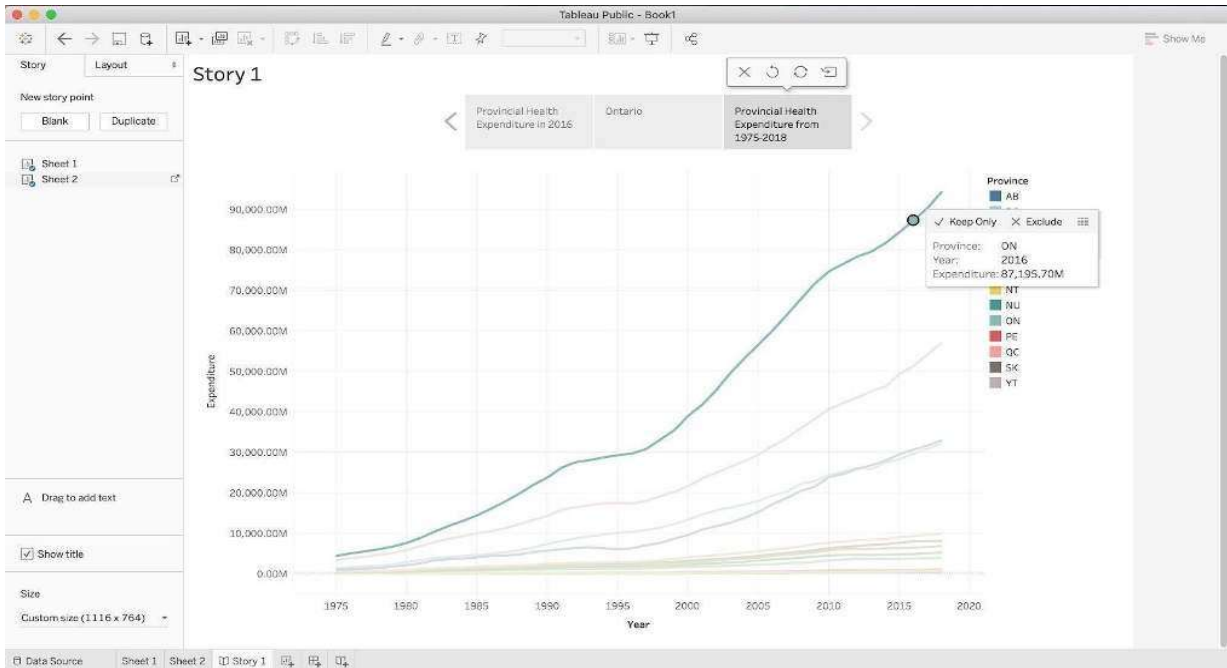
In this story, we are going to narrow in and draw attention to the province or territory that is spending the most amount of money on health. Drag an additional copy of “Sheet 1” and drop it between the two existing sheets. Select “Add a caption” and rename it to “Ontario”.



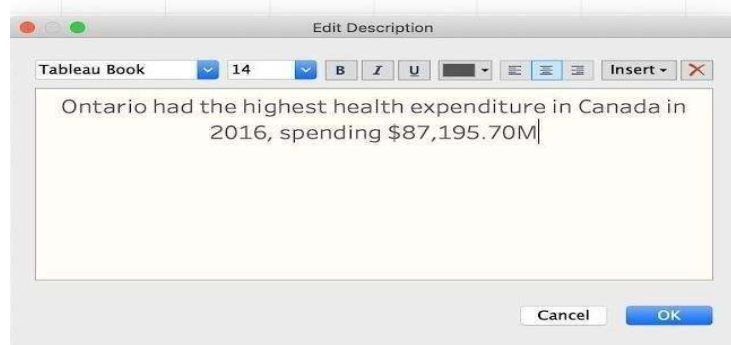
On the map, click on the province Ontario and then navigate to the caption field and select “Update”. Your screen will show Ontario highlighted from the rest of Canada.



Select the right arrow to navigate to “Provincial Health Expenditure from 1975-2018”. Hover over the line representing Ontario and select the data point representing health expenditure during the year 2016. Then click “Update”. Your screen should look like this:



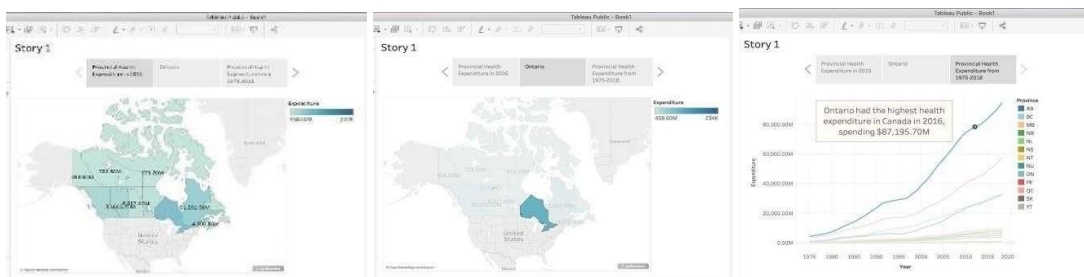
We can add a textbox to label the highlighted point by dragging “Drag to add text” onto the line graph. Write a key message in the text box, such as “Ontario had the highest health expenditure in Canada in 2016, spending \$87,195.70M”. Select “OK”.



You can edit the text box by selecting “More options” which will open a drop-down menu. Expand the text box by dragging the borders in order to show the full message.



We have now created a story with three sheets of how Ontario had the highest health expenditure in the year 2016. If you choose to add a dashboard, it will allow your audience to play with data. You can navigate between the story as shown below.



## SAVING AND PUBLISHING YOUR TABLEAU PUBLIC WORKBOOK

Once satisfied with your workbook, which includes sheets, dashboards, and stories, you can publish it to the Tableau Public website. This is the only way to save your work when using Tableau Public, so make sure to do it if you wish to return to the workbook in the future.

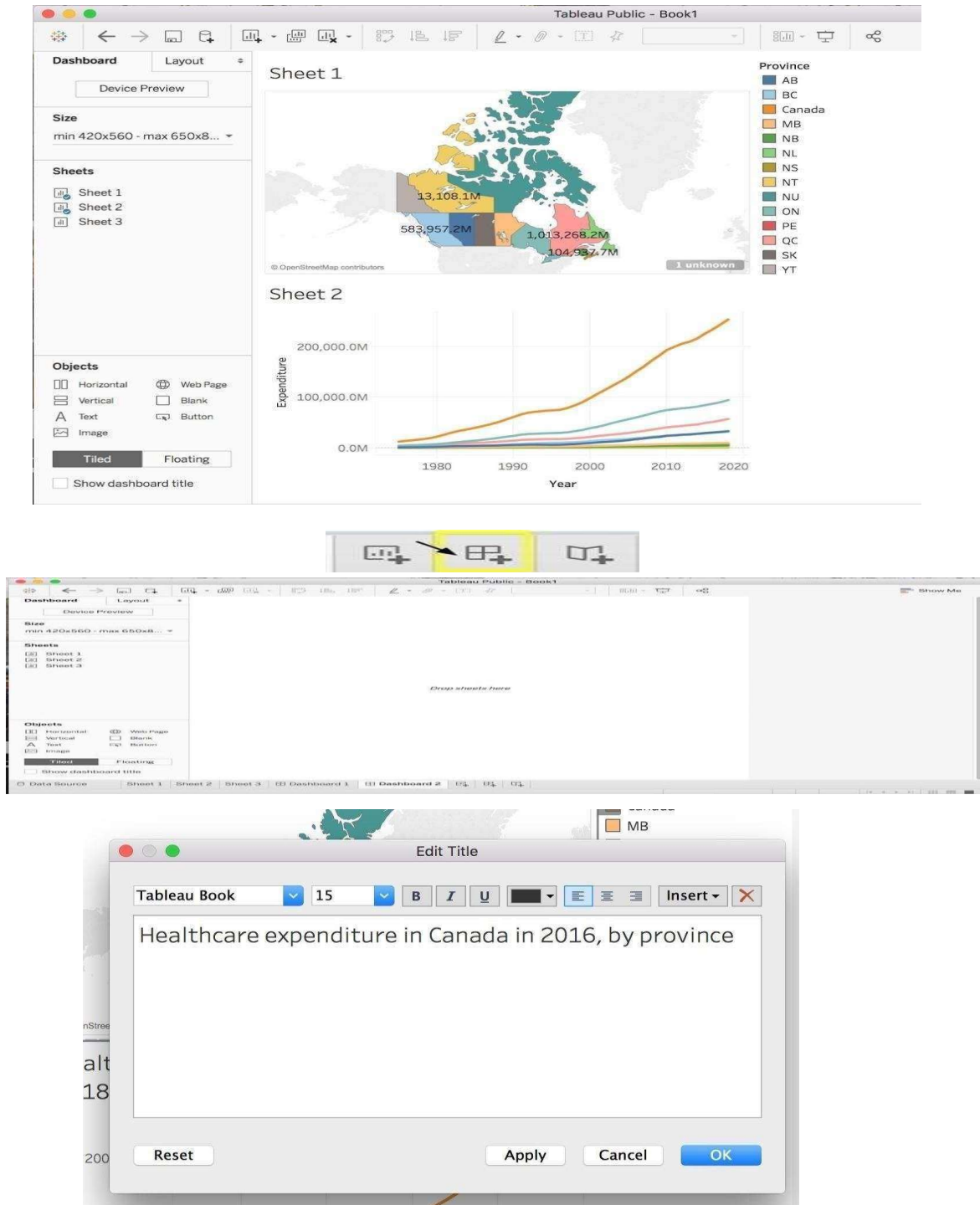
Once ready to publish, select the “Save to Tableau Public As...” option under the “File” tab.

## CREATING A DASHBOARD WITH TABLEAU

Dashboards are a great way to combine your data visualizations and have them interact with one another. A lot of businesses use dashboards to keep up-to-date in real time about key performance indicators at a glance.

In this example, we will combine just two of our data visualizations, the map and the line graph from the first section of the tutorial, but in reality, it can be used to combine many visualizations at once.


The first step in creating your dashboard is to open up the Dashboard tab at the bottom of the screen:



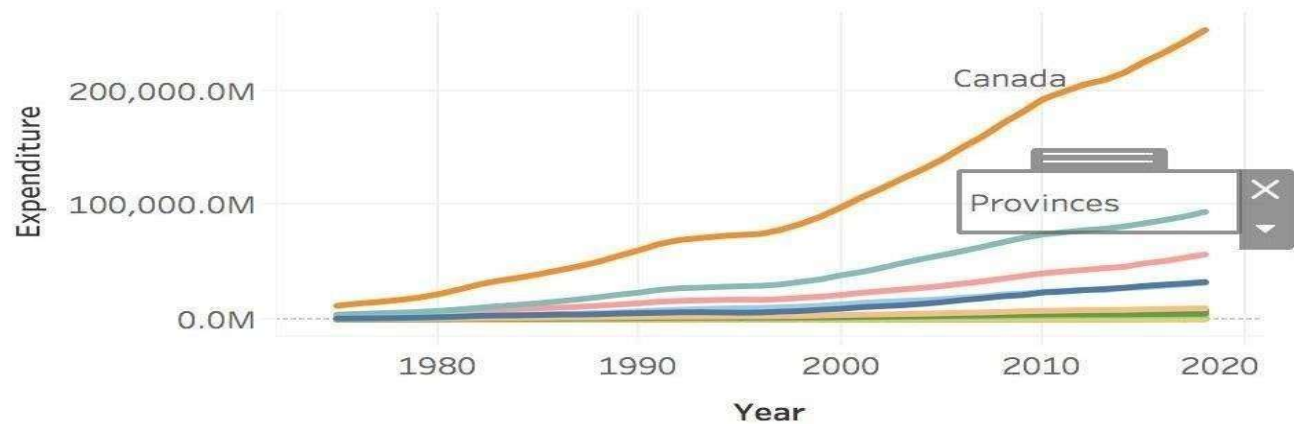
This is your Dashboard Sheet. On the left side you can see that there is a list of the sheets you have made from your current data source.

To build your dashboard, drag the sheet you want in to the center where it says *Drop sheets here*. For our purposes, we will need to drag Sheet 1 and Sheet 2 where the map and line graph are saved. When you drag, you will notice an area of your screen will shade over where your graph will drop when you put it down. Organize your dashboard to look like the following:

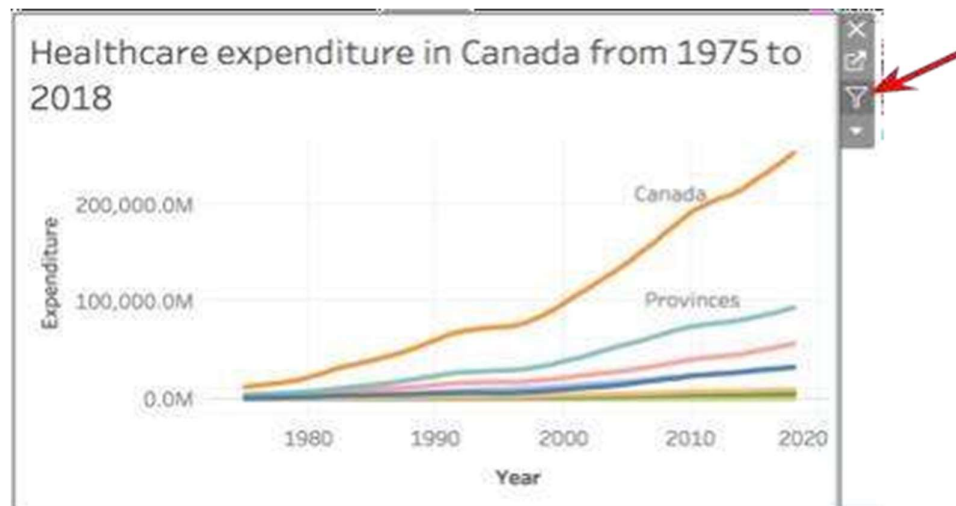
Now to add titles to the graphs that were chosen, double click on the automatic titles generated based on the sheet name, and a new window should appear, type in a title that describes the graph like so:

We can also add additional titles and objects to the dashboard by choosing an object from the Objects side panel and dragging it to the dashboard. We are going to add titles to the bottom line graph to differentiate between the Canada line and the provinces. To do this, click on the  Text icon in the Objects panel and drag it to the area near the orange line that corresponds to the sum of all province's expenditure throughout the years. Type in "Canada". Drag once more to label the remaining provinces. Your bottom graph should look like this:

## Healthcare expenditure in Canada from 1975 to 2018

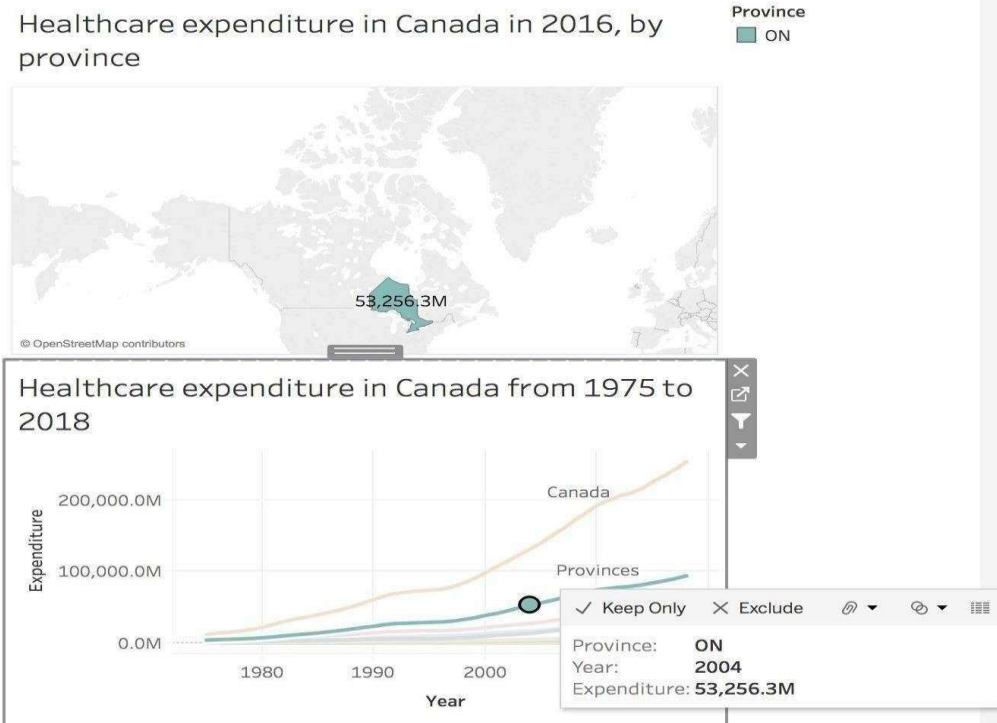


Now, to add an interactive layer between the graphs, we can choose a graph that can act as a filter to the other. We will choose the line graph to act as a filter to the map. To do this, click on the line graph and a grey sidebar should appear. From this bar, click the filter icon to use this graph as a filter:



Now, when you click a given line, it will be highlighted on the above map:





Congrats, now you have an interactive dashboard that is ready to be published or saved!