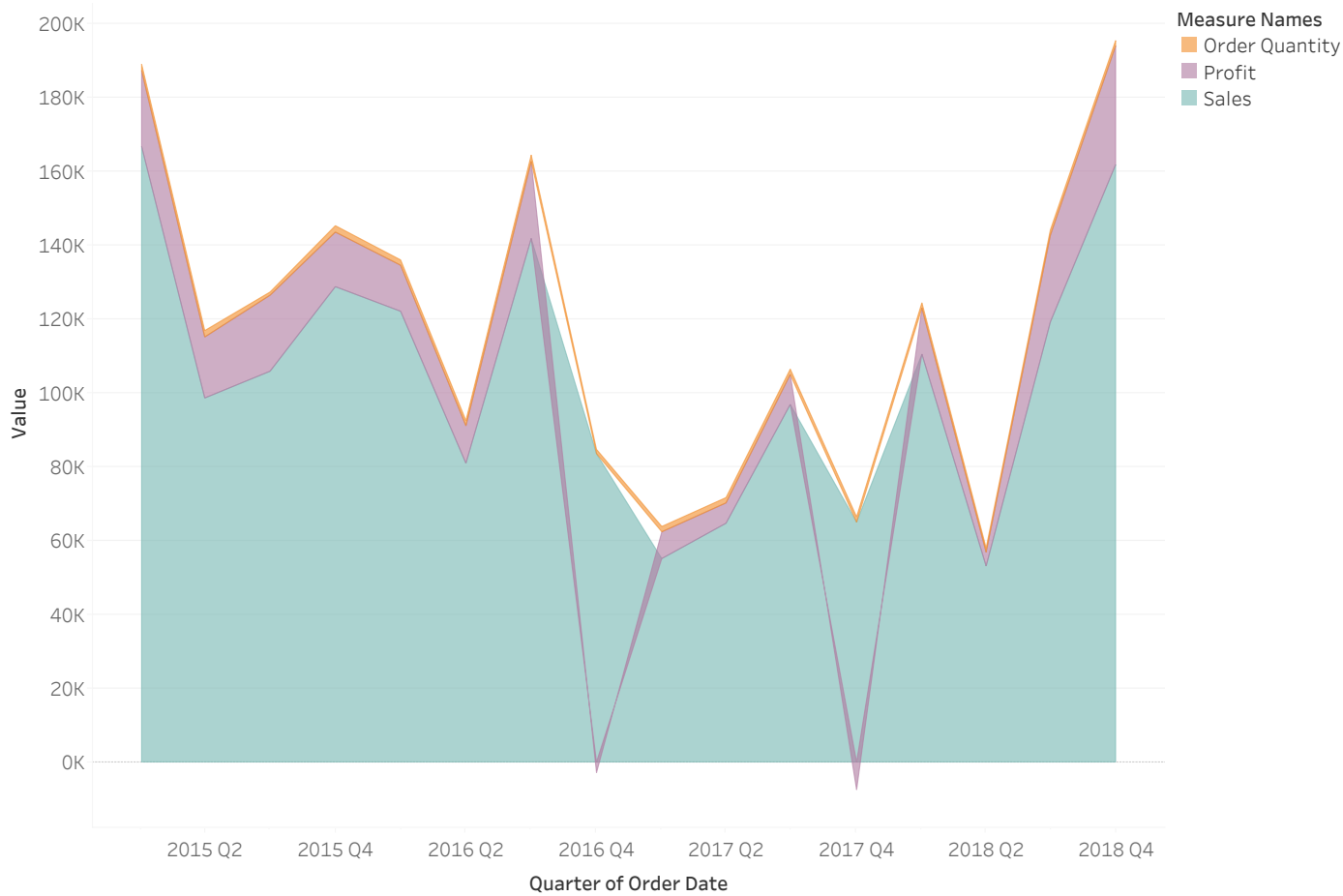


Line plot



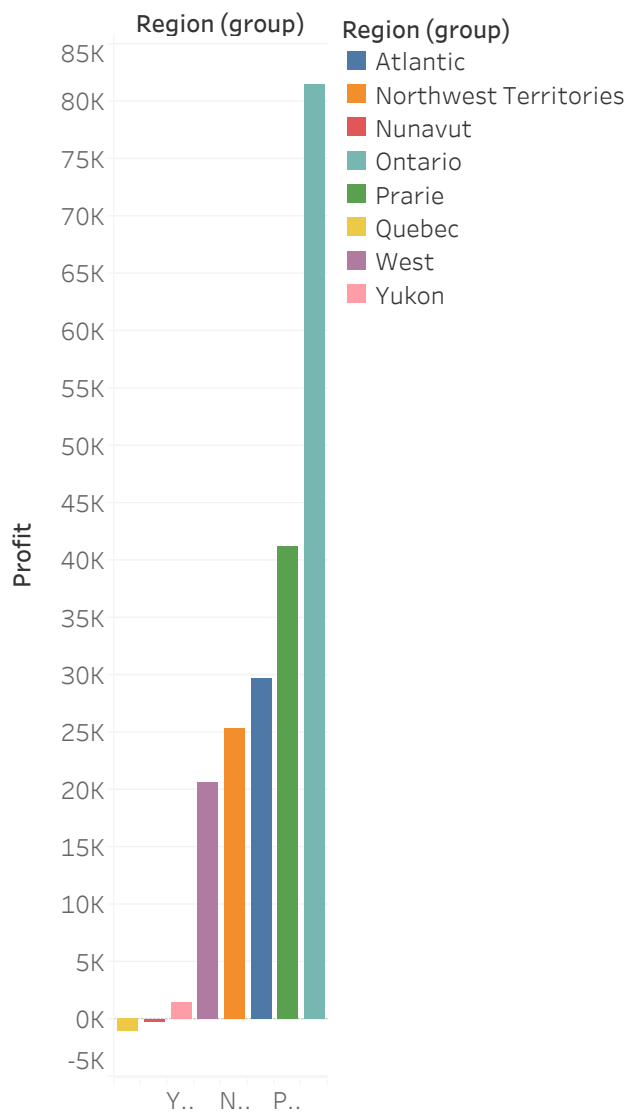
The trends of Profit and Sales for Order Date Quarter. Color shows details about Profit and Sales.

Area plot



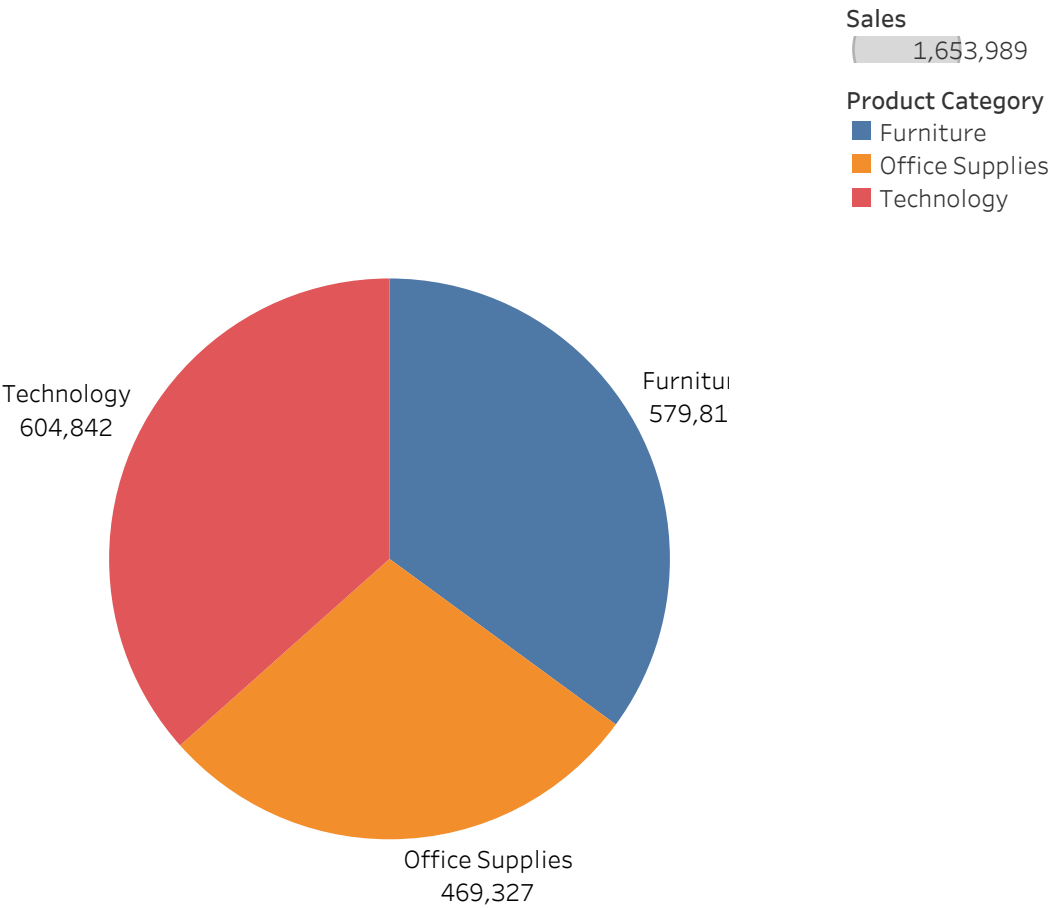
The plots of Order Quantity, Profit and Sales for Order Date Quarter. Color shows details about Order Quantity, Profit and Sales.

Grouping field



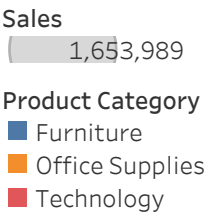
Sum of Profit for each Region (group). Color shows details about Region (group).

Sales of different product categories



Product Category and sum of Sales. Color shows details about Product Category. Size shows sum of Sales. The marks are labeled by Product Category and sum of Sales.

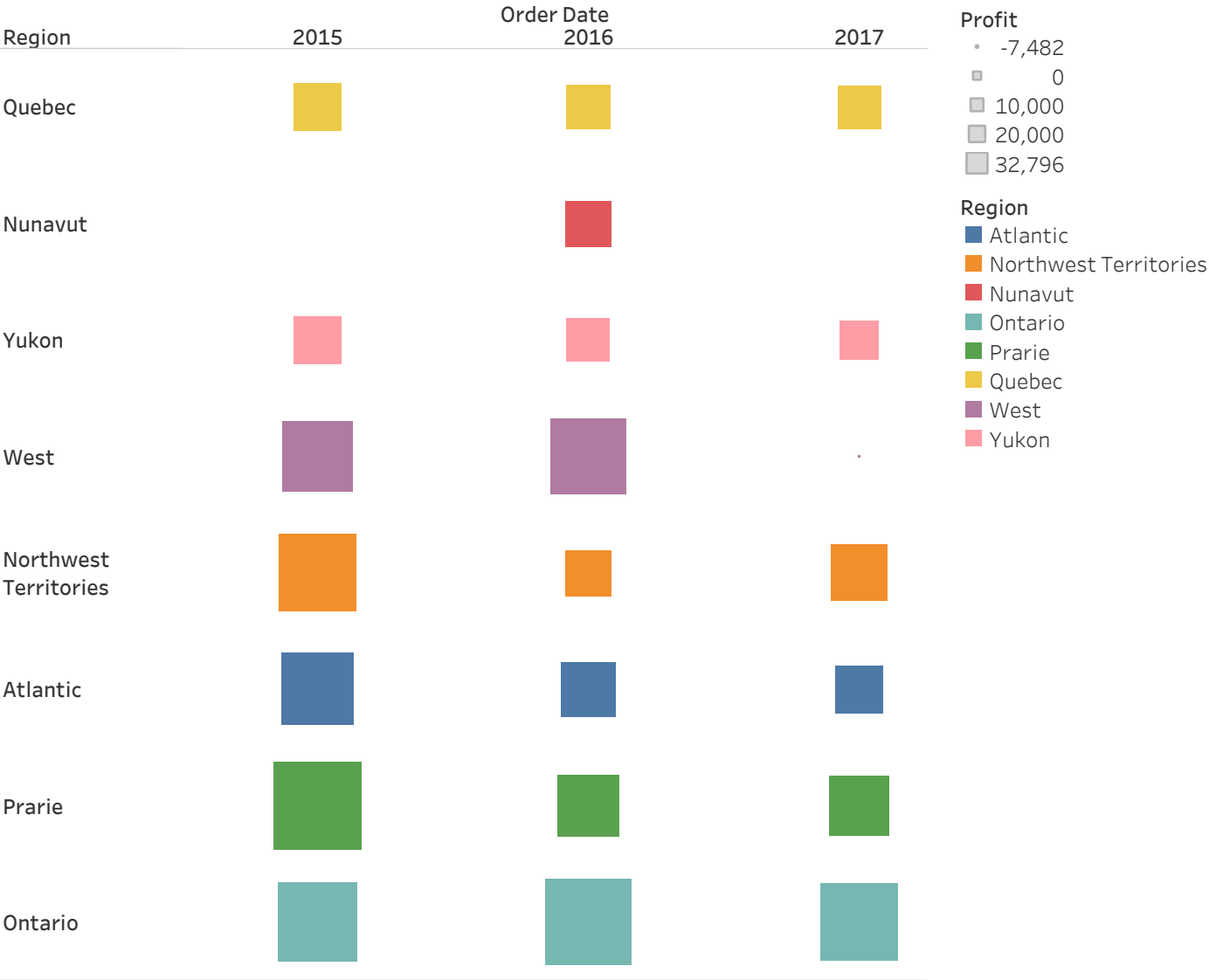
Sales of different product categories



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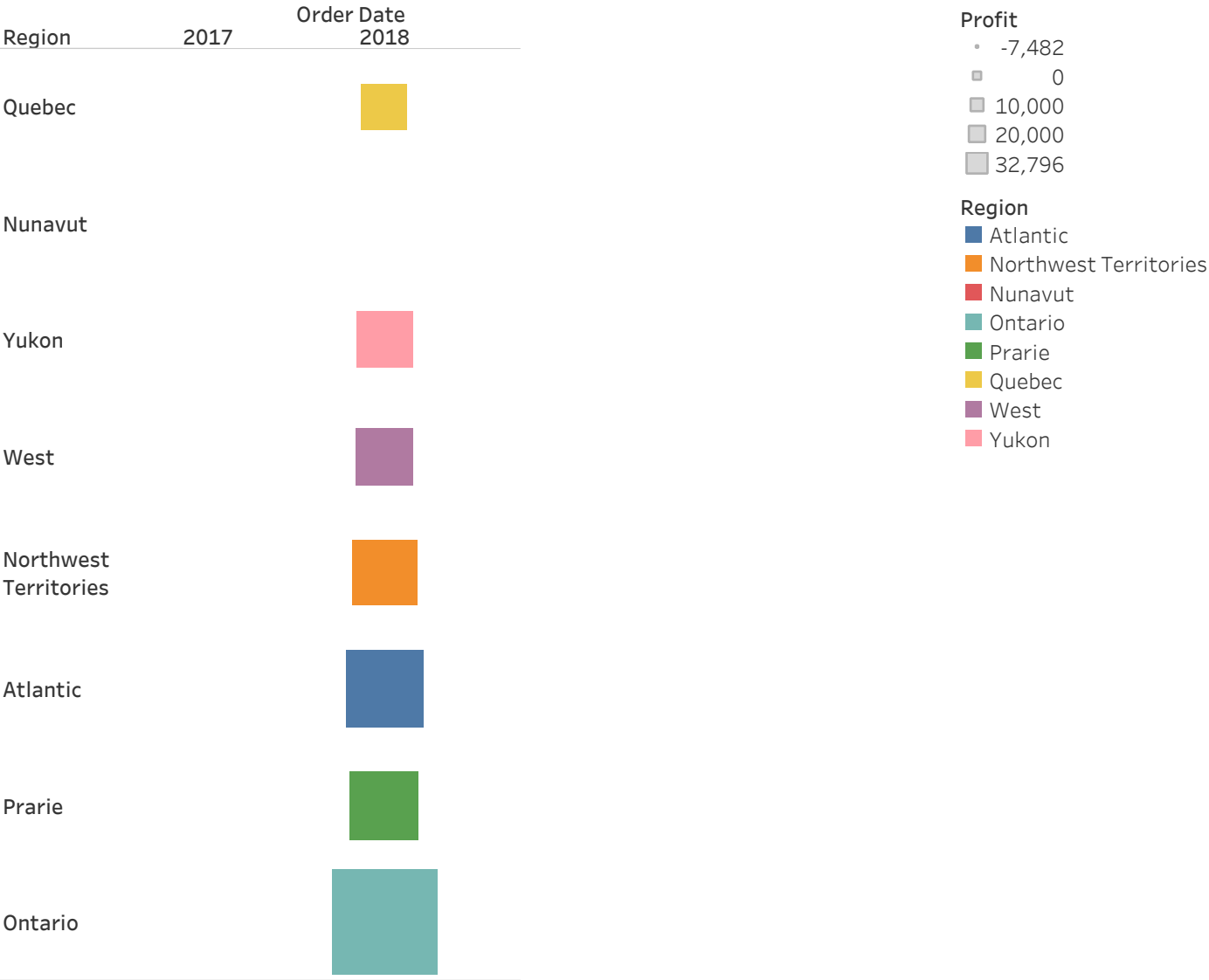
Product Category and sum of Sales. Color shows details about Product Category. Size shows sum of Sales. The marks are labeled by Product Category and sum of Sales.

Heat Map



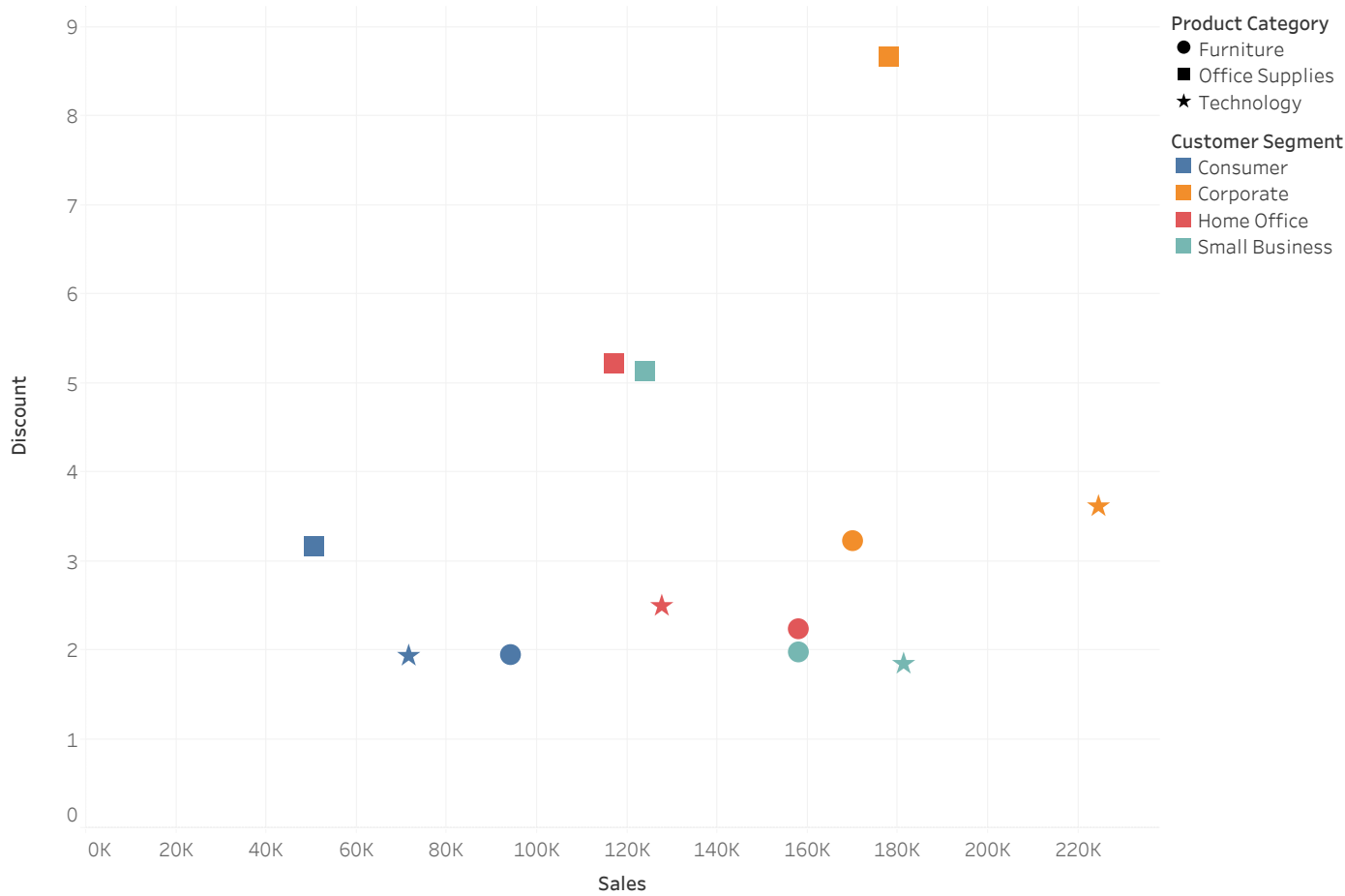
Region (color) and sum of Profit (size) broken down by Order Date Year vs. Region.

Heat Map



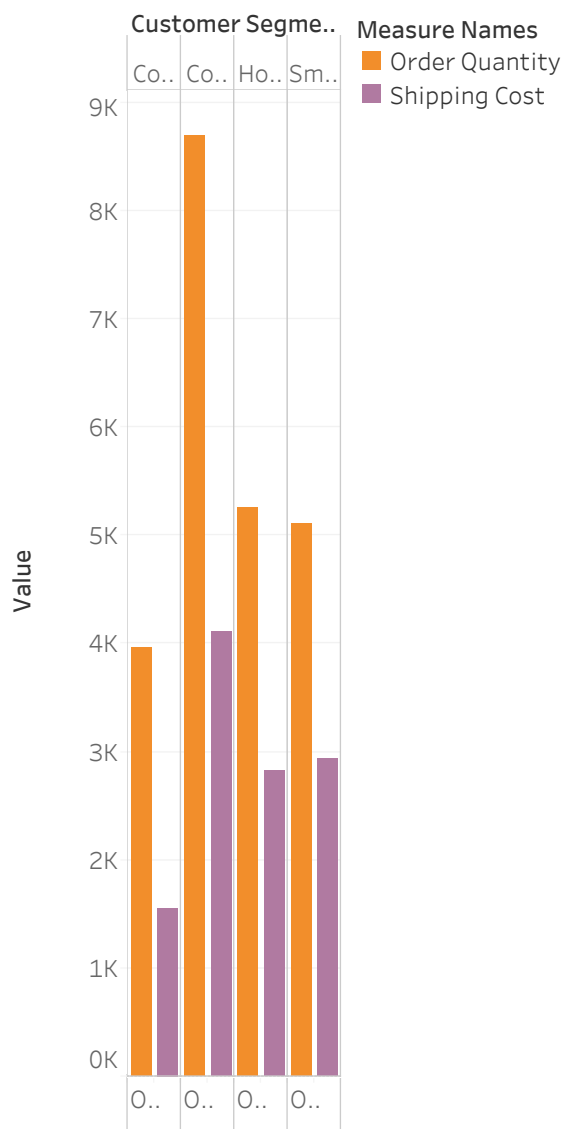
Region (color) and sum of Profit (size) broken down by Order Date Year vs. Region.

Scattered plot



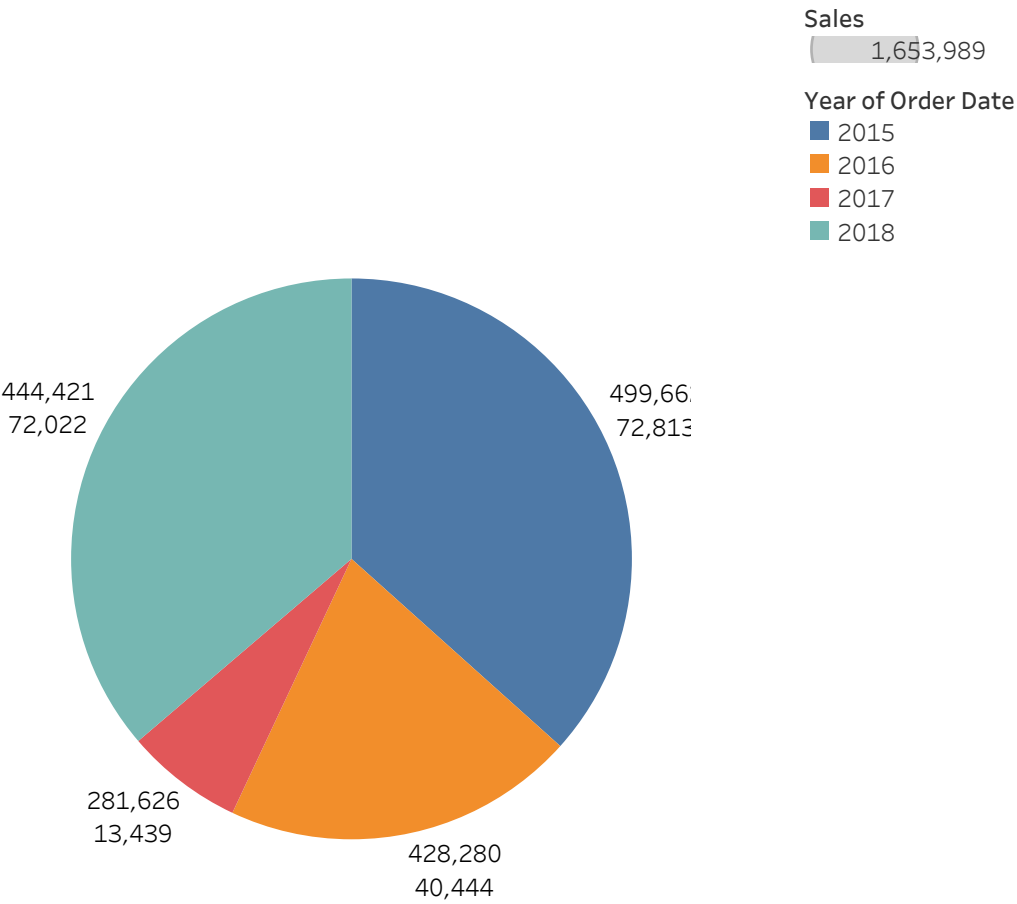
Sum of Sales vs. sum of Discount. Color shows details about Customer Segment. Shape shows details about Product Category.

Bar Plot



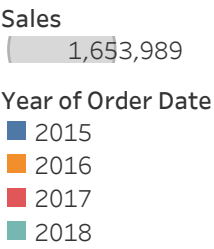
Order Quantity and Shipping Cost for each Customer Segment. Color shows details about Order Quantity and Shipping Cost.

Pie Chart



Sum of Sales and sum of Profit. Color shows details about Order Date Year. Size shows sum of Sales. The marks are labeled by sum of Sales and sum of Profit.

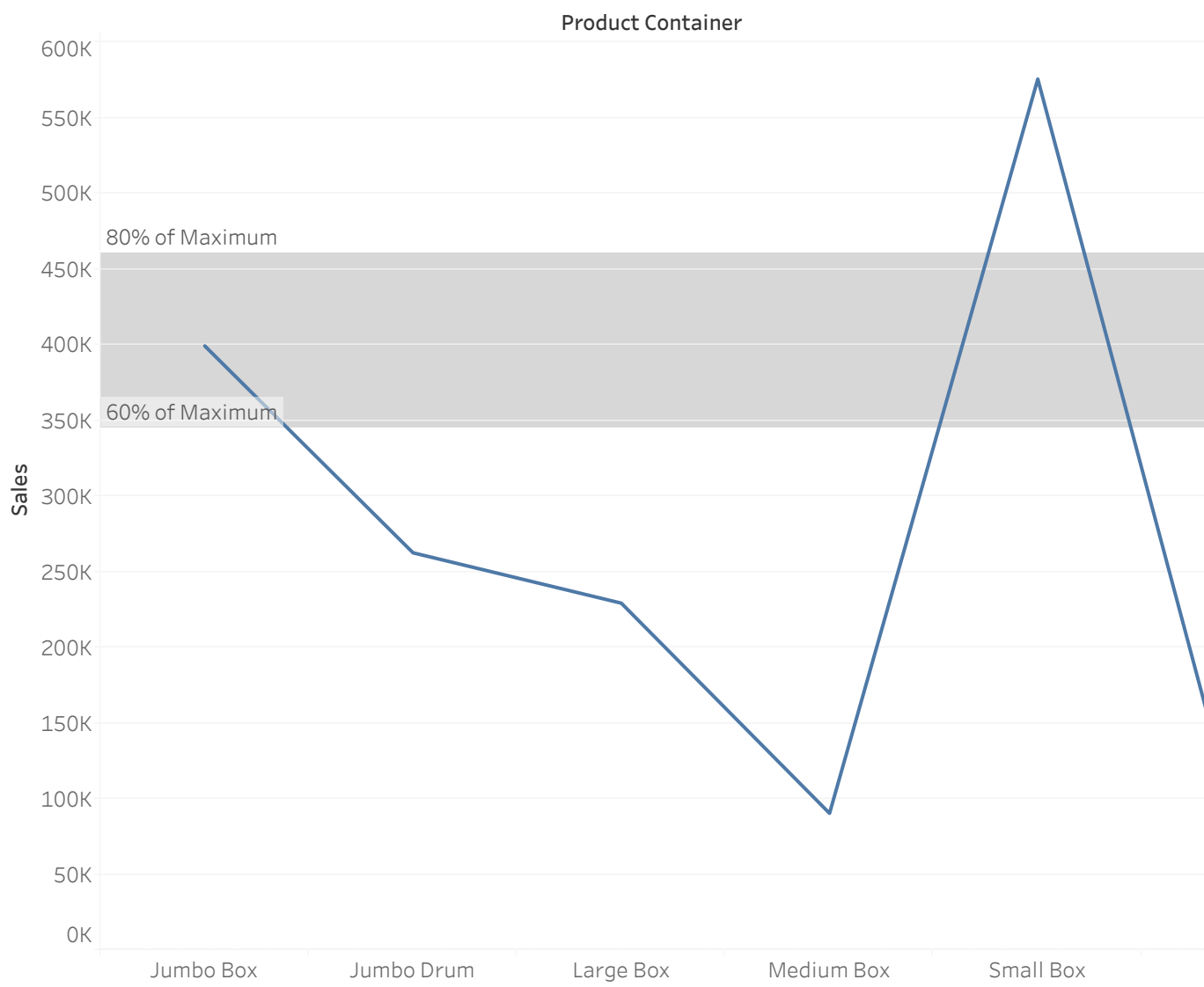
Pie Chart



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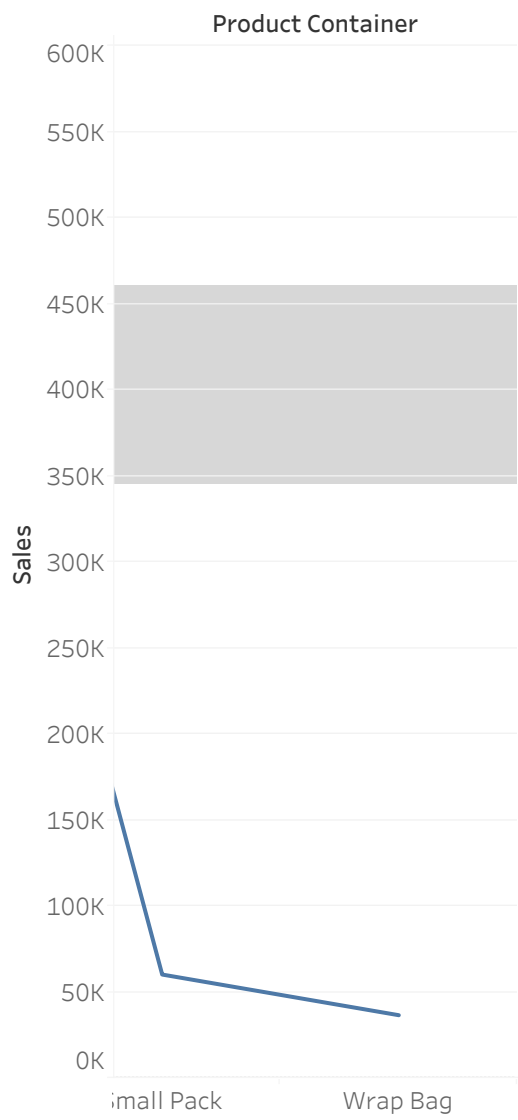
Sum of Sales and sum of Profit. Color shows details about Order Date Year. Size shows sum of Sales. The marks are labeled by sum of Sales and sum of Profit.

Distribution Band



The trend of sum of Sales for Product Container.

Distribution Band



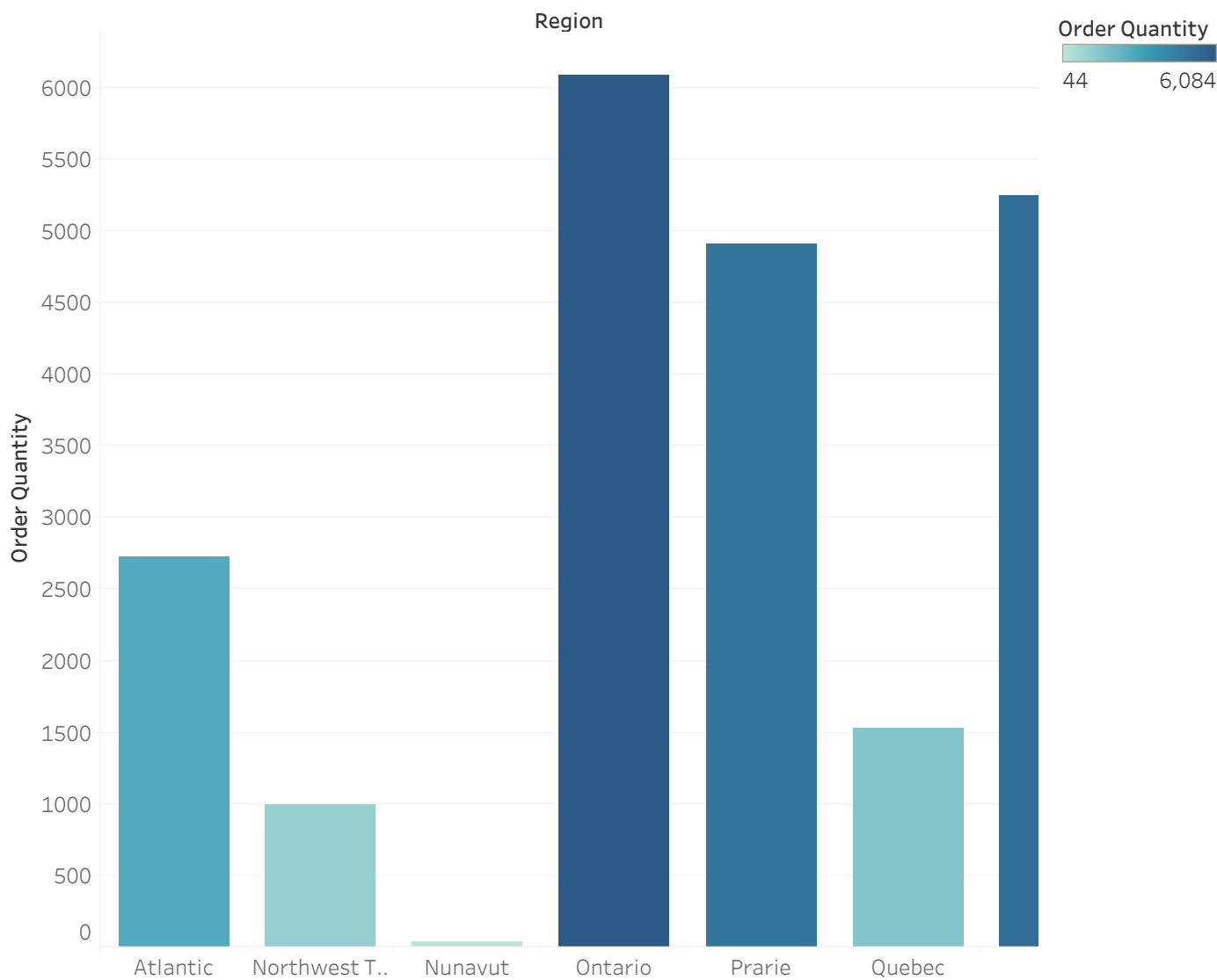
The trend of sum of Sales for Product Container.

Table Calculations

		Order Date		
	2015	2016	2017	2018
% of Total Disco..	23.66%	26.88%	24.86%	24.60%
% of Total Profit ..	36.64%	20.35%	6.76%	36.24%
% of Total Sales ..	30.21%	25.89%	17.03%	26.87%

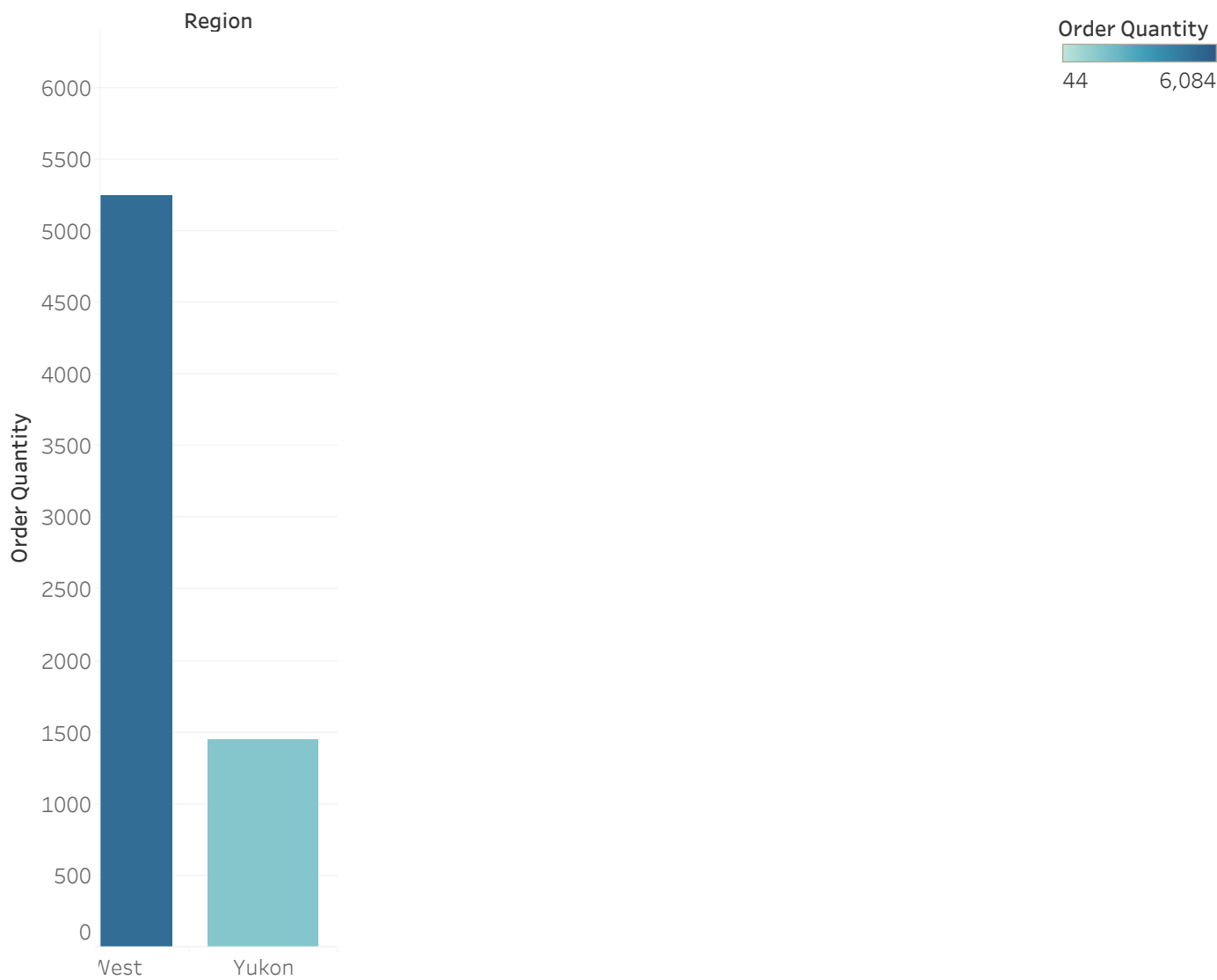
% of Total Discount along Table (Across), % of Total Profit along Table (Across) and % of Total Sales along Table (Across) broken down by Order Date Year.

Region wise order quantity



Sum of Order Quantity for each Region. Color shows sum of Order Quantity.

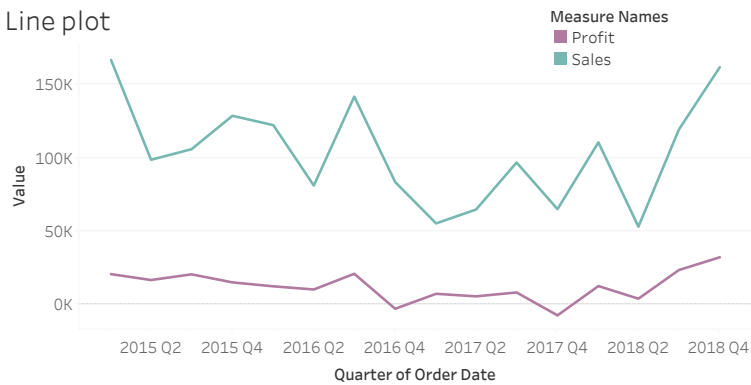
Region wise order quantity



Sum of Order Quantity for each Region. Color shows sum of Order Quantity.

Question 1

Line plot



Line plots:

Line graphs are used to display trends and changes in data over time or any continuous variable. They are particularly effective in highlighting patterns, comparing multiple variables, and analyzing the relationship between variables.

Steps to plot line graph:

Step 1: Launch Tableau and connect to your data source.

Step 2: Drag the relevant dimension field to the Columns shelf. (eg. order date)

Step 3: Drag the corresponding measure field to the Rows shelf. (eg. sales, profit)

Step 4: Click on the "Show Me" icon in the top right corner of the Tableau interface.

Step 5: In the "Show Me" pane, select the "Line" chart type.

Step 6: Customize the chart by adding additional dimensions or measures as needed.

Step 7: Adjust the colors, axes, labels, and formatting to enhance the visual appeal and readability.

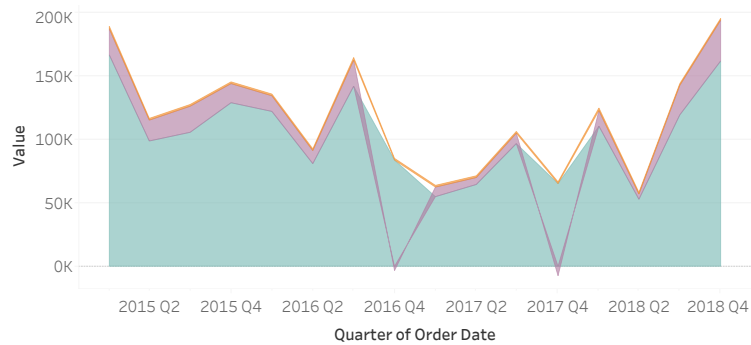
Area Graphs:

Area graphs are similar to line graphs but include shaded areas below the lines, which helps emphasize the magnitude of change. They are commonly used to showcase cumulative data or to compare the contribution of different categories to the whole.

Steps to plot area graph:

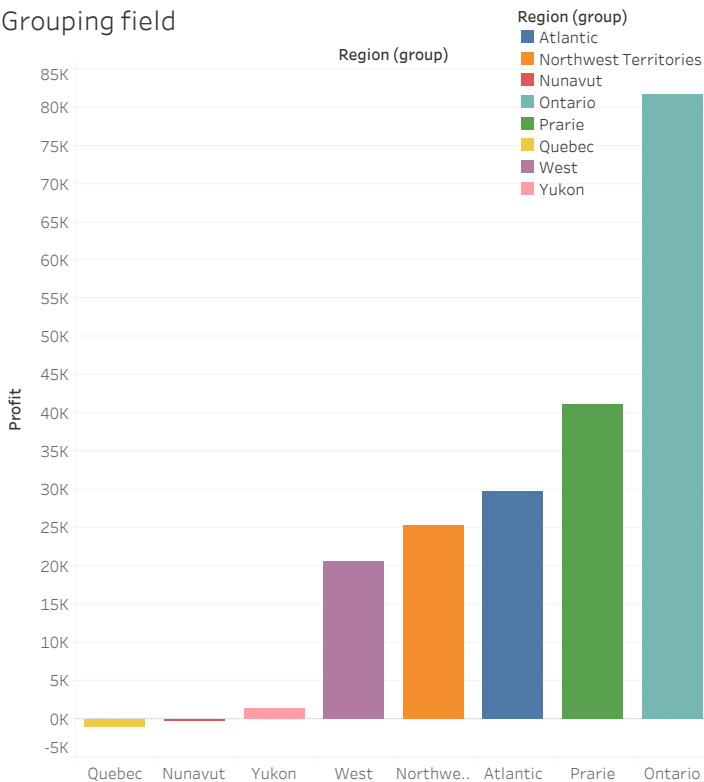
Follow the same step as in the line graph. In Step 5 select "Area" chart type.

Area plot



Question 2

Grouping field



Grouping fields in Tableau:

Grouping fields in Tableau allows you to combine categorical values into higher-level categories. This can be useful for aggregating data and simplifying the view.

Here are the steps to group fields in Tableau:

- Launch Tableau and connect to your data source.
- Drag the desired dimension field to the view.
- Select the individual values you want to group. Hold the Ctrl key to select multiple values and click on each.
- Right-click on the selected values and choose "Group." Alternatively, you can use the "Group" option from the "Data" menu. (eg. grouped regions and analyzed the profit in each region)
- Tableau will create a new group with the selected values, and you can rename the group as desired.

Combining Tables in Tableau:

Combining tables in Tableau allows you to bring data from multiple tables into a single view for analysis. Tableau supports two main methods for combining tables: data blending and joining.

1. **Data Blending:** Data blending is used when you have two or more tables with a common field but don't want to physically merge the tables. Tableau performs a visual and logical union of the data. To blend data, follow these steps:

- Connect to the first table in Tableau.
- Drag the second table onto the canvas, and Tableau will automatically identify the common field.
- Tableau will create a link between the tables, allowing you to use fields from both tables in your analysis.

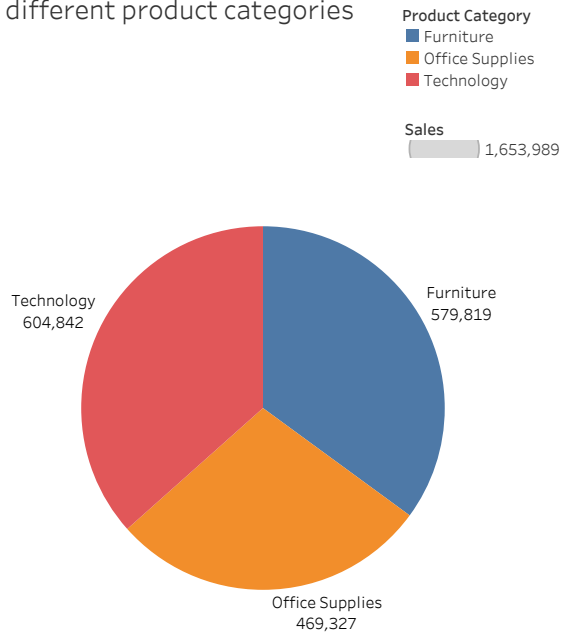
2. Steps to join data in Tableau:

- Connect to your data sources in Tableau.
- Drag and drop the common field(s) between the tables onto each other.
- Choose the desired join type (inner, left, right, or full outer join).
- Tableau will automatically perform the join based on the common field(s).
- Start analyzing and visualizing your data using the combined tables.

Here, the order table and return table have a common field as Order ID using which two tables are combined. The order table, target, and return tables can be joined. Here target and order table is joined using an inner join, return table is joined using an inner join.

Question 3

Sales of different product categories



The color and size options in the Marks card of Tableau are used to visually encode additional information in your visualizations.

1. Color: The color option lets you give different colors to data points or groups based on a field or measure of your choice. It aids in visually distinguishing and emphasizing key groups or trends within your data. Color can be used to represent categorical data such as product categories, geographical regions, or client segments. It can also be used to display continuous data by generating color gradients or heatmaps based on a metric like sales or profit.

Here, In the pie chart different product category is shown in different color.

2. Size: The size option allows you to represent the magnitude or value of a measure by changing the size of the data points. By mapping a measure to the size choice, you may visually display the relative importance, amount, or scale of the data elements.

Here, Drag the product category field from the orders table and place on the color in marks.

Bring sales in orders table and place on to the size to adjust the size of the pie chart.

By leveraging color and size options in the Marks card, you can enhance your visualizations and convey additional information beyond the basic positional encoding provided by the x and y-axis. They allow you to add more depth and context to your charts, making it easier to interpret and analyze the underlying data.

Question 4:

Tableau supports several types of joins to combine data from different tables. The different join types supported by Tableau are:

- 1. Inner Join:** An inner join returns only the matching records from both tables based on the common field(s). Rows with non-matching values are excluded from the result.
- 2. Left Join (or Left Outer Join):** A left join returns all the records from the left (first) table and the matching records from the right (second) table based on the common field(s). If there are no matches in the right table, NULL values are included.
- 3. Right Join (or Right Outer Join):** A right join returns all the records from the right (second) table and the matching records from the left (first) table based on the common field(s). If there are no matches in the left table, NULL values are included.
- 4. Full Outer Join:** A full outer join returns all the records from both tables, matching the records where available based on the common field(s). If there are no matches, NULL values are included in the result.
- 5. Cross Join (or Cartesian Join):** A cross join creates a Cartesian product, combining each row from the first table with every row from the second table. It doesn't require a common field and results in a large output dataset.

To perform a join in Tableau, you can connect to multiple tables or data sources, specify the join type, and define the join condition based on the common field(s) between the tables. Tableau's interface makes it easy to select the desired join type and customize the join conditions. Choosing the appropriate join type depends on your data and analysis requirements. Understanding the differences between these join types is crucial for accurate data integration and analysis in Tableau.

Here, Orders table and Returns table is joined using the inner join, Target table is joined using left join.

Drag the returns table in data source, tableau makes the connection automatically with the orders table. The inner join is created. To change the type of join we can click on the venn diagram shown between two tables connection choose the appropriate join. Like left join is created between orders table and target table.

Question 5:

To create a dashboard in Tableau, follow these steps:

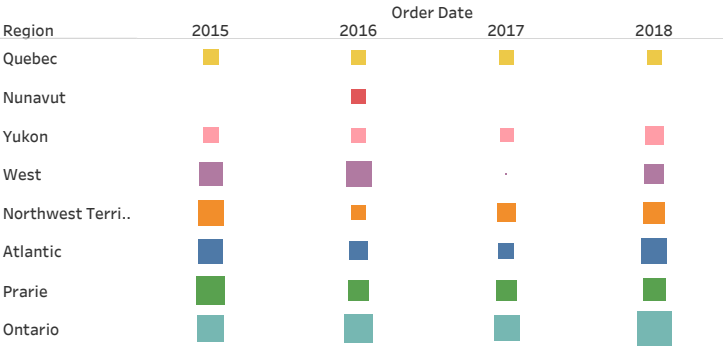
1. **Connect to your data:** Before creating a dashboard, you need to connect to your data source. You can connect to a variety of data sources, including spreadsheets, databases, and cloud services.
2. **Create worksheets:** Once you have connected to your data source, create worksheets to analyze your data. You can create multiple worksheets to analyze different aspects of your data.
3. **Click on the "New Dashboard" button:** To create a new dashboard, click on the "New Dashboard" button at the bottom of the Tableau window.
4. **Drag views onto the dashboard:** From the Sheets list on the left, drag views onto the dashboard on the right. You can add multiple views to a dashboard.
5. **Customize the dashboard:** Once you have added views to the dashboard, you can customize it by adding text, images, and other objects. You can also format the dashboard to make it look more visually appealing.
6. **Add interactivity:** You can add interactivity to your dashboard by using filters, actions, and parameters. Interactivity allows users to explore the data and gain insights.
7. **Publish the dashboard:** Once you have created and customized your dashboard, you can publish it to Tableau Server or Tableau Online so that others can view it. You can also export the dashboard as a PDF or image file.

In summary, to create a dashboard in Tableau, you need to connect to your data source, create worksheets, click on the "New Dashboard" button, drag views onto the dashboard, customize the dashboard, add interactivity, and publish the dashboard.

All the questions are answered using dashboard.

Question 6

Heat Map



Heat Map: A heat map is a graphical representation of data where values are encoded as colors on a matrix-like grid. It helps visualize the density or intensity of a variable across different categories or dimensions. Each cell in the grid represents a combination of two categorical variables, and the color of the cell represents the value or frequency of the variable.

To create a heat map in Tableau, you need a dataset that contains at least two categorical dimensions and one measure.

- To create a heat map in Tableau:**
- a. Connect to your dataset in Tableau.
 - b. Drag and drop the "Region" dimension onto the Columns shelf.
 - c. Drag and drop the "Order date" dimension onto the Rows shelf.
 - d. Drag and drop the "Profit" measure onto the Color shelf.
 - e. Tableau will automatically aggregate the sales values based on the dimensions, and you will see a heat map where the color intensity represents the sales values for each combination of region and product category.

Profit

- 7,482
- 0
- 10,000
- 20,000
- 32,796

Region

- Atlantic
- Northwest T..
- Nunavut
- Ontario
- Prarie
- Quebec
- West
- Yukon

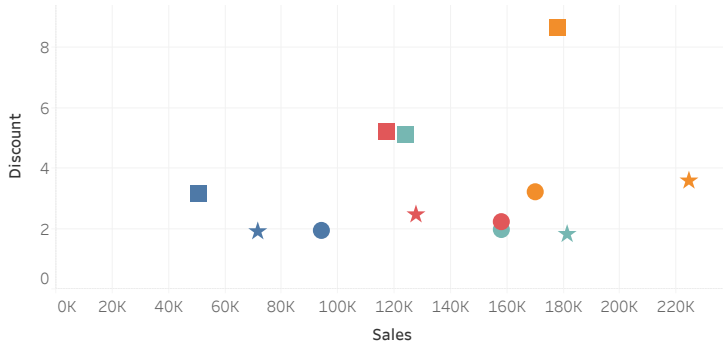
Customer Segm..

- Corporate
- Home Office
- Small Busine..

Product Category

- Furniture
- Office Suppli..
- Technology

Scattered plot



Scattered Plot: A scatter plot is a two-dimensional plot that displays the relationship between two continuous variables. It uses dots or markers to represent the data points, with one variable plotted on the x-axis and the other variable on the y-axis. Scatter plots are useful for identifying patterns, correlations, or outliers in the data.

To create a scatter plot in Tableau, you need a dataset that contains two numerical variables.

- To create a scatter plot in Tableau:**
- a. Connect to your dataset in Tableau.
 - b. Drag and drop the "Sales" measure onto the Columns shelf.
 - c. Drag and drop the "Discount" measure onto the Rows shelf.
 - d. Drag and drop "Product Category" on shapes and "Customer Segments" on color.
- You can further customize the scatter plot by adding labels, changing the marker shape or size, applying trend lines, or adding reference lines to indicate specific thresholds or benchmarks.

Question 7

Table Calculations

	2015	Order Date 2016	2017	2018
% of Total Discount along Table (Across)	23.66%	26.88%	24.86%	24.60%
% of Total Profit along Table (Across)	36.64%	20.35%	6.76%	36.24%
% of Total Sales along Table (Across)	30.21%	25.89%	17.03%	26.87%

Table calculations in Tableau are transformations that are applied to the values in a visualization. They are a special type of calculated field that computes the local data in Tableau. Table calculations can be used for a variety of purposes, including transforming values to rankings, showing running totals, and calculating percent differences. There are two types of table calculations in Tableau: quick table calculations and traditional table calculations. Quick table calculations are pre-built calculations that can be applied quickly to a visualization using the most typical settings for that calculation type. Some examples of quick table calculations include running total, difference, percent difference, percent of the total, rank, percentile, and moving average. Traditional table calculations, on the other hand, are custom calculations that can be created using the Table Calculation dialog box. They allow users to apply the same settings as quick table calculations but with more control over the calculation type and settings. Some examples of traditional table calculations include percent of previous, moving average with a window, and rank by partition.

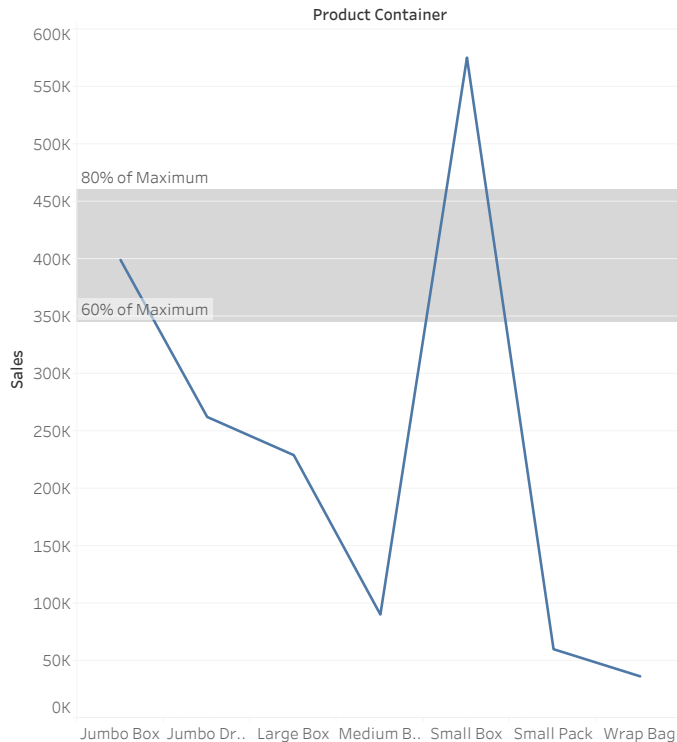
To create a table calculation in Tableau, you can follow these steps:

- a. Right-click on a measure in the view and select "Add Table Calculation".
- b. In the Table Calculation dialog box, select the calculation type you want to use.
- c. Configure the calculation settings, such as the compute using and addressing options.
- d. Click "OK" to apply the table calculation to the view.

Overall, table calculations are a powerful tool for analyzing data in Tableau, and can help users gain deeper insights into their data. By using quick table calculations or creating custom traditional table calculations, users can transform their data in a variety of ways to better understand patterns and trends.

Question 8

Distribution Band



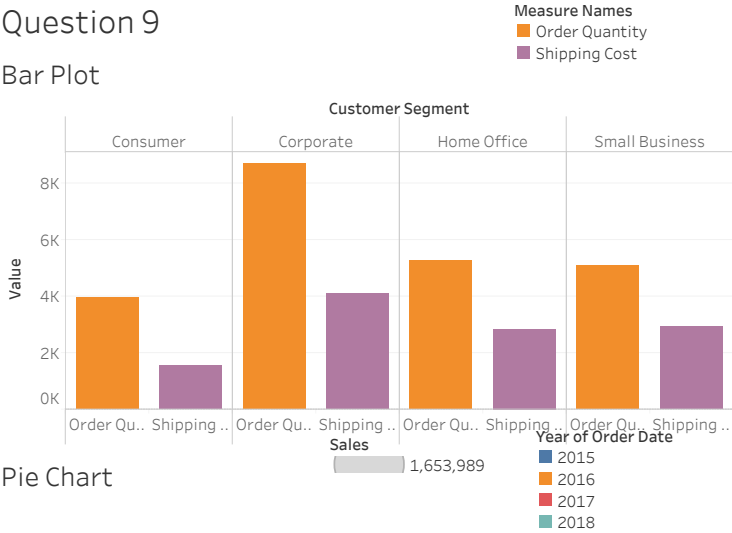
In Tableau, distribution bands are used to visually represent the spread of data in a view. They are a type of reference line that can be added to a continuous axis in a view to show the range of values that fall within a certain percentage of the data. To add a distribution band in Tableau, you can drag the "Distribution" option from the Analytics pane into the view. You can then choose the percentage of data you want to include in the band, as well as the color and opacity of the band. Distribution bands are often used in conjunction with other reference lines, such as average or median lines, to provide additional context for the data in a view. They can be particularly useful when comparing the distribution of data across different categories or time periods. It's worth noting that distribution bands in Tableau are based on statistical estimation, rather than exact calculations. The estimation type used by Tableau is based on the number of data points in the view and can be adjusted in the "Analysis" menu. Overall, distribution bands are a powerful tool for visualizing the spread of data in a Tableau view and can help users gain deeper insights into their data.

Steps to create a distribution band:

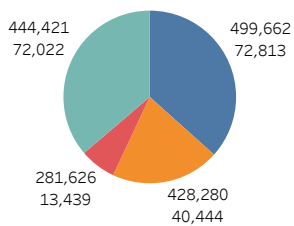
- Connect to your data source and create a visualization (such as a line chart) that represents the distribution of your continuous variable. Let's consider an example where you have an order with fields like "Product Container" and "Sales".
- Select the continuous variable (in this case, "Sales") for which you want to create the distribution bands.
- Navigate to the "Analytics" pane in Tableau, located on the left side of the screen.
- Drag and drop the "Distribution" option from the "Analytics" pane onto your visualization. This will add the distribution bands to the chart.
- Once the distribution bands are added, you can customize them by adjusting the parameters in the "Edit Bins" dialog box. This dialog box allows you to control the number of bins, the range of values, and the statistical method used to calculate the distribution.
- Additionally, you can modify the appearance of the distribution bands by adjusting the color, line thickness, transparency, and other formatting options.

Question 9

Bar Plot



Pie Chart



Bar Chart: A bar chart is a visualization that represents categorical data using rectangular bars of different lengths or heights. Each bar corresponds to a specific category, and the length or height of the bar represents a quantitative value associated with that category.

To create a bar chart in Tableau:

- a. Connect to your dataset in Tableau.
 - b. Drag and drop the "Customer Segment" dimension onto the Columns shelf.
 - c. Drag and drop the "Order Quantity" and "Shipment Cost" measure onto the Rows shelf.
 - d. Tableau will automatically aggregate the sales values by product category and display them as bars in the chart.
- You can further customize the chart by adjusting the color, sorting the bars, adding labels, or applying filters to focus on specific categories or values.

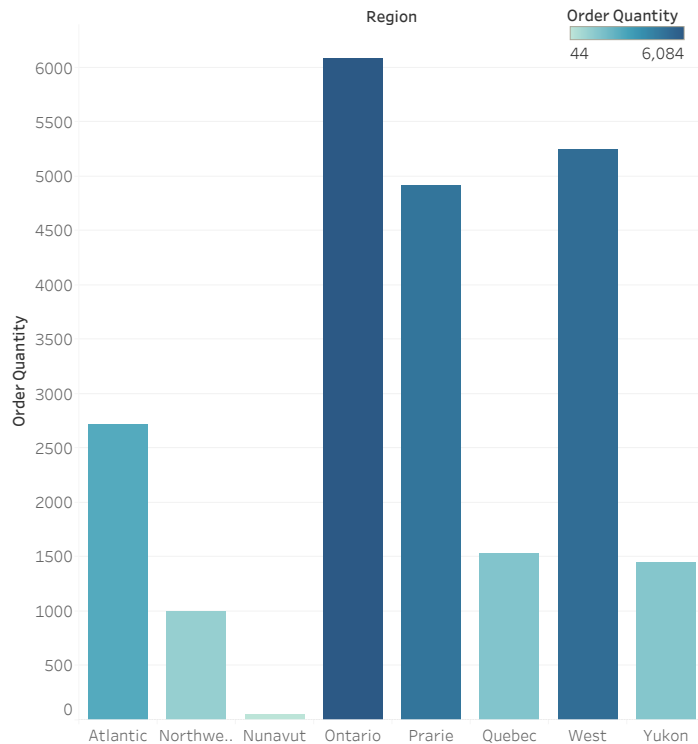
Pie Chart: A pie chart is a circular visualization that represents the proportion or percentage distribution of different categories within a whole. The whole circle represents 100% of the total, and each slice of the pie represents a specific category and its proportionate value.

To create a pie chart in Tableau:

- a. Connect to your dataset in Tableau.
 - b. Drag and drop the "Order date" dimension onto the Color shelf.
 - c. Drag and drop the "Profit" and "Sales" measures onto the Angle shelf.
 - d. Tableau will automatically calculate the percentage distribution of each music genre and display it as a slice in the pie chart.
- You can further customize the chart by adjusting the color, and labels, adding a legend, or applying filters to focus on specific genres or values.

Question 10

Region wise order quantity



This analysis measures SUM(Order Quantity) by Region.

- Total SUM(Order Quantity) is 22,988 across all eight entities.
- The SUM(Order Quantity) of 22,988 was driven by Ontario with 6,084, West with 5,243 and Prarie with 4,912.
- The minimum value is 44 (Nunavut) and the maximum is 6,084 (Ontario), a difference of 6,040, averaging 2,874.
- SUM(Order Quantity) is relatively concentrated with 71% of the total represented by three of the eight entities (38%).
- Ontario represents 26% of overall SUM(Order Quantity).
- Ontario (6,084) is more than two times bigger than the average across the eight entities.
- ...

Story points in Tableau are a way to build a narrative from data. They allow users to create a sequence of different charts that combine to provide a cohesive plot to its viewers. In essence, all these charts tell a story about the data which allows the viewers to form their conclusion. Each story point is either a worksheet or a dashboard. Story points are a powerful, often underutilized, feature of Tableau. They can be used to tell a story where the end isn't revealed right away. The audience would be led through the story step by step through a beginning, elaboration, and an end. This can be particularly useful for presentations or lectures on how to do something step by step.

Steps to add story points on the dashboard:

- Drag a sheet regarding which story points are to be created.
- In the dashboard tab on the left side of the screen go to objects and drag the data story onto the screen.
- Choose a worksheet to write about.
- Select the fields.
- Choose the appropriate options (discrete, continuous, percent of whole) to generate the story points.