

Lab 9. Analysis of revenue in sales dataset

i) Create a choropleth map (fill the map) to spot the special trends to show the state revenue.
ii) Create a line chart to show the revenue based on the month of the year.
iii) Create a bin of size 10 for the age measure to create a new dimension to show the revenue.
iv) Create a donut chart view to show the percentage of revenue per region by creating zero access in the calculated field.
v) Create a butterfly chart by reversing the bar chart to compare female & male revenue based on product category.
vi) Create a calculated field to show the average revenue per state & display profitable & non-profitable state.
vii) Build a dashboard.

1. Introduction

- This program is designed to help you analyze and visualize sales revenue data for different states across India using Power BI. The primary objective is to uncover trends and patterns within the data, such as high-performing states, monthly revenue trends, age-based revenue distribution, and region-based profitability. By building a variety of visualizations, including choropleth maps, line charts, and bar charts, you'll gain insights into factors driving sales performance. This analysis will allow you to explore how demographic factors (like age and gender) and product categories influence revenue.
- The final output will be a comprehensive Power BI dashboard that enables interactive exploration of sales metrics, making it easier to communicate findings and support data-driven decision-making.

2. Data Set Introduction

The dataset used in this analysis is a sales revenue dataset representing various Indian states. This dataset allows for in-depth analysis across various dimensions, helping identify which states, age groups, product types, and regions contribute the most to overall revenue.

- **State:** Lists different Indian states where sales transactions have been recorded, allowing for regional analysis.

- **Revenue:** The total revenue (in INR) generated from each transaction, with values varying across states, time periods, and product categories.
- **Date:** The date of each transaction, spanning various months in 2024. This field will support the analysis of monthly trends in revenue.
- **Age:** The age of the customer for each transaction, grouped in working-age ranges (from 27 to 52). Binning this column will help identify revenue trends across age groups.
- **Gender:** Specifies the gender of the customer (Male or Female) for each transaction, allowing gender-based revenue comparisons.
- **Product Category:** The type of product sold in each transaction, with categories like Electronics, Furniture, and Clothing. This enables analysis of revenue by product type.
- **Region:** The broader region of India where each transaction took place, divided into categories such as North, South, East, West, Central, and North-East.

Sales Dataset

State	Revenue	Date	Age	Gender	Product Category	Region
Maharashtra	950000	15-01-2024	34	Male	Electronics	West
Tamil Nadu	780000	20-01-2024	29	Female	Furniture	South
Karnataka	860000	10-02-2024	41	Female	Clothing	South
Delhi	1120000	18-02-2024	36	Male	Electronics	North
Gujarat	700000	05-03-2024	52	Female	Furniture	West
West Bengal	640000	22-03-2024	27	Male	Clothing	East
Uttar Pradesh	550000	10-04-2024	43	Male	Electronics	North
Rajasthan	480000	25-04-2024	37	Female	Clothing	North
Haryana	720000	15-05-2024	32	Male	Electronics	North
Punjab	820000	30-05-2024	40	Female	Furniture	North
Kerala	910000	12-06-2024	39	Male	Electronics	South
Odisha	530000	25-06-2024	45	Female	Clothing	East
Telangana	750000	05-07-2024	31	Male	Furniture	South
Bihar	620000	20-07-2024	29	Female	Electronics	East
Madhya Pradesh	580000	10-08-2024	46	Male	Clothing	Central
Chhattisgarh	540000	25-08-2024	50	Female	Furniture	Central
Assam	630000	15-09-2024	28	Male	Electronics	North-East
Jharkhand	600000	30-09-2024	39	Female	Furniture	East
Himachal Pradesh	560000	12-10-2024	44	Male	Clothing	North
Uttarakhand	680000	27-10-2024	48	Female	Furniture	North

(i) **Create a choropleth map (fill the map) to spot the special trends to show the state revenue.**

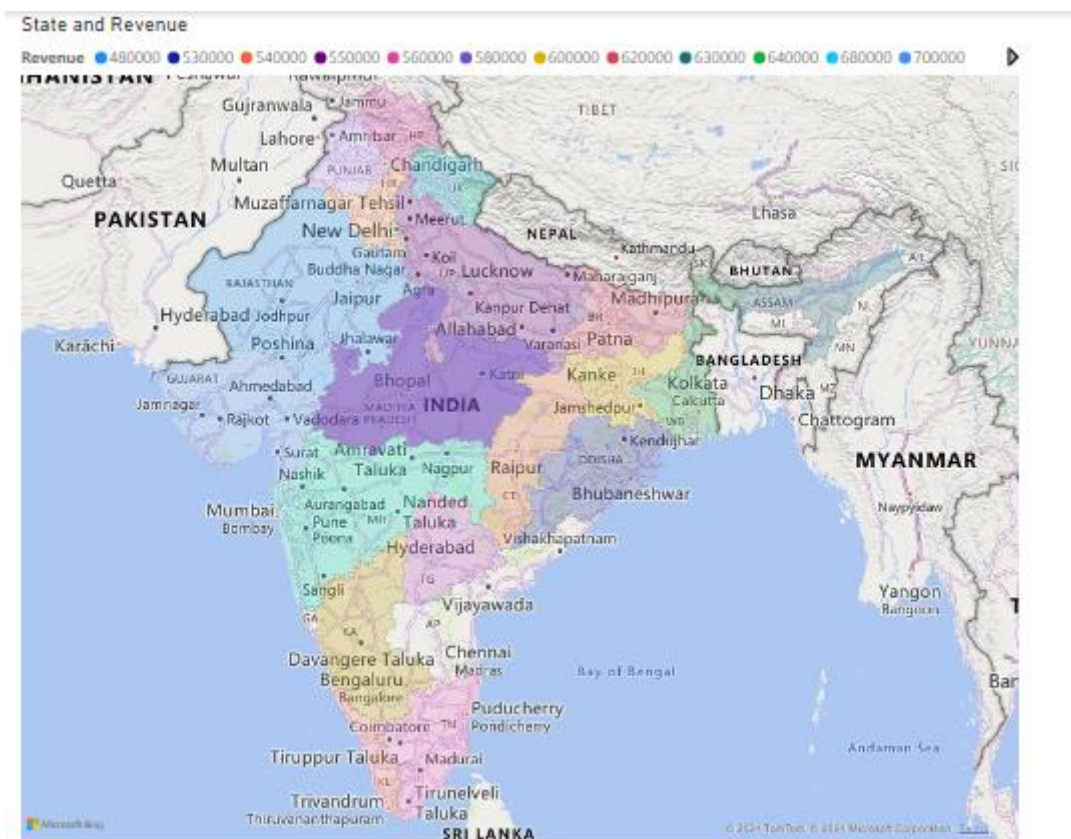
Choropleth Map is used to visualize revenue distribution by state. A choropleth map is a type of map where regions (in this case, Indian states) are shaded or colored in proportion to a specific data value

Insert the Filled Map:

- From the **Visualizations** pane, select the **Filled Map** visual.
- Drag the State field to the **Location** field, setting up the map by each state.

Adding Revenue Data:

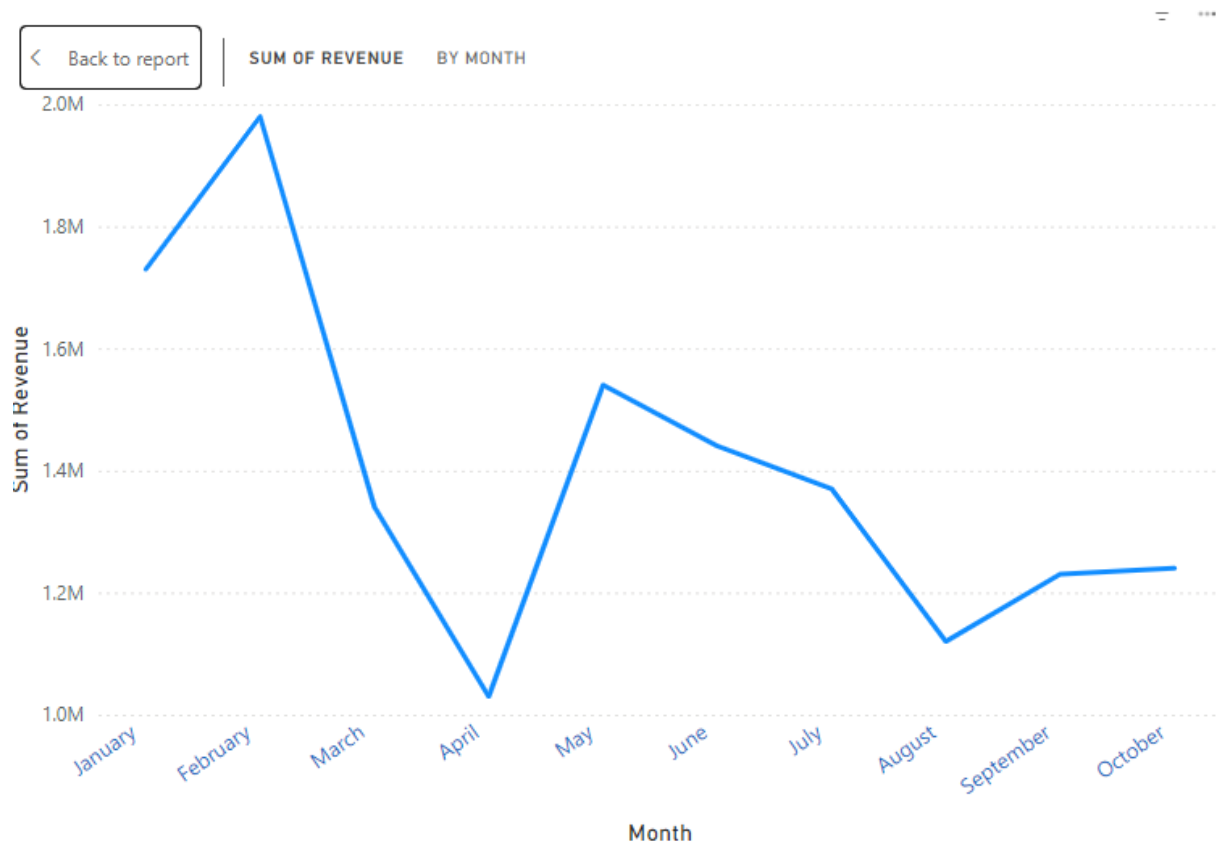
- Drag the Revenue field to the **Legend** field. This controls the shading of each state based on revenue,



ii) Create a line chart to show the revenue based on the month of the year.

Line Chart for Monthly Revenue Trend

- **Insert Line Chart:**
 - Choose the **Line Chart** visual.
 - Add Date to the **X Axis** field, ensuring it's grouped by **Month**.
 - Drag Revenue into the **Y Axis** field.
- **Format Line Chart:**
 - Go to the **Format** pane, adjust line thickness and color for better visualization.
 - Add **Data Labels** if you want values displayed directly on the line.



iii) Create a bin of size 10 for the age measure to create a new dimension to show the revenue.

Binning is a technique used to group continuous data into discrete ranges or categories, making it easier to analyze and visualize patterns in the data. In Power BI, binning is often applied to numerical fields like Age, Revenue, or Income to transform them into manageable intervals (or "bins").

For example, instead of analyzing individual ages in a dataset, you can create age bins such as 20-29, 30-39, and 40-49. This allows you to quickly see how different age groups contribute to total revenue, for instance, and spot trends that may not be obvious from looking at raw data.

Bin Revenue Data by Age (Bin Size = 10)

1. Create Age Bins:

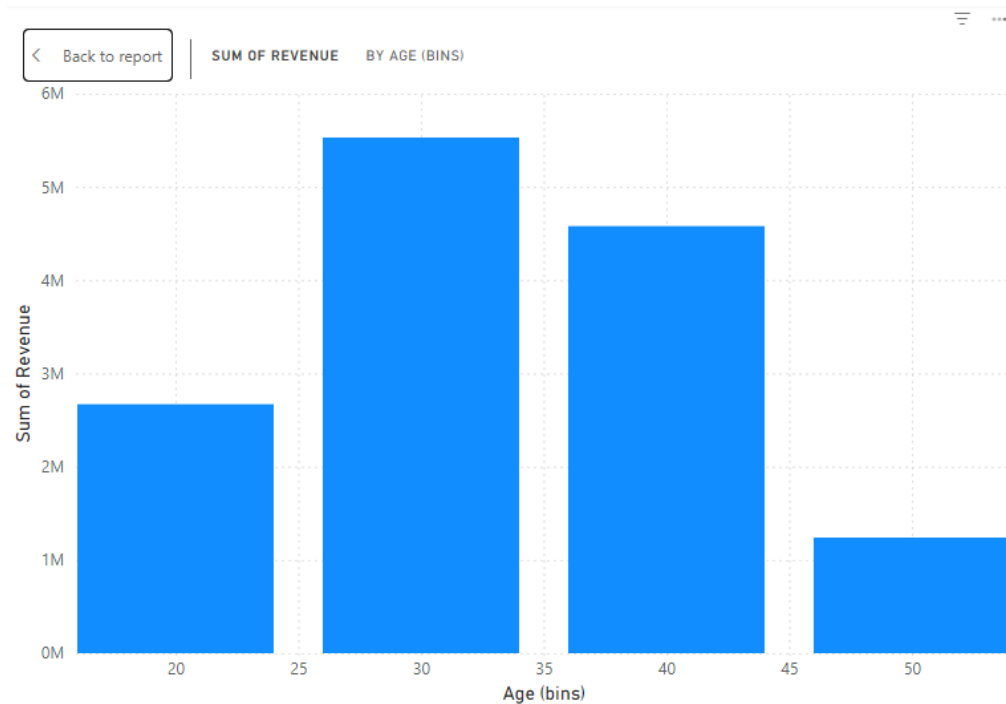
- Right Click on Age->New Group->Set Bin size=10.
- Ensure Group type is Bin.

State	Revenue	Date	Age	Gender	Product Category	Region	Age (bins)
Maharashtra	950000	15 January 2024	34	Male	Electronics	West	30
Tamil Nadu	780000	20 January 2024	29	Female	Furniture	South	20
Karnataka	860000	10 February 2024	41	Female	Clothing	South	40
Delhi	1120000	18 February 2024	36	Male	Electronics	North	30
Gujarat	700000	05 March 2024	52	Female	Furniture	West	50
West Bengal	640000	22 March 2024	27	Male	Clothing	East	20
Uttar Pradesh	550000	10 April 2024	43	Male	Electronics	North	40
Rajasthan	480000	25 April 2024	37	Female	Clothing	North	30
Haryana	720000	15 May 2024	32	Male	Electronics	North	30
Punjab	820000	30 May 2024	40	Female	Furniture	North	40
Kerala	910000	12 June 2024	39	Male	Electronics	South	30
Odisha	530000	25 June 2024	45	Female	Clothing	East	40
Telangana	750000	05 July 2024	31	Male	Furniture	South	30
Bihar	620000	20 July 2024	29	Female	Electronics	East	20
Madhya Pradesh	580000	10 August 2024	46	Male	Clothing	Central	40
Chhattisgarh	540000	25 August 2024	50	Female	Furniture	Central	50
Assam	630000	15 September 2024	28	Male	Electronics	North-East	20
Jharkhand	600000	30 September 2024	39	Female	Furniture	East	30
Himachal Pradesh	560000	12 October 2024	44	Male	Clothing	North	40
Uttarakhand	680000	27 October 2024	48	Female	Furniture	North	40

2. Display Revenue by Age Bins:

- Use a Bar chart(Clustered Column Chart) or other visuals to compare revenue across age groups.

- Place "Age Bins" in the **X-Axis** and Revenue in **the Y-Axis**.

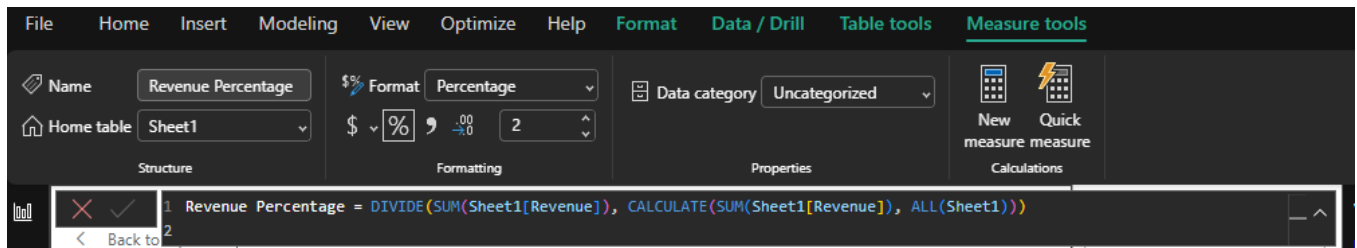


iv) Create a donut chart view to show the percentage of revenue per region by creating zero access in the calculated field.

Donut Charts

- A Donut Chart is a circular chart similar to a pie chart but with a hole in the center, creating a "donut" shape. It is used to show the proportional distribution of a whole by breaking it down into categories. Each segment of the donut represents a percentage of the total, allowing for easy comparison of parts to the whole.
- Donut charts are ideal for visualizing percentages or parts of a dataset (e.g., revenue by region) because they give an immediate sense of the relative size of each category. The empty center can also be used to display additional information, such as total values or key insights, making donut charts a compact and visually appealing option for comparing contributions across categories.

Step 1: Create a Calculated Field for Revenue Percentage



1. Define the Measure for Revenue Percentage:

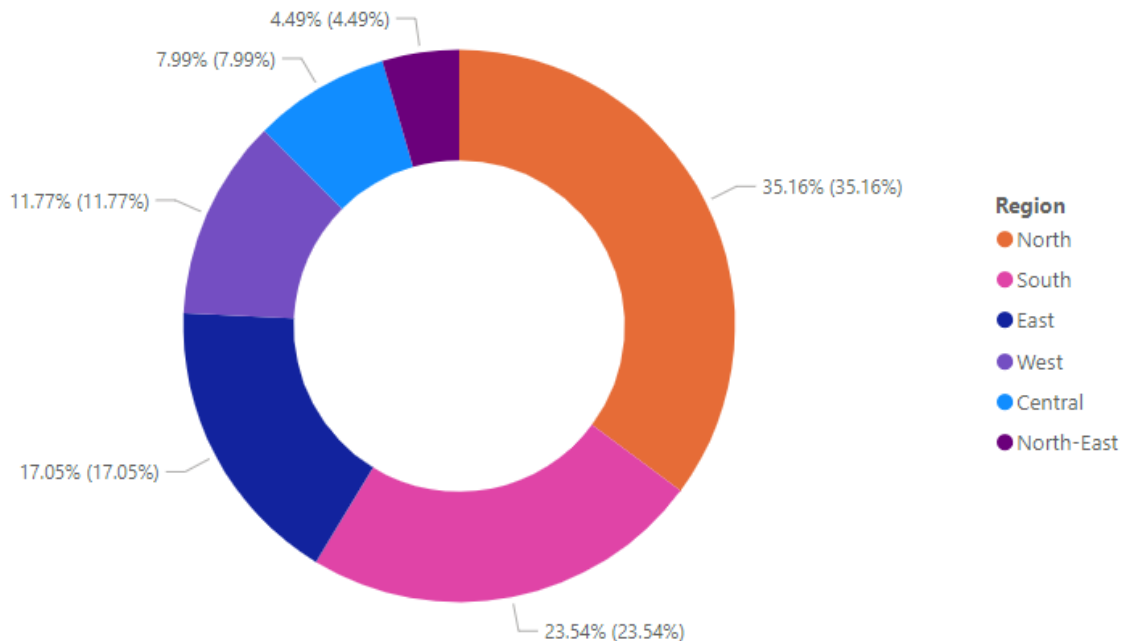
- Right click on Revenue field
- In the formula bar, enter the following formula to calculate the percentage of total revenue for each region.
- This formula calculates the revenue percentage for each region by dividing each region's revenue by the total revenue across all regions.

```
Revenue Percentage = DIVIDE(SUM(Sheet1[Revenue]), CALCULATE(SUM(Sheet1[Revenue]), ALL(Sheet1)))
```

2. Format as Percentage:

- After creating the measure, go to the **Measure Tools** tab and set the format to **Percentage** so it will display as a percentage in the chart.

Step 2: Create the Donut Chart



1. Insert a Donut Chart:

- Go to the **Visualizations** pane and select the **Donut Chart** icon.
- Drag the Donut Chart visual onto your report canvas.

2. Add Region to the Legend:

- Drag the Region field into the **Legend** field well of the donut chart. This will separate each section of the donut chart by region.

3. Add Revenue Percentage to Values:

- Drag the **Revenue Percentage** measure you created into the **Values** field well.
- This will make the donut chart display each region's revenue as a percentage of the total.

v) Create a butterfly chart by reversing the bar chart to compare female & male revenue based on product category.

A Butterfly Chart (also called a Tornado or Divergent Bar Chart) is used to compare two categories side-by-side across a common variable, often to show differences between two groups. The chart consists of two bar charts placed back-to-back, resembling a butterfly's wings, which gives the chart its name.

Butterfly charts are popular for gender-based comparisons (like revenue by product category for male vs. female customers), age-group comparisons, or regional comparisons. Each side of the chart displays one of the two categories, helping visualize differences or trends between them across different variables or dimensions.

The below measure calculates the total revenue for rows where the Gender is Male and Female.

Right Click on Revenue Field in the Data Pane and Create a Measure for Male Revenue:

Male Revenue = CALCULATE(SUM(Sheet1[Revenue]), Sheet1[Gender] = "Male")

Similarly, Create a Measure for **Female Revenue**:

Female Revenue = CALCULATE(SUM(Sheet1[Revenue]), Sheet1[Gender] = "Female")

Step 2: Add the Measures to a Bar Chart for Comparison

1. Insert a Clustered Bar Chart:

- In the **Visualizations** pane, select the **Clustered Bar Chart** (or **Clustered Column Chart** for a vertical layout) and add it to your report canvas.

2. Add Product Category to the Axis:

- Drag the Product Category field into the **X-Axis** field well. This will be the common category along which you'll compare Male and Female Revenue.

3. Add Male and Female Revenue Measures to the Values:

- Drag the Male Revenue measure into the **Y-Axis** field well.
- Drag the Female Revenue measure into the **Y-Axis** field well as well.
- The chart will now display **side-by-side bars** for Male and Female Revenue for each product category.

