DATA VISUALIZATION USING MATPLOTLIB

Aim:

To analyze how alcohol, citric acid, and pH influence wine quality using different visualization techniques.

Algorithm:

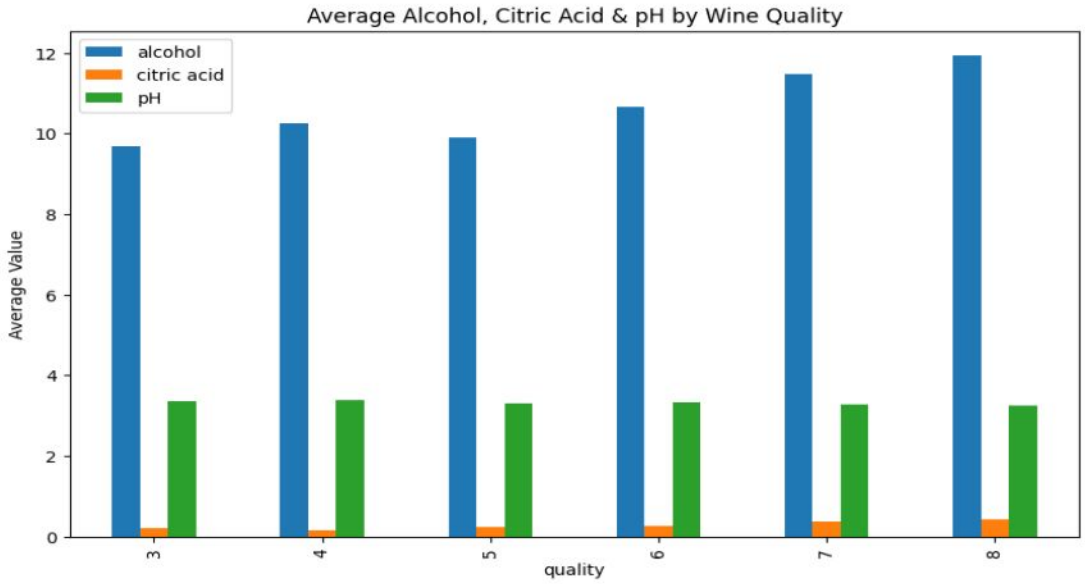
1. Import the required libraries — pandas, matplotlib, and seaborn.
2. Load the *WineQT.csv* dataset into a pandas DataFrame.
3. Display the first few rows using df.head() to understand the data structure.
4. Select the important features — alcohol, citric acid, and pH for analysis.
5. Group the dataset by wine quality and calculate the mean of selected features.
6. Reset the index to make 'quality' a separate column for plotting.
7. Plot a bar chart showing average alcohol, citric acid, and pH against wine quality.
8. Create a strip plot to visualize alcohol and citric acid distribution across quality levels.
9. Generate a scatter plot to observe the relationship between alcohol and citric acid, colored by quality.
10. Draw a violin plot to show the distribution of alcohol content for each wine quality.
11. Analyze the plotted results to interpret how chemical properties vary with wine quality.

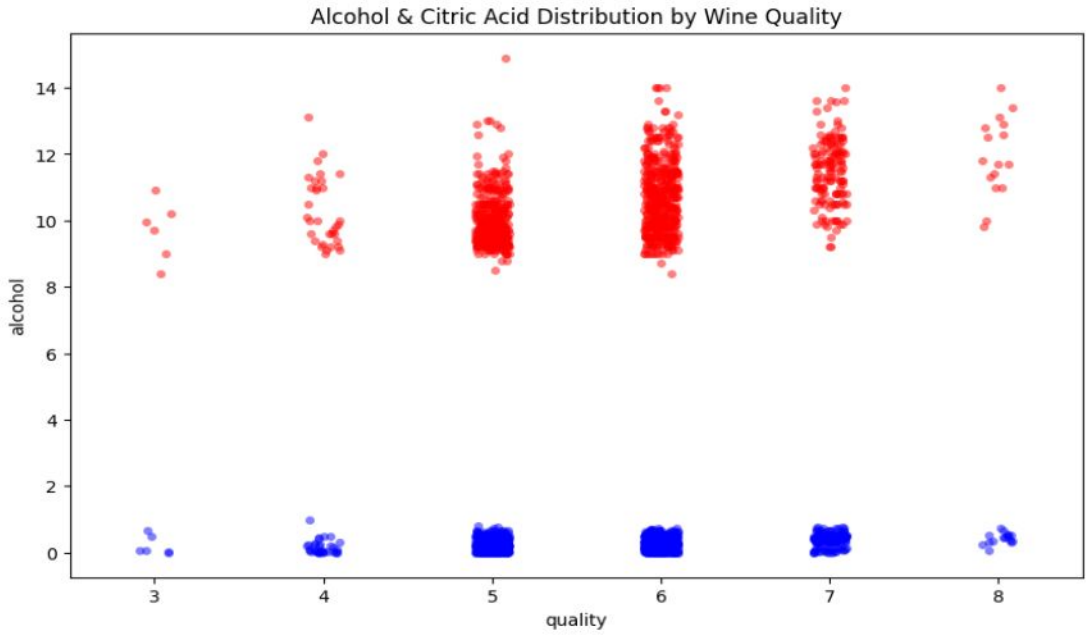
Code:

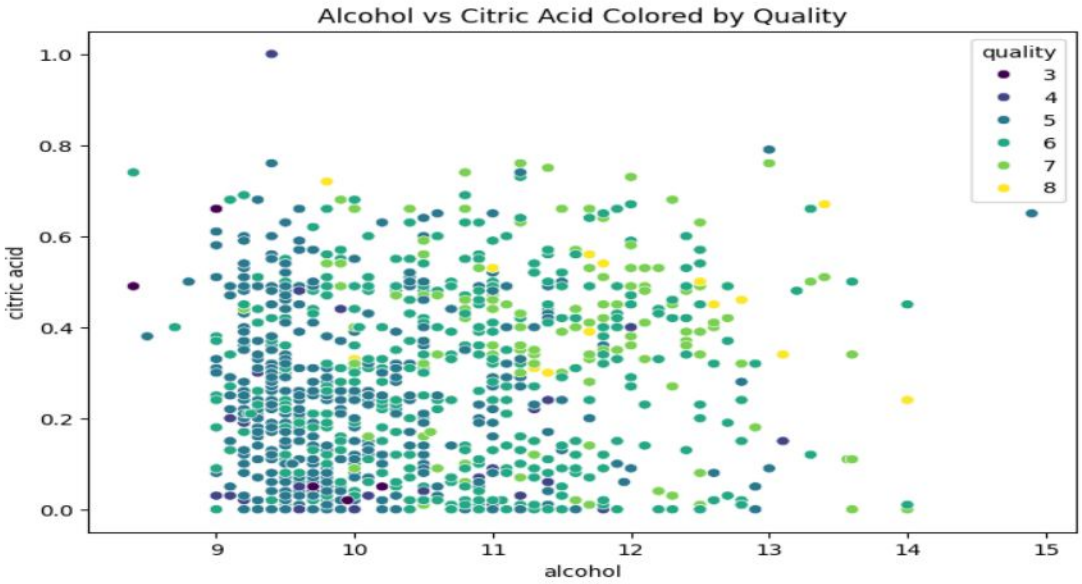
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

df = pd.read_csv('/content/WineQT.csv')
features = ['alcohol', 'citric acid', 'pH']
avg_df = df.groupby('quality')[features].mean().reset_index()
avg_df.plot(x='quality', kind='bar', figsize=(10,6))
plt.title('Average Alcohol, Citric Acid & pH by Wine Quality')
plt.ylabel('Average Value')
plt.show()

plt.figure(figsize=(10,6))
sns.stripplot(x='quality', y='alcohol', data=df, color='red', alpha=0.5)
sns.stripplot(x='quality', y='citric acid', data=df, color='blue', alpha=0.5)
plt.title('Alcohol & Citric Acid Distribution by Wine Quality')
plt.show()

plt.figure(figsize=(8,6))
sns.scatterplot(x='alcohol', y='citric acid', hue='quality', data=df,
palette='viridis')
plt.title('Alcohol vs Citric Acid Colored by Quality')
plt.show()
```

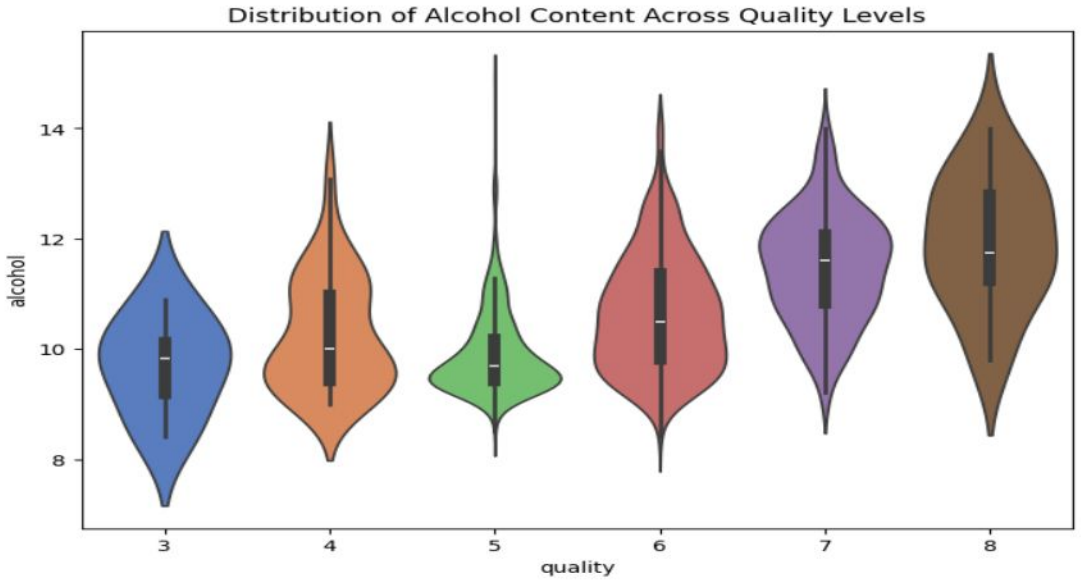
```
plt.figure(figsize=(8, 6))
sns.violinplot(x='quality', y='alcohol', data=df, palette='muted')
plt.title('Distribution of Alcohol Content Across Quality Levels')
plt.show()
```

Output:







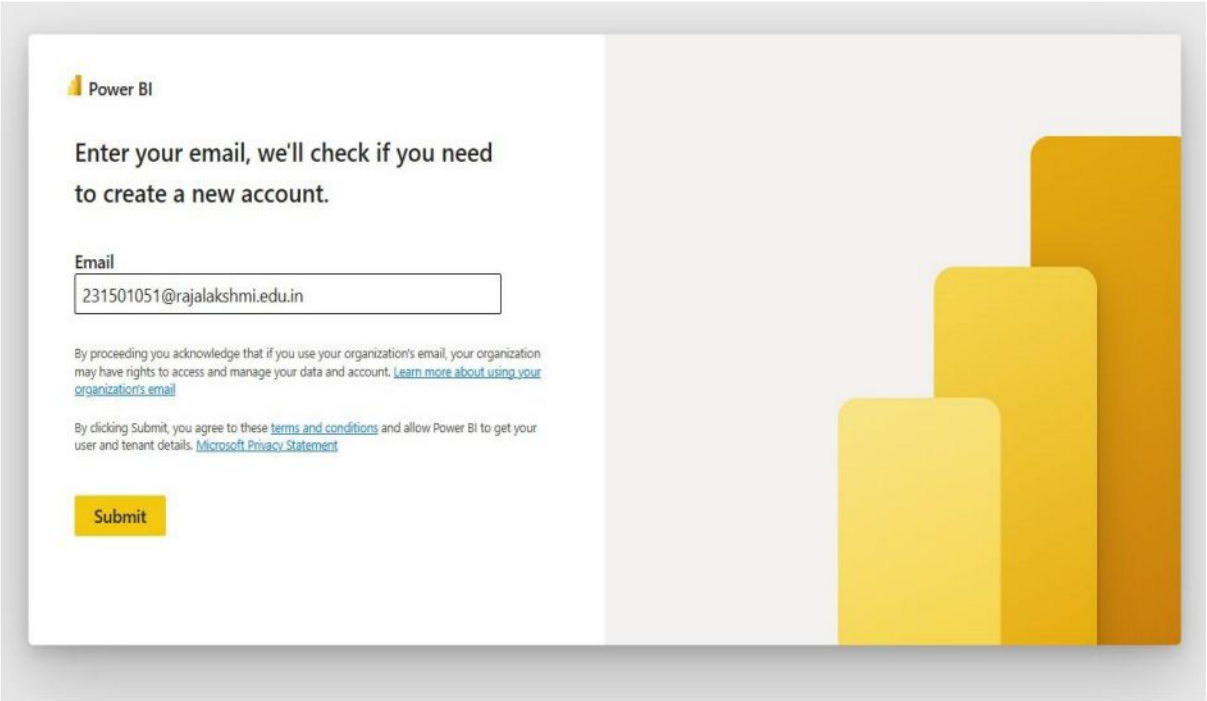


Result:

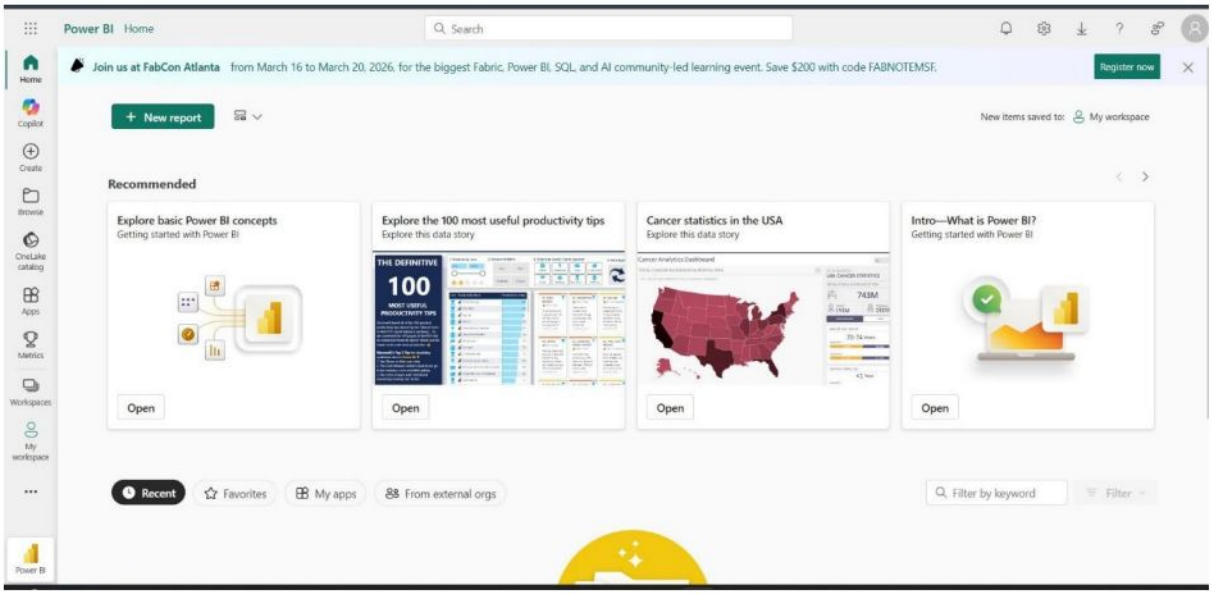
The analysis shows that wines with higher alcohol content tend to have better quality, while citric acid and pH have a smaller influence on quality variation.

POWER BI login and procedure

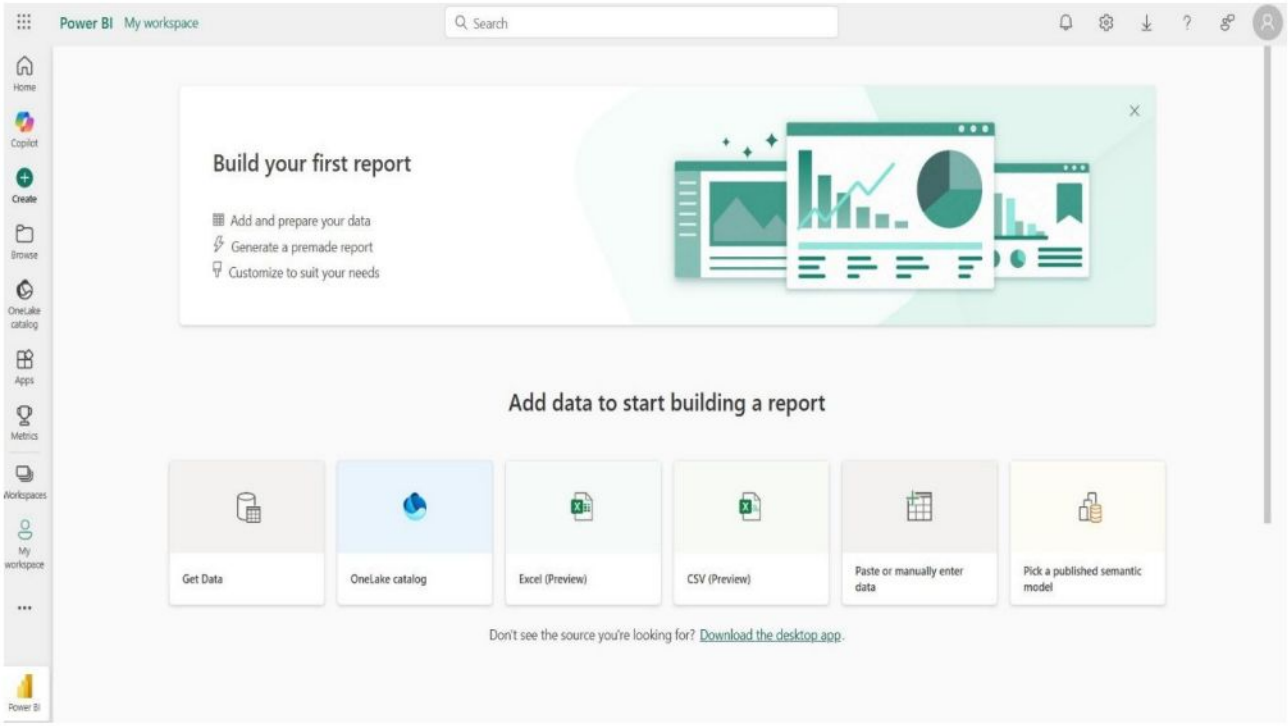
1.Login(clg. Mail)



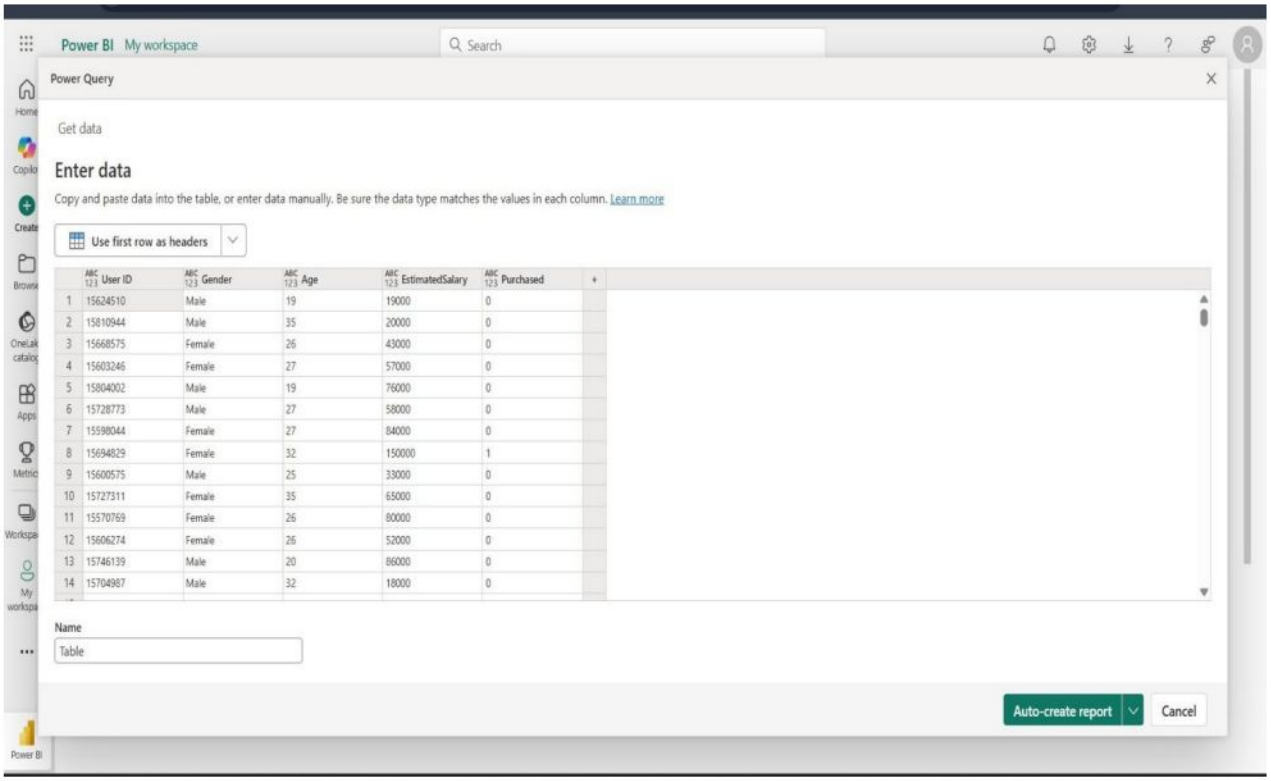
2.click **“+New report”**



3.click – **“paste of manually enter data”**



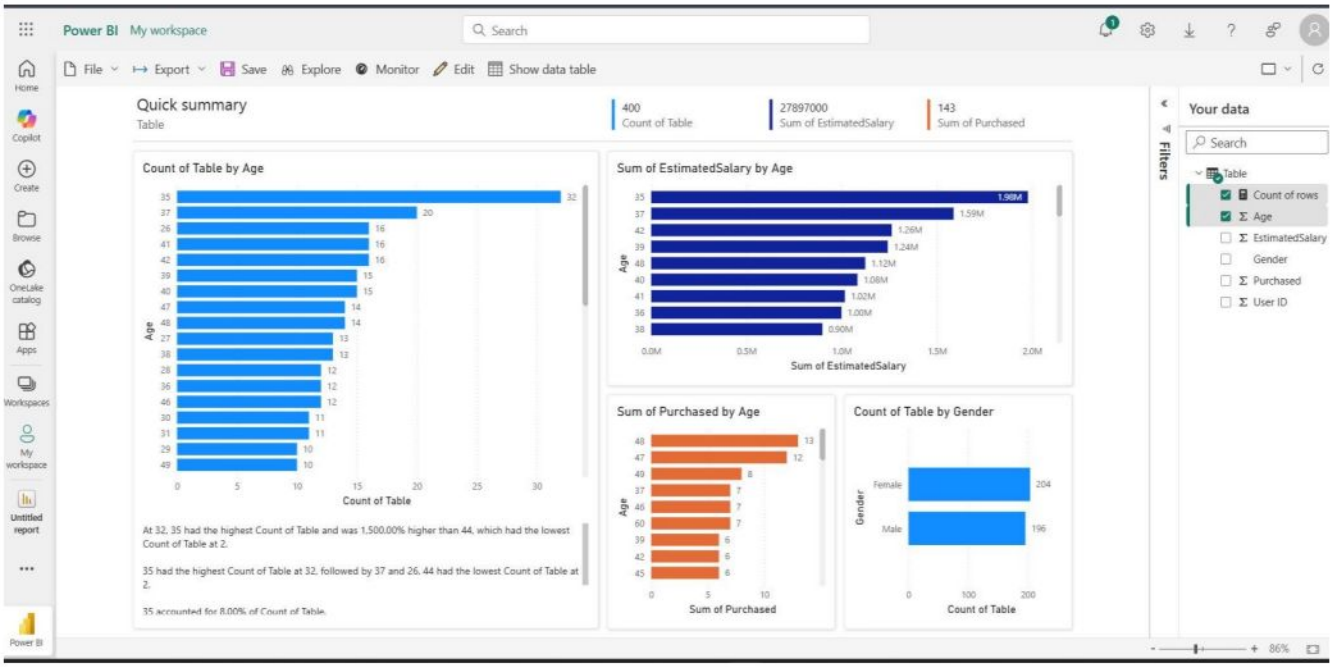
4.copy the downloaded dataset fully & paste it in the first cell



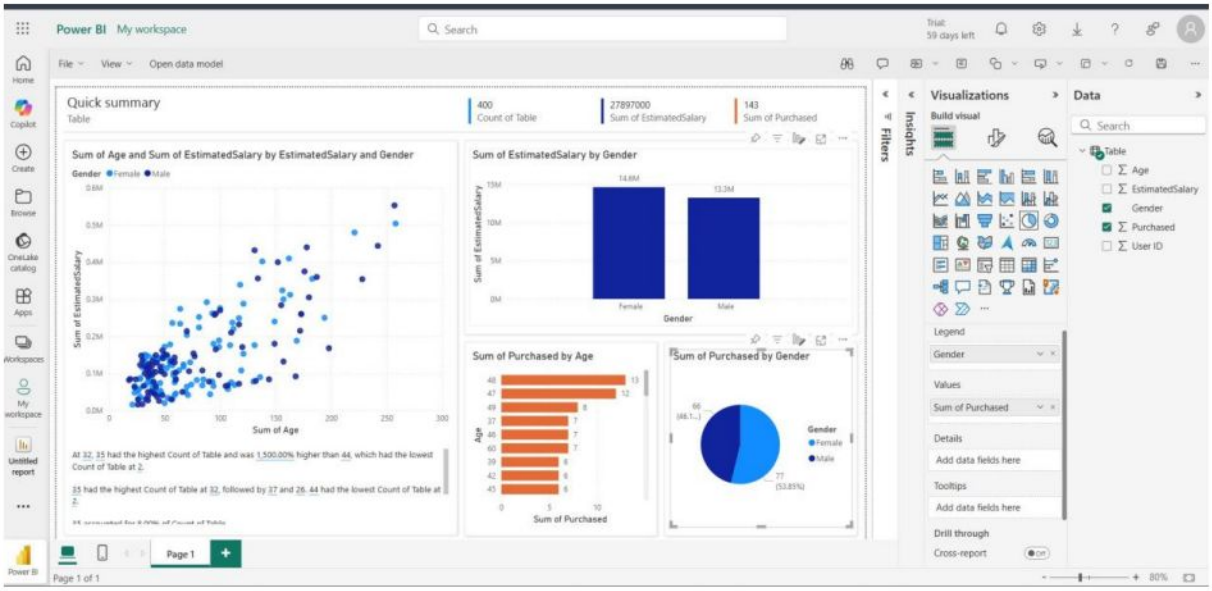
5. after pasted it, click – “use first row as headers”

6. then select “Auto-create report”

7. it will create a visualization chart, now select **“Edit”** in that page



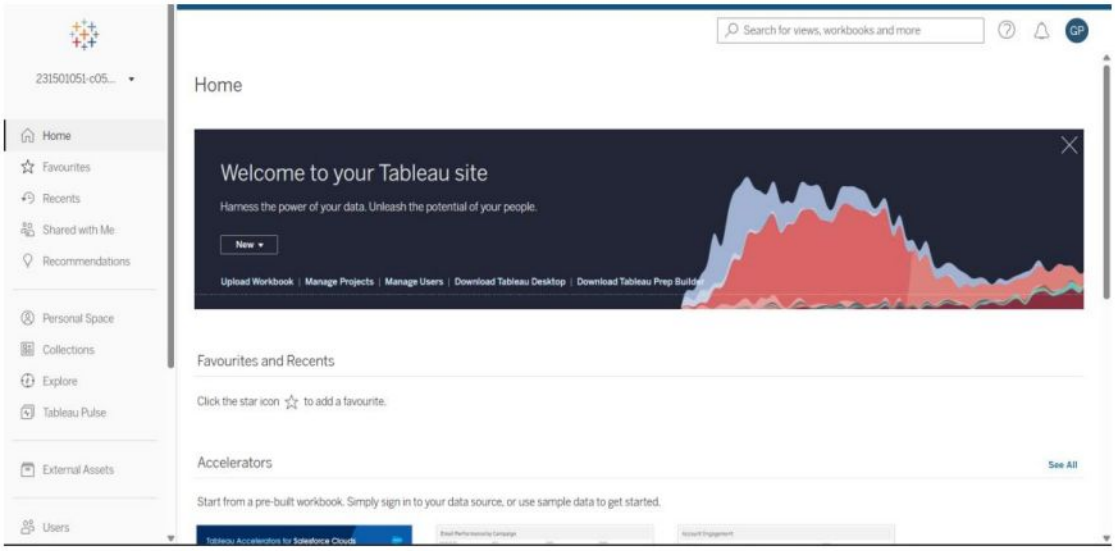
8. now we can edit what visualization chart we want(mini. 4 vis. Chart)



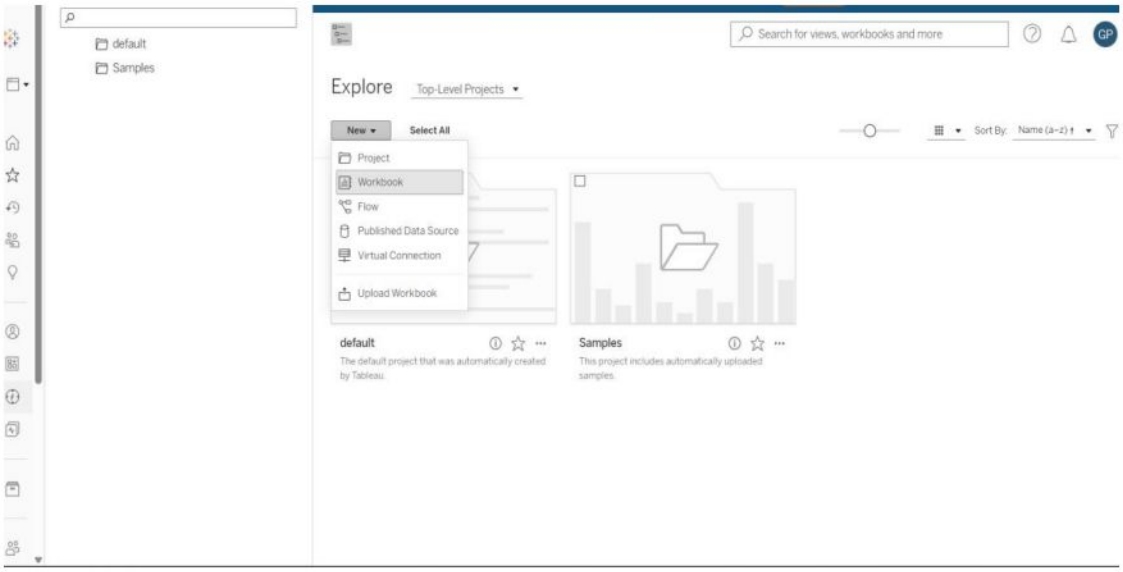
This is the final visualization chart!

DATA VISUALIZAION USING TABLEAU

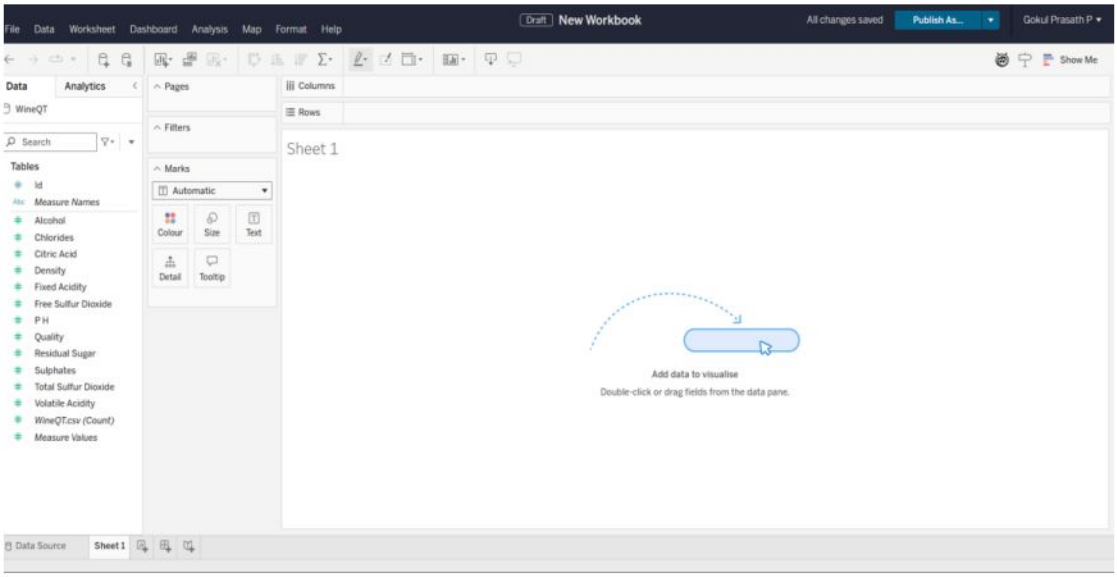
1.HomePage



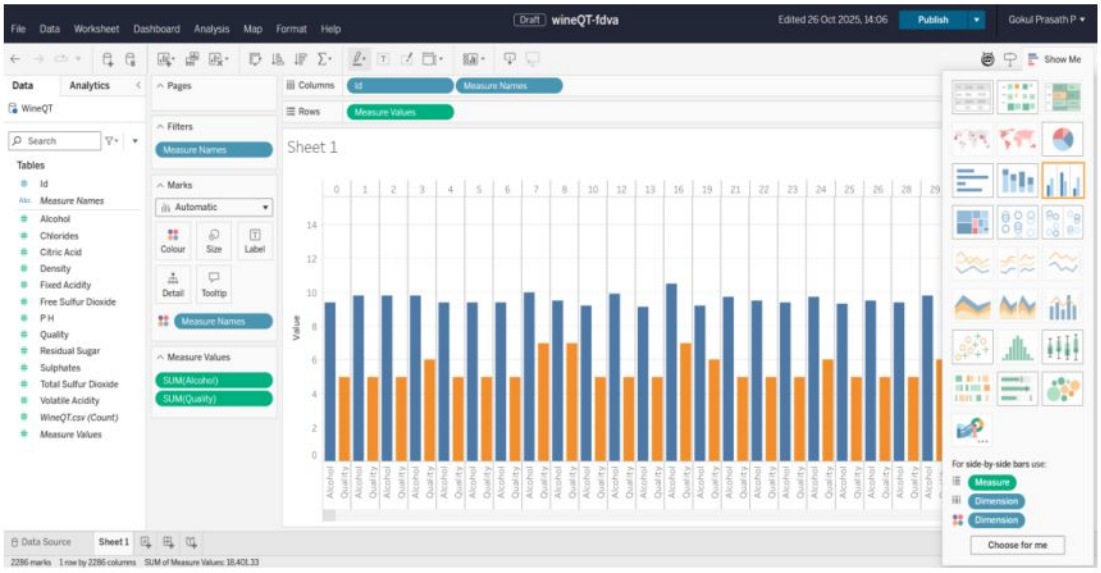
2.Explore -> New -> Workbook



3.Upload file from your device



4.Drag required features in **‘Columns’** & **‘Rows’** click **‘show me’** & visualize it



5.Final Tableau Dashboard