Experiment No 2

Implimentation of Histogram

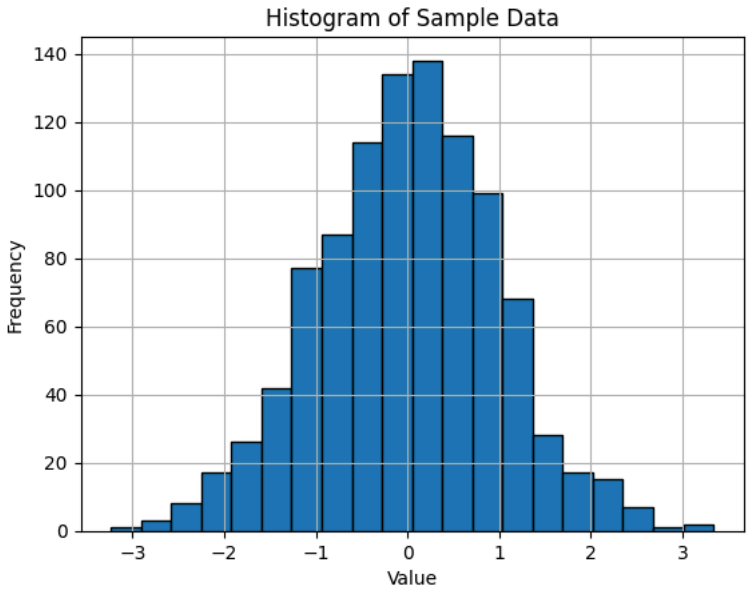
Purpose: Visualizes the distribution of continuous data by dividing the data range into bins (intervals) and plotting the frequency of data points within each bin.

Use Case: Analyze how data is spread out, identify outliers, and compare distributions across different datasets.

```
import matplotlib.pyplot as plt
import numpy as np

# Sample data
data = np.random.randn(1000)  # Generate random normal distribution data

# Create the histogram
plt.hist(data, bins=20, edgecolor='black')  # Adjust bins for better visualization
plt.xlabel('Value')
plt.ylabel('Frequency')
plt.title('Histogram of Sample Data')
plt.grid(True)
plt.show()
```



Implimentation of Bar Chart

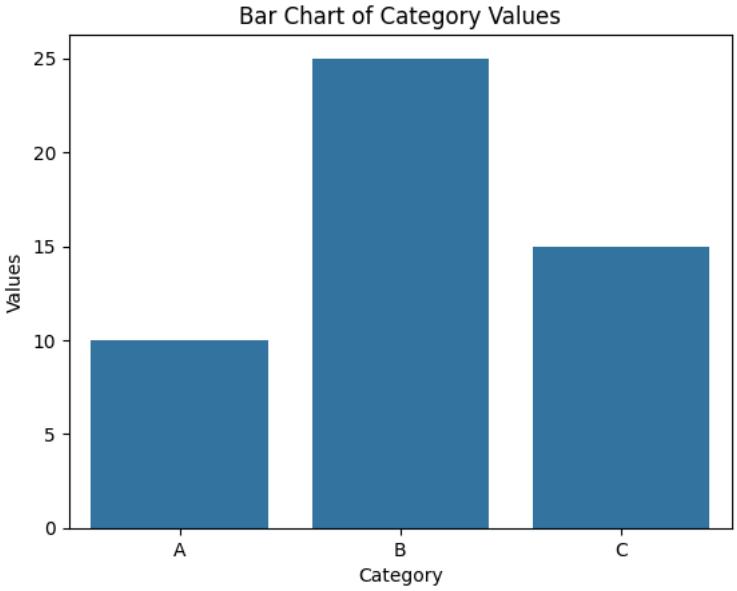
Purpose: Compares categorical data sets by representing each category with a rectangular bar. The bar height represents the value associated with each category.

Use Case: Compare quantities across different categories, identify trends or differences between groups.

```
import seaborn as sns
import pandas as pd

# Sample data as DataFrame
data = pd.DataFrame({'Category': ['A', 'B', 'C'], 'Values': [10, 25, 15]})

# Create the bar chart
sns.barplot(x='Category', y='Values', data=data)
plt.title('Bar Chart of Category Values')
plt.xlabel('Category')
plt.ylabel('Values')
plt.show()
```



Implimentation of Pie Chart

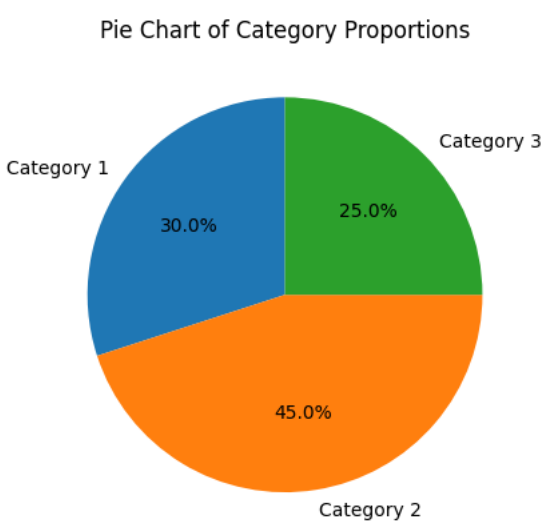
Purpose: Shows the proportion of a whole represented by different categories. Each category is represented by a slice of the pie, with the size of the slice proportional to its share of the whole.

Use Case: Visualize how a total value is divided amongst different categories, identify the dominant category, or compare the relative sizes of categories.

```
import matplotlib.pyplot as plt

# Sample data (ensure values sum to 1 for proportions)
data = [30, 45, 25]
labels = ['Category 1', 'Category 2', 'Category 3']

# Create the pie chart
plt.pie(data, labels=labels, autopct='%1.1f%%', startangle=90)  # Adjust startangle for slice orientation
plt.title('Pie Chart of Category Proportions')
plt.show()
```



Implimentation of Line Chart

Purpose: Shows how a value changes over time. Data points are connected with lines to illustrate trends or patterns over time.

Use Case: Visualize trends and relationships between a variable and time, identify fluctuations or seasonality in data.

```
import seaborn as sns
import pandas as pd

# Sample data as DataFrame with time series
data = pd.DataFrame({'Time': pd.date_range(start='2023-01-01', periods=12), 'Values': [2, 5, 7, 10, 8, 12, 15, 13, 11, 9, 6, 4]})

# Create the line graph
sns.lineplot(x='Time', y='Values', data=data)
plt.title('Line Graph of Values over Time')
plt.xlabel('Time')
plt.ylabel('Values')
plt.xticks(rotation=45)  # Rotate x-axis labels for readability with many data points
plt.grid(True)
plt.show()
```