# AKTU B.Tech Second Year

## PYTHON PROGRAMMING

### Unit 5

### Python file operations

### LEC-4

**Today's Target**

- **matplotlib**
- **AKTU PYQs**

Gateway Classes

**By**
**Pragya Rajvanshi**

# Matplotlib

- Visualizing data helps us understand and share information more effectively.
- In Python , **Matplotlib** is one of the best tools for creating visualizations.

Different types of plolt

1.Line plot

2.Bar plot

3.Pie chart

4.Scatter plot

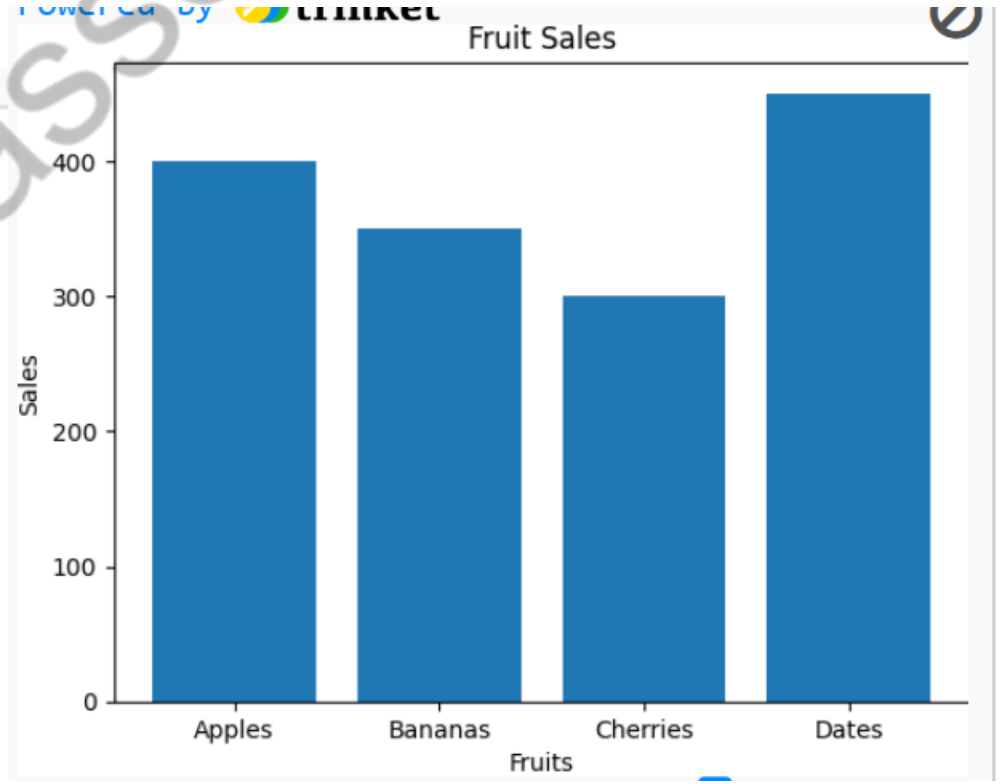
5.Histogram

Gateway Classes

# Bar plot

A **bar plot** or bar chart is a graph that represents the category of data with rectangular bars with lengths and heights that is proportional to the values which they represent.

```
import matplotlib.pyplot as plt
fruits = ['Apples', 'Bananas', 'Cherries', 'Dates']
sales = [400, 350, 300, 450]
plt.bar(fruits, sales)
plt.title('Fruit Sales')
plt.xlabel('Fruits')
plt.ylabel('Sales')
plt.show()
```



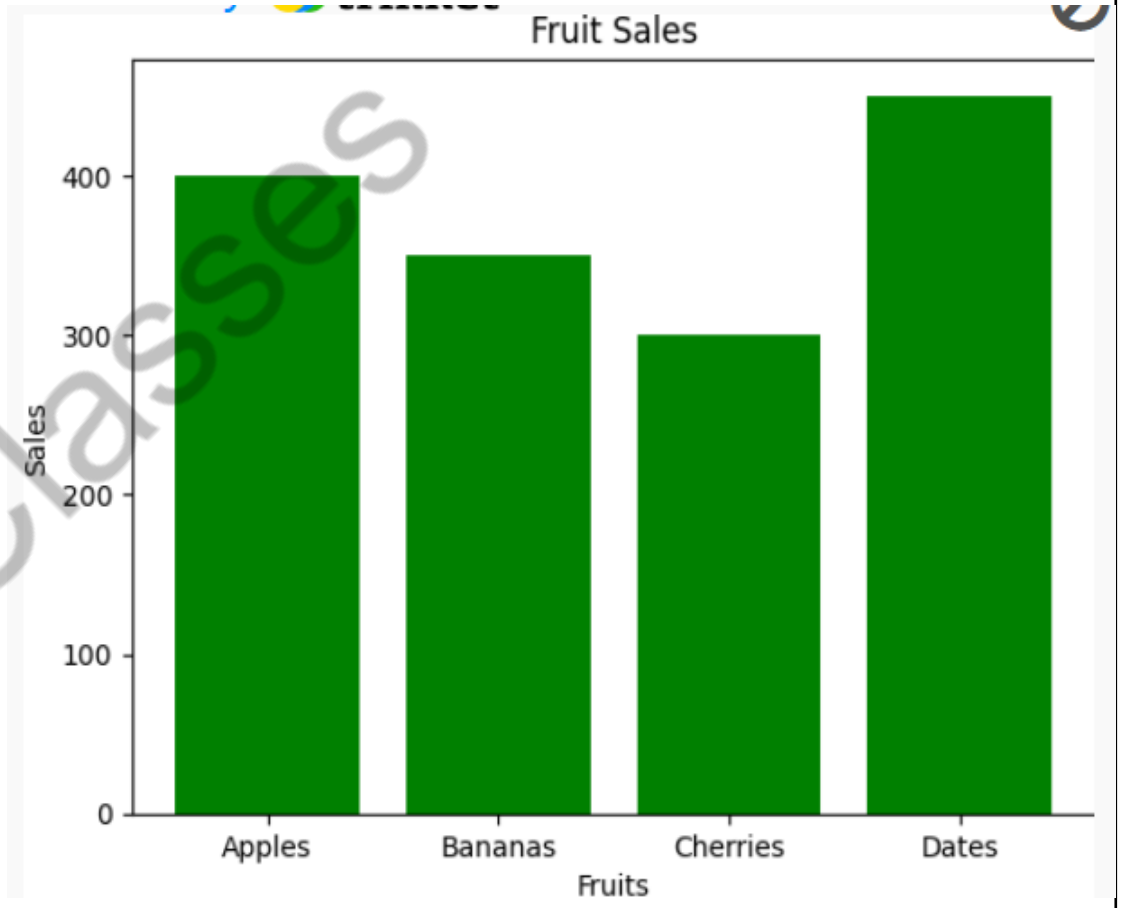

Gateway Classes

# Bar plot

## Customizing Bar Colors

```
import matplotlib.pyplot as plt
fruits = ['Apples', 'Bananas', 'Cherries', 'Dates']
sales = [400, 350, 300, 450]

plt.bar(fruits, sales, color='green')
plt.title('Fruit Sales')
plt.xlabel('Fruits')
plt.ylabel('Sales')
plt.show()
```

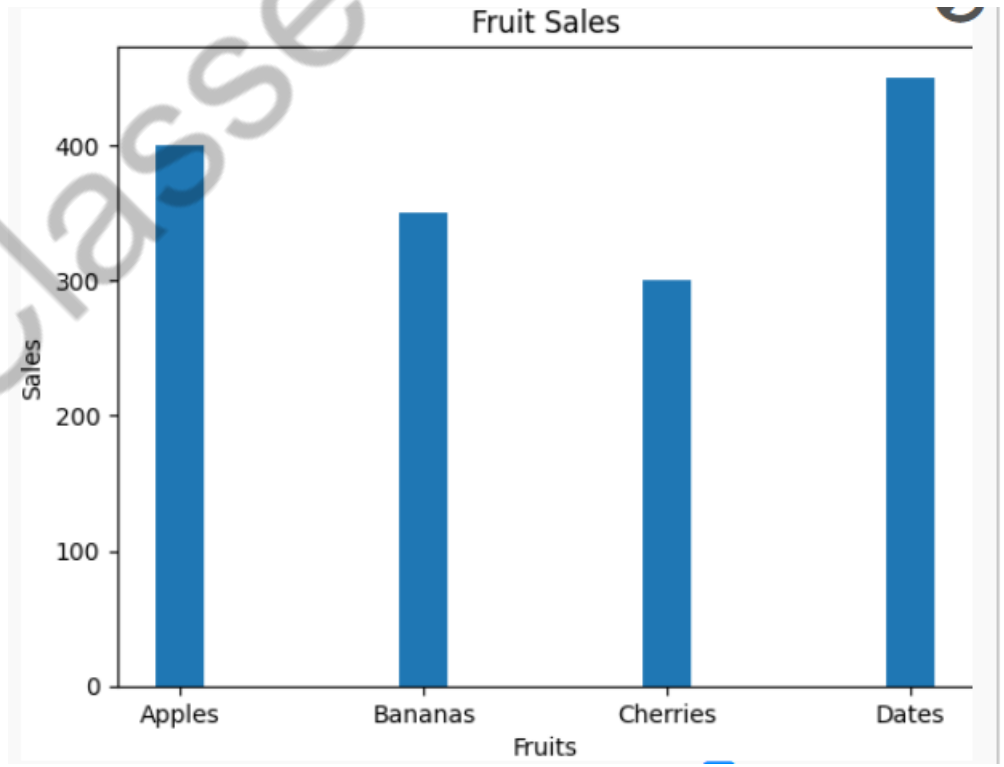



Gateway Classes

# Bar plot

## Adjusting Bar Width

```
import matplotlib.pyplot as plt
fruits = ['Apples', 'Bananas', 'Cherries', 'Dates']
sales = [400, 350, 300, 450]
plt.bar(fruits, sales, width=0.2)
plt.title('Fruit Sales')
plt.xlabel('Fruits')
plt.ylabel('Sales')
plt.show()
```

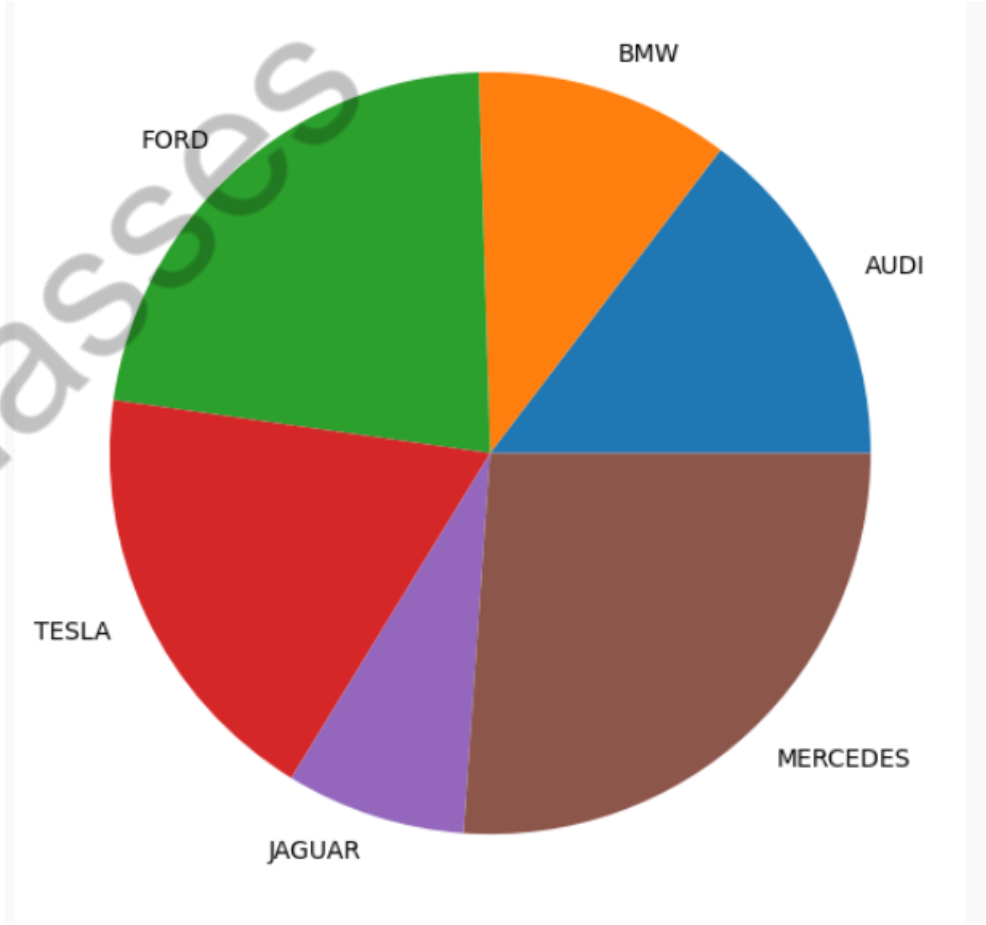



Gateway Classes

# piechart

```
# Import libraries
from matplotlib import pyplot as plt
# Creating dataset
cars = ['AUDI', 'BMW', 'FORD',
        'TESLA', 'JAGUAR', 'MERCEDES']

data = [23, 17, 35, 29, 12, 41]
# Creating plot
fig = plt.figure(figsize=(10, 7))
plt.pie(data, labels=cars)
# show plot
plt.show()
```




Gateway Classes

```
import matplotlib.pyplot as plt
x = [1, 2, 3, 4]

e  =(0.1, 0, 0, 0)

plt.pie(x, explode = e)

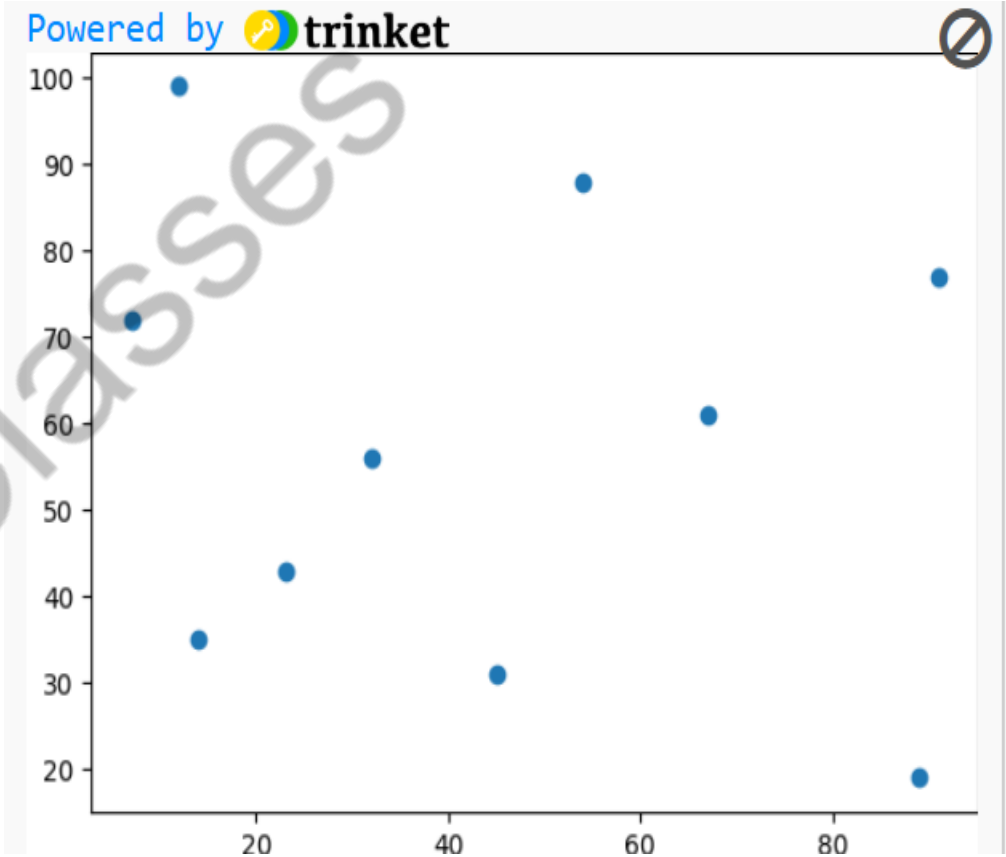
plt.title("Pie chart")
plt.show()
```



Gateway Classes

# Matplotlib Scatter

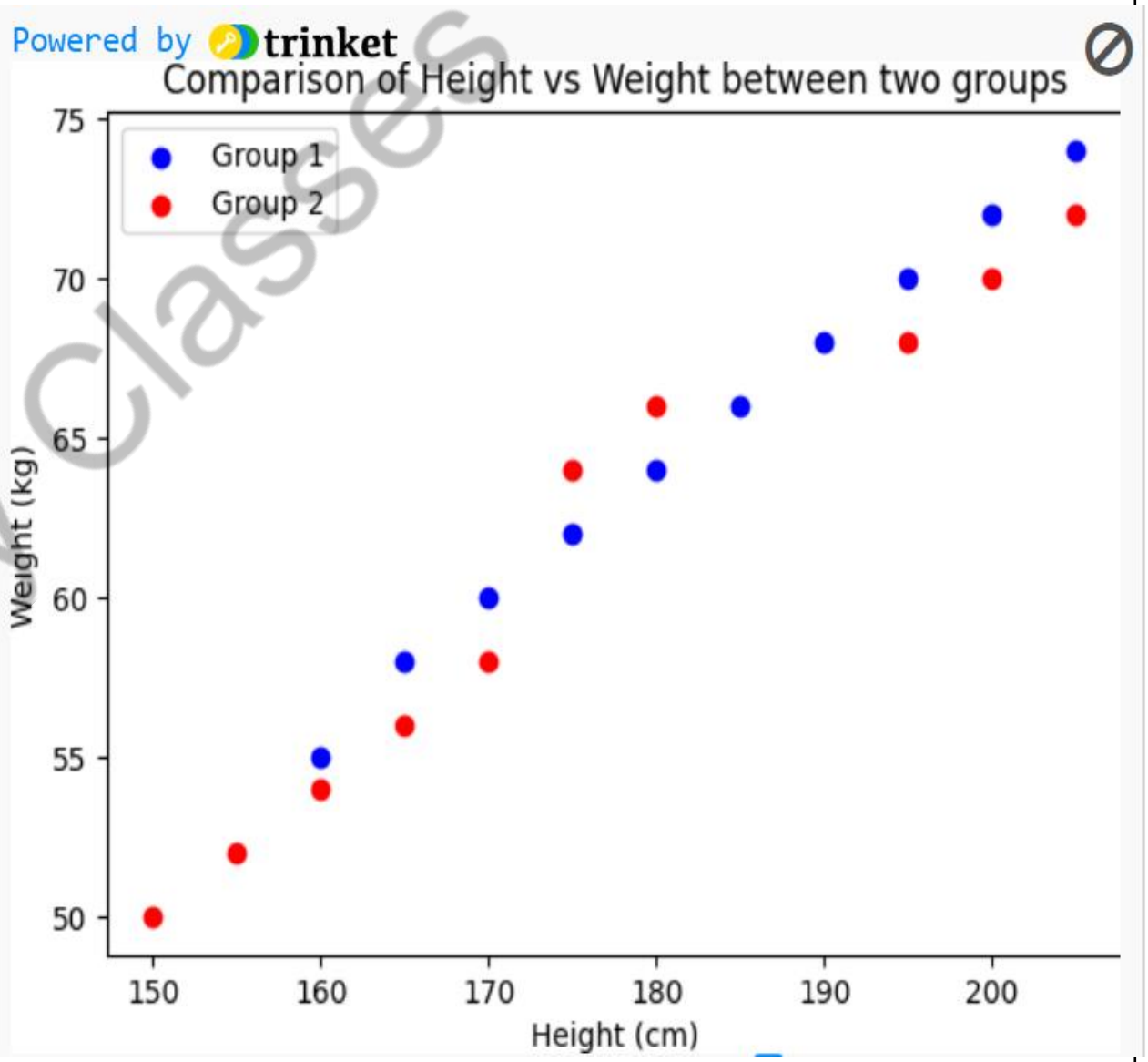
```
import matplotlib.pyplot as plt
import numpy as np
x = np.array([12, 45, 7, 32, 89, 54, 23, 67, 14, 91])
y = np.array([99, 31, 72, 56, 19, 88, 43, 61, 35, 77])
plt.scatter(x, y)
plt.show()
```




Gateway Classes

# Scatter Plot with Multiple Datasets

```
import matplotlib.pyplot as plt
import numpy as np
x1 = np.array([160, 165, 170, 175, 180, 185, 190, 195, 200, 205])
y1 = np.array([55, 58, 60, 62, 64, 66, 68, 70, 72, 74])
x2 = np.array([150, 155, 160, 165, 170, 175, 180, 195, 200, 205])
y2 = np.array([50, 52, 54, 56, 58, 64, 66, 68, 70, 72])
plt.scatter(x1, y1, color='blue', label='Group 1')
plt.scatter(x2, y2, color='red', label='Group 2')
plt.xlabel('Height (cm)')
plt.ylabel('Weight (kg)')
plt.title('Comparison of Height vs Weight between two groups')
plt.legend()
plt.show()
```




Gateway Classes

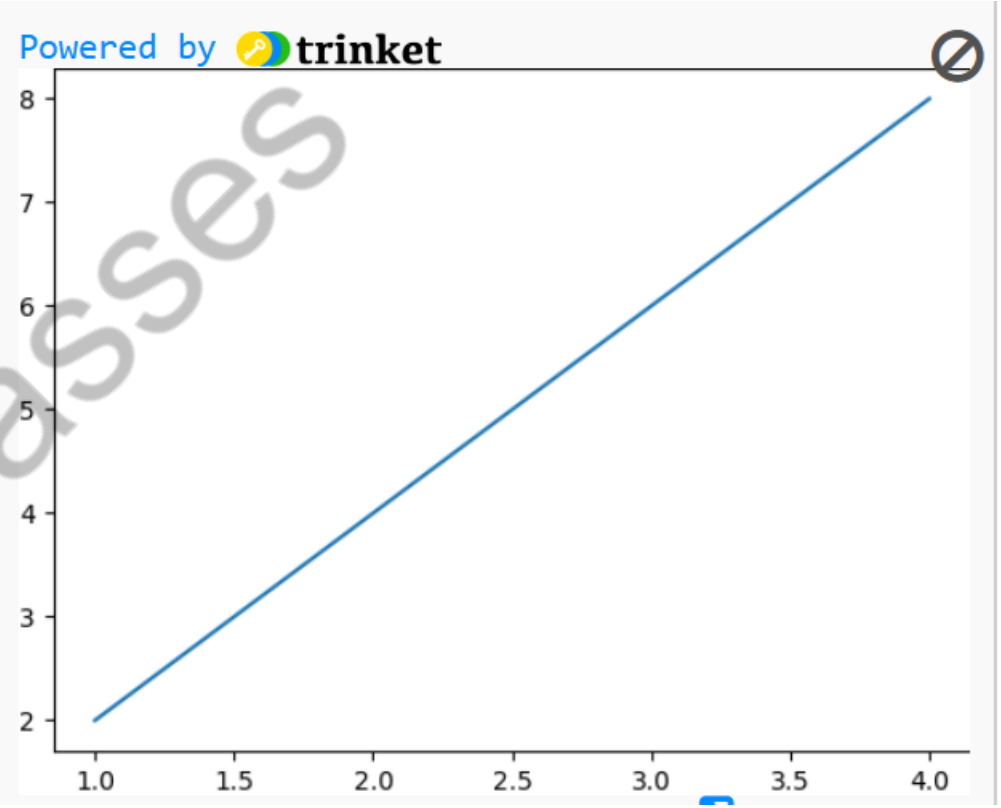
## Different Types of Plots

### 1. Line chart

```
# importing the required libraries
import matplotlib.pyplot as plt
import numpy as np

# define data values
x = np.array([1, 2, 3, 4])  # X-axis points
y = x*2  # Y-axis points

plt.plot(x, y)  # Plot the chart
plt.show()  # display
```




Gateway Classes

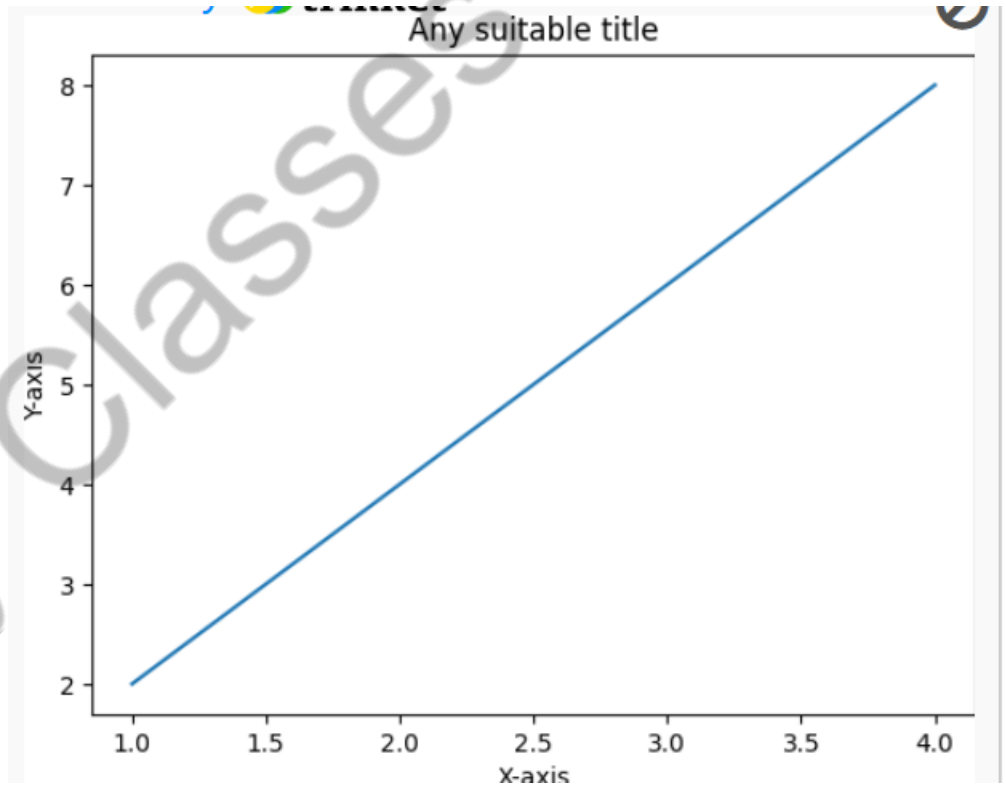
## Different Types of Plots

### 1. Line chart

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


# Define X and Y variable data
x = np.array([1, 2, 3, 4])
y = x*2

plt.plot(x, y)
plt.xlabel("X-axis")  # add X-axis label
plt.ylabel("Y-axis")  # add Y-axis label
plt.title("Any suitable title")  # add title
plt.show()
```




Gateway Classes

## Different Types of Plots
## Multiple Plots on the Same Axis

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

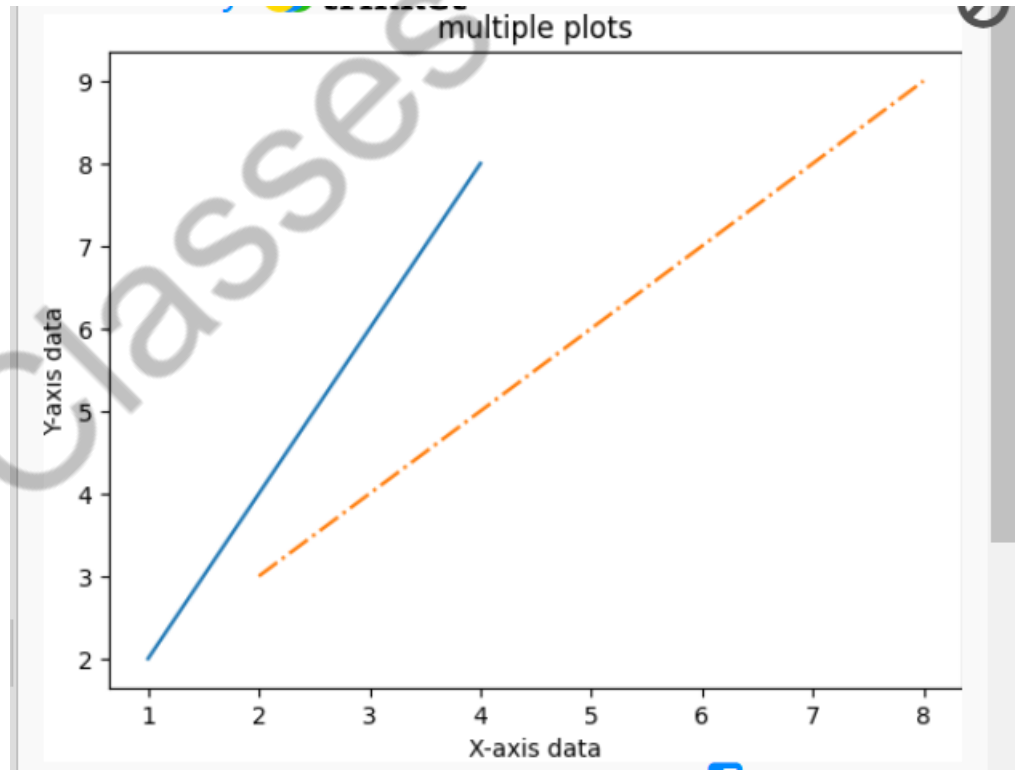
x = np.array([1, 2, 3, 4])
y = x*2

# first plot with X and Y data
plt.plot(x, y)

x1 = [2, 4, 6, 8]
y1 = [3, 5, 7, 9]

# second plot with x1 and y1 data
plt.plot(x1, y1, '-.')

plt.xlabel("X-axis data")
plt.ylabel("Y-axis data")
plt.title('multiple plots')
plt.show()
```

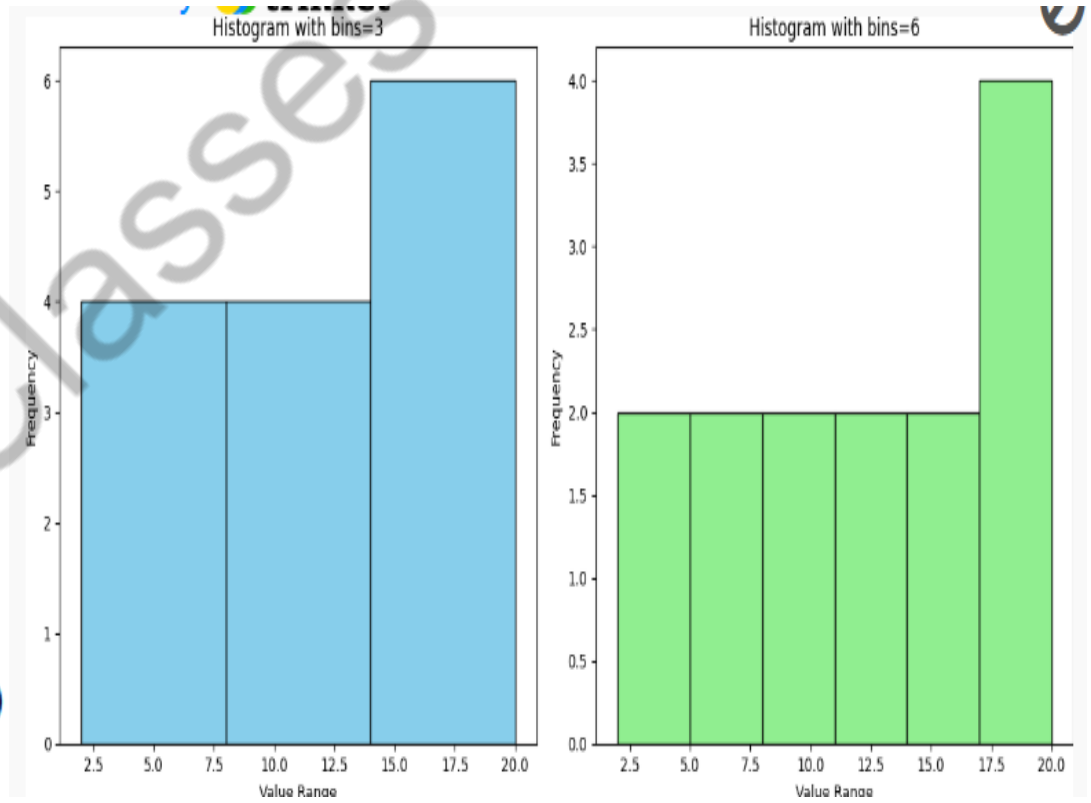



Gateway Classes

# Histogram

```python
import matplotlib.pyplot as plt
# Example data
data = [2, 3, 5, 7, 8, 9, 11, 13, 14, 15, 17, 18, 19, 20]
# Plot histogram with different bin sizes
plt.figure(figsize=(12, 6))
# Using bins=3
plt.subplot(1, 2, 1)  # First subplot
plt.hist(data, bins=3, color='skyblue', edgecolor='black')
plt.title('Histogram with bins=3')
plt.xlabel('Value Range')
plt.ylabel('Frequency')
# Using bins=6
plt.subplot(1, 2, 2)  # Second subplot
plt.hist(data, bins=6, color='lightgreen', edgecolor='black')
plt.title('Histogram with bins=6')
plt.xlabel('Value Range')
plt.ylabel('Frequency')

# Show the plots
plt.tight_layout()
plt.show()
```




Gateway Classes


Thank
you