What is Matplotlib?

**Matplotlib** is a Python library used to **create graphs and charts**.  
It helps us **visualize data** — like how you’d draw something on paper to understand it better.

How to Install Matplotlib

pip install matplotlib

Basic Structure

import matplotlib.pyplot as plt

x = [1, 2, 3, 4]

y = [10, 20, 25, 30]

plt.plot(x, y) # Create a line chart

plt.title("My First Chart")

plt.xlabel("X Axis")

plt.ylabel("Y Axis")

plt.show() # Show the chart

Types of Charts You Can Make

| **Chart Type** | **Function** | **Example** |
| --- | --- | --- |
| Line Chart | plt.plot() | Trends over time |
| Bar Chart | plt.bar() | Comparing categories |
| Pie Chart | plt.pie() | Showing percentages |
| Histogram | plt.hist() | Data distribution |
| Scatter Plot | plt.scatter() | Relationship between data |

Example 1: Bar Chart

import matplotlib.pyplot as plt

x = ['Math', 'Science', 'English']

y = [80, 70, 90]

plt.bar(x, y)

plt.title("Student Marks")

plt.xlabel("Subjects")

plt.ylabel("Marks")

plt.show()

Example 2: Pie Chart

import matplotlib.pyplot as plt

labels = ['Apple', 'Banana', 'Mango']

sizes = [30, 45, 25]

plt.pie(sizes, labels=labels, autopct='%1.1f%%')

plt.title("Fruit Popularity")

plt.show()

Example 3: Scatter Plot

import matplotlib.pyplot as plt

x = [1, 2, 3, 4, 5]

y = [10, 12, 20, 25, 30]

plt.scatter(x, y)

plt.title("My Scatter Plot")

plt.xlabel("X values")

plt.ylabel("Y values")

plt.show()

**🧠 Summary:**

* Use plt.plot() for line graph
* Use plt.bar() for bar chart
* Use plt.pie() for pie chart
* Always end with plt.show() to display the chart