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# 5.1 Matplotlib Overview & Setup

## Introduction

Matplotlib is an open‑source Python library for creating static, interactive and animated visualisations. It offers a MATLAB‑like plotting interface through the pyplot module and integrates well with other libraries such as NumPy and Pandas【98554664303776†L151-L182】.

## Key features

* Supports a wide variety of plots: line, bar, scatter, histogram, pie and more.
* Highly customisable: control colours, markers, line styles, fonts and layouts.
* Enables subplots for multiple charts within one figure.
* Exports figures to formats including PNG, PDF and SVG.
* Widely used in data science, machine learning and scientific computing.

## Setup

1. **Installation** – Install via pip install matplotlib.
2. **Importing** – In Python, import the plotting interface using import matplotlib.pyplot as plt.
3. **Creating a figure and axes** – Use plt.figure() or plt.subplots() to create a figure and axes before plotting.

## Example

Create a simple line plot of sales over time:

import matplotlib.pyplot as plt  
months = ['Jan','Feb','Mar','Apr']  
sales = [120, 150, 170, 160]  
plt.plot(months, sales)  
plt.xlabel('Month')  
plt.ylabel('Sales (₹)')  
plt.title('Monthly Sales')  
plt.show()

## Summary

Matplotlib provides flexible and powerful tools for data visualisation in Python. Its extensive customization options and integration with the scientific Python ecosystem make it a standard library in analytics【98554664303776†L151-L182】.

## Reflection questions

1. Why is Matplotlib widely used in the data science community?
2. How do you import Matplotlib in Python?
3. What are some advantages of using subplots?

## References