**KIDS & TEENS FREELANCING TRAINING INSTITUTE**

# MATPLOTLIB Course Outline

## Module 1: What is Matplotlib?

- Simple definition: Matplotlib is a Python library for creating charts and plots
- It helps you turn numbers into pictures that tell stories
- Real-life example: Showing your grades in a chart for better understanding
- Activity: Create a simple line plot of your favorite numbers

## Module 2: Types of Plots You Can Make

- Line plots, bar charts, histograms, and scatter plots
- Real-life example: Comparing the height of friends with a bar chart
- Why different plots are used for different types of data
- Activity: Draw different plots by hand before creating them with Matplotlib

## Module 3: Customizing Your Plots

- Adding titles, labels, legends, and gridlines
- Real-life example: Adding names to the bars on a bar chart
- How customizations make your plots clearer and more professional
- Activity: Customize a simple plot with title and labels

## Module 4: Advanced Plot Types

- Scatter plots, 3D plots, pie charts, and more
- Real-life example: Plotting the relationship between height and weight
- When to use each plot type for better insights
- Activity: Create a scatter plot to show data trends

## Module 5: Subplots and Multi-Plotting

- Creating multiple plots on the same figure
- Real-life example: Comparing two sets of data on one page
- How to use `subplot()` to organize your plots
- Activity: Create a multi-plot figure with 2 or more charts

## Module 6: Saving and Sharing Your Plots

- How to save your plots as images (PNG, JPG, etc.)
- Real-life example: Sharing your data results with a teacher or team
- Why saving plots helps keep a record of your work
- Activity: Save and share a plot you created earlier

## Module 7: Real-World Uses of Matplotlib

- Used in data analysis, finance, research, and AI
- Real-life example: Weather forecast charts or stock market trends
- Companies like Google and NASA use Matplotlib for visualization
- Activity: Use Matplotlib to visualize a real dataset (e.g., temperatures)

## Module 8: Matplotlib for Career Success

- Careers: Data Scientist, Analyst, Researcher, Software Developer
- Why every tech professional needs visualization skills
- Real-life example: Tech companies use visualization for quick decision-making
- Activity: Create a portfolio-worthy plot from a data story you want to tell

## Bonus Materials

- Sample datasets for plotting
- Code examples for different plot types
- Mini-projects to practice visualization
- Tips on improving plot aesthetics
- Certificate of Completion for Matplotlib