

## **Project Title: Matplotlib Library Introduction**

### **Members Duties:**

- Kevin: Coding/Info gathering
- Derian: Coding/Info gathering
- Abdullah: Info gathering/Visuals
- Labeeb: Info gathering/Visuals

### **Data Description:**

- Understand and explore one of the most powerful data visualization packages in Python. Provide information of Matplotlib's capabilities.

### **Project Components:**

- **Introduction:**
  - o History/development of the library?
  - o Comparision with other libraries?
- **Basic Plotting**
  - o Line plots, scatter plots, bar charts, histograms
  - o Customizing plot elements like colors, markers, line styles
  - o Adding titles, labels, and legends
  - o Working with multiple subplots
- **Intermediate Visualization Techniques**
  - o 3D plotting
  - o Image processing with Matplotlib
  - o Statistical visualizations
  - o Time series data visualization?
- **Advanced Features**
  - o Animation capabilities
  - o Interactive plots
  - o Custom visualization styles and themes
- **Practical Applications**
  - o Real-world visualization case studies?
  - o Integration with Numpy and Pandas

- Maybe best practices and design principles?
- **Project Implementation?**
  - Sample datasets for visualization exercises
  - Code examples with explanations

### **Goals:**

- Understand the Matplotlib interface
- Applying visualization techniques to different data types
- Creating high quality visualizations
- Customizing plots for specific communication needs

### **Potential Visualization of the Data:**

- We are creating a mock dataset that simulates some fictional companies over 20 years. The dataset contains these categories:
  - year: from 2000 to 2020
  - company: make up fictional company names
  - revenue: yearly revenue in millions
  - employees: number of employees
  - growth rate: simulated annual growth rate
- We will use matplotlib to make:
  - Line Plots – revenue trends over time
  - Bar Charts – comparing employee counts in the latest year
  - Scatter Plots – revenue vs. growth rate analysis
  - Stacked Area Charts – visualizing revenue share by company
  - Subplots – comparing companies side by side