4-Week Plan for Weather Data Analysis Project

# Week 1: Data Collection & Preprocessing

Goals:

• Collect the weather dataset from publicly available sources (CSV, Excel, or API).  
• Load the dataset into Python using Pandas.  
• Handle missing data (removal or imputation).  
• Convert data types (e.g., date columns to datetime).  
• Clean and normalize data for further analysis.

Tasks:

• Research and choose the dataset.  
• Perform data cleaning using Pandas.  
• Check for missing or outlier values and address them.  
• Ensure proper formatting of the dataset.

# Week 2: Exploratory Data Analysis (EDA)

Goals:

• Perform descriptive statistics on weather parameters (temperature, humidity, wind speed, etc.).  
• Use Pandas and NumPy to summarize the data.  
• Explore distributions of the weather variables.

Tasks:

• Calculate descriptive statistics (mean, median, variance) using NumPy.  
• Analyze the relationships between different weather variables.  
• Perform initial analysis of seasonal and time-based trends.

# Week 3: Data Visualization

Goals:

• Create clear visualizations of weather data trends and patterns using Matplotlib.  
• Plot temperature variations, precipitation trends, and other weather parameters over time.

Tasks:

• Create line plots for temperature trends.  
• Visualize relationships between variables using scatter plots and bar charts.  
• Generate boxplots for variability in weather conditions.  
• Prepare a heatmap to show correlation between variables.

# Week 4: Insights & Final Report

Goals:

• Derive insights from the visualizations and statistical analysis.  
• Compile findings into a report or presentation.

Tasks:

• Analyze key trends and significant findings from the data.  
• Document any correlations between temperature, humidity, precipitation, etc.  
• Write the final report, including all steps, visualizations, and insights.  
• Prepare and present the results.