Weather Analysis Project Report

# 1. Aim

The main aim of the project is to perform comprehensive data analysis on historical weather data to uncover patterns, trends, and insights using Python and relevant data science libraries.

# 2. Key Focus Areas

- Data Acquisition & Cleaning: Importing weather datasets and handling missing or inconsistent values.

- Exploratory Data Analysis (EDA): Visualizing temperature trends, rainfall, humidity, and other meteorological parameters.

- Statistical Analysis: Calculating averages, standard deviations, and identifying outliers.

- Temporal Patterns: Analyzing changes over months, seasons, and years.

- Correlation Analysis: Investigating relationships between variables like temperature and humidity.

- Visualization: Creating informative plots using matplotlib and seaborn for intuitive understanding.

# 3. Objectives

- Understand the structure and characteristics of the weather dataset.

- Identify seasonal weather variations.

- Discover correlations between different meteorological variables.

- Generate visual insights for easier interpretation of complex data.

- Provide a foundation for further predictive modeling (e.g., forecasting).

# 4. Tools and Libraries Used

- Python: Main programming language.

- Pandas: For data manipulation and analysis.

- NumPy: For numerical operations.

- Matplotlib & Seaborn: For data visualization.

- Google Colab: Development environment.

# 5. Expected Output

- Cleaned and processed weather dataset.

- Graphs showing temperature trends, rainfall distribution, humidity levels, etc.

- Statistical summary tables.

- Correlation heatmaps.

- Insights on how weather parameters interact and change over time.

