TITLE

Weather Dashboard

**1. Problem Statement:**

* **Aggregating weather data** from reliable sources (APIs) to ensure real-time and accurate information.
* **Providing easy-to-understand visualizations** such as temperature trends, humidity levels, precipitation patterns, and wind speeds.
* **Offering location-based forecasts** to make the dashboard personalized and relevant.
* **Supporting decision-making** for daily activities, travel planning, and agriculture-related tasks.

**2. Objective**

• The objective of this project is to **develop an interactive Weather Dashboard** that provides real-time and historical weather information to users in a simple and visually appealing manner. Despite the availability of multiple weather services, users often face challenges in **quickly accessing accurate weather data, comparing forecasts across days, or visualizing trends** in temperature, humidity, rainfall, and other weather parameters.

**3. Data Description**

• Source: Weather API

• Key Features: Country, City, local time, temperature, condition, wind speed

**4. Methodology**

• Tools: Python (Pandas, pymysql, Requests, time, Matplotlib, Seaborn), MySQL, Power BI

• Steps: Fetch data→ Data Cleaning → Exploratory Data Analysis → Visualization → Insights → Recommendations →Conclusion → Future Scope

**5. Exploratory Data Analysis (EDA)**

• Calculated basic statistics: mean, median, min, max, standard deviation for temperature, humidity, wind speed

• temperature trends over time

• humidity distribution across different cities

• wind speed variations

• Correlation Analysis

**6. Insights**

* Temperature and humidity show clear seasonal trends.
* Certain locations show higher wind speeds and precipitation, signaling potential alerts for storms or heavy rain.
* Weather conditions vary significantly between cities even in the same country.
* Negative correlation between temperature and humidity in some regions.

**7. Recommendations**

* Add alerts for extreme weather conditions (storm, heavy rain, heatwaves).
* Incorporate local events (festivals, sports events) to correlate with weather impact.
* Include **daily tips or advisories** based on weather (e.g., carry umbrella, sunscreen).

**8. Conclusion**

The Weather Dashboard project successfully aggregates real-time and historical weather data to provide actionable insights for users. Through EDA, patterns in temperature, humidity, wind, and precipitation were identified, enabling informed decision-making for daily activities, travel, and agriculture. Visualizations make the data intuitive, while correlations and trends highlight the predictive potential of weather parameters.

**9. Future Scope**

* Machine Learning Integration.
* Incorporate multiple weather APIs for improved accuracy and reliability.