REPORT ON WEATHER CLASSIFICATION DASHBOARD

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1. **Problem Statement**
   The primary goal of this analysis is to classify weather patterns based on key environmental factors such as temperature, humidity, wind speed, and cloud cover. The insights will help stakeholders understand the distribution of weather types across different seasons and locations for better planning and forecasting.

2. **Data Requirement**
   The dataset contains the following attributes:

   Temperature: Recorded in degrees Celsius.

   Humidity: Measured as a percentage.

   Wind Speed: Recorded in kilometers per hour.

   Precipitation (%): Likelihood of precipitation.

   Cloud Cover: Categorical value indicating weather conditions like "partly cloudy," "clear," or "overcast."

   Atmospheric Pressure: Measured in hPa.

   UV Index: Scale representing ultraviolet exposure levels.

   Season: Seasonal classification (e.g., Winter, Spring).

   Visibility (km): Measured distance of visibility.

   Location: Broad geographical categories (e.g., inland, mountain).

   Weather Type: Categorical value (e.g., Sunny, Rainy).

3. **Data Collection**
   The dataset was provided as a pre-compiled source file in .csv format, ensuring all relevant weather features were captured systematically.

4. **Data Validation**
   The dataset underwent initial validation for completeness and consistency. All

columns had non-null values, indicating no missing data. Data types align with expectations, and categorical values are consistent across entries.

5. **Data Cleaning**
No cleaning steps were required, as the dataset was already well-structured and free from anomalies.

6. **Tools Used in Power BI**
The following features were utilized in Power BI:

   Data Modeling: Relationships between categorical variables like Season and Weather Type were modeled.

   Visualizations: Used bar charts, scatter plots, and slicers for dynamic filtering.

   DAX Functions: Created measures for averages, maximums, and seasonal trends.

   Filters and Interactivity: Enabled detailed drill-downs and location-based segmentation.

7. **Dashboard Overview**
The dashboard visualizes the interplay between temperature, humidity, and weather type across seasons and locations. Key insights include:

   The correlation between atmospheric pressure and precipitation.

   Seasonal trends in UV Index and cloud cover.

   Regional variations in weather conditions, highlighting differences in inland vs. coastal areas.

8. **Storytelling**
The data reveals the following narrative:

   Weather variability is strongly seasonal, with winter predominantly marked by higher precipitation percentages and lower temperatures.

   Coastal regions experience clearer visibility and consistent atmospheric pressure, while mountain locations often report overcast conditions and higher UV Indexes.

The highest frequency of "Sunny" weather types aligns with Spring, making it a favorable season for outdoor activities.

Rainfall patterns are tied to humidity levels exceeding 70% across all locations, emphasizing the role of moisture in precipitation prediction.

The dashboard enables stakeholders to make informed decisions on resource allocation, event planning, and climate adaptation strategies.