**CAPSTONE PROJECT**

**WEATHER ANALYSIS**

**PROBLEM STATEMENT**

Analyse weather trends, seasonal variations, and correlations between weather attributes. Use Excel and SQL to gain insights and their impact. Develop a Power BI dashboard for weather monitoring and historical weather analysis.

I was given with the required data.

* City\_Attributes
* Humidity
* Pressure
* Temperature
* Weather\_Description
* Wind\_direction
* Wind\_speed

Each Data has its own descriptions and the purpose of those particular datasets.

Weather analysis involves the examination and interpretation of meteorological data to understand and predict atmospheric conditions. Meteorologists use a variety of tools and techniques to analyse the weather, ranging from traditional methods to sophisticated computer models.

**MECE APPROACH**

**About MECE**

MECE stands for **M**utually **E**xclusive **C**ollectively **E**xhaustive. It is often used to breakdown the complex problems into smaller sub-problems.

Here’s the breakdown of MECE

1. **Mutually Exclusive (ME)-**

This means that the categories or elements being considered do not overlap. Each item or option should fit into only one category, and there should be no ambiguity about where each item belongs.

1. **Collectively Exhaustive (CE):**

This means that the categories or elements considered together cover all possibilities without any gaps. There should be no omitted or unaccounted-for options.

* By applying the MECE framework, analysts and decision-makers can organize information in a structured and comprehensive manner.
* Reducing the risk of overlooking important factors and ensuring a clear understanding of the problem or situation at hand.
* This approach is valuable in breaking down complex problems into manageable components and facilitating more effective decision-making.

MECE breakdown for analysing the weather includes data on City, Humidity, Temperature, Pressure, Weather Description, Wind Direction, Wind Speed.

1. **Data Collection and Cleaning(Transforming)-**

* Collecting the Data from the given Sources based on the City Fields.
* Cleaning the Data, Like handing with Null Values and Missing Values, Changing of the datatypes to actual ones (if needed).

1. **Data Analysis-**

**Weather Trend Analysis-**

* Humidity Analysis: Analysing the humidity level over a time in each city, by considering the hourly pattern of the data.
* Pressure Analysis- examine the hourly air pressure in each city.
* Temperature Analysis – Investigate the hourly temperature pattern across all the cities.
* Wind Direction Analysis- Analyse the direction of wind passes through in degrees.
* Wind Speed Analysis- Assessing the Wind Speed per hour in each city. It usually measures in KMPH (Kilometre per Hour).
* Weather Description Analysis- here analysing qualitative aspects of the data on hourly basis for each city.

**Seasonal Variations Analysis-**

This Seasonal Variations are nothing but the difference or the variation among different seasons in each city. It will help to know about the patterns in all the seasons by considering the different attributes.

**Correlation Analysis-**

Analysing the relation between the attributes to know about how one attribute is corelated with another attribute. This will help us to know about the relation between attributes. Preferably it can be performed among the numeric data type attributes.

1. **Developing a Power Bi Dash Board-**

In this step all the analysis part will be taken into the consideration and integrate it into a power bi. Then, performing the analysis part into different types of Visualisations.

It includes the following steps.

1. Importing the data (cleaned)
2. Creating a data model.
3. Performing all the Analysis Part with the suitable Visualisations

* Weather Trend analysis.
* Seasonal Variation Analysis
* Correlation Analysis

1. **Making the insights Decisions from the final Dashboard.**