

# **PM ACCELERATOR:**

## **Our Mission:**

**By making industry-leading tools and education available to individuals from all backgrounds, we level the playing field for future PM leaders. This is the PM Accelerator motto, as we grant aspiring and experienced PMs what they need most—access. We introduce you to industry leaders, surround you with the right PM ecosystem, and discover the new world of AI product management skills.**

# Weather Data Analysis and Forecasting Report:

## Introduction:

This project involves analysing and forecasting weather data, focusing on **temperature and precipitation trends**. The workflow includes **data cleaning, exploratory data analysis (EDA), model building, and evaluation** to predict future weather conditions.

## Data Cleaning & Preprocessing

### Handling Missing Values :

- Checked for missing values using `df.isnull().sum()`.
- Missing values in numerical columns were **imputed with median values**.
- Categorical missing values (if any) were **filled with mode**.

### Handling Outliers :

- **Boxplots** revealed outliers in **temperature and precipitation**.
- **Capping method (1st and 99th percentile)** was applied.
- **Log transformation** was suggested for precipitation due to high skewness.

## Exploratory Data Analysis (EDA)

### Trend Analysis :

- Plotted time series graphs of **temperature and precipitation**.
- Identified seasonal and long-term trends.

### Correlation Analysis :

- Correlation matrix showed relationships between weather variables.
- Temperature had a **strong inverse relationship** with precipitation.

## Visualizations :

- **Boxplots** for detecting outliers.
- **Line plots** for temperature and precipitation trends.
- **Histograms** for distribution analysis.

## Model Building & Forecasting

### Time Series Forecasting Model :

- Used **Exponential Smoothing (Holt-Winters)** for forecasting.
- The **lastupdated** feature was used for time-based predictions.

### Model Evaluation :

- Metrics used:
  - **Mean Absolute Error (MAE)**
  - **Mean Squared Error (MSE)**
  - **Root Mean Squared Error (RMSE)**
- Forecasting accuracy was evaluated with these metrics.