Tech Assessment: Weather Trend Forecasting

Objective

Analyze the "Global Weather Repository.csv" dataset to forecast future weather trends and showcase data science skills through both basic and advanced techniques. This dataset provides Daily weather information for cities around the world. This dataset offers a comprehensive set of features that reflect the weather conditions worldwide. It includes over 40 features.

Note: You can choose between completing the basic or advanced assessments. Showcasing advanced analyses can reflect a higher level of skill, but fulfilling either set of requirements is acceptable.

Dataset

- The dataset is available on the Kaggle website.
  World Weather Repository:
  https://www.kaggle.com/datasets/nelgiriyewithana/global-weather-repository/code

Assessment Details

Basic Assessment

Data Cleaning & Preprocessing

- Handle missing values, outliers, and normalize data.

Exploratory Data Analysis (EDA)

- Perform basic EDA to uncover the trends, correlations, and patterns.
- Generate visualizations for temperature and precipitation.

Model Building

- Build a basic forecasting model and evaluate its performance using different metrics.
- Use lastupdated feature for the time series analysis.

Advanced Assessment

Advanced EDA

- Implement anomaly detection to identify and analyze outliers.

Forecasting with Multiple Models

- Build and compare multiple forecasting models

- Create an ensemble of models to improve forecast accuracy.

Unique Analyses

- Climate Analysis: Study long-term climate patterns and variations in different regions.
- Environmental Impact: Analyze air quality and its correlation with various weather parameters.
- Feature Importance: Apply different techniques to assess feature importance.
- Spatial Analysis: Analyze and visualize geographical patterns in the data.
- Geographical Patterns: Explore how weather conditions differ across countries and continents.

Deliverable:

- Display the PM Accelerator mission on the report/presentation/dashboard. You can find it on the website.
- Create a simple report or presentation that includes all analyses, model evaluations, and visualizations.
- Explain the data cleaning, EDA, forecasting models, advanced analyses, and insights in a well-organized format.
- Submit the report or presentation in a Github repository or project folder. Include a detailed `README.md` or equivalent documentation explaining the project, methodology, and results.
- Share the link to the repository or project folder by the submission deadline.