**Product Demand Forecasting**

**Project Overview**

This project aims to forecast product demand using machine learning techniques. The dataset has been provided by Team DecodeX, and various preprocessing, exploratory data analysis (EDA), and predictive modeling techniques have been applied to derive insights and make accurate predictions.

**Folder Structure**

**1. Problem Statement**

* **05 Product Demand Forecasting**: Contains the problem statement and project guidelines.

**2. Datasets**

* **CPMNT.csv**: Raw dataset for component-level details.
* **CPASF.csv**: Raw dataset for sales and forecasting.
* **SCHEME DETAILS.xlsx**: Raw dataset for scheme details.
* **Cleaned\_CPMNT.csv**: Preprocessed version of CPMNT.csv.
* **Cleaned\_CPASF.csv**: Preprocessed version of CPASF.csv.
* **Cleaned\_Scheme\_Details.csv**: Preprocessed version of SCHEME DETAILS.xlsx.
* **Final\_Merged\_Dataset.csv**: Fully processed and merged dataset combining all three.

**3. Notebooks**

* **clean.ipynb**: Code for cleaning and preprocessing different datasets.
* **data.ipynb**: Additional data preprocessing and handling.
* **eda.ipynb**: Exploratory Data Analysis (EDA) to understand data distributions and trends.
* **trail.ipynb**: Trial notebook for testing different machine learning models.
* **model.ipynb**: Main notebook containing the final predictive model for demand forecasting.

**4. PowerBI Dashboard**

* **Team\_Duo\_Dashboard.pbix**: PowerBI dashboard showcasing data visualizations and insights.

**5. Project Documentation**

* **Team\_Duo\_PPT.pptx**: Presentation summarizing the project.
* **Team\_Duo\_Report.pdf**: Detailed project report covering methodology, analysis, and results.

**How to Use**

1. **Data Preprocessing**: Run clean.ipynb and data.ipynb to preprocess raw data.
2. **Exploratory Data Analysis**: Use eda.ipynb to analyze data and derive insights.
3. **Model Training & Testing**: Utilize trail.ipynb to experiment with models, then finalize with model.ipynb.
4. **Dashboard & Presentation**:
   * Open Team\_Duo\_Dashboard.pbix in PowerBI for visualizations.
   * Review Team\_Duo\_PPT.pptx and Team\_Duo\_Report.pdf for project documentation.

**Requirements**

* Python (Recommended: 3.8+)
* Jupyter Notebook
* Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn
* PowerBI (for dashboard visualization)

**Contributors**

**Team Duo**