Product Demand Prediction

# INTRODUCTION

This table gives the break-up of the population by their economic activity status as 'main workers', 'marginal workers', 'non-workers' and 'marginal and non-worker' seeking/available for work cross classified with educational level and sex. This table gives the data for India/States/ UTs./Districts and City. This table is separate for SCs upto District level. It allows organizations to make informed decisions related to inventory levels, procurement, pricing, and marketing strategies.

DATASET

The data is obtained from [**https://tn.data.gov.in/catalog/marginal-workers-classified-age-industrial-category-and-sex-census-2011-india-and-states**](https://tn.data.gov.in/catalog/marginal-workers-classified-age-industrial-category-and-sex-census-2011-india-and-states)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table Code | State Code | District Code | Area Name | Total/ Rural/ Urban | Age group |
| B0806SC | `33 | `000 | State - TAMIL NADU | Total | Total |
| B0806SC | `33 | `000 | State - TAMIL NADU | Total | `5-14 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Total | 15-34 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Total | 35-59 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Total | 60+ |
| B0806SC | `33 | `000 | State - TAMIL NADU | Total | Age not stated |
| B0806SC | `33 | `000 | State - TAMIL NADU | Rural | Total |
| B0806SC | `33 | `000 | State - TAMIL NADU | Rural | `5-14 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Rural | 15-34 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Rural | 35-59 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Rural | 60+ |
| B0806SC | `33 | `000 | State - TAMIL NADU | Rural | Age not stated |
| B0806SC | `33 | `000 | State - TAMIL NADU | Urban | Total |
| B0806SC | `33 | `000 | State - TAMIL NADU | Urban | `5-14 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Urban | 15-34 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Urban | 35-59 |
| B0806SC | `33 | `000 | State - TAMIL NADU | Urban | 60+ |
| B0806SC | `33 | `000 | State - TAMIL NADU | Urban | Age not stated |
| B0806SC | `33 | `602 | District - Thiruvallur | Total | Total |
| B0806SC | `33 | `602 | District - Thiruvallur | Total | `5-14 |

# COLUMNS USED

From Product demand .csv data the following columns are used

TABLE CODE

STATE CODE

DISTRICT CODE

AREA NAME

AGE GROUP

# LIBRARIES USED

The Python 3 environment comes with many helpful analytics libraries installed and several helpful packages to load.

The essential libraries used in this project are :

* Importing OS (for kaggle inputs)
* Numpy and Pandas libraries
* Matplotlib
* Seaborn

# TRAIN AND TEST

Training the dataset by describe(), isnull().sum(), drop(), show(), and by using Linear Regression algorithm we train the data

Testing the data by importing sklearn.linear\_modal from Linear Regression with ensuring the plot range and axis labels producing the values, scattering the data by mean\_absolute\_error and producing 3D plot.

# REST OF THE EXPLANATIONS

## Data Collection

The process involves gathering products data, which includes information about their purchase history, demographics, and interaction patterns.

## Data Preprocessing

The task involves preparing and cleaning data, handling missing values, and converting categorical features into numerical representations.

## Feature Engineering

Data preparation and cleaning, handling missing values, and the transformation of categorical features into numerical representations are all part of the task.

Modal Evaluation

Evaluate the model's performance on the test set using appropriate evaluation metrics. Common metrics for demand prediction include Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and Mean Absolute Percentage Error (MAPE).

# ALGORITHMS USED

Apply clustering algorithms like K-Means, DBSCAN, or hierarchical clustering to segment customers.

Visualization: Visualize the customer segments using techniques like scatter plots, bar charts, and heatmaps. Interpretation: Analyze and interpret the characteristics of each customer segment to derive actionable insights for marketing strategies.

# DESIGN AND DATAFLOW

1.Physical data flow diagram:



