

# PROJECT OBJECTIVE

TEAM ID	PNT2022TMID45520
PROJECT NAME	AI POWERED FOOD DEMAND FORECASTER

## DemandEst - AI powered Food Demand Forecaster

### 1. Project Description:

A food delivery service has to deal with a lot of perishable raw materials which makes it all, the most important factor for such a company is to accurately forecast daily and weekly demand. Too much inventory in the warehouse means more risk of wastage, and not enough could lead to out-of-stocks - and push customers to seek solutions from your competitors. The replenishment of majority of raw materials is done on weekly basis and since the raw material is perishable, the procurement planning is of utmost importance, the task is to predict the demand for 10 weeks

The main aim of this project is to create an appropriate machine learning model to forecast the number of orders to gather raw materials for next ten weeks. To achieve this, we should know the information about of fulfilment center like area, city etc., and meal information like category of food sub category of food price of the food or discount in particular week. By using this data, we can use any classification algorithm to forecast the quantity for 10 weeks. A web application is built which is integrated with the model built.

### 2 .Linear Regression:

It is way technique which uses a Bayesian network for the aim of machine learning. We formulate linear regression using probability distributions instead of point estimates. The anticipated value of the variable is completed by the very best probability value of distribution of unobserved variables against observed variables. The conditional dependencies are often expressed in sort of a graph or data structure using this probabilistic model. It's mainly defined by three variables: conditional probability, variate variable and conditional dependency condition between random variables.

Description:- Predicting the age of abalone from physical measurements. The age of abalone is determined by cutting the shell through the cone, staining it, and counting the number of rings through a microscope -- a boring and time-consuming task. Other measurements, which are easier to obtain, are used to predict age. Further information, such as weather patterns and location (hence foodavailability) may be required to solve the problem.

### Attribute Information:

Given is the attribute name, attribute type, measurement unit, and a brief description. The number of rings is the value to predict: either as a continuous value or as a classification problem.

Name / Data Type / Measurement Unit / Description

- 1- Sex / nominal / -- / M, F, and I (infant)
- 2- Length / continuous / mm / Longest shell measurement
- 3- Diameter / continuous / mm / perpendicular to length
- 4- Height / continuous / mm / with meat in shell
- 5- Whole weight / continuous / grams / whole abalone
- 6- Shucked weight / continuous / grams / weight of meat
- 7- Viscera weight / continuous / grams / gut weight (after bleeding)
- 8- Shell weight / continuous / grams / after being dried
- 9- Rings / integer / -- / +1.5 gives the age in years

Building a Regression Model

1. Download the dataset: Dataset
2. Load the dataset into the tool.
3. Perform Below Visualizations.
  - Univariate Analysis
  - Bi-Variate Analysis
  - Multi-Variate Analysis
4. Perform descriptive statistics on the dataset.
5. Check for Missing values and deal with them.
6. Find the outliers and replace them outliers
7. Check for Categorical columns and perform encoding.
8. Split the data into dependent and independent variables.
9. Scale the independent variables
10. Split the data into training and testing
11. Build the Model

12. Train the Model
13. Test the Model
14. Measure the performance using Metrics.

### **3 . Data pre processing:**

Data preprocessing, a component of data preparation, describes any type of processing performed on raw data to prepare it for another data processing procedure.

1. Import the Libraries.
2. Reading the dataset.
3. Exploratory Data Analysis
4. Checking for Null Values.
5. Reading and merging .csv files
6. Dropping the columns
7. Label Encoding
8. Data Visualization.
9. Splitting the Dataset into Dependent and Independent variable
10. Splitting Data into Train and Test

### **4 . Clustering algorithms :**

Clustering algorithms can be divided in two main families: hierarchical and partitional (or commonly referred as K-means) clustering techniques (Karypis et al., 2000).

- Hierarchical Clustering: production of a nested sequence of partitions which at the highest level presents a single cluster comprehensive of all N time series and, at the lowest level, singleton clusters (formed by a single time series). Each of the intermediate level is formed either splitting clusters from higher levels (divisive approach) or agglomerating clusters from lower levels (agglomerative approach). The nested partitions can be graphically represented by a dendrogram, which can be then employed by the user to decide how to conduct the necessary action of selecting the preferred clustering level. The dendrogram (of which an example is reported in Fig. 2), in fact, qualitatively shows the number and the enclosed dissimilarity related to each clustering level, thus being a key tool to select the appropriate level for the application considered.

#### **Problem Statement**

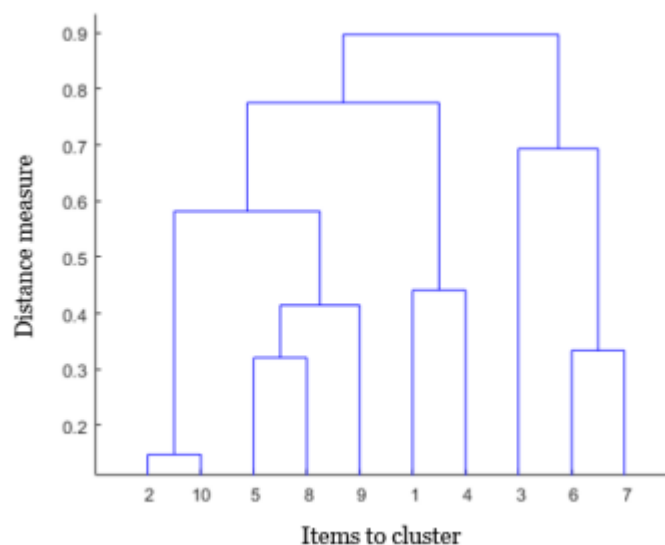
You own the mall and want to understand the customers who can quickly converge [Target Customers] so that the insight can be given to the marketing team and plan the strategy accordingly.

### **Perform the below Tasks to complete the assignment:-**

Clustering the data and performing classification algorithms

1. Download the dataset: Dataset
2. Load the dataset into the tool.
3. Perform Below Visualizations.

- Univariate Analysis
  - Bi- Variate Analysis
  - Multi-Variate Analysis
4. Perform descriptive statistics on the dataset.
  5. Check for Missing values and deal with them.
  6. Find the outliers and replace them outliers
  7. Check for Categorical columns and perform encoding.
  8. Scaling the data
  9. Perform any of the clustering algorithms
  10. Add the cluster data with the primary dataset
  11. Split the data into dependent and independent variables.
  12. Split the data into training and testing
  13. Build the Model
  14. Train the Model
  15. Test the Model
  16. Measure the performance using Evaluation Metrics.



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## **5. Python flask:**

Flask is a lightweight Python web framework that provides useful tools and features for creating web applications in the Python Language. It gives developers flexibility and is an accessible framework for new developers because you can build a web application quickly using only a single Python file.

### **Step 1 : Installing Flask**

In this step, you'll activate your Python environment and install Flask using the pip package installer.

First, activate your programming environment if you haven't already:

```
source env/bin/activate
```

### **Step 2 : Creating a Simple Application**

Now that you have your programming environment set up, you'll start using Flask. In this step, you'll make a small Flask web application inside a Python file, in which you'll write HTML code to display on the browser.

In your `flask_app` directory, open a file named `app.py` for editing, use `nano` or your favorite text editor:

```
from flask import Flask
```

```
app = Flask(__name__)
```

```
@app.route('/')
```

```
def hello():
```

```
    return '<h1>Hello, World!</h1>'
```

