

# Product Demand Prediction with Machine Learnings

## Problem Statement:

Create a machine learning model that forecasts product demand based on historical sales and external factors, helping businesses optimize inventory management and production planning to meet customer needs efficiently.

## Problem Definition:

The problem is to create a machine learning model that forecasts product demand based on historical sales data and external factors. The goal is to help businesses optimize inventory management and production planning to efficiently meet customer needs. This project involves data collection, data preprocessing,

feature engineering, model selection, training, and evaluation.

## Design Thinking:

1. Data Collection: Collect historical sales data and external factors that influence demand, such as marketing campaigns, holidays, economic indicators, etc.
2. Data Preprocessing: Clean and preprocess the data, handle missing values, and convert categorical features into numerical representations
3. Feature Engineering: Create additional features that capture seasonal patterns, trends, and external influences on product demand.
4. Model Selection: Choose suitable regression algorithms (e.g., Linear

Regression, Random Forest, XGBoost) for demand forecasting.

5. Model Training: Train the selected model using the preprocessed data.

Evaluation: Evaluate the model's performance using appropriate regression metrics (e.g., Mean Absolute Error, Root Mean Squared Error).

## Product Demand Prediction :

A product company plans to offer discounts on its product during the upcoming holiday season. The company wants to find the price at which its product can be a better deal compared to its competitors. For this task, the company provided a dataset of past changes in sales based on price changes. You need to train a model that can predict the demand for the product in the market with different price segments.

The dataset that we have for this task contains data about:

- 1.The product id
- 2.Store id
- 3.Total price at which product was sold
- 4.Base price at which product was sold
- 5.Units sold (quantity demanded)