**PRODUCT DEMAND PREDICTION USING MACHINE LEARNING**

**Problem Definition:**

Product demand prediction is the process of estimating the future demand for a product or service. It is a critical task for businesses of all sizes, as it helps to optimize inventory levels, pricing, and marketing campaigns.

Traditionally, demand forecasting has been done using statistical methods. However, in recent years, machine learning has emerged as a powerful tool for demand prediction. Machine learning algorithms can learn from historical data to identify patterns and trends that can be used to predict future demand.

**DESIGN THINKING:**

To build Product Demand Prediction using Machine Learning we need to install some packages and they are:

* NumPy
* Pandas
* Matplotlib

· Scikit Learn

Dataset is taken from <https://www.kaggle.com/code/dcarrera/product-demand-prediction/datset>**.**

Since the data in the dataset is the raw data, it needs to undergo the following stages:

* **Data Collection:**

Data has to be collected from various sources to form a dataset. The dataset should contain some medical details or features such as glucose levels, ages, pressure, BMI etc.

* **Data Preprocessing or cleaning and Visualization:**

Since the dataset is collected from various sources it may consist of duplicates, nullable and Irrelevant data. So, data needs to be cleaned, normalized, replacing the nullable values with standard values etc. Once the data is cleaned it can be used to prepare for training.

* **Feature Selection:**

We need to select relevant features like glucose levels, ages, pressure, BMI etc. that can cause diabetics.

**Model Selection:**

We are going to build the model using various algorithms like:

* Logistic Regression
* Support Vector Machine
* KNN
* Random Forest Classifier
* Naivye Bayes
* Gradient Boosting

**Evaluation:**

We will evaluate the model's performance using metrics like:

* Accuracy Score
* ROC AUC Curve
* Cross Validation
* Confusion Matrix

**Iterative Improvement:**

We will fine-tune the model parameters and explore techniques like feature engineering to enhance prediction accuracy.