

1. A bank wants to predict whether a loan applicant will default based on credit score, income, and past loan history. What type of ML problem is this, and what steps would you take to solve it?

## **Predict Loan Default**

### **Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning**.

### **Problem type:**

Classification because the prediction output is categorized value.

### **Step by step logic:**

#### **Collect the Data**

Gather the data related to loan applicant credit score, income and past loan history.

#### **Preprocess Data**

Handle the missing values, nan values, outlier.

#### **Split the Dataset**

Split the dataset into training set, testing set.

#### **Choose the Algorithm**

Select any one Classification Algorithm based on the scenario like Random Forest Classifier, K-Nearest Neighbour.

#### **Train the Model**

Fit the model on training set.

#### **Evaluate Performance**

Use Evaluation Matrices like Confusion Matrix, Recall, F1-Measure.

#### **Make Predictions**

Use the Model we can make prediction for loan applicant

2. A retail store wants to predict the demand for different products to optimize inventory levels. What type of ML problem is this, and what steps would you take to solve it?

## **Enhance the Products Inventory Level**

**Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning**.

**Problem type:**

**Regression** because the prediction output (demand) is numerical.

**Step by step logic:****Collect the Data**

Gather the data related to product name, sales details of each product.

**Preprocessing Data**

Handle the missing values, nan values, Finding outlier.

**Split the Dataset**

Split the dataset into training set, testing set.

**Choose the Algorithm**

Select any one Regression Algorithm based on the scenario like Multiple Linear Regression, Support Vector Machine.

**Train the Model**

Fit the model on training set.

**Evaluate Performance**

Use Evaluation Matrices like  $R^2$  value, Root Mean Square Error.

**Make Predictions**

Use the Model we can make prediction for demand of each product.

3. A factory wants to detect whether a manufactured product is defective based on sensor readings and quality control data. What type of ML problem is this, and what steps would you take to solve it?

**Predict the product is defective or not****Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning**.

**Problem type:**

Classification because the prediction output is categorized value.

### **Step by step logic:**

#### **Collect the Data**

Gather the data related to manufactured product.

#### **Preprocess Data**

Handle the missing values, nan values, Finding outlier.

#### **Split the Dataset**

Split the dataset into training set, testing set.

#### **Choose the Algorithm**

Select any one Classification Algorithm based on the scenario like Random Forest Classifier-Nearest Neighbour .

#### **Train the Model**

Fit the model on training set.

#### **Evaluate Performance**

Use Evaluation Matrices like Confusion Matrix, Recall, F1-Measure.

#### **Make Predictions**

Use the Model we can make prediction for defective product.

4. A healthcare provider wants to analyze patient symptoms and classify them into different disease categories. What type of ML problem is this, and what steps would you take to solve it?

### **Classifying Medical Diagnoses**

#### **Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning**.

#### **Problem type:**

Classification.

### **Step by step logic:**

#### **Collect the Data**

Gather the data related to patient disease, symptoms.

#### **Preprocess Data**

Handle the missing values, nan values, Finding outlier.

#### **Split the Dataset**

Split the dataset into training set, testing set.

**Choose the Algorithm**

Select any one Classification Algorithm based on the scenario like Random Forest Classifier-Nearest Neighbour .

**Train the Model**

Fit the model on training set.

**Evaluate Performance**

Use Evaluation Matrices like Confusion Matrix, Recall, and Precision-.

**Make Predictions**

Use the Model we can make prediction for patient disease.

5. An e-commerce company wants to identify and remove fake reviews posted by bots or fraudsters. What type of ML problem is this, and what steps would you take to solve it?

**Detect the Fake Review****Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning.**

**Problem type:**

Classification.

**Step by step logic:****Collect the Data**

Gather the data relevant to fake and real reviews.

**Preprocess Data**

Removing unwanted character, Handling emojis.

**Split the Dataset**

Split the dataset into training set, testing set.

**Choose the Algorithm**

Select any one Classification Algorithm based on the scenario like Logistic Regression, Decision Tree .

**Train the Model**

Fit the model on training set.

**Evaluate Performance**

Use Evaluation Matrices like Confusion Matrix, Recall, and Precision.

## **Make Predictions**

Use the Model we will spot fake reviews .

6. A financial firm wants to predict stock price movements based on historical price data and market indicators. What type of ML problem is this, and what steps would you take to solve it?

### **Predict Stock Price in Stock Market**

#### **Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning**.

#### **Problem type:**

Regression.

#### **Step by step logic:**

##### **Collect the Data**

Gather the data relevant stock. eg stock name, historical price data and market indicators.

##### **Preprocessing Data**

Handle the missing values.

##### **Split the Dataset**

Split the dataset into training set, testing set.

##### **Choose the Algorithm**

Select any one Regression Algorithm based on the scenario like Multiple Linear Regression, Support Vector Machine.

##### **Train the Model**

Fit the model on training set.

##### **Evaluate Performance**

Use Evaluation Matrices like  $R^2$  value, Root Mean Square Error.

##### **Make Predictions**

We predict the price for each stock.

7. A social media platform wants to detect fake user accounts based on user activity and profile data. What type of ML problem is this, and what steps would you take to solve it?

### **Detect Fake User Account**

**Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning**.

**Problem type:**

Classification.

**Step by step logic:****Collect the Data**

Gather the data relevant to user activity and user profile data.

**Preprocess Data**

Removing unwanted character.

**Split the Dataset**

Split the dataset into training set, testing set.

**Choose the Algorithm**

Select any one Classification Algorithm based on the scenario like Logistic Regression, Decision Tree Classifier.

**Train the Model**

Fit the model on training set.

**Evaluate Performance**

Use Evaluation Matrices like Confusion Matrix, Recall, and Precision and F1-Measure.

**Make Predictions**

Use the Model we will identify fake user accounts.

8. A marketing agency wants to segment customers into different groups based on their purchasing behavior. What type of ML problem is this, and what steps would you take to solve it?

**Grouping the Customer****Domain:**

**Machine Learning.** Output is not clear so this scenario comes under **UnSupervised Learning**.

**Problem type:**

Clustering.

### **Step by step logic:**

#### **Collect the Data**

Gather the data related to customer purchasing behavior.

#### **Preprocessing Data**

Convert categorical features into numerical format, handle missing data.

#### **Split the Dataset**

Split the dataset into training set, testing set.

#### **Choose the Algorithm**

Select any one Clustering Algorithm based on the scenario like Random Forest Hierarchical, Grid-based.

#### **Train the Model**

Fit the model on training set.

#### **Analyze Clusters –**

Interpret results to identify purchasing behavior like complex buying, habitual buying and Variety-seeking .

#### **Make Decision**

Based on purchasing behavior we will send the related ads to customer

9. A geospatial research team wants to analyze satellite images to classify different land types (forest, water, urban). What type of ML problem is this, and what steps would you take to solve it?

### **Classify Satellite image on its Types**

#### **Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning.**

#### **Problem type:**

Classification.

### **Step by step logic:**

#### **Collect the Data**

Gather the data relevant to user activity and user profile data.

#### **Preprocess Data**

Removing unwanted image, noise.

**Split the Dataset**

Split the dataset into training set, testing set.

**Choose the Algorithm**

Select any one Classification Algorithm based on the scenario like Navie Bayes, K-Nearest Neighbour..

**Train the Model**

Fit the model on training set.

**Evaluate Performance**

Use Evaluation Matrices like Confusion Matrix, Recall, and F1-Measure.

**Make Predictions**

Use the Model we will classify satellite the image .

10. A streaming service wants to predict which users are likely to cancel their subscriptions. What type of ML problem is this, and what steps would you take to solve it?

**Classify Satellite image on its Types****Domain:**

**Machine Learning.** Input & output is clear so this scenario comes under **Supervised Learning.**

**Problem type:**

Classification.

**Step by step logic:****Collect the Data**

Collect the data relevant to user activity and user profile data.

**Preprocess Data**

Removing unwanted image, noise.

**Split the Dataset**

Split the dataset into training set, testing set.

**Choose the Algorithm**

Select any one Classification Algorithm based on the scenario like Navie Bayes, K-Nearest Neighbour..

**Train the Model**

Fit the model on training set.

**Evaluate Performance**

Use Evaluation Matrices like Confusion Matrix, Recall, and F1-Measure.

**Make Predictions**

Use the Model we will predict which users cancel their subscription in future.