1. A real estate company wants to develop a system that predicts house prices based on square footage, number of bedrooms, and location.
   Q: Identify the problem type and outline the step-by-step logic to solve it.

Predicting House Prices

Domain:

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

Problem type:

Regression because the prediction output (House Price) is numerical.

Step by step logic:

Collect the Data

Gather the data related to square footage, number of bedrooms, location.

Preprocessing 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 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 new data.

2. A bank wants to build a model to detect fraudulent transactions by analyzing customer spending behavior and transaction history.
   Q: Identify the problem type and outline the step-by-step logic to solve it.

Identifying Fraudulent Transactions

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 customer spending behavior, transaction history.

Preprocessing 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-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 new data.

3. A supermarket wants to segment its customers based on their shopping patterns to provide personalized promotions.
Q: Identify the problem type and outline the step-by-step logic 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 shopping pattern.

Preprocessing Data

Normalize the 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 high-spending, medium-spending, and low-spending customer groups.

Make Decision

Based on buying capabilities we will provide personalized promotions for each customer.

4. A company wants to estimate an employee's salary based on their years of experience, job title, and education level.

Q: Identify the problem type and outline the step-by-step logic to solve it.

Predicting Employee Salary

Domain:

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

Problem type:

Regression because the prediction output (Employee Salary) is numerical.

Step by step logic:

Collect the Data

Collect the data related to employee job, years of experience, education level.

Preprocessing Data

Handle the missing values, nan values, find 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 salary prediction for new employee.

5. An email provider wants to automatically classify incoming emails as spam or not spam based on their content and sender details.

Q: Identify the problem type and outline the step-by-step logic to solve it.

Identifying the Mail Spam or Not

Domain:

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

Problem type:

Classification because the prediction output (spam or not) is categorized value.

Step by step logic:

Collect the Data

Gather the data related to mail content and sender details.

Preprocessing Data

Handle the missing values, nan values,

Split the Dataset

Split the dataset into training set, testing set.

Choose the Algorithm

Select any one Classification Algorithm based on the scenario like Decision tree, K-Nearest Neighbours

Train the Model

Fit the model on training set.

Evaluate Model

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

Deploy the Model

Use the Model we can make prediction for the incoming mails are spam or not.

6. A business wants to analyze customer reviews of its products and determine whether the sentiment is positive or negative.
Q: Identify the problem type and outline the step-by-step logic to solve it.

Analyzing Customer reviews

Domain:

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

Problem type:

Classification because the prediction output is categorical value.

Step by step logic:

Collect the Data

Collect the data related to customer name, product name, customer reviews.

Preprocessing Data

Handle the missing values, nan values,.

Split the Dataset

Split the dataset into training set, testing set.

Choose the Algorithm

Select any one classification 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 Confusion Matrix, Recall, Precision, Accuracy.

Make Predictions

Use the Model we can predict the customer reviews are positive or negative.

7. An insurance company wants to predict whether a customer is likely to file a claim in the next year based on their driving history and demographics.
Q: Identify the problem type and outline the step-by-step logic to solve it.

Predict the Customer claim insurance

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 customer driving history and demographics

Preprocessing Data

Handle the missing values, null values,

Split the Dataset

Split the dataset into training set, testing set.

Choose the Algorithm

Select any one Classification Algorithm based on the scenario like Decision tree, K-Nearest Neighbours

Train the Model

Make the model on training set.

Evaluate Model

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

Deploy the Model

Use the Model we can make prediction for the new customer claim the insurance .

8. A streaming platform wants to recommend movies to users by grouping them based on their viewing preferences and watch history.
Q: Identify the problem type and outline the step-by-step logic to solve it.

Recommending Movies Based on Viewing History

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 based on user viewing preferences and watch history.

Preprocessing Data

Convert categorical movie genres into numerical format.

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 Density-based, Model-based.

Train the Model

Fit the model on training set.

Analyze Clusters

Identify user categories (e.g., "Action Lovers”,”Horror”)

Make Decision

Suggest movies based on cluster basis.

9. A hospital wants to predict the recovery time of patients after surgery based on their age, medical history, and lifestyle habits.
Q: Identify the problem type and outline the step-by-step logic to solve it.

Predicting Recovery time of patients

Problem type:

Regression because the prediction output (Recovery Time) is numerical.

Step by step logic:

Collect the Data

Gather the data related to patients age, medical history, and lifestyle habits.

Preprocessing 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 Regression Algorithm based on the scenario like Decision Tree Regression, Logistic Regression.

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 Patient recovery time.

10. A university wants to predict a student's final exam score based on study hours, attendance, and past academic performance.
Q: Identify the problem type and outline the step-by-step logic to solve it.

Predicting Exam Score

Domain:

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

Problem type:

Regression because the prediction output (Exam Score) is numerical.

Step by step logic:

Collect the Data

Collect the data related to student study hours, attendance, and past academic performance.

Preprocessing 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 Regression Algorithm based on the scenario like Decision Tree Regression, Logistic Regression, and Support Vector Machine.

Train the Model

Make 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 final exam score for new student.