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.

   Problem Type: Supervised- Regression
   Step-by-step logic:
   Data Collection – Collect the required data from the real estate company
   Data Preprocessing – update the null values and convert categorical data to numerical.
   Split Input and Output – Split Independent and Dependent variable
   Split train and test set – Split the train set to train the model and test set to test the model.
   Choose Algorithm – Use Regression Algorithms like Linear Regression, SVM
   Model Creation – Fit the model
   Evaluation Metrics – Based on the R2 score save the best model

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.

   Problem Type: Supervised- Classification
   Step-by-step logic:
   Data Collection – Collect the required data from the bank
   Data Preprocessing – update the null values and convert categorical data to numerical.
   Split Input and Output – Split Independent and Dependent variable
   Split train and test set – Split the train set to train the model and test set to test the model.
   Choose Algorithm – Use Classification Algorithms like Random Forest
   Model Creation – Fit the model
   Evaluation Metrics – Based on the confusion Matrix score save the best model

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.

   Problem Type: Unsupervised- Clustering
   Step-by-step logic:
   Data Collection – Collect the required data from the Supermarket
   Data Preprocessing – update the null values and convert categorical data to numerical.
   Split Input – Split Independent variable.
   Choose Algorithm – Use Clustering Algorithms like kmeans, DBScan
   Train Model – Apply clustering algorithm to know about Minimum & Maximum Purchase, Repeated 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.

   Problem Type: Supervised- Regression
   Step-by-step logic:
   Data Collection – Collect the years of experience, job title, and education level data from the company
   Data Preprocessing – update the null values and convert categorical data to numerical.
   Split Input and Output – Split Independent and Dependent variable
   Split train and test set – Split the train set to train the model and test set to test the model.
   Choose Algorithm – Use Regression Algorithms like Decision Tree, SVM
   Model Creation – Fit the model
   Evaluation Metrics – Based on the R2 score save the best model

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.

   Problem Type: Supervised- Classification
   Step-by-step logic:
   Data Collection – Collect the required data
   Data Preprocessing – update the null values and convert categorical data to numerical.
   Split Input and Output – Split Independent and Dependent variable
   Split train and test set – Split the train set to train the model and test set to test the model.
   Choose Algorithm – Use Classification Algorithms like Random Forest, svm
   Model Creation – Fit the model
   Evaluation Metrics – Based on the confusion Matrix score save the best model

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.

   Problem Type: Supervised- Classification
   Step-by-step logic:
   Data Collection – Collect the required data
   Data Preprocessing – update the null values and convert categorical data to numerical using sklearn TF-IDF, Stop Words Removal.
   Split Input and Output – Split Independent and Dependent variable
   Split train and test set – Split the train set to train the model and test set to test the model.
   Choose Algorithm – Use Classification Algorithms like Random Forest, svm

Model Creation – Fit the model
Evaluation Metrics – Based on the confusion Matrix score save the best model

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.

   Problem Type: Supervised- Classification
   Step-by-step logic:
   Data Collection – Collect the required data
   Data Preprocessing – update the null values and encode categorical data to numerical.
   Split Input and Output – Split Independent and Dependent variable
   Split train and test set – Split the train set to train the model and test set to test the model.
   Choose Algorithm – Use Classification Algorithms like Random Forest, svm
   Model Creation – Fit the model
   Evaluation Metrics – Based on the confusion Matrix score save the best model

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.

   Problem Type: Unsupervised- Clustering
   Step-by-step logic:
   Data Collection – Collect the viewing preferences and watch history data
   Data Preprocessing – update the null values and convert categorical data to numerical.
   Split Input – Split Independent variable.
   Choose Algorithm – Use Clustering Algorithms like kmeans, DBScan
   Train Model – Apply clustering algorithm to get recommended movies based on viewing preferences and watch history.

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.

   Problem Type: Supervised- Regression
   Step-by-step logic:
   Data Collection – Collect the patient details from the hospital
   Data Preprocessing – update the null values and convert categorical data to numerical.
   Split Input and Output – Split Independent and Dependent variable
   Split train and test set – Split the train set to train the model and test set to test the model.
   Choose Algorithm – Use Regression Algorithms like Decision Tree, SVM
   Model Creation – Fit the model

Evaluation Metrics – Based on the R2 score save the best model

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.

    Problem Type: Supervised- Regression

    Step-by-step logic:
    Data Collection – Collect the Students study hours, attendance, and past academic performance
    Data Preprocessing – update the null values and convert categorical data to numerical.
    Split Input and Output – Split Independent and Dependent variable
    Split train and test set – Split the train set to train the model and test set to test the model.
    Choose Algorithm – Use Regression Algorithms like Decision Tree, SVM
    Model Creation – Fit the model
    Evaluation Metrics – Based on the R2 score save the best model