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.

   a) **Regression because the output house price is a continuous numerical value**
   b) **Supervised Learning**
   c) **Goal is to predict the house price**
   d) **Collect and Prepare the Data**
   e) **Preprocess the Data by using using One-Hot Encoding for location**
   f) **Split train and test set**
   g) **Create model by using linear regresssion**
   h) **Make prediction and evaluate the model**
   i) **Deploy 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.

   a) **Supervised Machine Learning and Classification Problem because the goal is to classify the transaction is fraudulent (1) or not fraudulent (0)).**
   b) **Collect and Prepare the Data.**
   c) **Preprocess the Data by using using One-Hot Encoding for location.**
   d) **Split train and test set .**
   e) **Create model by using clssification model LogisticRegression, RandomForestClassifier, XGBoostClassifier.**
   f) **Make prediction and evaluate the model**
   g) **Deploy 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.

   a) **Unsupervised Machine Learning and Clustering Problem because we want to group customers based on shopping behavior no labeled output.**
   b) **Collect and Prepare the Data.**
   c) **Preprocess the Data Scale numerical values using StandardScaler.**
   d) **Choose a Clustering Algorithm KMeans, DBSCAN, Hierarchical Clustering.**
   e) **Use Elbow Method or Silhouette Score.**
   f) **Then analyze the cluster.**

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.

   a) **Supervised and regression problem because Goal Predict an employee's salary.**
   b) **Collect and Prepare the Data.**
   c) **Encode Categorical Variables use OneHotEncoder.**
   d) **Split train and test set .**
   e) **Choose a Regression ModelLinearRegression, RandomForestRegressor, GradientBoostingRegressor.**
   f) **Train the Model**
   g) **Make Predictions**
   h) **Evaluate the Model**
   i) **Deploy 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.

   a) **Supervised and Classification Problem because classifying emails into two categories Spam (1) or Not Spam (0). goal is to automatically label incoming emails as spam or not.**
   b) **Collect and Clean the Data.**
   c) **Preprocess the Text Data.**
   d) **Encode the Features.**
   e) **Split train and test set .**
   f) **Create model by using clssification model LogisticRegression, RandomForestClassifier, XGBoostClassifier and some other .**
   g) **Train the Model.**
   h) **Predict on Test Data.**
   i) **Evaluate the Model.**
   j) **Deploy 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.

   a) **Supervised and Classification Problem. Because classifying each customer review Positive or Negative.**
   b) **Collect and Prepare the Dataset**
   c) **Split train and test set .**
   d) **Choose a Classification Mode LogisticRegression, MultinomialNB , SVM.**
   e) **Predict and Evaluate.**

f) **Predict New Sentiment.**
g) **Deploy 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.

   a) **Supervised and Classification Problem. because goal is to predict whether a customer will file a claim Yes/No based on their past data.**
   b) **Collect and Prepare the Dataset**
   c) **Encode Categorical Variables**
   d) **Split train and test set .**
   e) **Choose a Classification Mode LogisticRegression, MultinomialNB , SVM.**
   f) **Predict and Evaluate.**
   g) **Predict New Sentiment.**
   h) **Deploy 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.

   a) **Unsupervised Machine Learning and Clustering Problem.**
   b) **Goal is to grouping them based on their viewing preferences and watch history.**
   c) **Collect and Prepare Data**
   d) **Normalize the Data.**
   e) **Choose a Clustering Algorithm: K-Means, DBSCAN, Hierarchical Clustering .**
   f) **Create model.**
   g) **Analyze the Clusters.**

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.

   a) **Supervised Machine Learning and Regression Problem.**
   b) **Goal is to predict the recovery time of patients after surgery based on their age, medical history, and lifestyle habits.**
   c) **Collect and Prepare Data.**
   d) **Encode Categorical Variables.**
   e) **Split Data into Train and Test Sets.**
   f) **Choose and Train a Regression Model:LinearRegression, RandomForestRegressor, XGBoostRegressor.**
   g) **Evalute and predict.**

h) **Deploy 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.

    a) **Supervised Machine Learning and Regression Problem.**
    b) **Goal is to predict the student's final exam score based on study hours, attendance, and past academic performance.**
    c) **Collect and Prepare Data.**
    d) **Split Data into Training and Testing.**
    e) **Choose and Train a Regression Model.**
    f) **Predict and evaluate the model.**
    g) **Deploy the best model**