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.

**Ans:** **It’s a supervised machine learning- regression problem**

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**Step1: collect data:** Collect data from client or source

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any categorical features convert into numerical by using one hot encoding

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Regression algorithm, if our data has only one independent and one dependent use simple linear regression algorithm

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using R2.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s a supervised machine learning- classification problem**

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**Step1: collect data:** Collect data from client or source (**categorical output**)

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any categorical features convert into numerical by using one hot encoding

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Classification algorithms,like(logistic regression, svm,decision tree,Random forest)

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using Confusion matrix because its classification problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s an Unsupervised machine learning- clustering problem**

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**Step1: collect data:** Collect data from client or source (**for segment output**)

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using **one hot encoding**

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Clustering algorithms,

like**(K-mens, DBSCAN, HDBSCAN, Hierrarical clustering**)

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using **Sum of squared errors (SSE) and silhouette score** because its clustering problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s an supervised machine learning- Regression problem**

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**Step1: collect data:** Collect data from client or source **for salary based output**

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using **one hot encoding**

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Regression algorithms.

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using **R2 score** because its Regression problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s a supervised machine learning- classification problem**

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**Step1: collect data:** Collect data from client or source for **classified emails output**.

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using one hot encoding.

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Classification algorithms,like(logistic regression, svm,decision tree,Random forest)

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using Confusion matrix because its **classification** problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s a supervised machine learning- classification problem**

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**Step1: collect data:** Collect data from client or source for **sentiment is positive or negative output.**

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using one hot encoding.

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Classification algorithms,like (logistic regression, svm,decision tree,Random forest)

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using Confusion matrix because its **classification** problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s a supervised machine learning- classification problem**

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**Step1: collect data:** Collect data from client or source for **insurance claim or not output.**

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using one hot encoding.

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Classification algorithms,like (logistic regression, svm,decision tree,Random forest)

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using Confusion matrix because its **classification** problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s an Unsupervised machine learning- clustering problem**

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**Step1: collect data:** Collect data from client or source **Clustering of customers output**

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using **one hot encoding**

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Clustering algorithms,

like**(K-mens, DBSCAN, HDBSCAN, Hierrarical clustering**)

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using **Sum of squared errors (SSE) and silhouette score** because its clustering problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s an supervised machine learning- Regression problem**

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**Step1: collect data:** Collect data from client or source **for predict the recovery time output**

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using **one hot encoding**

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Regression algorithms.

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using **R2 score** because its Regression problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model

1. 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.

**Ans: It’s an supervised machine learning- Regression problem**

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**Step1: collect data:** Collect data from client or source **for a student’s final exam score output**

**Step2: preprocessing data:** preprocessing is process of making data ready for our predictable model, if there any **categorical features** convert into numerical by using **one hot encoding**

**Step3: split test and train set:** Using sklearn.model\_selection library split our data set into test and train

**Step4: Model creation using train set:** Create model using Regression algorithms.

**Step5: Evaluation metric:** Then, check our created model is good or need to fine tune by using **R2 score** because its Regression problem.

**Step:6: ready to predict:** Now our model is ready to predict new unseen data

**Setp7:** Then finally save our model