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?

   Problem Identification:

   Stage 1 : Domain selection – Machine Learning
   Stage 2: Learning selection – Supervised learning
   Stage 3: Regression/ Classification - Classification

   LOAN DEFAULTERS PREDICTION
   SUPERVISED LEARNING – CLASSIFICATION (DEFAULT / NOT DEFAULT)
   Data collection
   Data preprocessing
   Input output split
   Feature selection
   Train and test split
   Standardization
   Model creation
   Evaluation f1score, roc-auc score, accuracy, precision, recall
   Confusion matrix, classification report

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?

   Problem Identification:

   Stage 1 : Domain selection – Clustering
   Stage 2: Learning selection – Unsupervised learning
   Stage 3: Regression/ Classification – NA no output labels

   CLUSTERING grouping of similar products and identify the demand
   Data collection
   Data preprocessing
   Feature selection
   Model creation – fit_predict(X) ,fitting and predict the entire input because there is no output to test
   Evaluation – calculate silhouette score

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?

   Problem Identification:

   Stage 1 : Domain selection – Machine Learning
   Stage 2: Learning selection – Supervised learning
   Stage 3: Regression/ Classification – Binary Classification

PRODUCT DEFECTIVE DETECTION (DEFECTIVE / NOT DEFECTIVE)
Data collection
Data preprocessing
Input output split
Feature selection
Train and test split
Standardization
Model creation
Evaluation f1score, roc-auc score, accuracy, precision, recall
Confusion matrix, classification report

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?
   Problem Identification:
   Stage 1: Domain selection – Machine Learning
   Stage 2: Learning selection – Supervised learning
   Stage 3: Regression/ Classification – Multiclass Classification

   SUPERVISED LEARNING - CLASSIFICATION
   Data collection
   Data preprocessing
   Input output split
   Feature selection
   Train and test split
   Standardization
   Model creation
   Evaluation f1score, roc-auc score, accuracy, precision, recall
   Confusion matrix, classification report

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?
   Problem Identification:
   Stage 1 : Domain selection – Natural language processing
   Stage 2: Learning selection – Supervised learning
   Stage 3: Regression/ Classification – Classification

   FAKE NEWS DETECTION
   Data collection
   Text preprocessing – removing unnecessary symbols, hashtags, URL
   Text representation – tokenized and converting text into numbers
   Input output split
   Feature selection
   Train and test split

Model creation
Evaluation f1score, roc-auc score, accuracy, precision, recall
Confusion matrix, classification report

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?

   Problem Identification:

   Stage 1 : Domain selection – Machine Learning
   Stage 2: Learning selection – Supervised learning
   Stage 3: Regression/ Classification - Regression

   STOCK PRICE PREDICTION
   Data collection
   Data preprocessing
   Input output split
   Feature selection
   Train and test split
   Standardization
   Model creation
   Evaluation – r2 score, mse, mae

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?

   Problem Identification:

   Stage 1 : Domain selection – Natural language processing
   Stage 2: Learning selection – Supervised learning
   Stage 3: Regression/ Classification – Binary Classification

   Data collection
   Text preprocessing – removing unnecessary symbols, hashtags, URL
   Text representation – tokenized and converting text into numbers
   Input output split
   Feature selection
   Train and test split
   Model creation
   Evaluation f1score, roc-auc score, accuracy, precision, recall

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?

   Problem Identification:

   Stage 1 : Domain selection – Machine Learning
   Stage 2: Learning selection – Unsupervised learning

Stage 3: Regression/ Classification – NA (no outputs, similar groups)

CUSTOMER SEGMENTATION
Data collection
Data preprocessing
Feature selection
Model creation – fit_predict(X) ,fitting and predict the entire input because there is no output to test
Evaluation – calculate silhouette score

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?

Problem Identification:

Stage 1 : Domain selection – Deep Learning
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Multi class classification

SUPERVISED LEARNING - CLASSIFICATION
Data collection
Data preprocessing
Input output split
Feature selection
Train and test split
Standardization
Model creation
Evaluation f1score, roc-auc score, accuracy, precision, recall
Confusion matrix, classification report

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?

Problem Identification:

Stage 1 : Domain selection – Machine Learning
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Binary Classification

USER CHURN PREDICTION
SUPERVISED LEARNING - CLASSIFICATION
Data collection
Data preprocessing
Input output split
Feature selection
Train and test split
Standardization
Model creation
Evaluation f1score, roc-auc score, accuracy, precision, recall, confusion matrix.