1. A power company wants to predict the electricity demand in different regions based on past usage, temperature, and time of year. What type of machine learning approach would be suitable? Outline the steps to build the model.

Problem Identification:
Stage 1: Domain selection – Time series
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Classification

FORECASE ELECTRICITY DEMAND 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. An e-commerce platform wants to identify and filter out fake product reviews based on user behavior, review patterns, and sentiment analysis. What type of machine learning approach would be suitable? Outline the steps to build the model.

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

FAKE PRODUCT REVIEW DETECTION
SUPERVISED LEARNING – CLASSIFICATION (FAKE / REAL)
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

3. A city traffic department wants to estimate traffic congestion levels based on GPS data, road construction reports, and weather conditions. What type of machine learning approach would be suitable? Outline the steps to build the model.

Problem Identification:
Stage 1: Domain selection – Time series
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Regression
TRAFFIC CONGESTION LEVEL PREDICTION
SUPERVISED LEARNING – REGRESSION (NUMBER)
Data collection
Data preprocessing
Input output split
Feature selection
Train and test split
Standardization
Model creation
Evaluation r2 score

4. A bank wants to determine whether a loan applicant should be approved or rejected based on income, credit history, and previous loan repayment behavior. What type of machine learning approach would be suitable? Outline the steps to build the model.

Problem Identification:
Stage 1: Domain selection – Machine Learning
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Classification
LOAN APPROVAL PREDICTION
SUPERVISED LEARNING – CLASSIFICATION (YES / NO)
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. A factory wants to automatically detect defective products using images from a quality control camera. What type of machine learning approach would be suitable? Outline the steps to build the model.

Problem Identification:
Stage 1: Domain selection – Deep Learning
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Classification
DEFECTIVE PRODUCT PREDICTION
SUPERVISED LEARNING – CLASSIFICATION (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

6. An agricultural company wants to predict the best crops to grow based on soil composition, rainfall, and past harvest data. What type of machine learning approach would be suitable? Outline the steps to build the model.

Problem Identification:
Stage 1: Domain selection – Machine Learning
Stage 2: Learning selection – Supervised learning
Stage 3: Regression / Classification – Classification
CROP PREDICTION
SUPERVISED LEARNING – CLASSIFICATION (Crop names – corn ,wheat, maida, rice etc)
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

7. A business wants to analyze customer responses to different types of advertisements and promotions to determine the most effective marketing strategy. What type of machine learning approach would be suitable? Outline the steps to build the model.

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

CUSTOMER RESPONSE ANALYSIS FOR MARKETING EFFECTIVENESS
SUPERVISED LEARNING – CLASSIFICATION (AD / PROMOTION/ ANYOTHER)
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

8. A software company wants to build a system that can analyze source code and predict whether a particular piece of code is likely to contain a bug. What type of machine learning approach would be suitable? Outline the steps to build the model.

Problem Identification:
Stage 1 : Domain selection – Natural Language Processing
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Binary Classification
CODE BUG PREDICTION
SUPERVISED LEARNING – CLASSIFICATION (BUG / NO BUG)
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.

9. A fitness app wants to recommend personalized workout plans for users based on their exercise history, fitness level, and preferences. What type of machine learning approach would be suitable? Outline the steps to build the model.

ITEM BASED RECOMMENDATION

Recommend workout plans to users based on exercise history, fitness level, preferences they have already worked out here user details not included

- Data collection – Collect user-workout data (exercise history, metadata) importing the csv dataset into pandas,
- Data preprocessing – preprocessing the data – removing null, NA values, converting categorical data into numbers using one hot or label encoding, create pivot table for matrix index
- Compute similarity scores
- Evaluation – Use metrics like Precision, Recall, RMSE, or MAE.
- Prediction – Recommend top-N items for each user.

10. A social media platform wants to detect fake accounts by analyzing user activity, posting patterns, and interactions with other users. Give steps to Achieve.

Problem Identification:
Stage 1 : Domain selection – Machine Learning
Stage 2: Learning selection – Supervised learning
Stage 3: Regression/ Classification – Binary Classification
FAKE ACCOUNT DETECTION
SUPERVISED LEARNING – CLASSIFICATION(FAKE / NOT FAKE)
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.