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.

Identify the problem type: Regression

Step by step logic:

Collect data: Collect the data for electricity consumption

Preprocess data: Handle the missing value and normalize the numerical features.

Choose algorithm: Use Linear Regression, Random Forest algorithm and train the model

Evaluate Model: Calculate root mean square error and R- score.

Make predictions: Now forecast future electricity demand.

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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.

Identify the problem type: Classification

Step by step logic:

Collect data: Get the input as user credentials and verify that if the user is originally perched from our e-commerce website

Preprocess data: Handle the missing value and find and remove the suspicious and negative words which they are using.

Choose algorithm: Use naive bayes and logistic regression algorithm.

Train model: Fit the model using the training data set

Evaluate Model: Calculate the accuracy and confusion matrix

Make predictions: Now remove the fake review from those comments.

Ramishahope Artificial Intelligence Pvt Ltd

36, Old Anandas, SG Arcade, Marudhamalai Main Road, Vadavalli, Coimbatore -641041.

+91 6385383227 | www.hopelearning.net | mdaravind@hopelearning.net | 33AAMCR3722R1ZU

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.

Identify the problem type: Regression

Step by step logic:

Collect data: Get historical traffic data and external factors like weather and road conditions.

Preprocess data: Normalize numerical values, encode categorical features.

Choose algorithm: Use Random Forest Regression, Gradient Boosting algorithm, train the model.

Evaluate Model: Calculate the root mean square error.

Make predictions: Deploy the model for real-time traffic predictions.

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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.

Identify the problem type: Classification

Step by step logic:

Collect data: Collect the data for credit score, Account statement, income per month, past loan history

Preprocess data: Handel the missing value, Change the categorical data to numerical data and split the training data and test data.

Choose algorithm: Use Random Forest, logistic regression, decision tree

Train model: Train the model using the training data.

Evaluate Model: Use Recall and f1-score.

Make predictions: Give the new user data to find the default loan application.

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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.

Identify the problem type: Classification

Step by step logic:

Collect data: Get the data from sensors, get the defected label and production details.

Preprocess data: Handle the missing value, change the categorical data

Choose algorithm: Use decision tree and support vector machine algorithm, split the training data and test data.

Train model: Train the model using the training data from production details

Evaluate Model: Use f1-score, precision, recall

Make predictions: Now detect the defective product from the production

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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.

Identify the problem type: Regression

Step by step logic:

Collect data: Collect the agricultural data, including soil quality, rainfall harvest history.

Preprocess data: Handle missing values and normalize numerical features.

Choose algorithm: Use Random Forest Regression, Gradient Boosting and train the model.

Evaluate Model: Calculate the root mean square error

Make predictions: Now recommend crops for optimal yield

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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.

Identify the problem type: Classification

Step by step logic:

Collect data: Get the response data from past marketing campaigns

Preprocess data: Handle missing values and encode categorical variables.

Choose algorithm: Use Decision Trees, Logistic Regression, or Gradient Boosting, and train the model.

Evaluate Model: Calculate accuracy, recall

Make predictions: Now predict the customer response to future.

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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.

Identify the problem type: Classification

Step by step logic:

Collect data: Collect the bug reports from the historical data.

Preprocess data: Convert code into numerical features using NLP techniques like TF-IDF or BERT embeddings.

Choose algorithm: Use Random Forest, SVM, or Neural Networks.

Train the model: Train the model using labeled bug/non-bug data.

Evaluate Model: Calculate precision, recall, and confusion matrix

Make predictions: Now detect the bugs from new code.

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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.

Identify the problem type: Clustering

Step by step logic:

Collect data: Collect the data based on their workout history, intensity, and preferences

Preprocess data: Normalize numerical values and encode categorical variables.

Choose algorithm: Use K-Means Clustering or Hierarchical Clustering

Evaluate Model: Use Elbow Method and group users into clusters based on fitness.

Make predictions: now Recommend the workout plans for each user.

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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.

Identify the problem type: Classification

Step by step logic:

Collect data: Get the data from the user activity like profile data, user credential and user activity

Preprocess data: Handle the missing values, split the training data and test data

Choose algorithm: Use Random Forest and support vector machine algorithm

Train model: Train the model using the training data

Evaluate Model: Calculate the f1 score and precision for the accuracy

Make predictions: Give the input to find the given details of the user account to detect fake or original.