1. A telecom company notices that 30% of customers who made complaints in the last three months have left. However, 70% of customers who didn’t complain remained. How would you modify your feature engineering strategy to improve churn prediction?

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Identify the Problem type: Classification

* Logic:
* Collect data: Get the data from the telecom company which all are complaints
* Preprocessing Data: Conver the missing values
* Choose algorithm: Use decision tree and logistic regression
* Evaluate Model: Calculate the accuracy

Make Prediction: Now predict the customers response for the future

1. A warehouse manager observes that demand for certain products fluctuates seasonally, but your model is not capturing these patterns. How would you improve the model’s predictive power?

Identify the Problem type: Clustering

* Logic:
* Collect data: Collect the data on their seasonl product
* Preprocessing Data: Normalize the numerical values and encode categorical variables
* Choose algorithm: Use the K – means clustering and Hierarchial clustering
* Evaluate Model: Use the Elbow method and group in the cluster based on the season

Make Prediction: Now give the product as input.

1. Your bank’s fraud detection model has a high false positive rate, flagging many legitimate transactions as suspicious. What steps would you take to reduce false alarms while still detecting money laundering effectively?

Identify the Problem type: Classification

* Logic:
* Collect data: Collect the data for the transactions history
* Preprocessing Data: Handle the missing values
* 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 Prediction: Now give the new trainsaction history for the alarms works.

1. An airline wants to use weather data in its flight delay prediction model, but 20% of past records lack weather conditions. How would you handle missing weather data without compromising model accuracy?

Identify the Problem type: Regression

* Logic:
* Collect data: Collect the weather data from the airlines
* Preprocessing Data: Handle the missing values and normalize the numerical features
* Choose algorithm: Use the Linear regression, random forest algorithm
* Train model: Now we can train the model using the last 25% of the data
* Evaluate Model: Calculate the root mean square error and R-score

Make Prediction: Now forecost the weather data

1. A student with high quiz scores but low engagement time is placed in an advanced learning path by your clustering model. However, they struggle with the content. How would you refine your clustering approach?

Identify the Problem type: clustering

* Logic:
* Collect data: Collect the student score and engagement time as input data
* Preprocessing Data: Normalize the numerical values and encode categorical variables
* Choose algorithm: Use k-menas clustering or hierarchcal clustering
* Evaluate Model: Use elbow method for the quiz score

Make Prediction: Now the give the input value for the engagement time

1. Your model predicts unusually low rental prices for high-end properties in luxury neighborhoods. What factors could be missing from the dataset, and how would you improve your model?

Identify the Problem type: Regression

* Logic:
* Collect data: Get the data about the properties
* Preprocessing Data: Normalize numerical values, encode categorical features.
* Choose algorithm: Use the random forest and gradient boosting algorithm
* Train model: Train the model using the training data
* Evaluate Model: calculate the root mean square error

Make Prediction: Redeploy the model and test the new values

1. Your anomaly detection system raises an alert about a network traffic pattern, but IT specialists confirm it’s a routine software update. How would you improve the system to reduce such false positives?

Identify the Problem type: Classification

* Logic:
* Collect data: Get the data for when the alert is raises
* Preprocessing Data: Handle the missing values
* Choose algorithm: Use decision tree, logistic regression
* Evaluate Model: Calculate the accuracy, recall

Make Prediction: Now Predict the software update is normal or not.

1. A hospital’s classification model struggles to differentiate between flu and COVID-19 because many symptoms overlap. What techniques can improve the model’s ability to distinguish between these conditions?

Identify the Problem type: classification

* Logic:
* Collect data: Get the extra data flu and covid-19
* Preprocessing Data: Handle the missing symptoms that which all are not overlap.
* Choose algorithm: Now we can create the another model like random forest and SVM
* Train model: Train the model using test data and now splite the data for training in first 25%
* Evaluate Model: Calculate the f1 score and precision for the disease to find the accuracy
* Make Prediction: Now give the different input from the new collected data.

1. Your ad engagement prediction model performs well on historical data but fails to generalize to new ad formats. What strategies can you use to improve its adaptability?

Identify the Problem type: Classification

* Logic:
* Collect data: Get the response data from ad engagement
* Preprocessing Data: Handel the missing value
* Choose algorithm: Use Decision tree and Gradient boosting and logistic regression
* Evaluate Model: Calculate the accuracy, recall
* Make Prediction: Now predict the future response

1. A recruiter tries to bypass the fake job detection model by slightly modifying fraudulent job descriptions. How would you make the model more robust against such adversarial tactics?

Identify the Problem type: Classification

* Logic:
* Collect data: Get the data from the recruiter job description, and his user credential.
* Preprocessing Data: Handle the missing values and split the training data and test data
* Choose algorithm: Use random forest and SVM algorithm
* Train model: Train the model using training data
* Evaluate Model: Calculate the f1 score
* Make Prediction: Give the input to find the given details of the fake job detection.