MACHINE LEARNING

In Q1 to Q11, only one option is correct, choose the correct option:

1. Which of the following methods do we use to find the best fit line for data in Linear Regression?
   A) Least Square Error B) Maximum Likelihood
   C) Logarithmic Loss D) Both A and B

Ans.(Least Square Error)

2. Which of the following statement is true about outliers in linear regression?
   A) Linear regression is sensitive to outliers B) linear regression is not sensitive to outliers
   C) Can't say D) none of these

Ans.(Linear regression is sensitive to outliers)

3. A line falls from left to right if a slope is _____?
   A) Positive B) Negative C) Zero D) Undefined

Ans.(Negative)

4. Which of the following will have symmetric relation between dependent variable and independent variable?
   A) Regression B) Correlation C) Both of them D) None of these

Ans.(Correlation)

5. Which of the following is the reason for over fitting condition?
   A) High bias and high variance B) Low bias and low variance
   C) Low bias and high variance D) none of these

Ans.(Low bias and high variance)

6. If output involves label then that model is called as:
   A) Descriptive model B) Predictive modal
   C) Reinforcement learning D) All of the above

Ans.(Descriptive model)

7. Lasso and Ridge regression techniques belong to _____?
   A) Cross validation B) Removing outliers
   C) SMOTE D) Regularization

Ans.(Cross validation)

8. To overcome with imbalance dataset which technique can be used?
   A) Cross validation B) Regularization
   C) Kernel D) SMOTE

Ans.(Kernel)

9. The AUC Receiver Operator Characteristic (AUCROC) curve is an evaluation metric for binary classification problems. It uses _____ to make graph?
   A) TPR and FPR B) Sensitivity and precision
   C) Sensitivity and Specificity D) Recall and precision

Ans.(TPR and FPR)

10. In AUC Receiver Operator Characteristic (AUCROC) curve for the better model area under the curve should be less.
A) True B) False

Ans.(False)

11. Pick the feature extraction from below: A) Construction bag of words from a email
B) Apply PCA to project high dimensional data
C) Removing stop words
D) Forward selection

Ans.(Removing stop words)

In Q12, more than one options are correct, choose all the correct options:

12. Which of the following is true about Normal Equation used to compute the coefficient of the Linear Regression?
A) We don't have to choose the learning rate.
B) It becomes slow when number of features is very large.
C) We need to iterate.
D) It does not make use of dependent variable.

Ans.(It becomes slow when number of features is very large.)

MACHINE LEARNING

Q13 and Q15 are subjective answer type questions, Answer them briefly.

13. Explain the term regularization?

Ans.(Regularization is a technique used in machine learning to prevent overfitting by adding a penalty to the model's complexity. It helps ensure the model generalizes better to new, unseen data. This penalty discourages the model from fitting the training data too closely, which can lead to better performance on validation or test sets.)

14. Which particular algorithms are used for regularization?

Ans. Here are some key algorithms that use regularization:

1. Ridge Regression (L2 regularization)
2. Lasso Regression (L1 regularization)
3. Elastic Net (L1 and L2 regularization)
4. Support Vector Machines (SVM)
5. Logistic Regression
6. Neural Networks (e.g., dropout, weight decay)

These algorithms incorporate regularization to help prevent overfitting and improve generalization.

15. Explain the term error present in linear regression equation?

Ans. In linear regression, "error" refers to the difference between the actual value and the predicted value. It is calculated as:

Error = Actual Value - Predicted Value

This error reflects how far off the model's predictions are from the true data.