ASSIGNMENT – 39

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

**Answer:** A) 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

**Answer:** A) 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

**Answer:** B) 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

**Answer:** B) 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

**Answer:** C) 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

**Answer:** B) Predictive modal

7. Lasso and Ridge regression techniques belong to \_\_\_\_\_\_\_\_\_.

A) Cross validation B) Removing outliers

C) SMOTE D) Regularization

**Answer:** D) Regularization

8. To overcome with imbalance dataset which technique can be used?

A) Cross validation B) Regularization

C) Kernel D) SMOTE

**Answer;** D) SMOTE

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

**Answer:** A) 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

**Answer:** A) True

11. Pick the feature extraction from below:

A) Construction bag of words from an email B) Apply PCA to project high dimensional data

C) Removing stop words D) Forward selection

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 do not 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.

**Answer:**

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

C) We need to iterate.

ASSIGNMENT – 39

MACHINE LEARNING

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

13. Explain the term regularization?

**Answer:**

Regularization means to make things regular or acceptable. This is exactly why we use it for applied machine learning. In the context of machine learning, regularization is the process, which regularizes or shrinks the coefficients towards zero. In simple words, regularization discourages learning a more complex or flexible model, to prevent overfitting.

14. Which particular algorithms are used for regularization?

**Answer:**

There are two main regularization techniques, namely Ridge Regression and Lasso Regression. They both differ in the way they assign a penalty to the coefficients.

Ridge Regression (L2 Regularization)

This regularization technique performs L2 regularization. It modifies the RSS by adding the penalty (shrinkage quantity) equivalent to the square of the magnitude of coefficients.

Lasso Regression (L1 Regularization)

This regularization technique performs L1 regularization. It modifies the RSS by adding the penalty (shrinkage quantity) equivalent to the sum of the absolute value of coefficients.

Lasso Regression is different from ridge regression as it uses absolute coefficient values for normalization.

As loss function only considers absolute coefficients (weights), the optimization algorithm will penalize high coefficients. This is known as the L1 norm.

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

**Answer;**

Linear regression most often uses mean-square error (MSE) to calculate the error of the model.

MSE is calculated by

Measuring the distance of the observed y-values from the predicted y-values at each value of x.

Squaring each of these distances.

Calculating the mean of each of the squared distances.

Linear regression fits a line to the data by finding the regression coefficient those results in the smallest MSE.