MACHINE LEARNING

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 – Decriptive model

7. Lasso and Ridge regression techniques belong to _____?

A) Cross validation B) Removing outliers

C) SMOTE D) Regularization

Ans - Regularization

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

A) Cross validation B) Regularization

C) Kernel D) SMOTE

Ans – SMOTE (Synthetic Minority Over Sampling Technique)

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 an email B) Apply PCA to project high dimensional data

C) Removing stop words D) Forward selection

Ans – Apply PCA to project high dimensional data

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 – A,B

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

13. Explain the term regularization?

Ans) "Regularization" is a way to give a penalty to certain models (usually overly complex ones). Two commonly used types of regularized regression methods are ridge regression and lasso regression. Ridge regression belongs to the set of **L2 regularization** tools. L2 regularization adds a penalty called an L2 penalty, which is the same as the square of the magnitude of coefficients. All coefficients are shrunk by the same factor, so all the coefficients remain in the model. The strength of the penalty term is controlled by a tuning parameter. When this tuning parameter (λ) is set to zero, ridge regression equals least squares regression. If $\lambda = \infty$, all coefficients are shrunk to zero. The ideal penalty is therefore somewhere in between 0 and ∞.
The other type of regularization, L1 regularization, limits the size of the coefficients by adding an L1

penalty equal to the absolute value of the magnitude of coefficients. This sometimes results in the elimination of some coefficients altogether, which can result in sparse models.

14. Which particular algorithms are used for regularization?

Ans) Two commonly used types of regularized regression methods are ridge regression and lasso regression.

- **Ridge regression** is a way to create a parsimonious model when the number of predictor variables in a set exceeds the number of observations, or when a data set has multicollinearity (correlations between predictor variables).
- **Lasso regression** is a type of linear regression that uses shrinkage. Shrinkage is where data values are shrunk towards a central point, like the mean. This type is very useful when you have high levels of muticollinearity or when you want to automate certain parts of model selection, like variable selection/parameter elimination.

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

Ans) In regression models, we assume that the relation between the response variable and predictors to be linear and we find out a straight line that fits the relation well.

The error term in regression is a catch-all for what we miss out with this model, because in reality

-The true relation may not be linear

-There may be other variables not included in the model that cause variation in response variable

-There may be measurement errors in the observations

The error is calculated as the difference between actual and estimated value of the response.