MACHINE LEARNING
----------Solutions----------

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

Solution 1- 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

Solution 2- 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

Solution 3-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

Solution 4-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

Solution 5- 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

Solution 6-B) Predictive modal

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

Solution 7- D) Regularization

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

Solution 8-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

Solution 9- 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

Solution 10-B) 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

Solution 11- D) Forward selection

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.

Solution 12- Correct options:

A) We don't have to choose the learning rate.

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

13. Explain the term regularization?

Solution 13-While training a machine learning model, the model can easily be overfitted or underfitted. To avoid this, we use regularization in machine learning to properly fit a model onto our test set. Regularization techniques help reduce the chance of overfitting and Underfitting and help us get on optimal model.

14. Which particular algorithms are used for regularization?

Solution 14- Algorithms used for regularization:

Ridge Regression: Adds a penalty term equal to the sum of squared coefficients, shrinking them towards zero.

Lasso Regression: Uses an L1 penalty, which can shrink some coefficients to exactly zero, effectively performing feature selection.

Elastic Net Regression: Combines L1 and L2 penalties, offering a balance between feature selection and coefficient shrinkage.

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

Solution 15-The error term represents the difference between the actual observed values (y) and the values predicted by the linear regression model (ŷ).

Representation: $y = \beta 0 + \beta 1x + \varepsilon$ (ε is the error term)