

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 – A

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 – B

3. A line falls from left to right if a slope is _____?

- A) Positive B) Negative
- C) Zero D) Undefined

Ans – B

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 – B

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 – C

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 – B

7. Lasso and Ridge regression techniques belong to _____?

- A) Cross validation B) Removing outliers
- C) SMOTE D) Regularization

Ans - D

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

- A) Cross validation B) Regularization
- C) Kernel D) SMOTE

Ans – D

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 – A

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

- A) True B) False

Ans - B

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 – B

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 and C

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

13. Explain the term regularization?

Ans – In the machine learning, models are learned or train well but its fail to perform in test data. It means it not able predict the test data. This is called as overfitting, and we can handle or dealt such situation by regularization.

It is used to check whether the model is overfitting or not and to avoid it, so regularization technique is used because preventing overfitting is necessary to improve the performance of our machine learning model.

Regularization is a method to penalizing the extra features.

14. Which particular algorithms are used for regularization?

Ans - Regularization is a technique, in which we add some information or weight in machine learning model so that you reduce the overfitting. There are three algorithms are used i.e. below

1. Ridge Regularization
2. Lasso Regularization
3. Elastic Net

Ridge Regularization: -

In this, ridge regularization penalized the model based on sum square of magnitude of the coefficient. Due to this an actual best fit line slope will reduce because of it, it gives less error and we select that line which is gives the best result. By using this our bias will get rise and variance becomes low.

In ridge regularization, it selects all feature while feature selection but gives very less importance for calculating label.

$$L = \sum (y - y^{\wedge})^2 + \lambda \sum (m)^2$$

Lasso Regularization:-

In Lasso penalizes the model on the sum of magnitude of the coefficient. It also does the feature selection. If there is a dummy feature whose not contributing in label and there is no relationship with label. It avoid that feature while calculating label.

$$L = \sum (y - y^{\wedge})^2 + \lambda \sum |m|$$

Whenever you increase the value of λ it will more impact on coefficient. If you works on high diamensional data then you will prefer lasso regularization over ridge regularization.

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

Ans – The error term in a regression equation represent the effect of the variable that were excluded from the equation.

$$Y = m x + x + \text{error}$$

This equation represents the value response variable as per the regression model. If we want to know the actual value of response variable, then we need to know the error value.

Error is a difference between actual value and predicted one.

$$\text{error} = \text{actual} - \text{predicted}$$

$$\text{error} = y - (m x + b)$$

$$y = m x + b + \text{error}$$

where, m is slope of line, b is an intercept

The error terms are not normally distributed.