

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) 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. 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

Ans. 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

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. 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

Ans. B) Predictive model

7. Lasso and Ridge regression techniques belong to _____?

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

Ans. D) Regularization

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

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

Ans. 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

Ans. 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

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

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) We don't have to choose the learning rate and

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

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

13. Explain the term regularization?

Ans. Certain times, when we worked with models, the model start reacting differently means it start hitting somewhere else, far away from the actual data points instead of predicting the actual answers/points and we call this situation as Bias Variance Trade Off.

For example, we have certain points inside the model and linear regression will try to make the best fit lines according to the certain points in the model. But instead, it start assuming the answers on its own, away from the actual points and that means its not learning the points. When the model bypassing the learning and start assuming its own points or answers, we call this situation as underfitting. On the other side, model starts learning all the points even the outliers, we call this situation as overfitting.

Both underfitting and overfitting is known as Bias Variance Trade Off. To overcome the problem of underfitting and overfitting, we use some techniques known as Regularisation Techniques.

14. Which particular algorithms are used for regularization?

Ans. There are two algorithms used for regularization:

1. Lasso Regression (L1): Lasso will try to omit certain independent features (x_1, x_2, x_3, \dots) which are affecting the y output. Therefore, the Lasso will make this features to zero, so that there is no impact of these features on y output. And it is completely controlled by the Lasso which features are important for the y and which are not.
2. Ridge Regression (L2): Ridge will try to reduce the coefficient values of features which is affecting the y output. For example, we have x_1 and x_2 features and some coefficient are giving large positive impact and some are giving large negative impact on y output. So, there would be high differences. The ridge regression will try to minimize these gap/difference between positive and negative coefficient, in order to avoid any kind of overfitting and underfitting.

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

Ans. The equation of Linear Regression is: $y = a + b_1x_1 + b_2x_2 + b_nx_n \dots + e$

Here, e is an error..

If there is much gap between the predicted y value and actual y value, then there is an error.

This error is calculated by using least squares method.

Least squares method are used to find out the difference between the actual points and predicted points in the model itself.