

1. A) and B)
2. A)
3. B)
4. B)
5. C)
6. B)
7. D)
8. D)
9. A)
10. B)
11. A)
12. B)

13. Explain the term regularization?

14. Which particular algorithms are used for regularization?

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

13.Regularization:

Regularization is a technique in machine learning that aims to prevent overfitting by adding a penalty term to the model's objective function. This penalty discourages the model from fitting the training data too closely, promoting simpler and more generalized solutions. Regularization helps improve the model's ability to perform well on unseen data by reducing the potential impact of noise and fluctuations in the training data.

14. Algorithms commonly used for regularization include:

- Lasso Regression (L1 regularization)
- Ridge Regression (L2 regularization)
- Elastic Net Regression (combining L1 and L2)
- Logistic Regression with regularization
- Support Vector Machines with regularization (C parameter)
- Neural Networks with dropout regularization

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

In the context of a linear regression equation, the "error" refers to the difference between the actual observed values of the dependent variable and the predicted values generated by the

linear regression model. These errors represent the unexplained variability in the data that the model couldn't capture. Minimizing these errors is the goal of linear regression, and techniques like least squares are used to find the line that best fits the data by minimizing the sum of squared errors.

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.

$$MSE = \frac{1}{n} \sum \left(\underbrace{y - \hat{y}}_{\substack{\text{The square of the difference} \\ \text{between actual and} \\ \text{predicted}}} \right)^2$$