

MACHINE LEARNING:

1. Option (a)
2. Option (a)
3. Option (b)
4. Option (b)
5. Option (c)
6. Option (a)
7. Option (d)
8. Option (d)
9. Option (a)
10. Option (b)
11. Option (b)
12. Option (a) (b) (c)

13. Explain the term regularization?

Regularization is a technique used to reduce the errors by fitting the function appropriately on the given training set and avoid over fitting.

A simple relation for linear regression looks like this. Here Y represents the learned relation and β represents the coefficient estimates for different variables or predictors(X).

$$Y \approx \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p$$

The fitting procedure involves a loss function, known as residual sum of squares or RSS. The coefficients are chosen, such that they minimize this loss function.

$$RSS = \sum_{i=1}^n \left(y_i - \beta_0 - \sum_{j=1}^p \beta_j x_{ij} \right)^2$$

Now, this will adjust the coefficients based on your training data. If there is noise in the training data, then the estimated coefficients won't generalize well to the future data. This is where regularization comes in and shrinks or regularizes these learned estimates towards zero.

14. Which particular algorithms are used for regularization?

There are three main regularization techniques, namely:

- Ridge Regression (L2 Norm)
- Lasso (L1 Norm)
- Dropout

Ridge and Lasso can be used for any algorithms involving weight parameters, including neural nets. Dropout is primarily used in any kind of neural networks e.g. ANN, DNN, CNN or RNN to moderate the learning.

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

An error term is a residual variable produced by a statistical or mathematical model, which is created when the model does not fully represent the actual relationship between the independent variables and the dependent variables. As a result of this incomplete relationship, the error term is the amount at which the equation may differ during empirical analysis. The error term is also known as the residual, disturbance, or remainder term, and is variously represented in models by the letters e , ϵ , or u . An error term appears in a statistical model, like a regression model, to indicate the uncertainty in the model. The error term is a residual variable that accounts for a lack of perfect goodness of fit.