

MACHINE LEARNING – 3

1. In the linear regression equation $y = \theta_0 + \theta_1 x$, θ_0 is the:

- A) Slope of the line
- B) Independent variable
- C) y intercept
- D) Coefficient of determination

Ans: C) y intercept

2. True or False: Linear Regression is a supervised learning algorithm

- A) True
- B) False

Ans: A) True

3. In regression analysis, the variable that is being predicted is

- A) the independent variable
- B) the dependent variable
- C) usually denoted by x
- D) usually denoted by r

Ans: B) the dependent variable

4. Generally, which of the following method(s) is used for predicting continuous dependent variables?

- A) Logistic Regression
- B) Linear Regression
- C) Both
- D) None of the above

Ans: B) Linear Regression

5. The coefficient of determination is:

- A) the square root of the correlation coefficient
- B) usually less than zero
- C) the correlation coefficient squared
- D) equal to zero

Ans: C) the correlation coefficient squared

6. If the slope of the regression equation is positive, then:

- A) y decreases as x increases
- B) y increases as x increases
- C) y decreases as x decreases
- D) None of these

Ans: B) y increases as x increases

7. Linear Regression works best for:

- A) linear data
- B) non-linear data
- C) both linear and non-linear data
- D) None of the above

Ans: A) linear data

8. The coefficient of determination can be in the range of:

- A) 0 to 1
- B) -1 to 1
- C) -1 to 0
- D) 0 to infinity

Ans: A) 0 to 1

9. Which of the following evaluation metrics can be used for linear regression?

- A) Classification Report
- B) RMSE
- C) ROC curve
- D) MAE

**Ans: B) RMSE
D) MAE**

10. Which of the following is true for linear regression?

- A) Linear regression is a supervised learning algorithm.
- B) Linear regression supports multi-collinearity.
- C) Shape of linear regression's cost function is convex.
- D) Linear regression is used to predict discrete dependent variable

**Ans: A) Linear regression is a supervised learning algorithm.
C) Shape of linear regression's cost function is convex.**

11. Which of the following regularizations can be applied to linear regression?

- A) Ridge
- B) Lasso
- C) Pruning
- D) Elastic Net

Ans: A) Ridge
B) Lasso
D) Elastic Net

12. Linear regression performs better for:

- A) Large amount of training samples with small number of features.
- B) Same number of features and training samples
- C) Large number of features
- D) The variables which are drawn independently, identically distributed

Ans: A) Large amount of training samples with small number of features
B) Same number of features and training samples

13. Which of the following assumptions are true for linear regression?

- A) Linearity
- B) Homoscedasticity
- C) Non-Independent
- D) Normality

Ans: A) Linearity
B) Homoscedasticity
D) Normality

14. Explain Linear Regression?

Linear regression is a supervised learning algorithm. It is a statistical method that determines the intensity of the relationship between dependent and independent variables. This type of distribution forms a line and so called as linear regression. It is one of the most common types of predictive analysis.

Linear regression is a powerful tool for understanding and predicting the behavior of a variable, but it has some limitations. One is that it assumes a linear relationship between the independent variables and the dependent variable which is not always be the case. Linear regression is sensitive to outliers, these outliers can have effect on the fitted line, leading to inaccurate predictions

Before applying the linear regression model we need to consider the following assumptions linearity, homoscedasticity, Normality, Independence and No Multicollinearity.

Evaluation Metrics for linear Regression: R Square/Adjusted R Square, Mean Squared Error (MSE), Root Mean Squared Error (RMSE)

Linear regression is used in many different fields, including finance, economics, and psychology, to understand and predict the behavior of a particular variable.

Moreover Linear Regression is classified into two types simple and multiple regression.

15. What is difference between simple linear and multiple linear regression?

Linear Regression is of two types: **Simple and Multiple**

Simple Linear Regression is where only one independent variable is present and the model has to find the linear relationship of it with the dependent variable.

It is when we have only one predictor, or X variable, predicting the response or Y variable. Simple linear regression occurs in 2 dimension.

Multiple Linear Regression have more than one independent variables for the model to find the relationship.

Multiple regression you can have multiple X predictors that all contribute to predicting Y. It can occur in an infinite number of dimensions.