**ASSIGNMENT NO-10**

**MACHINE LEARNING**

Q. 1. In the linear regression equation y = θ0 + θ1x, θ0 is the:

**ANS. C) y intercept**

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

**ANS. A) True**

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

**ANS. B) the dependent variable**

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

**ANS. B) Linear Regression**

Q. 5. The coefficient of determination is:

**ANS. C) the correlation coefficient squared**

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

**ANS. B) y increases as x increases**

Q. 7. Linear Regression works best for:

**ANS. A) linear data**

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

**ANS. B) -1 to 1**

In Q9 to Q13, more than one options are correct, Choose all the correct options:

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

**ANS. B) RMSE D) MAE**

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

**ANS.A) Linear regression is a supervised learning algorithm.**

**C) Shape of linear regression’s cost function is convex.**

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

**ANS. A) Ridge B) Lasso**

Q. 12. Linear regression performs better for:

**ANS. A) Large amount of training samples with small number of features.**

**D) The variables which are drawn independently, identically distributed**

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

**ANS. A) Linearity B) Homoscedasticity D) Normality**

**Q14 and Q15 are subjective answer type questions, Answer them briefly**

**Q. 14. Explain Linear Regression?**

ANS. Linear regression is a statistical method that tries to show a relationship between variables. It looks at different data points and plots a trend line. A simple example of linear regression is finding that the cost of repairing a piece of machinery increases with time.

More precisely, linear regression is used to determine the character and strength of the association between a dependent variable and a series of other independent variables. It helps create models to make predictions, such as predicting a company's stock price.

In short, linear regression tries to model the relationship between two variables by applying a linear equation to the observed data. A linear regression line can be represented using the equation of a straight line: **y=mx+ b**

* **y** is the estimated dependant variable (or the output)
* **m** is the regression coefficient (or the slope)
* **x** is the independent variable (or the input)
* **b** is the constant (or the y-intercept)

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

Ans. The **simple linear regression** method tries to find the relationship between a single independent variable and a corresponding dependent variable. The independent variable is the input, and the corresponding dependent variable is the output.

The **multiple linear regression** method tries to find the relationship between two or more independent variables and the corresponding dependent variable. There's also a special case of multiple linear regression called [**polynomial regression**](https://www.statsdirect.com/help/regression_and_correlation/polynomial.htm).

Simply put, a simple linear regression model has only a single independent variable, whereas a multiple linear regression model will have two or more independent variables. And yes, there are other non-linear regression methods used for highly complicated data analysis.