**MACHINE LEARNING**

**ASSIGNMENT – 10**

**In Q1 to Q8, only one option is correct, Choose the correct option:**

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

A) Slope of the line

**B) Independent variable**

C) y intercept

D) Coefficient of determination

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

**A) True**

B) False

**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

**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

**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**

**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**

**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

**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

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

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

A) Classification Report

**B) RMSE**

C) ROC curve

**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.**

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

A) Ridge

B) Lasso

C) Pruning

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

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

A) Linearity

B) Homoscedasticity

C) Non-Independent

D) Normality

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

**14. Explain Linear Regression?**

Linear regression analysis is used to predict the value of a variable based on the value of another variable. The variable you want to predict is called the dependent variable. The variable you are using to predict the other variable's value is called the independent variable. This form of analysis estimates the coefficients of the linear equation, involving one or more independent variables that best predict the value of the dependent variable. Linear regression fits a straight line or surface that minimizes the discrepancies between predicted and actual output values. There are simple linear regression calculators that use a “least squares” method to discover the best-fit line for a set of paired data. You then estimate the value of X (dependent variable) from Y (independent variable)

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

Regression analysis is a common statistical method used in finance and investing. Linear regression is one of the most common techniques of regression analysis. Multiple regression is a broader class of regressions that encompasses linear and nonlinear regressions with multiple explanatory variables. Regression as a tool helps pool data together to help people and companies make informed decisions. There are different variables at play in regression, including a dependent variable—the main variable that you're trying to understand—and an independent variable—factors that may have an impact on the dependent variable