1. C

2. B

3. A

4. C

5. A

6. A

7. B

8. C

9. BD

10. BC

11. A

12.

R-squared is the total variance in dependent variable explained by Independent variables.

Mathematically, it can be written as,

R2 = 1- (RSS/TSS)

Where, RSS is Residual Sum of Squares and TSS means Total Sum of Squares.

The drawback of R-squared is that it either remains unchanged or increases with the addition of new variables even if they are completely useless. Therefore, we designed Adjusted R-squared which penalizes the model on addition of unnecessary features.

Mathematically, it can be written as,

R2adj = 1 - {(1 - R2) \* (N-1/N-M-1)}

Where N is the number of records and M is the number of variables.

13.

The cost function is what we want to minimize in Linear Regression using Gradient Descent algorithm. Cost function is the distance between the Regression line and original data points. We want to fit a generalized line to our data points such that the collective sum of distances over all the points from line is as low as possible. In ideal cases, the cost function comes out to be zero.

Mathematically, it can be written as,

1/2m \* Sigma 1m (Yi - Yihat) 2

14.

SSE stands for Sum of Squares of Errors. SSR stands for Sum of Squares due to regression and SST stands for Sum of Squares of Total.

Mathematically, we can write

SST = SSR + SSE

SST denoetes the total variance in dependent variable explained by the baseline model, that is the mean of the target variable.

SSR denotes the extra variance in dependent variable explained by the regression model over Baseline model.

SSE denotes the unexplained variable in dependent variable even after the adoption of Regression Model.

Mathematical equations for these can be written as follows-

SST = Sigma (Y-Y\_bar)2

SSR= igma (Y\_hat-Y\_bar)2

SSE = Sigma (Y-Y\_hat)2

Where, Y is the target variable, Y\_bar is the mean value of Y and Y\_hat is the predictions by Regression model.

15.

Various Evaluation metrics for linear regression are as follows-

1. Mean Squared Error

2. Mean Absolute Error

3. Root Mean Squared Error

4. R-squared

5. Adjusted R-squared

R-squared and Adjusted R-squared have already been discussed in detail above.

MSE = Sigma (Y-Y\_hat)2

MAE = Sigma | Y-Y\_hat |

MSE is the squared difference between the predicted value and real value while MAE is the absolute difference between the predicted value and real value. RMSE on the other hand is square root of MSE.