Q1)

Ans : A) Least Square Error

Q2)

Ans : A) Linear regression is sensitive to outliers

Q3)

Ans : B) Negative

Q4)

Ans : B) Correlation

Q5)

Ans : C) Low bias and high variance

Q6)

Ans :

Q7)

Ans : D) Regularization

Q8)

Ans : A) Cross validation

Q9)

Ans : C) Sensitivity and Specificity

Q10)

Ans : B) False

Q11)

Ans : B) Apply PCA to project high dimensional data

Q12)

Ans : A , B and C

A) We don’t have to choose the learning rate.

B) It becomes slow when number of features is very large.

C) We need to iterate.

Q13)

Ans : Regularizations are techniques used to reduce the error by fitting a function appropriately on the given training set and avoid overfitting .

- Sometimes in machine learning model performs well with training data but does not perform well with the test data. It means the model is does not able to predict the output

when deals with unseen data by introducing noise in the output , and hence the model is called overfitted. This problem can be deal with the help of regularization technique.

- This technique can be used in such way that it will allow to maintain all variables or features in the model by reducing the magnitude of the variables. Hence ,it maintains accuracy as well as regularization of the model.
- It mainly regularizes or reduces the coefficient of features toward zero .

Q14)

Ans : There are three types of regularization algorithm

- Ridge Regression

It is a method for analyzing data suffer from multicollinearity.

$$Loss = \sum_{i=1}^{n} (y_i - (w_i x_i + c))^2 + \lambda \sum_{i=1}^{n} w_i^2$$

Ridge regression adds a penalty to the loss function that is equivalent to the squar of the magnitude of the coefficients.
The regularisation parameter regularizes the coefficients such that if the coefficients take large value,the loss function is penalized.
It also known as L2 regularization.

- LASSO Regression

LASSO Regression analysis method that perform both features selection and regularization in order to enhance the prediction accuracy of the model.

$$Loss = \sum_{i=1}^{n} (y_i - (w_i x_i + c))^2 + \lambda \sum_{i=1}^{n} |w_i|$$

LASSO Regression adds penalty to the loss function that is equivalent to the magnitude of the coefficients .
In LASSO regression, the penalty has the effect of forcing some of the coefficient estimates to be exactly equal to zero when the regularization parameter λ sufficiently large.
It is also known as L1 regularization.

- Elastic – Net Regression

  Elastic-net regression is s regularized regression method that linearly combine the L1 and L2 PENALTIES OF THE LASSO and Ridge methods respectively

$$Loss = \sum_{i=0}^{n} (y_i - (w_i x_i + c))^2 + \lambda_1 \sum_{i=0}^{n} |w_i| + \lambda_2 \sum_{i=0}^{n} w_i^2$$

Q15)

Ans : Mean Absolute Error : The **mean absolute error** (MAE) is the simplest regression error metric to understand. We'll calculate the residual for every data point, taking only the absolute value of each so that negative and positive residuals do not cancel out. We then take the average of all these residuals. Effectively, MAE describes the *typical* magnitude of the residual.

Mean Square Error : The **mean square error** (MSE) is just like the MAE, but *squares* the difference before summing them all instead of using the absolute value. We can see this difference in the equation below.

$$MSE = \frac{1}{n} \Sigma \underbrace{\left(y - \hat{y} \right)^2}_{\text{The square of the difference between actual and predicted}}$$

- Mean Absolute Percentage Error : The **mean absolute percentage error** (MAPE) is the percentage equivalent of MAE. The equation looks just like that of MAE, but with adjustments to convert everything into percentages.