Machine Learning Worksheet

1.Ans – a

2.Ans – a

3. Ans – b

4.Ans – b

5.Ans – c

6. Ans – b

7 Ans - d

8. Ans- d

9.Ans- a

10. Ans- b

11. Ans -

12. Ans – a, b, c

13 Ans – Regularization: - Regularization is a technique used to reduce the errors by fitting the function appropriately on the given training set and avoid overfitting. model performs well with the training data but does not perform well with the test data. It means the model is 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 a regularization technique.

14.Ans -Algorithms used for Regularization :-

The commonly used regularization algorithms are :

1. L1 regularization
2. L2 regularization

A regression model which uses **L1 Regularization** technique is called **LASSO (Least Absolute Shrinkage and Selection Operator)** regression.
A regression model that uses **L2 regularization** technique is called **Ridge regression**.

- **Lasso Regression** adds *"absolute value of magnitude"* of coefficient as penalty term to the loss function(L).
  Loss function with L1 regularization :

$$L = y \log (mx + c) + (1 - y)\log(1 - (mx + c)) + lambda*||w||_1$$

- **Ridge regression** adds "*squared magnitude*" of coefficient as penalty term to the loss function(L).

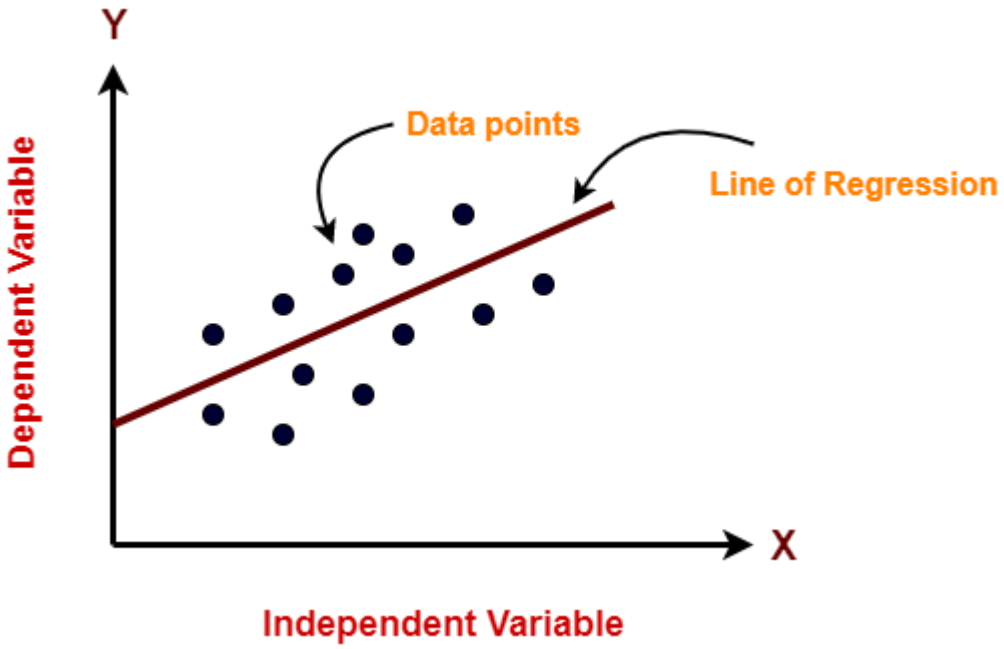
  Loss function with L2 regularization :

$$L = y \log (mx + c) + (1 - y)\log(1 - (mx + c)) + lambda*||w||^2$$

  lambda is a Hyperparameter Known as regularization constant and it is greater than zero.

15 Ans – Linear regression algorithm shows a linear relationship between a dependent (y) and one or more independent (y) variables

The linear regression model provides a sloped straight line representing the relationship between the variables. Consider the below image:

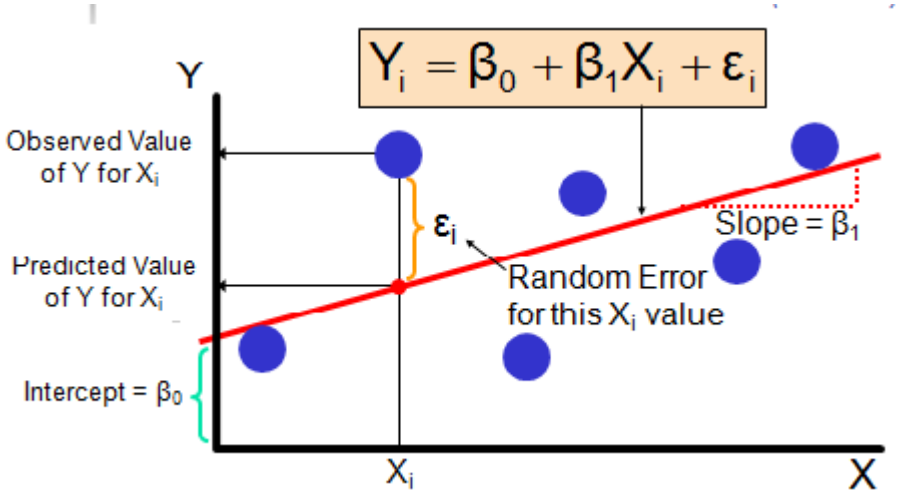


Mathematically, we can represent a linear regression as:

Y= mX + C +e

Y = Dependent variable(Target Variable)
X = Independent variable(Predictor variable)
m = slope(Linear regression coefficient)
C = intercept of the line
e = random error

The values for x and y variables are training datasets for Linear Regression model representation.



Error (e) = (Observed value for data points) - (Predicted value for data points)