# In Q1 to Q11, only one option is correct, choose the correct option:

1. Which of the following methods do we use to find the best fit line for data in Linear Regression?
   1. Least Square Error B) Maximum Likelihood
   2. Logarithmic Loss D) Both A and B

**Answer :- A) Least Square Error**

1. Which of the following statement is true about outliers in linear regression?
   1. Linear regression is sensitive to outliers B) linear regression is not sensitive to outliers
   2. Can’t say D) none of these

**Answer:-A) Linear regression is sensitive to outliers**

1. A line falls from left to right if a slope is ?
   1. Positive B) Negative
   2. Zero D) Undefined

**Answer:- B) Negative**

1. Which of the following will have symmetric relation between dependent variable and independent variable?
   1. Regression B) Correlation
   2. Both of them D) None of these

**Answer:- B) Correlation**

1. Which of the following is the reason for over fitting condition?
   1. High bias and high variance B) Low bias and low variance
   2. Low bias and high variance D) none of these

**Answer:- C) Low bias and high variance**

1. If output involves label then that model is called as:
   1. Descriptive model B) Predictive modal
   2. Reinforcement learning D) All of the above

**Answer:- Predictive modal**

1. Lasso and Ridge regression techniques belong to ?
   1. Cross validation B) Removing outliers
   2. SMOTE D) Regularization

**Answer:- Regularization**

1. To overcome with imbalance dataset which technique can be used?
   1. Cross validation B) Regularization
   2. Kernel D) SMOTE

**Answer:- SMOTE**

1. The AUC Receiver Operator Characteristic (AUCROC) curve is an evaluation metric for binary classification problems. It uses to make graph?
   1. TPR and FPR B) Sensitivity and precision
   2. Sensitivity and Specificity D) Recall and precision

**Answer:- TPR and FPR**

1. In AUC Receiver Operator Characteristic (AUCROC) curve for the better model area under the curve should be less.
   1. True B) False

**Answer:- B) False**

1. Pick the feature extraction from below:
   1. Construction bag of words from a email
   2. Apply PCA to project high dimensional data
   3. Removing stop words
   4. Forward selection

# **Answer:- Construction bag of words from a email**

# In Q12, more than one options are correct, choose all the correct options:

1. Which of the following is true about Normal Equation used to compute the coefficient of the Linear Regression?
2. We don’t have to choose the learning rate
3. It becomes slow when number of features is very large.
4. We need to iterate.
5. It does not make use of dependent variable

**Answer:- A) We don’t have to choose the learning rate**

1. **It becomes slow when number of features is very large**

# Q13 and Q15 are subjective answer type questions, Answer them briefly.

1. Explain the term regularization?

Regularization is a technique used in machine learning to prevent overfitting and improve the generalization performance of a model. It involves adding a penalty term to the loss function of the model that discourages large values of the model parameters. The penalty term is usually a function of the magnitude of the parameters, and its purpose is to reduce the complexity of the model by shrinking the values of the parameters towards zero.

Regularization can be achieved through different techniques, such as L1 regularization (Lasso), L2 regularization (Ridge regression), and Elastic Net regularization. L1 regularization adds the absolute value of the coefficients as a penalty term, while L2 regularization adds the squared value of the coefficients. Elastic Net is a combination of both L1 and L2 regularization.

Regularization helps to prevent overfitting by reducing the model complexity, which in turn reduces the variance of the model. It is particularly useful when the number of features in the dataset is large, as it can help to select the most important features and avoid overfitting due to the curse of dimensionality.

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1. Which particular algorithms are used for regularization?

**Answer : -**

Several machine learning algorithms use regularization to prevent overfitting, such as:

1. Ridge Regression
2. Lasso Regression
3. Elastic Net
4. Logistic Regression with L1 or L2 penalty
5. Support Vector Machines with L1 or L2 penalty
6. Decision Trees with Pruning
7. Neural Networks with L1 or L2 penalty
8. Explain the term error present in linear regression equation?

**Answer:-** In linear regression, the error term refers to the difference between the predicted values and the actual values of the dependent variable. The error term, also known as the residual, is denoted by the letter e in the linear regression equation y = β0 + β1x + e.

The goal of linear regression is to minimize the sum of the squared errors (SSE), which is the sum of the squared differences between the predicted values and the actual values of the dependent variable. By minimizing the SSE, the linear regression line is fitted as closely as possible to the observed data points, and the error term is minimized.

The presence of error in the linear regression equation is inevitable as it represents the variation in the dependent variable that cannot be explained by the independent variable(s). However, minimizing the error term helps to improve the accuracy of the linear regression model and make more accurate predictions.