**MACHINE LEARNING – WORKSHEET 1: ANSWERS**

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

**Answer:** A) Least Square Error

1. Which of the following statement is true about outliers in linear regression?
2. Linear regression is sensitive to outliers
3. Linear regression is not sensitive to outliers
4. Can’t say
5. None of these

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

1. A line falls from left to right if a slope is \_\_\_\_\_\_?
2. Positive
3. Negative
4. Zero
5. Undefined

**Answer:** B) Negative

1. Which of the following will have symmetric relation between dependent variable and independent variable?
2. Regression
3. Correlation
4. Both of them
5. None of these

**Answer:** A) Regression

1. Which of the following is the reason for over fitting condition?
2. High bias and high variance
3. Low bias and low variance
4. Low bias and high variance
5. None of these

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

1. If output involves label then that model is called as:
2. Descriptive model
3. Predictive model
4. Reinforcement learning
5. All of the above

**Answer:** B) Predictive model

1. Lasso and Ridge regression techniques belong to \_\_\_\_\_\_\_\_\_?
2. Cross validation
3. Removing outliers
4. SMOTE
5. Regularization
6. **Answer:** D) Regularization
7. To overcome with imbalance dataset which technique can be used?
8. Cross validation
9. Regularization
10. Kernel
11. SMOTE
12. **Answer:** D) SMOTE
13. The AUC Receiver Operator Characteristic (AUCROC) curve is an evaluation metric for binary classification problems. It uses \_\_\_\_\_ to make graph?
14. TPR and FPR
15. Sensitivity and precision
16. Sensitivity and Specificity
17. Recall and precision

**Answer:** A) TPR and FPR

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

**Answer:** True

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

**Answer:** B) Apply PCA to project high dimensional data

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

1. Explain the term regularization?

Regularization refers to techniques that are used to calibrate machine learning models in order to minimize the adjusted loss function and prevent overfitting or underfitting. Using Regularization, we can fit our machine learning model appropriately on a given test set and hence reduce the errors in it.

1. Which particular algorithms are used for regularization?

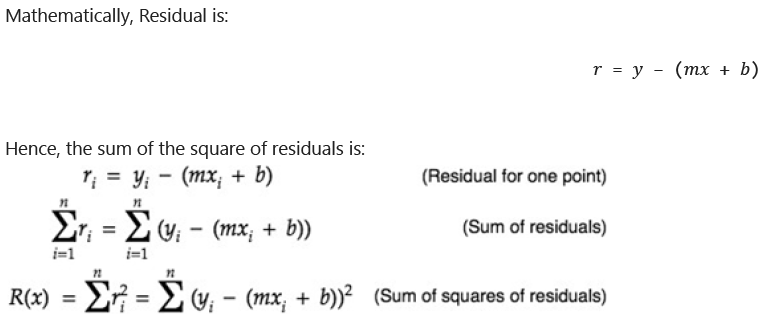
The most common types of regularization algorithms are lasso, ridge, and elastic net.

* **Lasso Regularization**: [Lasso](https://en.wikipedia.org/wiki/Lasso_(statistics)) is a type of regularization that uses L1-norm Regularization. Lasso regularization works by adding a penalty to the absolute value of the magnitude of coefficients. This forces certain coefficients to be equal to zero, which in turn helps to reduce overfitting.
* **Ridge Regularization**: [Ridge](https://en.wikipedia.org/wiki/Ridge_regression) is a type of regularization that uses L2-norm Regularization. Ridge regularization works by adding a penalty to the square of the magnitude of coefficients. This forces all coefficients to be close to zero but does not allow them to be equal to zero. It **is effective at reducing overfitting.**
* **Elastic net Regularization**: [Elastic net](https://en.wikipedia.org/wiki/Elastic_net_regularization) is a type of regularization that combines L1-norm Regularization and L2-norm Regularization. It is effective at both reducing overfitting and improving interpretability.

1. Explain the term error present in linear regression equation?

An error term is a residual variable produced by a statistical or mathematical model, which is created when the model does not fully represent the actual relationship between the independent variables and the dependent variables. The error term is also known as the residual. Residual is the distance between the actual Y and the predicted Y, as shown below:





**\*\* \*\* \*\***