**Chapter 6**

**Research about different classification algorithms**

Some of the classification algorithms are: -

1. Logistic Regression
2. Support Vector Machines
3. Decision Trees
4. Random Forest
5. Naïve Bayes
6. K-Nearest Neighbours

**6.1 Logistic Regression: -**

1. It is used to predict probabilities for a given datapoint.
2. Since it predicts probabilities, the range of outcomes is between 0 and 1.
3. The same can be used to perform binary classification between two classes.
4. However, it is sensitive to outliers and assumes linear relationship between input variables.

**6.2 Support Vector Machines: -**

1. It helps to build the hyperplane that enables to differentiate between two classes in the dataset.
2. It can handle complex, non-linear classifications.
3. It is inefficient when we have large number of features.
4. It can be computationally expensive.

**6.3 Decision Trees: -**

1. It has a flowchart-like structure with if else conditions.
2. But it tends to overfit and prone to errors if there is small change in dataset.
3. It can be used for both binary classification and multi-class classification.

**6.4 Random Forest: -**

1. It uses many decision trees to make predictions.
2. The results of different trees are combined to get the final outcome of the classifier.
3. Since many trees are used, there is lesser chance of overfitting and higher probability of better results.
4. It works well on scaled and complex data.
5. Since it uses decision trees, Random Forest can also be used for both binary classification and multi-class classification.

**6.5 Naïve Bayes: -**

1. It assumes each feature is independent and computes probability for each class based on the independent features.
2. It can perform well on large datasets.
3. It handles irrelevant features.
4. It is mainly used for text dataset.

**6.6 K-Nearest Neighbors: -**

1. It is also represented as k-NN.
2. It classifies each input into one of the two classes based on the class having ‘k’ nearest points in the training dataset.
3. Thus, the datapoints that are similar are neighbors of each other.
4. It gets impacted by irrelevant features and the scale of the data.
5. It can be used for both binary classification and multi-class classification.