# Classification Assignment

**Support Vector Machine:**

1. What is the percentage of correct classification of both (Purchased & Unpurchased) to the total input of the test set?
   Ans: 72%
2. What is the percentage of correct classification of 'Purchased' to the total input of 'Purchased' in the test set?
   Ans: 20%
3. What is the percentage of correct classification of 'Unpurchased' to the total input of 'Unpurchased' in the test set?
   Ans: 99%
4. What is the percentage of correct classification of 'Purchased' to sum of correctly classified and wrongly classified of 'Purchased' in the test set?
   Ans: 89%
5. What is the percentage of correct classification of 'Unpurchased' to sum of correctly classified and wrongly classified of 'Unpurchased' in the test set?
   Ans: 70%
6. What is the overall performance of 'Purchased'?
   Ans: 32%
7. What is the overall performance of 'Unpurchased'?
   Ans: 82%
8. What is the Average performance of precision of 'Purchased & Unpurchased'?
   Ans: 80%
9. What is the Average performance of recall of 'Purchased & Unpurchased'?
   Ans: 59%
10. What is the Average performance of F1 measure of 'Purchased & Unpurchased'?
    Ans: 57%
11. What is the precision sum of product of proportion rate (weight) of each class?
    Ans: 77%
12. What is the recall sum of product of proportion rate (weight) of each class?
    Ans: 72%
13. What is the F1 measure sum of product of proportion rate (weight) of each class?
    Ans: 65%

**Decision Tree:**

1. What is the percentage of correct classification of both (Purchased & Unpurchased) to the total input of the test set?
   Ans: 88%
2. What is the percentage of correct classification of 'Purchased' to the total input of 'Purchased' in the test set?
   Ans: 85%
3. What is the percentage of correct classification of 'Unpurchased' to the total input of 'Unpurchased' in the test set?

Ans: 90%

4. What is the percentage of correct classification of ‘Purchased’ to sum of correctly classified and wrongly classified of ‘Purchased’ in the test set?
   Ans: 81%
5. What is the percentage of correct classification of ‘Unpurchased’ to sum of correctly classified and wrongly classified of ‘Unpurchased’ in the test set?
   Ans: 92%
6. What is the overall performance of ‘Purchased’?
   Ans: 83%
7. What is the overall performance of ‘Unpurchased’?
   Ans: 91%
8. What is the Average performance of precision of ‘Purchased & Unpurchased’?
   Ans: 87%
9. What is the Average performance of recall of ‘Purchased & Unpurchased’?
   Ans: 88%
10. What is the Average performance of F1 measure of ‘Purchased & Unpurchased’?
    Ans: 87%
11. What is the precision sum of product of proportion rate (weight) of each class?
    Ans: 89%
12. What is the recall sum of product of proportion rate (weight) of each class?
    Ans: 88%
13. What is the F1 measure sum of product of proportion rate (weight) of each class?
    Ans: 88%

**Random Forest:**

1. What is the percentage of correct classification of both (Purchased & Unpurchased) to the total input of the test set?
   Ans: 89%
2. What is the percentage of correct classification of ‘Purchased’ to the total input of ‘Purchased’ in the test set?
   Ans: 85%
3. What is the percentage of correct classification of ‘Unpurchased’ to the total input of ‘Unpurchased’ in the test set?
   Ans: 91%
4. What is the percentage of correct classification of ‘Purchased’ to sum of correctly classified and wrongly classified of ‘Purchased’ in the test set?
   Ans: 83%
5. What is the percentage of correct classification of ‘Unpurchased’ to sum of correctly classified and wrongly classified of ‘Unpurchased’ in the test set?
   Ans: 92%
6. What is the overall performance of ‘Purchased’?
   Ans: 84%
7. What is the overall performance of ‘Unpurchased’?
   Ans: 92%

8. What is the Average performance of precision of ‘Purchased & Unpurchased’?
   Ans: 88%
9. What is the Average performance of recall of ‘Purchased & Unpurchased’?
   Ans: 88%
10. What is the Average performance of F1 measure of ‘Purchased & Unpurchased’?
    Ans: 88%
11. What is the precision sum of product of proportion rate (weight) of each class?
    Ans: 89%
12. What is the recall sum of product of proportion rate (weight) of each class?
    Ans: 89%
13. What is the F1 measure sum of product of proportion rate (weight) of each class?
    Ans: 89%

**K nearest neighbors:**

1. What is the percentage of correct classification of both (Purchased & Unpurchased) to the total input of the test set?
   Ans: 83%
2. What is the percentage of correct classification of ‘Purchased’ to the total input of ‘Purchased’ in the test set?
   Ans: 68%
3. What is the percentage of correct classification of ‘Unpurchased’ to the total input of ‘Unpurchased’ in the test set?
   Ans: 91%
4. What is the percentage of correct classification of ‘Purchased’ to sum of correctly classified and wrongly classified of ‘Purchased’ in the test set?
   Ans: 80%
5. What is the percentage of correct classification of ‘Unpurchased’ to sum of correctly classified and wrongly classified of ‘Unpurchased’ in the test set?
   Ans: 85%
6. What is the overall performance of ‘Purchased’?
   Ans: 74%
7. What is the overall performance of ‘Unpurchased’?
   Ans: 88%
8. What is the Average performance of precision of ‘Purchased & Unpurchased’?
   Ans: 82%
9. What is the Average performance of recall of ‘Purchased & Unpurchased’?
   Ans: 80%
10. What is the Average performance of F1 measure of ‘Purchased & Unpurchased’?
    Ans: 81%
11. What is the precision sum of product of proportion rate (weight) of each class?
    Ans: 83%
12. What is the recall sum of product of proportion rate (weight) of each class?
    Ans: 83%
13. What is the F1 measure sum of product of proportion rate (weight) of each class?

Ans: 83%

**Logistic Regression:**

1. What is the percentage of correct classification of both (Purchased & Unpurchased) to the total input of the test set?
   Ans: 66%
2. What is the percentage of correct classification of 'Purchased' to the total input of 'Purchased' in the test set?
   Ans: 0%
3. What is the percentage of correct classification of 'Unpurchased' to the total input of 'Unpurchased' in the test set?
   Ans: 100%
4. What is the percentage of correct classification of 'Purchased' to sum of correctly classified and wrongly classified of 'Purchased' in the test set?
   Ans: 0%
5. What is the percentage of correct classification of 'Unpurchased' to sum of correctly classified and wrongly classified of 'Unpurchased' in the test set?
   Ans: 66%
6. What is the overall performance of 'Purchased'?
   Ans: 0%
7. What is the overall performance of 'Unpurchased'?
   Ans: 79%
8. What is the Average performance of precision of 'Purchased & Unpurchased'?
   Ans: 33%
9. What is the Average performance of recall of 'Purchased & Unpurchased'?
   Ans: 50%
10. What is the Average performance of F1 measure of 'Purchased & Unpurchased'?
    Ans: 40%
11. What is the precision sum of product of proportion rate (weight) of each class?
    Ans: 43%
12. What is the recall sum of product of proportion rate (weight) of each class?
    Ans: 66%
13. What is the F1 measure sum of product of proportion rate (weight) of each class?
    Ans: 52%

Naïve bayes algorithm providing very less accuracy, recall, precision and F1 score.

In all Machine learning classification algorithm, Random forest providing good accuracy, recall, precision and F1 score. So this model to be deployed.