# Machine Learning – Classification

## *Decision Tree - Algorithm*

**Q)** What is the Percentage of correct classification of both classes (Purchased and Not Purchased) to the total test set input?

**A)** The Accuracy value of the classification is **0.90** (or) **90%**


**Q)** What is the Percentage of correct classification of Purchased to the total test set input?

**A)** The Recall value of the Purchased class is **0.86** (or) **86%**


**Q)** What is the Percentage of correct classification of Not Purchased to the total test set input?

**A)** The Recall value of the Not Purchased class is **0.91** (or) **91%**


**Q)** What is the Percentage of correctly classified and wrongly classified of Purchased class in the test set?

**A)** The Precision value of the Purchased class is **0.79** (or) **79%**


**Q)** What is the Percentage of correctly classified and wrongly classified of Not Purchased class in the test set?

**A)** The Precision value of the Purchased class is **0.95** (or) **95%**


**Q)** What is the Overall performance of the Purchased class?

**A)** The F1 Score is **0.83** (or) **83%**


**Q)** What is the Overall performance of the Not Purchased class?

**A)** The F1 Score is **0.93** (or) **93%**

**Q)** What is the Average performance of all the Evaluation Metrics of both classes?

**A)** The Macro Average values are below:

- Precision = **0.87** (or) **87%**
- Recall = **0.89** (or) **89%**
- F1 Score = **0.88** (or) **88%**

**Q)** What is the Sum of Proportion rate of both classes?

**A)** The Weighted Average values are below:

- Precision = **0.90** (or) **90%**
- Recall = **0.90** (or) **90%**
- F1 Score = **0.90** (or) **90%**

**Report:**

```
              precision    recall  f1-score   support

           0       0.95      0.91      0.93        58
           1       0.79      0.86      0.83        22

    accuracy                           0.90        80
   macro avg       0.87      0.89      0.88        80
weighted avg       0.90      0.90      0.90        80
```

# Random Forest - Algorithm

**Q)** What is the Percentage of correct classification of both classes (Purchased and Not Purchased) to the total test set input?

**A)** The Accuracy value of the classification is **0.94** (or) **94%**

**Q)** What is the Percentage of correct classification of Purchased to the total test set input?

**A)** The Recall value of the Purchased class is **0.95** (or) **95%**

**Q)** What is the Percentage of correct classification of Not Purchased to the total test set input?

**A)** The Recall value of the Not Purchased class is **0.93** (or) **93%**

**Q)** What is the Percentage of correctly classified and wrongly classified of Purchased class in the test set?

**A)** The Precision value of the Purchased class is **0.84** (or) **84%**

**Q)** What is the Percentage of correctly classified and wrongly classified of Not Purchased class in the test set?

**A)** The Precision value of the Purchased class is **0.98** (or) **98%**

**Q)** What is the Overall performance of the Purchased class?

**A)** The F1 Score is **0.89** (or) **89%**

**Q)** What is the Overall performance of the Not Purchased class?

**A)** The F1 Score is **0.96** (or) **96%**

**Q)** What is the Average performance of all the Evaluation Metrics of both classes?

**A)** The Macro Average values are below:

- Precision = **0.91** (or) **91%**
- Recall = **0.94** (or) **94%**
- F1 Score = **0.92** (or) **92%**

**Q)** What is the Sum of Proportion rate of both classes?

**A)** The Weighted Average values are below:

- Precision = **0.94** (or) **94%**
- Recall = **0.94** (or) **94%**
- F1 Score = **0.94** (or) **94%**

**Report:**

|  | precision | recall | f1-score | support |
|---|---|---|---|---|
| 0 | 0.98 | 0.93 | 0.96 | 58 |
| 1 | 0.84 | 0.95 | 0.89 | 22 |
| accuracy |  |  | 0.94 | 80 |
| macro avg | 0.91 | 0.94 | 0.92 | 80 |
| weighted avg | 0.94 | 0.94 | 0.94 | 80 |

# *Support Vector Machine*

**Q)** What is the Percentage of correct classification of both classes (Purchased and Not Purchased) to the total test set input?

**A)** The Accuracy value of the classification is **0.72** (or) **72%**

**Q)** What is the Percentage of correct classification of Purchased to the total test set input?

**A)** The Recall value of the Purchased class is **0.00** (or) **0%**

**Q)** What is the Percentage of correct classification of Not Purchased to the total test set input?

**A)** The Recall value of the Not Purchased class is **1.00** (or) **100%**

**Q)** What is the Percentage of correctly classified and wrongly classified of Purchased class in the test set?

**A)** The Precision value of the Purchased class is **0.00** (or) **0%**

**Q)** What is the Percentage of correctly classified and wrongly classified of Not Purchased class in the test set?

**A)** The Precision value of the Purchased class is **1.00** (or) **100%**

**Q)** What is the Overall performance of the Purchased class?

**A)** The F1 Score is **0.00** (or) **0%**

**Q)** What is the Overall performance of the Not Purchased class?

**A)** The F1 Score is **0.84** (or) **84%**

**Q)** What is the Average performance of all the Evaluation Metrics of both classes?

**A)** The Macro Average values are below:

- Precision = **0.36** (or) **36%**
- Recall = **0.50** (or) **50%**
- F1 Score = **0.42** (or) **42%**

**Q)** What is the Sum of Proportion rate of both classes?

**A)** The Weighted Average values are below:

- Precision = **0.53** (or) **53%**
- Recall = **0.72** (or) **72%**
- F1 Score = **0.61** (or) **61%**

**Report:**

|  | precision | recall | f1-score | support |
|---|---|---|---|---|
| 0 | 0.72 | 1.00 | 0.84 | 58 |
| 1 | 0.00 | 0.00 | 0.00 | 22 |
| accuracy |  |  | 0.72 | 80 |
| macro avg | 0.36 | 0.50 | 0.42 | 80 |
| weighted avg | 0.53 | 0.72 | 0.61 | 80 |