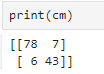
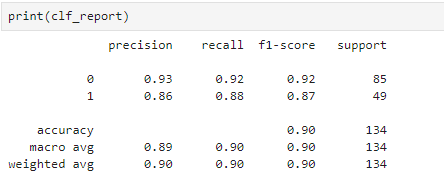
**RandomForestClassifier**





To calculate precision, recall, F1-score, accuracy, macro average, and weighted average:

**Confusion Matrix Result:**

**[78 7]**

**[6 43]**

True Not Purchased**, T(NP)**= 78

False Not Purchased, **F(NP)** = 7

False Purchased, **F(P)** = 6

True Purchased, **T(P)** = 43

Total Count of Not Purchased, **TC[NP]** = 85

Total Count of Purchased, **TC[P]** =49

Total Count of the Purchased & Non Purchased, **TC[P+NP]**= 134

**Questions:**

1. What is the percentage of correct classification of both (Purchased & Not Purchased) to the total input of the test set?

Accuracy=(T(P)+T(NP)) / (T(P)+T(NP)+F(P)+F(NP))

Accuracy=(43+78) / (43+78+6+7)=121/134

**Accuracy= 0.9029=0.90**

2. What is the percentage of correct classification of Purchased to the total input of Purchased in the test set?

Recall Purchased = T(P) / (Total count of Purchased)

Recall Purchased = 43/49

**Recall [P] = 0. 8775=0.88**

3. What is the percentage of correct classification of Not Purchased to the total input of Not Purchased in the test set?

Recall Not Purchased = T(NP) / (Total count of Not Purchased)

Recall Not Purchased = 78/85

**Recall [NP] = 0.9176=0.92**

4. What is the percentage of correct classification of Purchased to sum of **correctly** classified as Purchased and **wrongly** classified as Purchased in the test set?

Precision Purchased = T(P) / [T(P)+F(NP)]

Precision Purchased = 43/[43+7]=43/50

**Precision [P] = 0.86**

5. What is the percentage of correct classification of Not Purchased to sum of **correctly** classified as Not Purchased and **wrongly** classified as Not Purchased in the test set?

Precision Not Purchased = T(NP) / [T(NP)+F(P)]

Precision Not Purchased = 78/[78+6]=78/84

**Precision [NP] = 0.92857=0.93**

6. What is the overall performance of Purchased?

F1 Measure Purchased = (2\*[Recall [P] \* Precision [P] ] / [Recall [P] + Precision [P] ] )

F1 Measure Purchased = (2 \*[0.88\*0.86]/[0.88+0.86])=1.5136/1.74

**F1 Measure [P] = 0.8698=0.87**

7. What is the overall performance of Not Purchased?

F1 Measure Not Purchased = (2\*[Recall [NP] \* Precision [NP] ] / [Recall [NP] + Precision [NP] ] )

F1 Measure Not Purchased = (2 \*[0.92\*0.93]/[0.92+0.93])=1.7112/1.85

**F1 Measure [NP] = 0.9249=0.93**

8. What is the average performance of Precision (correctly and wrongly classified)?

Macro Average Precision = [Precision [P] + Precision [NP] ] / 2

Macro Average Precision = [0.86+0.93] / 2

**Macro Average Precision = 0.895=0.90**

9. What is the average performance of Recall (correctly and wrongly classified)?

Macro Average Recall = [Recall [P] + Recall [NP] ] / 2

Macro Average Recall = [0.88+0.92] / 2

**Macro Average Recall = 0.90**

10. What is the average performance of F1 Measure (correctly and wrongly classified)?

Macro Average F1 Measure = [F1 Measure [P] + F1 Measure [NP] ] / 2

Macro Average F1 Measure = [0.87+0.93] / 2

**Macro Average F1 Measure =0.90**

11. What is the Sum of Product of Proportion rate (weight) of each class (Precision) ?

Weighted Average (Precision) = {Precision [P]\*(TC[P] / TC[P+NP])} + {Precision [NP]\*( TC[NP] / TC[P+NP])}

Weighted Average (Precision) = {0.86\*(49/134)} + {0.93\*(85/134)}

Weighted Average (Precision) = 0.31447 + 0.5899

**Weighted Average (Precision) = 0.90437=0.91**

12. What is the Sum of Product of Proportion rate (weight) of each class (Recall) ?

Weighted Average (Recall) = { Recall [P]\*(TC[P] / TC[P+NP])} + { Recall [NP]\*( TC[NP] / TC[P+NP])}

Weighted Average (Recall) = {0.88\*(49/134)} + {0.92\*(85/134)}

Weighted Average (Recall) = 0.32179 + 0.58358

**Weighted Average (Recall) = 0.90537=0.91**

13. What is the Sum of Product of Proportion rate (weight) of each class (F1 Measure) ?

Weighted Average (F1 Measure) = { F1 Measure [P]\*(TC[P] / TC[P+NP])} + { F1 Measure [NP]\*( TC[NP] / TC[P+NP])}

Weighted Average (F1 Measure) = {0.87\*(49/134)} + {0.93\*(85/134)}

Weighted Average (F1 Measure) = 0.3181 + 0.5899

**Weighted Average (F1 Measure) = 0.9080=0.91**