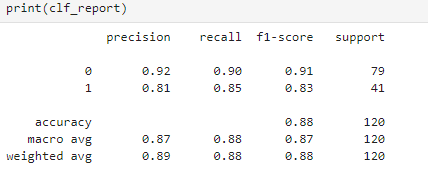
**Decision Tree**

**Confusion Matrix**

**[[71, 8],**

**[ 6, 35]]**

**Classification Report**



**Accuracy**

What is the percentage of **correct classification of both** to the total input of the test set?

What is **the overall performance**?

Total count of Correctly classified as Not Purchased = 71

Total count of Correctly classified as Purchased = 35

Total count in the input set = 71+8+6+35 = 120

1.**Accuracy** = (Total count of Correctly classified as Not Purchased + Total count of Correctly classified as Purchased) / Total count in the input set

= (TP+TN) / (TP+FN+FP+TN) = (71+35) / 120 = 106/120 = 0.88 🡺 **88%**

**Recall**

What is the percentage of **correct classification** of the total input of the test set?

**2.Not purchased** = TP / (TP + FN) = 71/ (71+8) = 71/79 = 0.90 🡺 **90%**

**3.Purchased** = TN / (FP + TN) = 35 / (35+6) = 35/41 = 0.85 🡺 **85%**

**Precision**

What is the **percentage of correct classification** to sum of **correctly classified and wrong classified** of the total input of the test set?

**4.Not** **purchased** = TP/ (TP+FP) = 71 / (71+6) = 71/77 = 0.92 🡺 **92%**

**5.Purchased** = TN / (TN+FN) = 35 / (35+8) = 35/43 = 0.81 🡺 **81%**

**F1 score**

What is the **Overall performance** of this model?

**6.Not purchased** = 2\*recall\*precision / (recall + precision)

= 2\*0.90\*0.92 / (0.90+0.92) = 1.656/1.82 = 0.91 🡺 **91%**

**7.Purchased** = 2\*recall\*precision / (recall + precision)

= 2\*0.85\*0.81 / (0.85 + 0.81) = 1.377/1.66 = 0.83 **🡺 83%**

**Macro Average of Precision**

What is the **average performance of correctly and wrongly classified**?

8.(Precision of Not purchased + Precision of Purchased) / 2 = (0.92 + 0.81)/2 = 1.73/2 = 0.87 **🡺 87%**

**Macro Average of Recall**

What is the **average performance of correctly classified**?

9.(Recall of Not Purchased + Recall of Purchased) / 2 = (0.90+0.85)/2 = 1.75/2 = 0.88 **🡺 88%**

**Macro Average of f1-score**

What is **the average performance of overall performance**?

10.(f1-score of Not Purchased + f1-score of Purchased) / 2 = (0.91+0.83)/2 =1.74/2=0.87🡺 **87%**

Total count in the test set = 120

Total count of Not Purchased in the test set = 79

Total count of Purchased in the test set = 41

**Weighted Average of Precision**

What is the **sum of product of proportion rate** (**weight**) of each class of correctly and wrongly classified?

11.Precision (Not Purchased) \* (79/120) + Precision (Purchased) \* (41/120)

= 0.92 \* 0.66 + 0.81\*0.34 = 0.61 + 0.28 = 0.89 🡺 **89%**

**Weighted Average of Recall**

What is the sum of product of proportion rate (weight) of each class of correctly classified?

12.Recall (Not Purchased) \* (79/120) + Recall (Purchased) \* (41/120)

= 0.90\*0.66 + 0.85\*0.34 = 0.59 + 0.29 = 0.88 🡺 **88%**

**Weighted Average of f1-score**

What is the sum of product of proportion rate of each class of overall performance?

13.F1-score (Not Purchased) \* (79/120) + F1-score (Purchased) \* (41/120)

= 0.91\*0.66 + 0.83\*0.34 = 0.60 + 0.28 = 0.88 **🡺 88%**