DECISION TREE CLASSIFICATION

CONFUSION MATRIX (Evaluation Metric for Classification Problems)

Dataset: Input – Age, Gender,Estimated salary

Output Labels – Purchased -1,NotPurchased-0

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Predicted** | | |
| **Actual** |  | Purchased | Not Purchased |
| Purchased | **True Positive** (Predicted Purchased as Purchased) | **False Negative** (should be classified as Purchased but predicted as Not purchased) |
| Not Purchased | **False Positive** (should be classified as Not purchased but predicted as purchased) | **True Negative** (Predicted Not Purchased as Not Purchased) |

array([[76, 9],

[ 8, 41]], dtype=int64)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Precision | Recall | F1-score | support |
| 0 | 0.90 | 0.89 | 0.90 | 85 |
| 1 | 0.82 | 0.84 | 0.83 | 49 |
| accuracy |  |  | 0.87 | 134 |
| Macro Avg | 0.86 | 0.87 | 0.86 | 134 |
| weighted Avg | 0.87 | 0.87 | 0.87 | 134 |

1.What is the overall Percentage of correct classification of both features to the total input of testset

Accuracy=

=(76+41)/(76+41+9+8)

=0.87

2.What is the Percentage of Correct Classification of Notpurchased to the total input of Notpurchased in testset

Recall(NotPurchased)=(TP)/(TP+FN)

=76/(76+9)

=0.894

3.What is the Percentage of Correct Classification of purchased to the total input of Purchased in test set

Recall( Purchased)=(TN)/(TN+FP)

=41/(41+8)

=0.836

4.What is the Percentage of correct classification of NotPurchased to the correct and wrong Classification of NotPurchased

Precision(NotPurchased)=(TP)/(TP+FP)

=76/(76+8)

=0.904

5.What is the Percentage of correct classification of Purchased to the correct and wrong Classification of Purchased

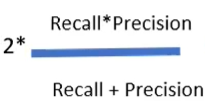
Precision( Purchased)=(TN)/(TN+FN)

=41/(41+9)

=0.82

6.what is the overall performance of NotPurchased?

F1 SCORE

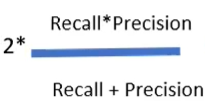


2\*((0.89\*0.90)/(0.89+0.90)) = 2\*(0.801/1.79)

=0.894

7. what is the overall performance of Purchased?

F1 SCORE



2\*((0.84\*0.82)/(0.84+0.82)) = 2\*(0.6888/1.66)

=0.8298