Assignment-Classification Algorithms

SVC:

Passed Parameter in SVC

Kernel = rbf

Random_state = 0

Confusion Matrix

```
print(cm)

[[82  3]
 [26 23]]
```

Classification Report

```
print(clf_report)

              precision    recall  f1-score   support

           0       0.76      0.96      0.85        85
           1       0.88      0.47      0.61        49

    accuracy                           0.78       134
   macro avg       0.82      0.72      0.73       134
weighted avg       0.81      0.78      0.76       134
```

Question and Answer for Random Tree from above result

Question 1:

1. What proportions of the model's predictions are correct?

(Or)

2. What is the overall correctness percentage for both 'purchased' and 'not-purchased' categories with respect to the entire test set?

Answer:

Formula	Value
$$Accuracy = \frac{TN + TP}{TN + FP + TP + FN}$$	0.78

Question 2:

    1. What is the accuracy percentage for correctly classifying 'purchased/not-purchased' items in the total test set?

<div align="center">(Or)</div>

    2. Could you provide the percentage of accurate classifications for 'purchased/not-purchased' items in relation to the entire test set?

Answer:

Formula	Value	
$$Recall = \dfrac{TP}{TP + FN}$$	Purchased = 1	0.47
	Not Purchased = 0	0.96

Question 3:

    1. What portion of instances classified as 'purchased/not-purchased' corresponds to the precision percentage, considering both true positives and false positives in the test set?

<div align="center">(Or)</div>

    2. How often are 'purchased/not-purchased' items correctly identified, expressed as a percentage of the sum of correct and incorrect classifications for 'purchased' in the test set?

Answer

Formula	Value	
$$Precision = \dfrac{TP}{TP + FP}$$	Purchased = 1	0.88
	Not Purchased = 0	0.76

Question 4:

1. What is the combined performance for 'purchased' and 'non-purchased' categories?

(Or)

2. Could you elaborate on the combined performance metrics for both 'purchased' and 'non-purchased' outcomes?

Answer

Formula	Value	
$F1\ Score = 2 * \dfrac{Precision * Recall}{Precision + Recall}$	**Purchased = 1**	**0.61**
	Not Purchased = 0	**0.85**

Question 5.1

1. Could you elaborate on the overall precision performance, taking into account both correct and incorrect classifications?

(Or)

2. What is the combined precision score, considering both accurate and inaccurate classifications?

Answer

Formula	Value
$\dfrac{Precision(Apple)+Precision(Orange)}{2}$	**0.82**

Question 5.2

1. Can you provide insights into the overall recall performance, considering instances that were correctly identified?

(Or)

2. What is the combined recall score, focusing on instances that were correctly classified?

Answer

Formula	Value
$$\frac{\text{Recall(Apple)+Recall(Orange)}}{2}$$	**0.72**

Question 5.3

1. Can you provide insights into the overall performance captured by the F1 Measure?

(Or)

2. What is the combined F1 Measure score, representing the average performance across precision and recall?

Answer

Formula	Value
$$\frac{\text{F1(Apple)+f2(Orange)}}{2}$$	**0.73**

Question 6

1. Could you provide the total obtained by multiplying the proportion rates (weights) for each class and summing them?

(Or)

2. What is the cumulative result of multiplying and summing the proportion rates (weights) assigned to each class?

Answer

Formula	Value
Precision(Apple)*(85/134)+Precision(Orange)*(49/134)	0.81
Recall(Apple)*(85/134)+Recall(Orange)*(49/134)	0.78
F1(Apple)*(85/134)+F2(Orange)*(49/134)	0.76

Question 7:

What is the support value for Purchased and Not Purchased from test data?

Answer

Total count of Purchased = 85

Total count of Not Purchased = 49

Question 8:

What is the sum of all value for Purchased and Not Purchased from test data?

Answer

Total Count of Purchased and Not Purchased = 134