Confusion Matrix - Simple Summary

➢ Decision Tree

```
[16]: print(clf_report)
```

	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 performance of the model? / What is the percentage of "correct classification of both purchased and not purchased" to the "total input" of test set?**
   Accuracy - 87%
2. **What is the percentage of "correct classification of purchased" to the "total input of the purchased" in the test set?**
   Recall - purchased: 84%
3. **What is the percentage of "correct classification of not-purchased" to the "total input of the not-purchased" in the test set?**
   Recall – not purchased: 89%
4. **What is the percentage of "correct classification of purchased" to the "sum of correctly classified as purchased and wrongly classified as purchased" in the test set?**
   Precision - purchased: 82%
5. **What is the percentage of "correct classification of not-purchased" to the "sum of correctly classified as not-purchased and wrongly classified as not-purchased" in the test set?**
   Precision - not purchased: 90%
6. **What is the balanced performance of the purchased class?**
   F1 score - purchased: 83%
7. **What is the balanced performance of the not purchased class?**
   F1 score – not purchased: 90%
8. **What is the simple average performance across both classes?**
   Macro average: Precision = 86%, recall = 87%, f1 score = 86%
9. **What is the average performance after considering how many customers are in each group? / What is the model's overall score considering the proportion of each class?**
   Weighted average: precision, recall, f1 score = 87%

➢ Random Forest

```
[18]: print(clf_report)
```

	precision	recall	f1-score	support
0	0.93	0.92	0.92	85
1	0.86	0.88	0.87	49
accuracy			0.90	134
macro avg	0.89	0.90	0.90	134
weighted avg	0.90	0.90	0.90	134

1. **What is the overall performance of the model? / What is the percentage of "correct classification of both purchased and not purchased" to the "total input" of test set?**
   Accuracy - 90%
2. **What is the percentage of "correct classification of purchased" to the "total input of the purchased" in the test set?**
   Recall - purchased: 88%
3. **What is the percentage of "correct classification of not-purchased" to the "total input of the not-purchased" in the test set?**
   Recall – not purchased: 92%
4. **What is the percentage of "correct classification of purchased" to the "sum of correctly classified as purchased and wrongly classified as purchased" in the test set?**
   Precision - purchased: 86%
5. **What is the percentage of "correct classification of not-purchased" to the "sum of correctly classified as not-purchased and wrongly classified as not-purchased" in the test set?**
   Precision - not purchased: 93%
6. **What is the balanced performance of the purchased class?**
   F1 score - purchased: 87%
7. **What is the balanced performance of the not purchased class?**
   F1 score – not purchased: 92%
8. **What is the simple average performance across both classes?**
   Macro average: Precision = 89%, recall = 90%, f1 score = 90%
9. **What is the average performance after considering how many customers are in each group? / What is the model's overall score considering the proportion of each class?**
   Weighted average: precision, recall, f1 score = 90%

➢ SVM

```
[17]: 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

1. **What is the overall performance of the model? / What is the percentage of "correct classification of both purchased and not purchased" to the "total input" of test set?**
   Accuracy - 78%
2. **What is the percentage of "correct classification of purchased" to the "total input of the purchased" in the test set?**
   Recall - purchased: 47%
3. **What is the percentage of "correct classification of not-purchased" to the "total input of the not-purchased" in the test set?**
   Recall – not purchased: 96%
4. **What is the percentage of "correct classification of purchased" to the "sum of correctly classified as purchased and wrongly classified as purchased" in the test set?**
   Precision - purchased: 88%
5. **What is the percentage of "correct classification of not-purchased" to the "sum of correctly classified as not-purchased and wrongly classified as not-purchased" in the test set?**
   Precision - not purchased: 76%
6. **What is the balanced performance of the purchased class?**
   F1 score - purchased: 61%
7. **What is the balanced performance of the not purchased class?**
   F1 score – not purchased: 85%
8. **What is the simple average performance across both classes?**
   Macro average: Precision = 82%, recall = 72%, f1 score = 73%
9. **What is the average performance after considering how many customers are in each group? / What is the model's overall score considering the proportion of each class?**
   Weighted average: precision = 81%, recall = 78%, f1 score = 76%