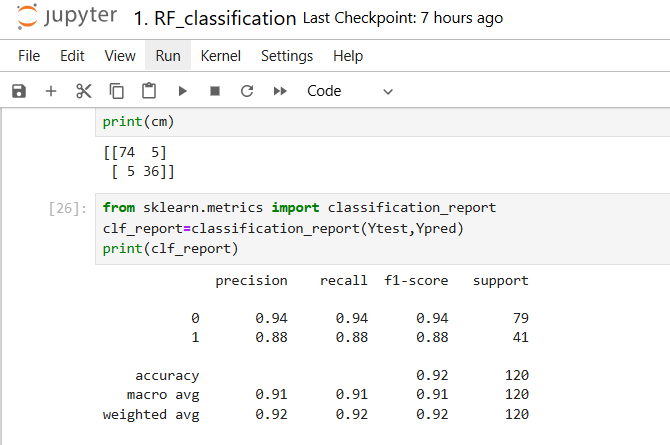
1. **Random Forest Classification**

**Metric Values:**



**Q1. What is overall performance of this dataset or Out of all predictions, what proportion were correct or Overall Correctness or How many instances did the model label correctly or Overall, how often is the classifier correct??**

Ans: Accuracy/ Overall Correctness/ Classification Rate =0.92

**Q2. Out of all predictions, what proportion were incorrect or Misclassification Rate or Overall, how often is it wrong?**

Ans: Error Rate/ Misclassification Rate: 0.08 (8%) (1-0.92)

**Q3. Out of all positive predictions, how many were correctly predicted positives or Out of all predicted positives, how many were actually positive or What is the correctness of positives or Positive correctness or proportion of positive predictions that were correct or How believable the model is when it says an instance is a positive or When it predicts yes, how often is it correct?**

Ans: Precision/Positive predictive value: 0.88

**Q4. Out of all positive predictions, how many were wrongly predicted as positive or Out of all predicted positives, how many were actually negative or When it predicts yes, how often is it wrong?**

Ans: False Discovery Rate (FDR) = FP / (TP + FP) = 1 – Precision

= (1-0.88) =0.12(12%)

**Q5. Out of all negative predictions, how many were correctly predicted negatives or Out of all predicted negatives, how many were actually negative or Out of all customers we said *won’t* buy, how many actually didn’t buy?**

Ans: Negative predictive value: 0.94

**Q6. Out of all negative predictions, how many were wrongly predicted as negative or Out of all predicted negatives, how many were actually positive or When it predicts no, how often is it wrong?**  
 Ans**:** False Omission Rate (FOR) = FN / (FN + TN) = 1 – NPV

= (1**-**0.94) =0.06(6%)

**Q7. Out of all actual positive, how many were correctly predicted as positive or Out of all actual positives, how many were correctly identified as positive or What is the completeness of positives or Positive completeness or proportion of real or actual positives that were predicted correctly or When it's actually yes, how often does it predict yes??**

Ans: Recall/Sensitivity/True Positive Rate/Hit Rate: 0.88

**Q8: Out of all actual positives, how many were missed (predicted as negative) or Of the actual positives, how many did we miss?**  
Ans: False Negative Rate, Miss Rate): 0.12 (12%)(100-0.88)

Formula: **FN / (TP + FN)**  
🔹 Note: FNR = 1 – TPR

**Q9. Out of all actual negatives, how many were correctly predicted as negative or Out of all actual negatives, how many were correctly identified as negative or Out of all actual non-buyers, how many we correctly identified or proportion of actual negatives that were correctly predicted?**

Ans: Specificity/True negative Rate: 0.94

**Q10. Out of all actual negatives, how many were wrongly classified as positive or probability of false alarm or When it's actually no, how often does it predict yes or Of the actual negatives, how many did we wrongly mark positive?**

*Ans: FP /False Positive Rate/ Fall-out: 0.06(6 %)(100-0.94)*

*Formula:* ***FP / (TN + FP)*** *🔹 Note: FPR = 1 − TNR*

**Q11. Combining both correctness and completeness for positives, what is the balanced score or How good is the model for positive cases overall?**

Ans: F1-Score for positives: 0.88

**Q12: Combining correctness and completeness for negatives, what is the balanced score?***Ans: F1-Score for negatives:* 0.94 (94%)

**Q13: If you treat each class equally important, what’s the average performance?  
Ans** *: Macro Average for Precision/Recall/F1*

* Precision: 0.91
* Recall: 0.91
* F1: 0.91

**Q14. If you weight classes by how many samples they have, what’s the overall performance?**  
*Ans: Weighted Average for Precision/Recall/F1:*

* Precision: 0.92
* Recall: 0.92
* F1: 0.92

**2. Decision Tree Classification:**

A screenshot of a computer

AI-generated content may be incorrect.

**Q1. What is overall performance of this dataset or Out of all predictions, what proportion were correct or Overall Correctness or How many instances did the model label correctly or Overall, how often is the classifier correct??**

Ans: Accuracy/ Overall Correctness/ Classification Rate =0.88

**Q2. Out of all predictions, what proportion were incorrect or Misclassification Rate or Overall, how often is it wrong?**

Ans: Error Rate/ Misclassification Rate: 0.12 (12%) (1-0.88)

**Q3. Out of all positive predictions, how many were correctly predicted positives or Out of all predicted positives, how many were actually positive or What is the correctness of positives or Positive correctness or proportion of positive predictions that were correct or How believable the model is when it says an instance is a positive or When it predicts yes, how often is it correct?**

Ans: Precision/Positive predictive value: 0.80

**Q4. Out of all positive predictions, how many were wrongly predicted as positive or Out of all predicted positives, how many were actually negative or When it predicts yes, how often is it wrong?**

Ans: False Discovery Rate (FDR) = FP / (TP + FP) = 1 – Precision

= (1-0.80) =0.2(20%)

**Q5. Out of all negative predictions, how many were correctly predicted negatives or Out of all predicted negatives, how many were actually negative or Out of all customers we said *won’t* buy, how many actually didn’t buy?**

Ans: Negative predictive value: 0.93

**Q6. Out of all negative predictions, how many were wrongly predicted as negative or Out of all predicted negatives, how many were actually positive or When it predicts no, how often is it wrong?**

Ans: False Omission Rate (FOR) = FN / (FN + TN) = 1 – NPV

= (1-0.93) =0.07(7%)

**Q7. Out of all actual positive, how many were correctly predicted as positive or Out of all actual positives, how many were correctly identified as positive or What is the completeness of positives or Positive completeness or proportion of real or actual positives that were predicted correctly or When it's actually yes, how often does it predict yes??**

Ans: Recall/Sensitivity/True Positive Rate/Hit Rate: 0.88

**Q8: Out of all actual positives, how many were missed (predicted as negative) or Of the actual positives, how many did we miss?**  
Ans: False Negative Rate, Miss Rate): 0.12 (12%)(1-0.88)

Formula: **FN / (TP + FN)**  
🔹 Note: FNR = 1 – TPR

**Q9. Out of all actual negatives, how many were correctly predicted as negative or Out of all actual negatives, how many were correctly identified as negative or Out of all actual non-buyers, how many we correctly identified or proportion of actual negatives that were correctly predicted?**

Ans: Specificity/True negative Rate: 0.89

**Q10. Out of all actual negatives, how many were wrongly classified as positive or probability of false alarm or When it's actually no, how often does it predict yes or Of the actual negatives, how many did we wrongly mark positive?**

*Ans: FP /False Positive Rate/ Fall-out: 0.11(11 %)(1-0.89)*

*Formula:* ***FP / (TN + FP)*** *🔹 Note: FPR = 1 − TNR*

**Q11. Combining both correctness and completeness for positives, what is the balanced score or How good is the model for positive cases overall?**

Ans: F1-Score for positives: 0.84

**Q12: Combining correctness and completeness for negatives, what is the balanced score?***Ans: F1-Score for negatives:* 0.91 (91%)

**Q13: If you treat each class equally important, what’s the average performance?  
Ans** *: Macro Average for Precision/Recall/F1*

* Precision: 0.87
* Recall: 0.88
* F1: 0.87

**Q14. If you weight classes by how many samples they have, what’s the overall performance?**  
*Ans: Weighted Average for Precision/Recall/F1:*

* Precision: 0.89
* Recall: 0.88
* F1: 0.88

**3. Support Vector Classifictaion:**

A screenshot of a computer

AI-generated content may be incorrect.

**Q1. What is overall performance of this dataset or Out of all predictions, what proportion were correct or Overall Correctness or How many instances did the model label correctly or Overall, how often is the classifier correct??**

Ans: Accuracy/ Overall Correctness/ Classification Rate =0.91

**Q2. Out of all predictions, what proportion were incorrect or Misclassification Rate or Overall, how often is it wrong?**

Ans: Error Rate/ Misclassification Rate: 0.09 (9%) (1-0.91)

**Q3. Out of all positive predictions, how many were correctly predicted positives or Out of all predicted positives, how many were actually positive or What is the correctness of positives or Positive correctness or proportion of positive predictions that were correct or How believable the model is when it says an instance is a positive or When it predicts yes, how often is it correct?**

Ans: Precision/Positive predictive value: 0.84

**Q4. Out of all positive predictions, how many were wrongly predicted as positive or Out of all predicted positives, how many were actually negative or When it predicts yes, how often is it wrong?**

Ans: False Discovery Rate (FDR) = FP / (TP + FP) = 1 – Precision

= (1-0.84) =0.16(16%)

**Q5. Out of all negative predictions, how many were correctly predicted negatives or Out of all predicted negatives, how many were actually negative or Out of all customers we said *won’t* buy, how many actually didn’t buy?**

Ans: Negative predictive value: 0.95

**Q6. Out of all negative predictions, how many were wrongly predicted as negative or Out of all predicted negatives, how many were actually positive or When it predicts no, how often is it wrong?**  
 Ans**:** False Omission Rate (FOR) = FN / (FN + TN) = 1 – NPV

= (1**-**0.95) =0.05(5%)

**Q7. Out of all actual positive, how many were correctly predicted as positive or Out of all actual positives, how many were correctly identified as positive or What is the completeness of positives or Positive completeness or proportion of real or actual positives that were predicted correctly or When it's actually yes, how often does it predict yes??**

Ans: Recall/Sensitivity/True Positive Rate/Hit Rate: 0.90

**Q8: Out of all actual positives, how many were missed (predicted as negative) or Of the actual positives, how many did we miss?**  
Ans: False Negative Rate, Miss Rate): 0.10 (10%)(1-0.90)

Formula: **FN / (TP + FN)**  
🔹 Note: FNR = 1 – TPR

**Q9. Out of all actual negatives, how many were correctly predicted as negative or Out of all actual negatives, how many were correctly identified as negative or Out of all actual non-buyers, how many we correctly identified or proportion of actual negatives that were correctly predicted?**

Ans: Specificity/True negative Rate: 0.91

**Q10. Out of all actual negatives, how many were wrongly classified as positive or probability of false alarm or When it's actually no, how often does it predict yes or Of the actual negatives, how many did we wrongly mark positive?**

*Ans: FP /False Positive Rate/ Fall-out: 0.09(9 %)(1-0.91)*

*Formula:* ***FP / (TN + FP)*** *🔹 Note: FPR = 1 − TNR*

**Q11. Combining both correctness and completeness for positives, what is the balanced score or How good is the model for positive cases overall?**

Ans: F1-Score for positives: 0.87

**Q12: Combining correctness and completeness for negatives, what is the balanced score?***Ans: F1-Score for negatives:* 0.93 (93%)

**Q13: If you treat each class equally important, what’s the average performance?  
Ans** *: Macro Average for Precision/Recall/F1*

* Precision: 0.89
* Recall: 0.91
* F1: 0.90

**Q14. If you weight classes by how many samples they have, what’s the overall performance?**  
*Ans: Weighted Average for Precision/Recall/F1:*

* Precision: 0.91
* Recall: 0.91
* F1: 0.91