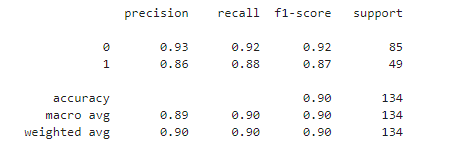
Random forest



* Accuracy: Question: What is the overall performance of the model? 0.90
* **Precision**: **Question**:
  + "Among all the people the model predicted would buy the product, how many actually bought the product?" 0.86
  + "Among all the people the model predicted would not buy the product, how many did not purchase the product?" 0.93
* **Recall**: Q**uestion**:
  + "Out of all the people who actually bought the product, how many did the model correctly identify as buyers?" 0.88
  + "Out of all the people who did not buy the product, how many did the model correctly identify as non-buyers? “0.92
* **F1 Score**: **Question**:
  + "How well does the model balance precision and recall when predicting buyers of the product?" 0.87
  + "How well does the model balance precision and recall when predicting buyers of the product?"0.92
* **Support**: **Question**: "How many actual instances of each class (buyers and non-buyers) are there in the test dataset?"
  + **Buyers: 49**
  + **Non-buyers: 85**
* **Macro Average**: **Question**: "What is the average performance of the model across all classes, giving equal weight to each class?"

**Macro Precision**: On average, how accurate are the positive predictions for each class? 0.89

**Macro Recall**: On average, how well does the classifier identify all positive instances for each class (of purchased and not-purchased)? 0.90

**Macro F1-Score**: On average, how balanced is the classifier's precision and recall for each class? 0.90

* **Weighted Precision**: How accurate are the positive predictions for each class, weighted by the number of instances in each class?

**Weighted Average**: **Question**: "What is the average performance of the model across all classes, considering the number of instances of each class?" 0.90

**Weighted Recall**: How well does the classifier identify all positive instances for each class, weighted by the number of instances in each class? 0.90

**Weighted F1-Score**: How balanced is the classifier's precision and recall for each class, weighted by the number of instances in each class? 0.90

CONFUSION MATRIX SNAPSHOT



* True not purchased: 78
* False not purchased: 7
* True purchased: 43
* False purchased: 6
* Total count of not purchased = 78 + 7 = 85
* Total count of purchased = 43 + 6 = 49
* Total count of purchased and not purchased = 134

Support

* + **Buyers: 49**
  + **Non-buyers: 85**

Calculated values from the classification report:

**Class 0 OR Not Purchased values:**

1. **Precision for Not Purchased**
   * **Formula**: Precision = TN / (TN + FN)
   * **Substitution**: Precision = 78 / (78 + 6) ≈ 0.93
2. **Recall for Class Not Purchased**
   * **Formula**: Recall = TN / (TN + FP)
   * **Substitution**: Recall = 78 / (78 + 7) ≈ 0.92
3. **F1 Score for Class Not Purchased**
   * **Formula**: F1 Score = 2 \* (Precision \* Recall) / (Precision + Recall)
   * **Substitution**: F1 Score = 2 \* (0.93 \* 0.92) / (0.93 + 0.92) ≈ 0.92

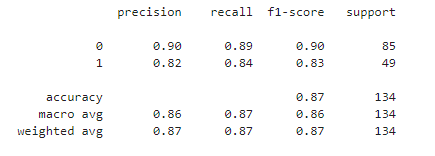
**Class 1 OR Purchased values**

1. **Precision for Purchased**
   * **Formula**: Precision = TP / (TP + FP)
   * **Substitution**: Precision = 43 / (43 + 7) ≈ 0.86
2. **Recall for Purchased**
   * **Formula**: Recall = TP / (TP + FN)
   * **Substitution**: Recall = 43 / (43 + 6) ≈ 0.88
3. **F1 Score for Purchased**
   * **Formula**: F1 Score = 2 \* (Precision \* Recall) / (Precision + Recall)
   * **Substitution**: F1 Score = 2 \* (0.86 \* 0.88) / (0.86 + 0.88) ≈ 0.87

**Overall Metrics**

1. **Accuracy**
   * **Formula**: Accuracy = (TP + TN) / (TP + TN + FP + FN)
   * **Substitution**: Accuracy = (43 + 78) / (43 + 78 + 7 + 6) ≈ 0.90
2. **Macro Average Precision**
   * **Formula**: Macro Average Precision = (Precision for Class 0 + Precision for Class 1) / 2
   * **Substitution**: Macro Average Precision = (0.93 + 0.86) / 2 ≈ 0.89
3. **Macro Average Recall**
   * **Formula**: Macro Average Recall = (Recall for Class 0 + Recall for Class 1) / 2
   * **Substitution**: Macro Average Recall = (0.92 + 0.88) / 2 ≈ 0.90
4. **Macro Average F1 Score**
   * **Formula**: Macro Average F1 Score = (F1 Score for Class 0 + F1 Score for Class 1) / 2
   * **Substitution**: Macro Average F1 Score = (0.92 + 0.87) / 2 ≈ 0.90
5. **Weighted Average Precision**
   * **Formula**: Weighted Average Precision = (Precision for Class 0 \* Support for Class 0 + Precision for Class 1 \* Support for Class 1) / Total Support
   * **Substitution**: Weighted Average Precision = (0.93 \* 85 + 0.86 \* 49) / 134 ≈ 0.90
6. **Weighted Average Recall**
   * **Formula**: Weighted Average Recall = (Recall for Class 0 \* Support for Class 0 + Recall for Class 1 \* Support for Class 1) / Total Support
   * **Substitution**: Weighted Average Recall = (0.92 \* 85 + 0.88 \* 49) / 134 ≈ 0.90
7. **Weighted Average F1 Score**
   * **Formula**: Weighted Average F1 Score = (F1 Score for Class 0 \* Support for Class 0 + F1 Score for Class 1 \* Support for Class 1) / Total Support
   * **Substitution**: Weighted Average F1 Score = (0.92 \* 85 + 0.87 \* 49) / 134 ≈ 0.90

Decision tree



* Accuracy: Question: What is the overall performance of the model? 0.87
* **Precision**: **Question**:
  + "Among all the people the model predicted would buy the product, how many actually bought the product?" 0.82
  + "Among all the people the model predicted would not buy the product, how many did not purchase the product?" 0.90
* **Recall**: Q**uestion**:
  + "Out of all the people who actually bought the product, how many did the model correctly identify as buyers?" 0.84
  + "Out of all the people who did not buy the product, how many did the model correctly identify as non-buyers? “0.89
* **F1 Score**: **Question**:
  + "How well does the model balance precision and recall when predicting buyers of the product?" 0.83
  + "How well does the model balance precision and recall when predicting buyers of the product?"0.90
* **Support**: **Question**: "How many actual instances of each class (buyers and non-buyers) are there in the test dataset?"
  + **Buyers: 49**
  + **Non-buyers: 85**
* **Macro Average**: **Question**: "What is the average performance of the model across all classes, giving equal weight to each class?"

**Macro Precision**: On average, how accurate are the positive predictions for each class? 0.86

**Macro Recall**: On average, how well does the classifier identify all positive instances for each class (of purchased and not-purchased)? 0.87

**Macro F1-Score**: On average, how balanced is the classifier's precision and recall for each class? 0.86

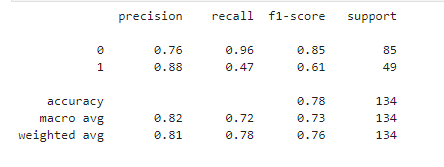
* **Weighted Average**: **Question**: "What is the average performance of the model across all classes, considering the number of instances of each class?"

**Weighted Average**: **Question**: "What is the average performance of the model across all classes, considering the number of instances of each class?" 0.87

**Weighted Recall**: How well does the classifier identify all positive instances for each class, weighted by the number of instances in each class? 0.87

**Weighted F1-Score**: How balanced is the classifier's precision and recall for each class, weighted by the number of instances in each class? 0.87

SVM – rbf kernel - Classification



* Accuracy: Question: What is the overall performance of the model? 0.78
* **Precision**: **Question**:
  + "Among all the people the model predicted would buy the product, how many actually bought the product?" 0.88
  + "Among all the people the model predicted would not buy the product, how many did not purchase the product?" 0.76
* **Recall**: Q**uestion**:
  + "Out of all the people who actually bought the product, how many did the model correctly identify as buyers?" 0.47
  + "Out of all the people who did not buy the product, how many did the model correctly identify as non-buyers? 0.96
* **F1 Score**: **Question**:
  + "How well does the model balance precision and recall when predicting buyers of the product?" 0.61
  + "How well does the model balance precision and recall when predicting buyers of the product?"0.85
* **Support**: **Question**: "How many actual instances of each class (buyers and non-buyers) are there in the test dataset?"
  + **Buyers: 49**
  + **Non-buyers: 85**
* **Macro Average**: **Question**: "What is the average performance of the model across all classes, giving equal weight to each class?"

**Macro Precision**: On average, how accurate are the positive predictions for each class? 0.82

**Macro Recall**: On average, how well does the classifier identify all positive instances for each class (of purchased and not-purchased)? 0.72

**Macro F1-Score**: On average, how balanced is the classifier's precision and recall for each class? 0.73

* **Weighted Average**: **Question**: "What is the average performance of the model across all classes, considering the number of instances of each class?"

**Weighted Average**: **Question**: "What is the average performance of the model across all classes, considering the number of instances of each class?" 0.81

**Weighted Recall**: How well does the classifier identify all positive instances for each class, weighted by the number of instances in each class? 0.78

**Weighted F1-Score**: How balanced is the classifier's precision and recall for each class, weighted by the number of instances in each class? 0.76