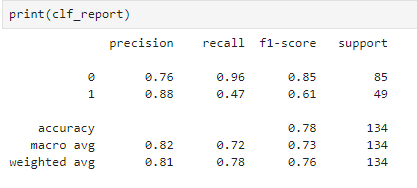
**CONFUSION MATRIX – EVALUATION METRICS CALCULATION FOR SVM SAMPLES**

**I.SAMPLE 2 – SVM - Social\_Network\_Ad**

**Confusion Matrix:**

****

**Classification Report**

****

1. **ACCURACY**

**Question:**

What is the Percentage of Correct Classification of Both PURCHASED and NOT PURCHASED (0 & 1) to the total input of the test set?

**Calculation:**

|  |  |
| --- | --- |
| **Accuracy** | = **(T0 + T1) / (T0 + F0 + T1 + F1)** |
|  | = (82 + 23) / (82 + 3 + 23 + 26) |
|  | **= 0.78** |

2. **RECALL**

**2.1. Recall – Not Purchased**

**Question:**

What is the Percentage of Correct Classification of NOT PURCHASED (0) to the total input of NOT PURCHASED in the test set?

**Calculation:**

|  |  |
| --- | --- |
| **Recall (Not Purchased)** | = **(T0) / (T0 + F0)** |
|  | = (82) / (82 + 3) |
|  | **= 0.96** |

**2.2. Recall – Purchased**

**Question:**

What is the Percentage of Correct Classification of PURCHASED (1) to the total input of PURCHASED in the test set?

**Calculation:**

|  |  |
| --- | --- |
| **Recall (Purchased)** | = **(T1) / (T1 + F1)** |
|  | = (23) / (23+26) |
|  | **=** 0**.**469 **= 0.47** |

3. **PRECISION**

**3.1. Precision – Not Purchased**

**Question:**

What is the Percentage of Correct Classification of NOT PURCHASED (0) to the sum of Correctly Classified as NOT PURCHASED and wrongly classified as NOT PURCHASED in the test set?

**Calculation:**

|  |  |
| --- | --- |
| **Precision**  **( Not Purchased)** | = **(T0) / (T0 + F1)** |
|  | = (82) / (82 + 26) |
|  | **= 0.76** |

**3.2. Precision –Purchased**

**Question:**

What is the Percentage of Correct Classification of PURCHASED (0) to the sum of Correctly Classified as PURCHASED and wrongly classified as PURCHASED in the test set?

**Calculation:**

|  |  |
| --- | --- |
| **Precision (Purchased)** | = **(T1) / (T1 + F0)** |
|  | = (23) / (23 + 3) |
|  | **= 0.88** |

4. **F1 MEASURE**

**4.1. F1 Measure – Not Purchased**

**Question:**

What is the Overall Performance of NOT PURCHASED (0)?

**Calculation:**

|  |  |
| --- | --- |
| **F1 Measure**  **( Not Purchased)** | = **2 \* { (Recall(0) \* Precision(0)) / (Recall(0) \* Precision(0)) }** |
|  | = 2 \* { (0.96 \* 0.76) / (0.96 + 0.76) } |
|  | **=** 2 \* { 0.73 / 1.72} = 0.8488 |
|  | **= 0.85** |
|  |  |

**4.2. F1 Measure –Purchased**

**Question:**

What is the Overall Performance of PURCHASED (1)?

**Calculation:**

|  |  |
| --- | --- |
| **F1 Measure**  **(Purchased)** | = **2 \* { (Recall(1) \* Precision(1)) / (Recall(1) \* Precision(1)) }** |
|  | = 2 \* { (0.47 \* 0.88) / (0.47 + 0.88) } |
|  | **=** 2 \* { 0.4136 / 1.35} |
|  | **= 0.61** |

5. **MACRO AVERAGE**

**5.1. Macro Average – Precision**

**Question:**

What is the Average Performance of Precision - Correctly and wrongly classified PURCHASED AND NOT PURCHASED (0 & 1)?

**Calculation:**

|  |  |
| --- | --- |
| **Macro Average (Precision)** | = (**Precision (0) + Precision (0)) / 2** |
|  | = (0.76 + 0.88) / 2 |
|  | = 1.72 / 2 |
|  | **= 0.82** |

**5.2. Macro Average – Recall**

**Question:**

What is the Average Performance of Recall - Correctly and wrongly classified PURCHASED AND NOT PURCHASED (0 & 1)?

**Calculation:**

|  |  |
| --- | --- |
| **Macro Average (Recall)** | = **(Recall (0) + Recall (0)) / 2** |
|  | = (0.96 + 0.47) / 2 |
|  | = 1.73 / 2 = 0.715 |
|  | **= 0.72** |

**5.3. Macro Average – F1 Measure**

**Question:**

What is the Average Performance of F1 Measure - Correctly and wrongly classified PURCHASED AND NOT PURCHASED (0 & 1)?

**Calculation:**

|  |  |
| --- | --- |
| **Macro Average (F1 Measure)** | = **(F1 Measure (0) + F1 Measure (0)) / 2** |
|  | = (0.85 + 0.61) / 2 |
|  | = 1.46 / 2 = 0.865 |
|  | **= 0.73** |

6. **WEIGHTED AVERAGE**

**6.1. Weighted Average – Precision**

**Question:**

**What is the Sum of Product of proportion rate (weight) of Precision of each class NOT PURCHASED and PURCHASED (0 & 1)?**

**Calculation:**

|  |  |
| --- | --- |
| **Macro Average (Precision)** | = { (**Precision (0)) \* ((Total Sum of Not Purchased(0) samples) / (Total Number of Samples in the test set)) }**  **+**  **{ (Precision (1)) \* ((Total Sum of Purchased(1) samples) / (Total Number of Samples in the test set)) }** |
|  | = {(0.76) \* (85/134) } + { (0.88) \* (49/134) } |
|  | = {(0.76) \* (0.634) } + { (0.88) \* (0.366) } |
|  | = { 0.481 + 0.322) |
|  | **= 0.80** |

**6.2. Weighted Average – Recall**

**Question:**

**What is the Sum of Product of proportion rate (weight) of Recall of each class NOT PURCHASED and PURCHASED (0 & 1)?**

**Calculation:**

|  |  |
| --- | --- |
| **Macro Average (Recall)** | = { (**Recall (0)) \* ((Total Sum of Not Purchased(0) samples) / (Total Number of Samples in the test set)) }**  **+**  **{ (Recall (1)) \* ((Total Sum of Purchased(1) samples) / (Total Number of Samples in the test set)) }** |
|  | = {(0.96) \* (85/134) } + { (0.47) \* (49/134) } |
|  | = {(0.96) \* (0.634) } + { (0.47) \* (0.366) } |
|  | = { 0.61 + 0.17) |
|  | **= 0.78** |

**6.3. Weighted Average – F1 Measure**

**Question:**

**What is the Sum of Product of proportion rate (weight) of F1 Measure of each class NOT PURCHASED and PURCHASED (0 & 1)?**

**Calculation:**

|  |  |
| --- | --- |
| **Macro Average (F1 Measure)** | = { (**F1 Measure (0)) \* ((Total Sum of Not Purchased(0) samples) / (Total Number of Samples in the test set)) }**  **+**  **{ (F1 Measure (1)) \* ((Total Sum of Purchased(1) samples) / (Total Number of Samples in the test set)) }** |
|  | = {(0.85) \* (85/134) } + { (0.61) \* (49/134) } |
|  | = {(0.85) \* (0.634) } + { (0.61) \* (0.366) } |
|  | = { 0.54 + 0.22) |
|  | **= 0.76** |