Assignment 6 - ML-Classification-Navie Bayes

Not Purchased	Purchased
0	257
1	143

		Actual Class	
Predicted Class		**True (Not Purchased)**	**Purchased**
	True (Not Purchased)	72	7
	Purchased	13	28

Evaluation Metrics - Accuracy

Accuracy for Purchased and Not Purchased Data set:

What is the percentage of correct classification of both ("Not Purchased" and "Purchased") to the total input in the test set?

$$\frac{\text{True (Not Purchased) + True (Purchased)}}{\text{True (Not Purchased) + True (Purchased) + False (Not Purchased) + False (Purchased)}}$$

Evaluation Metrics - Recall

Recall for Not Purchased:

What is the percentage of correct classification of "Not Purchased" to the total input of (Not Purchased) in the test set?

$$\frac{\text{True (Not Purchased)}}{\text{True (Not Purchased) + False (Not Purchased)}}$$

Recall for Purchased:

What is the percentage correct classification of "Purchased" to the total input of (Purchased) in the test set?

$$\text{True (Purchased)}$$

Evaluation Metrics - Precision

Precision for Not Purchased:

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?

$$\frac{\text{True (Not Purchased)}}{\text{True (Not Purchased) + False (Purchased)}}$$

Precision for Purchased:

What is the percentage of correct classification of "**Purchased**" to the Sum of correctly classified as "Not Purchased" and wrongly classified as "Purchased in the test set?

$$\frac{\text{True (Purchased)}}{\text{True (Purchased) + False (Not Purchased)}}$$

Evaluation Metrics - F1-Measure

F1-Measure for Not Purchased:

What is the overall performance of "Not Purchased"?

$$2 * \frac{\text{Recall (Not Purchased) * Precision (Not Purchased)}}{\text{Recall (Not Purchased) + Precision (Not Purchased)}}$$

F1-Measure for Purchased:

What is the overall performance of "Not Purchased"?

$$2 * \frac{\text{Recall (Purchased) * Precision (Purchased)}}{\text{Recall (Purchased) + Precision (Purchased)}}$$

Macro Average:

Precision:

What is the average performance of Precision (Correctly and wrongly classified)?

$$\frac{\text{Precision of "Not Purchased" + Precision of "Purchased}}{2}$$

Recall:

What is the average performance of Recall (Correctly and wrongly classified)?

$$\frac{\text{Recall of "Not Purchased" + Recall of "Purchased}}{2}$$

F1-Measure:

What is the average performance of F1-Measure (Correctly and wrongly classified)?

$$\frac{\text{F1(Not Purchased) + F1(Purchased)}}{2}$$

Weighted Average

Precision:

What is the sum of product of proportion rate (Weight) of each class

Precision ("Not Purchased") * 79/120 + Precision ("Purchased") * 41/120

Recall

What is the sum of product of proportion rate (Weight) of each class

Recall ("Not Purchased") * 79/120 + Recall ("Purchased") * 41/120

F1-Measure

What is the sum of product of proportion rate (Weight) of each class

F1 ("Not Purchased") * 79/120 + f2 ("Purchased") * 41/120

BernoulliNB

	precision	recall	f1-score	support
0	0.66	1.00	0.79	79
1	0.00	0.00	0.00	41
accuracy			0.66	120
macro avg	0.33	0.50	0.40	120
weighted avg	0.43	0.66	0.52	120

MultinomialNB

	precision	recall	f1-score	support
0	0.71	0.86	0.78	79
1	0.54	0.32	0.40	41
accuracy			0.68	120
macro avg	0.62	0.59	0.59	120
weighted avg	0.65	0.68	0.65	120

CategoricalNB

	precision	recall	f1-score	support
0	0.89	0.96	0.93	79
1	0.91	0.78	0.84	41
accuracy			0.90	120
macro avg	0.90	0.87	0.88	120
weighted avg	0.90	0.90	0.90	120

ComplementNB

	precision	recall	f1-score	support
0	0.68	0.53	0.60	79
1	0.36	0.51	0.42	41
accuracy			0.53	120
macro avg	0.52	0.52	0.51	120
weighted avg	0.57	0.52	0.54	120