

## NORMAL SPLIT DATA 80/10/10

## NAIVE BAYES MULTINOMIAL 4 CLASSES

## COUNTVECTORIZER

Resultados en datos de validación:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

```
_warn_prf(average, modifier, msg_start, len(result))
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C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	precision	recall	f1-score	support
0	0.65	0.94	0.77	265
1	0.50	0.02	0.04	44
2	0.56	0.26	0.35	93
3	0.00	0.00	0.00	30
accuracy			0.64	432
macro avg	0.43	0.31	0.29	432
weighted avg	0.57	0.64	0.55	432

Resultados en datos de prueba:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	precision	recall	f1-score	support
0	0.65	0.92	0.76	222
1	0.00	0.00	0.00	31
2	0.53	0.28	0.37	86
3	0.00	0.00	0.00	21
accuracy			0.64	360
macro avg	0.30	0.30	0.28	360
weighted avg	0.53	0.64	0.56	360

# TFIDFVECTORIZER

Resultados en datos de validación:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precision	recall	f1-score	support
0	0.61	1.00	0.76	265
1	0.00	0.00	0.00	44
2	0.00	0.00	0.00	93
3	0.00	0.00	0.00	30
accuracy			0.61	432
macro avg	0.15	0.25	0.19	432
weighted avg	0.38	0.61	0.47	432

Resultados en datos de prueba:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning:

Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```

	Precisión	recall	f1-score	support
0	0.62	1.00	0.76	222
1	0.00	0.00	0.00	31
2	0.00	0.00	0.00	86
3	0.00	0.00	0.00	21
accuracy				0.62 360
macro avg	0.15	0.25	0.19	360
weighted avg	0.38	0.62	0.47	360

# NAIVE BAYES MULTINOMIAL 2 CLASSES

## COUNTVECTORIZER

Resultados en datos de validación:

	Precisión	recall	f1-score	support
0	0.71	0.78	0.75	265
1	0.59	0.49	0.54	167
accuracy			0.67	432
macro avg	0.65	0.64	0.64	432
weighted avg	0.66	0.67	0.66	432

Resultados en datos de prueba:

	Precisión	recall	f1-score	support
0	0.73	0.77	0.75	222
1	0.59	0.54	0.57	138
accuracy			0.68	360
macro avg	0.66	0.65	0.66	360
weighted avg	0.68	0.68	0.68	360

# TFIDFVECTORIZER

Resultados en datos de validación:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.61	1.00	0.76	265
1	0.00	0.00	0.00	167
accuracy			0.61	432
macro avg	0.31	0.50	0.38	432
weighted avg	0.38	0.61	0.47	432

Resultados en datos de prueba:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.62	1.00	0.76	222
1	0.00	0.00	0.00	138
accuracy			0.62	360
macro avg	0.31	0.50	0.38	360
weighted avg	0.38	0.62	0.47	360

# NAIVE BAYES BERNOULLI 4 CLASSES

## COUNTVECTORIZER/ TFIDFVECTORIZER

Resultados en datos de validación:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.61	0.83	0.70	110
1	0.00	0.00	0.00	16
2	0.20	0.11	0.14	47
3	0.17	0.14	0.15	7
accuracy			0.54	180
macro avg	0.24	0.27	0.25	180
weighted avg	0.43	0.54	0.47	180



Resultados en datos de prueba:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.64	0.84	0.73	112
1	0.00	0.00	0.00	15
2	0.28	0.18	0.22	39
3	0.00	0.00	0.00	14
accuracy			0.56	180
macro avg	0.23	0.25	0.24	180
weighted avg	0.46	0.56	0.50	180

# NAIVE BAYES BERNOULLI 2 CLASSES

## COUNTVECTORIZER/ TFIDFVECTORIZER

Resultados en datos de validación:

	Precisión	recall	f1-score	support
0	0.64	0.76	0.70	110
1	0.47	0.33	0.39	70
accuracy			0.59	180
macro avg	0.56	0.55	0.54	180
weighted avg	0.57	0.59	0.58	180

Resultados en datos de prueba:

	Precisión	recall	f1-score	support
0	0.65	0.73	0.69	112
1	0.43	0.34	0.38	68
accuracy			0.58	180
macro avg	0.54	0.54	0.53	180
weighted avg	0.57	0.58	0.57	180

# STRATIFY SPLIT DATA 80/10/10

## NAIVE BAYES MULTINOMIAL 4 CLASSES

### TFIDFVECTORIZER

Resultados en datos de validación:

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	precision	recall	f1-score	support
0	0.63	1.00	0.77	113
1	0.00	0.00	0.00	16
2	0.00	0.00	0.00	39
3	0.00	0.00	0.00	12
accuracy			0.63	180
macro avg	0.16	0.25	0.19	180
weighted avg	0.39	0.63	0.48	180

Resultados en datos de prueba:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
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```

	precision	recall	f1-score	support
0	0.63	1.00	0.77	113
1	0.00	0.00	0.00	16
2	0.00	0.00	0.00	40
3	0.00	0.00	0.00	11
accuracy			0.63	180
macro avg	0.16	0.25	0.19	180
weighted avg	0.39	0.63	0.48	180

# COUNTVECTORIZER

Resultados en datos de validación:

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	precision	recall	f1-score	support
0	0.68	0.92	0.78	113
1	0.00	0.00	0.00	16
2	0.56	0.36	0.44	39
3	1.00	0.08	0.15	12
accuracy			0.66	180
macro avg	0.56	0.34	0.34	180
weighted avg	0.61	0.66	0.59	180

Resultados en datos de prueba:

	precision	recall	f1-score	support
0	0.66	0.90	0.76	113
1	1.00	0.06	0.12	16
2	0.48	0.28	0.35	40
3	0.00	0.00	0.00	11
accuracy			0.63	180
macro avg	0.53	0.31	0.31	180
weighted avg	0.61	0.63	0.57	180

# NAIVE BAYES MULTINOMIAL 2 CLASSES

## TFIDFVECTORIZER

Resultados en datos de validación:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.63	1.00	0.77	113
1	0.00	0.00	0.00	67
accuracy			0.63	180
macro avg	0.31	0.50	0.39	180
weighted avg	0.39	0.63	0.48	180

Resultados en datos de prueba:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.63	1.00	0.77	113
1	0.00	0.00	0.00	67
accuracy			0.63	180
macro avg	0.31	0.50	0.39	180
weighted avg	0.39	0.63	0.48	180



# COUNTVECTORIZER

Resultados en datos de validación:

	precision	recall	f1-score	support
0	0.74	0.83	0.78	113
1	0.64	0.51	0.57	67
accuracy			0.71	180
macro avg	0.69	0.67	0.67	180
weighted avg	0.70	0.71	0.70	180

Resultados en datos de prueba:

	precision	recall	f1-score	support
0	0.73	0.73	0.73	113
1	0.54	0.55	0.55	67
accuracy			0.66	180
macro avg	0.64	0.64	0.64	180
weighted avg	0.66	0.66	0.66	180

# NAIVE BAYES BERNOULLI 4 CLASSES

## COUNTVECTORIZER/ TFIDFVECTORIZER

Resultados en datos de validación:

C:\Users\jesus\AppData\Local\Programs\Python\Python311\Lib\site-packages\sklearn\metrics\\_classification.py:1469: UndefinedMetricWarning: Precision and F-score are ill-defined and being set to 0.0 in labels with no predicted samples. Use `zero\_division` parameter to control this behavior.

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.64	0.83	0.72	113
1	0.00	0.00	0.00	16
2	0.32	0.18	0.23	39
3	0.20	0.17	0.18	12
accuracy			0.57	180
macro avg	0.29	0.29	0.28	180
weighted avg	0.48	0.57	0.51	180

Resultados en datos de prueba:

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```
_warn_prf(average, modifier, msg_start, len(result))
```

	Precisión	recall	f1-score	support
0	0.66	0.91	0.76	113
1	0.00	0.00	0.00	16
2	0.41	0.17	0.25	40
3	0.17	0.09	0.12	11
accuracy			0.62	180
macro avg	0.31	0.29	0.28	180
weighted avg	0.51	0.62	0.54	180

# NAIVE BAYES BERNOULLI 2 CLASSES

## COUNTVECTORIZER/ TFIDFVECTORIZER

Resultados en datos de validación:

	Precisión	recall	f1-score	support
0	0.70	0.82	0.76	113
1	0.57	0.40	0.47	67
Accuracy			0.67	180
macro avg	0.64	0.61	0.61	180
weighted avg	0.65	0.67	0.65	180

Resultados en datos de prueba:

	Precisión	recall	f1-score	support
0	0.67	0.85	0.75	113
1	0.54	0.30	0.38	67
accuracy			0.64	180
macro avg	0.61	0.57	0.57	180
weighted avg	0.62	0.64	0.61	180

NORMAL SPLIT (TEXT/LABEL)

MULTINOMIAL 4 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL .29

TEST .28

MULTINOMIAL 4 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL .19

TEST .19

MULTINOMIAL 2 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL .64

TEST .66

MULTINOMIAL 2 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL .38

TEST .38

BERNOULLI 4 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL .25

TEST .24

BERNOULLI 2 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL .54

TEST .53

STRATIFY SPLIT (TEXT/LABEL)

MULTINOMIAL 4 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL .34

TEST .31

MULTINOMIAL 4 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL .19

TEST .19

MULTINOMIAL 2 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL .67

TEST .64

MULTINOMIAL 2 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL .39

TEST .39

////BERNOULLI

BERNOULLI 4 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL .28

TEST .28

BERNOULLI 2 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL .61

TEST .57

STRATIFY SPLIT (KEYWORD/LABEL)

MULTINOMIAL 4 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL .32

TEST .28

MULTINOMIAL 4 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL .28

TEST .29

MULTINOMIAL 2 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL .70

TEST .64

MULTINOMIAL 2 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL .70

TEST .65

BERNOULLI 4 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL .35

TEST .32

BERNOULLI 2 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL .66

TEST .65

STRATIFY SPLIT (KEYWORD/LABEL)

LEMMATIZED

MULTINOMIAL 4 LABEL

COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .33 NLTK .32

TEST SPACY .29 NLTK .28

MULTINOMIAL 4 LABEL

TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .30 NLTK .28

TEST SPACY .30 NLTK .29

MULTINOMIAL 2 LABEL

COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .67 NLTK .70

TEST SPACY .65 NLTK .64

MULTINOMIAL 2 LABEL

TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .67 NLTK .70

TEST SPACY .65 NLTK .65

BERNOULLI 4 LABEL

COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL SPACY .34 NLTK .35

TEST SPACY .29 NLTK .32

BERNOULLI 2 LABEL

COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL SPACY .67 NLTK .66

TEST SPACY .65 NLTK .65



STRATIFY SPLIT (TEXT/LABEL)

LEMMATIZED

MULTINOMIAL 4 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .34 NLTK .31

TEST SPACY .29 NLTK .31

MULTINOMIAL 4 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .19 NLTK .19

TEST SPACY .19 NLTK .19

MULTINOMIAL 2 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .61 NLTK .68

TEST SPACY .55 NLTK .62

MULTINOMIAL 2 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL SPACY .61 NLTK .39

TEST SPACY .55 NLTK .39

BERNOULLI 4 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL SPACY .26 NLTK .28

TEST SPACY .29 NLTK .28

BERNOULLI 2 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL SPACY .62 NLTK .61

TEST SPACY .54 NLTK .56

STRATIFY SPLIT (KEYWORD/LABEL)

STEM

MULTINOMIAL 4 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .30

TEST NLTK .30

MULTINOMIAL 4 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .26

TEST NLTK .29

MULTINOMIAL 2 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .70

TEST NLTK .66

MULTINOMIAL 2 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .69

TEST NLTK .65

BERNOULLI 4 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL NLTK .35

TEST NLTK .32

BERNOULLI 2 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL NLTK .68

TEST NLTK .67

STRATIFY SPLIT (TEXT/LABEL)

STEM

MULTINOMIAL 4 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .33

TEST NLTK .31

MULTINOMIAL 4 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .19

TEST NLTK .19

MULTINOMIAL 2 LABEL  
COUNTVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .72

TEST NLTK .65

MULTINOMIAL 2 LABEL  
TFDIFVECTORIZER F1 MACRO  
AVERAGE

VAL NLTK .38

TEST NLTK .39

BERNOULLI 4 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL NLTK .26

TEST NLTK .29

BERNOULLI 2 LABEL  
COUNTVECTORIZER/TFDIFVECTORIZE  
R F1 MACRO AVERAGE

VAL NLTK .62

TEST NLTK .56