

# Análisis de Sentimientos Multifuente con TF-IDF y Naive Bayes

**Objetivo:** Obtener una línea base fiable y reproducible para comparar mejoras y aplicar a nuevos textos.

**Dataset:** All-in-One Sentiment Dataset

## Pasos a Seguir:

1. **[Carga]** Cargar archivo local y detectar columnas de texto/etiqueta.
2. **[División]** Separar datos en `train` y `test`.
3. **[Vectorización]** Aplicar TF-IDF a los textos.
4. **[Entrenamiento]** Entrenar un modelo Naive Bayes Multinomial (para clases positivo/negativo/neutro).
5. **[Evaluación]** Generar métricas: `accuracy`, reporte de clasificación y matriz de confusión.
6. **[Inferencia]** Probar el modelo final prediciendo el sentimiento de frases nuevas.

## 1. Librerías

In [3]:

```
import os
import pandas as pd
import numpy as np

from sklearn.model_selection import train_test_split
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.naive_bayes import MultinomialNB
from sklearn.pipeline import Pipeline
from sklearn.metrics import accuracy_score, classification_report, confusion_matrix

import matplotlib.pyplot as plt

pd.set_option('display.max_colwidth', 120)
print("Librerías cargadas ✅")
```



## 2. Carga del dataset

In [ ]:

```
# 👉 Cambia a tu archivo subido
RUTA_ARCHIVO = "sentiment_dataset.csv" # o .xlsx

# Carga flexible
ext = os.path.splitext(RUTA_ARCHIVO)[1].lower()
if ext == ".csv":
    df = pd.read_csv(RUTA_ARCHIVO, encoding="utf-8", engine="python")
elif ext in [".xls", ".xlsx"]:
    df = pd.read_excel(RUTA_ARCHIVO)
```

```

else:
    raise ValueError("Formato no soportado. Usa .csv, .xls o .xlsx")

print(df.shape)
display(df.head())
print(df.columns.tolist())

```

(80000, 2)

		<b>sentiment</b>	<b>text</b>
0	1		And here is the rap song "African Warrior Queens", for which ChatGPT wrote the lyrics ❤️ Yes, amateur but beautiful :...
1	1		We asked chatGPT ,\n\nHow to become a successful trader?\n\nHere is what it thinks,\n\n#ChatGPT https://t.co/UKfbOqyurW
2	0		When I finally manage to convince myself to peel out from under the sheets each morning the second thing I'm interes...
3	0		Although a healthier alternative to your typical vanilla extract, I purchased this product to add some vanilla flavo...
4	1		In my latest test, I asked #ChatGPT to write me a welcome letter for our attendees for banking school. #bankingschoo...

['sentiment', 'text']

### 3. Selección de columnas

In [5]:

```

# 🔎 Detección heurística (ajústalo si no acierta)
text_candidates = [c for c in df.columns if c.lower() in ["text", "review",
label_candidates = [c for c in df.columns if c.lower() in ["label", "sentime

TEXT_COL = text_candidates[0] if text_candidates else None
LABEL_COL = label_candidates[0] if label_candidates else None

# 🤝 Si conoces Los nombres exactos, descomenta y fija:
# TEXT_COL = "texto"
# LABEL_COL = "sentiment"

assert TEXT_COL is not None and LABEL_COL is not None, "Ajusta TEXT_COL/LAB
df = df[[TEXT_COL, LABEL_COL]].rename(columns={TEXT_COL:"texto", LABEL_COL:
df = df["texto"].astype(str).str.strip()!=""].copy()

print(df.shape)
display(df.head())
print(df["etiqueta"].value_counts())

```

(80000, 2)

		<b>texto</b>	<b>etiqueta</b>
0		And here is the rap song "African Warrior Queens", for which ChatGPT wrote the lyrics ❤️ Yes, amateur but beautiful :...	1
1		We asked chatGPT ,\n\nHow to become a successful trader?\n\nHere is what it thinks,\n\n#ChatGPT https://t.co/UKfbOqyurW	1
2		When I finally manage to convince myself to peel out from under the sheets each morning the second thing I'm interes...	0

Although a healthier alternative to your typical vanilla extract, I purchased

3	Although a healthier alternative to your typical vanilla extract, I purchased this product to add some vanilla flavor.	0
4	In my latest test, I asked #ChatGPT to write me a welcome letter for our attendees for banking school. #bankingschoo...	1

```
etiqueta
1    40000
0    40000
Name: count, dtype: int64
```

## 4. Train/Test split

```
In [6]: x = df[ "texto" ].astype( str )
y = df[ "etiqueta" ].astype( str )

X_train, X_test, y_train, y_test = train_test_split(
    X, y, test_size=0.2, random_state=42, stratify=y
)

print("Train:", X_train.shape, " Test:", X_test.shape)
```

Train: (64000,) Test: (16000,)

## 5. Pipeline

```
In [7]: # Idioma para stopwords: "es" (español) o "en" (inglés)
IDIOMA = "es" # cambia a "en" si tu dataset está en inglés

pipe = Pipeline([
    ("tfidf", TfidfVectorizer(
        lowercase=True,
        strip_accents="unicode",
        ngram_range=(1,2),      # unigrams + bigrams
        min_df=2,                # ignora términos muy raros
        max_df=0.95,              # ignora términos demasiado comunes
        sublinear_tf=True,
        stop_words=("spanish" if IDIOMA=="es" else "english")
    )),
    ("nb", MultinomialNB(alpha=1.0))
])
```

## 6. Entrenamiento

```
In [15]: pipe.fit(X_train, y_train)
print("Modelo entrenado ✅")
```

Modelo entrenado ✅

## 7. Evaluación

```
In [16]: y_pred = pipe.predict(X_test)
acc = accuracy_score(y_test, y_pred)
print(f"Accuracy: {acc:.4f}\n")

print("Classification report:\n")
```

```
print(classification_report(y_test, y_pred))

# Matriz de confusión
labels_orden = sorted(pd.unique(y_test))
cm = confusion_matrix(y_test, y_pred, labels=labels_orden)
disp = ConfusionMatrixDisplay(confusion_matrix=cm, display_labels=labels_orden)

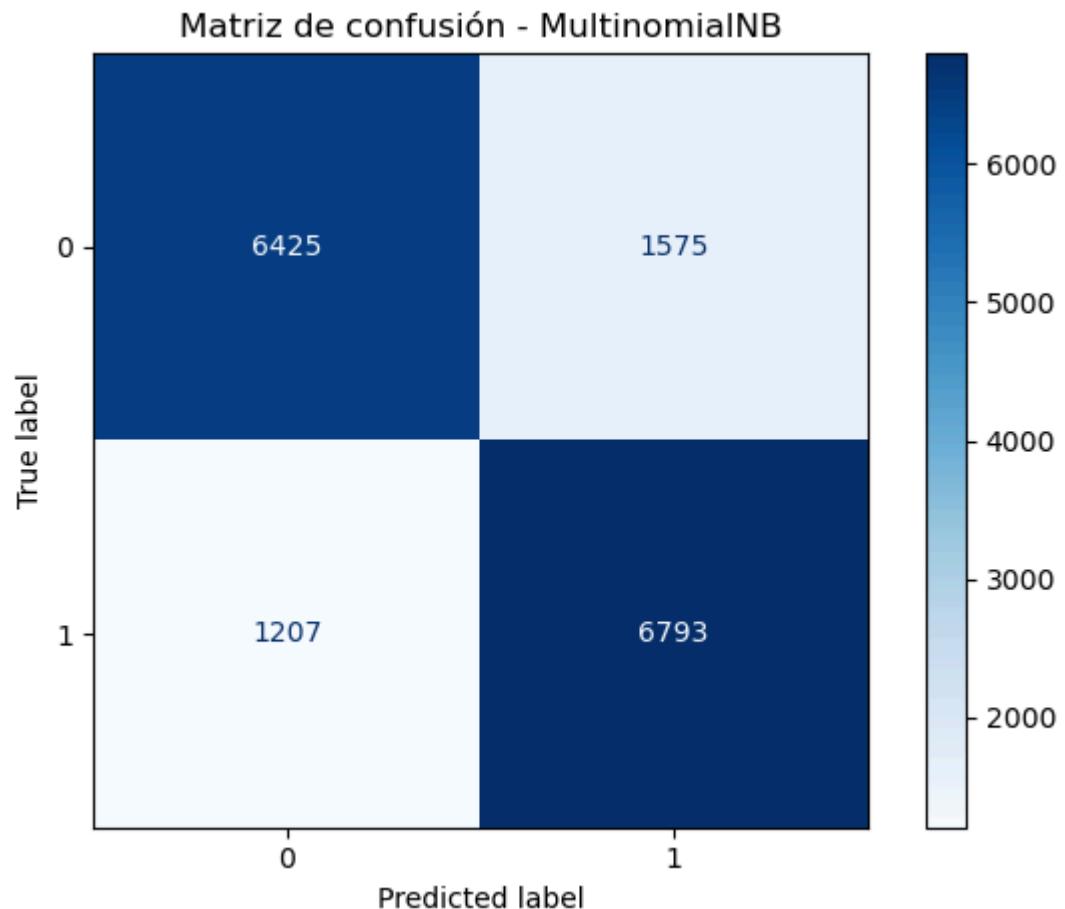
plt.figure(figsize=(5,4))
disp.plot(cmap="Blues", values_format="d")
plt.title("Matriz de confusión - MultinomialNB")
plt.tight_layout()
plt.show()
```

Accuracy: 0.8261

Classification report:

	precision	recall	f1-score	support
0	0.84	0.80	0.82	8000
1	0.81	0.85	0.83	8000
accuracy			0.83	16000
macro avg	0.83	0.83	0.83	16000
weighted avg	0.83	0.83	0.83	16000

<Figure size 500x400 with 0 Axes>



## 8. Predicción en nuevos textos

In [17]:

```
def predecir(textos):
    """
    textos: list[str] o pd.Series
```

```
return: DataFrame con texto y predicción
"""
textos = pd.Series(textos, name="texto").astype(str)
preds = pipe.predict(textos)
probs = None
try:
    probs = pipe.predict_proba(textos).max(axis=1)
except Exception:
    pass
out = pd.DataFrame({"texto": textos, "prediccion": preds})
if probs is not None:
    out["confianza_max"] = probs
return out

# Ejemplo:
ejemplo = ["el servicio fue excelente", "la comida llegó fría y tarde"]
predecir(ejemplo)
```

Out[17]:

texto	prediccion	confianza_max
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