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# Import necessary libraries

import pandas as pd

from sklearn.feature_extraction.text import CountVectorizer

from sklearn.model_selection import train_test_split

from sklearn.naive_bayes import MultinomialNB

from sklearn.metrics import accuracy_score, confusion_matrix, classification_report


# Load the SMS spam dataset

data = pd.read_csv('sms_spam.csv')


# Explore the dataset

print("Dataset head:")

print(data.head())


# Split the dataset into features (SMS messages) and labels (spam or non-spam)

X = data['message']

y = data['label']


# Convert labels to binary (0 for non-spam, 1 for spam)

y = y.map({'ham': 0, 'spam': 1})


# Split the dataset into training and testing sets

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


# Vectorize the SMS messages

vectorizer = CountVectorizer()

X_train_vectorized = vectorizer.fit_transform(X_train)

X_test_vectorized = vectorizer.transform(X_test)


# Train a Naive Bayes classifier

classifier = MultinomialNB()
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classifier.fit(X_train_vectorized, y_train)
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# Predictions
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y_pred = classifier.predict(X_test_vectorized)
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# Evaluate the model
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accuracy = accuracy_score(y_test, y_pred)
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print("\nAccuracy:", accuracy)
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conf_matrix = confusion_matrix(y_test, y_pred)
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print("\nConfusion Matrix:")
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print(conf_matrix)
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report = classification_report(y_test, y_pred)
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print("\nClassification Report:")
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print(report)
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