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import numpy as np
import pandas as pd
import itertools
from sklearn.model_selection import train_test_split
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.linear_model import PassiveAggressiveClassifier
from sklearn.metrics import accuracy_score, confusion_matrix

# Read the data
df = pd.read_csv('news.csv')

# Get shape and head
df.shape
df.head()

# Get the labels
labels = df.label
labels.head()

# Split the dataset
x_train, x_test, y_train, y_test = train_test_split(df['text'], labels, test_size=0.2, ran

# Initialize a TfidfVectorizer
tfidf_vectorizer = TfidfVectorizer(stop_words='english', max_df=0.7)

# Fit and transform train set, transform test set
tfidf_train = tfidf_vectorizer.fit_transform(x_train)
tfidf_test = tfidf_vectorizer.transform(x_test)

# Initialize the Passive Aggressive Classifier
pac = PassiveAggressiveClassifier(max_iter=50)
pac.fit(tfidf_train, y_train)

# Predict on the testing data
y_pred = pac.predict(tfidf_test)

# Build confusion matrix
confusion = confusion_matrix(y_test, y_pred, labels=['FAKE', 'REAL'])
print(confusion)
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       [ 46 583]]
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