import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from sklearn.model\_selection import train\_test\_split

from sklearn.naive\_bayes import GaussianNB

from sklearn.metrics import confusion\_matrix, accuracy\_score, precision\_score, recall\_score

df = pd.read\_csv("Iris.csv")

df = df.drop(columns=['Id'])

X = df.iloc[:, :-1]

y = df.iloc[:, -1]

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)

nb\_classifier = GaussianNB()

nb\_classifier.fit(X\_train, y\_train)

y\_pred = nb\_classifier.predict(X\_test)

cm = confusion\_matrix(y\_test, y\_pred)

TN, FP, FN, TP = cm.ravel() if cm.shape == (2,2) else (None, None, None, None)

accuracy = accuracy\_score(y\_test, y\_pred)

error\_rate = 1 - accuracy

precision = precision\_score(y\_test, y\_pred, average='weighted')

recall = recall\_score(y\_test, y\_pred, average='weighted')

print("Confusion Matrix:")

print(cm)

print(f"True Negatives (TN): {TN}")

print(f"False Positives (FP): {FP}")

print(f"False Negatives (FN): {FN}")

print(f"True Positives (TP): {TP}")

print(f"Accuracy: {accuracy:.4f}")

print(f"Error Rate: {error\_rate:.4f}")

print(f"Precision: {precision:.4f}")

print(f"Recall: {recall:.4f}")