EXPERINMENT-24

24.Question: K-Nearest Neighbors (KNN) Classifier

You are working on a classification problem to predict whether a patient has a certain medical condition or not based on their symptoms. You have collected a dataset of patients with labeled data (0 for no condition, 1 for the condition) and various symptom features.

Write a Python program that allows the user to input the features of a new patient and the value of k (number of neighbors). The program should use the KNN classifier from the scikit-learn library to predict whether the patient has the medical condition or not based on the input features.

Code:

```
import pandas as pd
from sklearn.neighbors import KNeighborsClassifier
from sklearn.preprocessing import StandardScaler
data = pd.read_csv("patients.csv")
X = data[["symptom1", "symptom2", "symptom3", "symptom4"]]
y = data["label"]
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
k = int(input("Enter the value of k: "))
knn = KNeighborsClassifier(n_neighbors=k)
knn.fit(X_scaled, y)
s1 = float(input("Enter symptom1 value: "))
s2 = float(input("Enter symptom2 value: "))
s3 = float(input("Enter symptom3 value: "))
s4 = float(input("Enter symptom4 value: "))
new_patient = pd.DataFrame([{
    "symptom1": s1,
    "symptom2": s2,
    "symptom3": s3,
    "symptom4": s4
}])
new_scaled = scaler.transform(new_patient)
prediction = knn.predict(new_scaled)[0]
probabilities = knn.predict_proba(new_scaled)[0]
print("Predicted Condition (1 = condition, 0 = no condition):", prediction)
print("Probabilities (no condition, condition):", probabilities)
```

Output:

```
[Running] python -u "c:\Users\karan\OneDrive\Desktop\New folder (2)\24.py"
Predicted label (0=no condition, 1=condition): 1
Probabilities: [0. 1.]

[Done] exited with code=0 in 2.821 seconds
```