Experiment No- 2.3

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Semester: 5 **Date of Performance: 11-10-22**
Subject Name: Machine Learning **Subject Code: 20CSP -317**

1. **Aim/Overview of the practical:** Implementing K-Nearest Neighbour on any dataset and analyse the accuracy.

2. **Task to be done/ Which logistics used:** Analysing accuracy by implementing the K-Nearest Neighbour on any dataset.

3. **Steps of experiment/Code:**

    1. **Importing libraries such as matplotlib, numpy and sklearn and reading the iris dataset. Also splitting the dataset for training and testing.**

```
# Import necessary modules
from sklearn.neighbors import KNeighborsClassifier
from sklearn.model_selection import train_test_split
from sklearn.datasets import load_iris
import numpy as np
import matplotlib.pyplot as plt

# Loading data
irisData = load_iris()

# Create feature and target arrays
X = irisData.data
y = irisData.target

# Split into training and test set
X_train, X_test, y_train, y_test = train_test_split(
            X, y, test_size = 0.2, random_state=42)

knn = KNeighborsClassifier(n_neighbors=7)

knn.fit(X_train, y_train)

# Predict on dataset which model has not seen before
print(knn.predict(X_test))
```

```
[1 0 2 1 1 0 1 2 2 1 2 0 0 0 0 1 2 1 1 2 0 2 0 2 2 2 2 2 0 0]
```

2. Implementing K-Nearest Neighbour and calculating the accuracy also generating the plot.

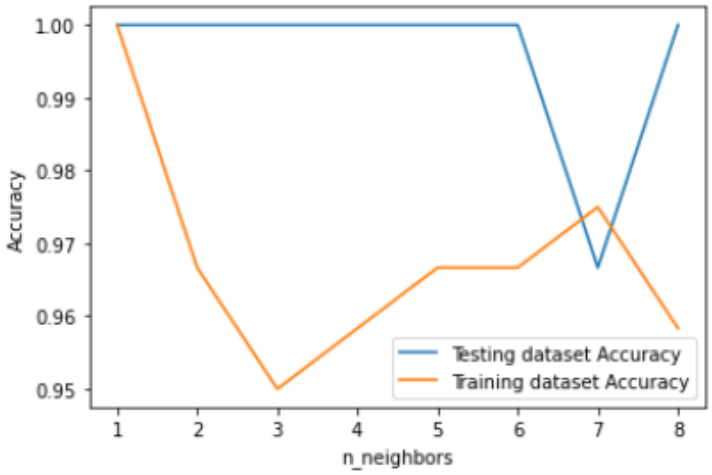
```
neighbors = np.arange(1, 9)
train_accuracy = np.empty(len(neighbors))
test_accuracy = np.empty(len(neighbors))

# Loop over K values
for i, k in enumerate(neighbors):
    knn = KNeighborsClassifier(n_neighbors=k)
    knn.fit(X_train, y_train)

    # Compute training and test data accuracy
    train_accuracy[i] = knn.score(X_train, y_train)
    test_accuracy[i] = knn.score(X_test, y_test)

# Generate plot
plt.plot(neighbors, test_accuracy, label = 'Testing dataset Accuracy')
plt.plot(neighbors, train_accuracy, label = 'Training dataset Accuracy')

plt.legend()
plt.xlabel('n_neighbors')
plt.ylabel('Accuracy')
plt.show()
```



Learning Outcomes (What I have learnt):

1. I have learnt about implementing K-Nearest Neighbour on any dataset .

2. I have learnt about splitting the dataset for training and testing purpose.

3. I have learnt about various libraries which are supported by python such as sklearn, numpy, matplotlib.

4. I have learnt about the various functions provided by various libraries.

5. I have understood the experiment very well.

Evaluation Grid:

	Parameters	Marks Obtained	Maximum Marks
1.	Student Performance (Conduct of experiment) objectives/Outcomes.		12
2.	Viva Voce		10
3.	Submission of Work Sheet (Record)		8
	Total		30