Tutorial No. 6

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Code

```
[1]: from sklearn.neighbors import KNeighborsClassifier
     from sklearn.model_selection import train_test_split
     from sklearn.datasets import load_iris

[2]: irisData = load_iris()

[3]: X = irisData.data
     y = irisData.target

[4]: 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)

[4]: KNeighborsClassifier
     KNeighborsClassifier(n_neighbors=7)

[5]: 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]

[ ]:
```

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Code

```
[1]: from sklearn.neighbors import KNeighborsClassifier
     from sklearn.model_selection import train_test_split
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[4]: 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)

[4]: KNeighborsClassifier
     KNeighborsClassifier(n_neighbors=7)

[5]: print(knn.score(X_test, y_test))

     0.9666666666666667

[ ]:
```

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Code

[1]:
```
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
```

[2]:
```
irisData = load_iris()
```

[3]:
```
X = irisData.data
y = irisData.target
```

[4]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.2, random_state=42)
neighbors = np.arange(1, 9)
train_accuracy = np.empty(len(neighbors))
test_accuracy = np.empty(len(neighbors))
```

[5]:
```
for i, k in enumerate(neighbors):
    knn = KNeighborsClassifier(n_neighbors=k)
    knn.fit(X_train, y_train)
```

[6]:
```
train_accuracy[i] = knn.score(X_train, y_train)
test_accuracy[i] = knn.score(X_test, y_test)
```

[7]:
```
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()
```

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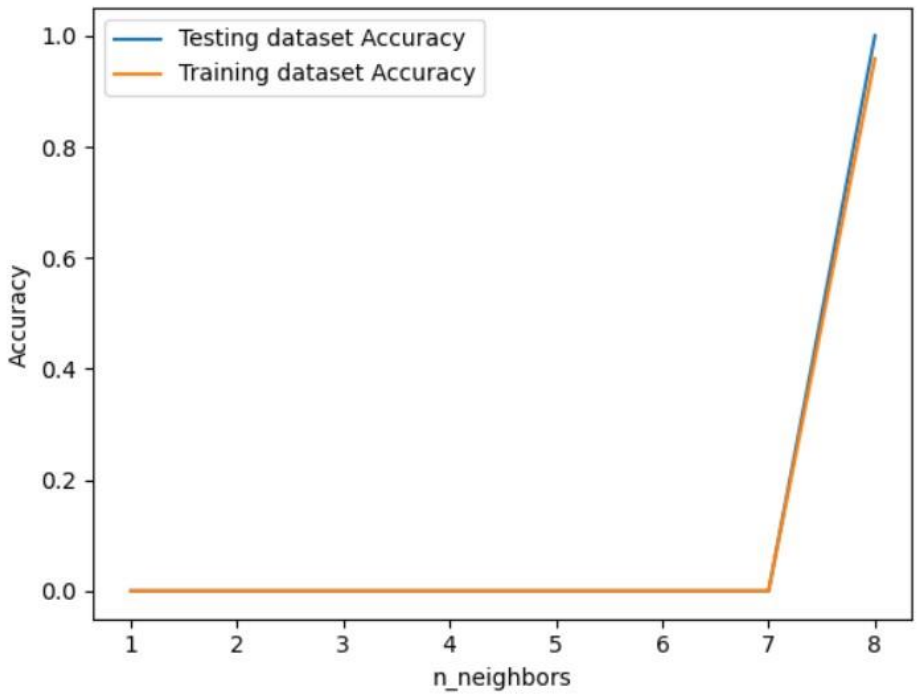
Code

```
test_accuracy[i] = knn.score(X_test, y_test)
```

[7]:
```
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()
```



[ ]: