

9 : K-Nearest Neighbour and classify iris dataset

load iris dataset

```
from sklearn.datasets import load_iris

iris_dataset = load_iris()

targets = iris_dataset.target_names
print(targets)

['setosa' 'versicolor' 'virginica']
```

split the dataset for testing and training

```
from sklearn.model_selection import train_test_split

data_store = train_test_split( iris_dataset.data, iris_dataset.target)

training_inputs, testing_inputs, training_outputs, testing_outputs = data_store
```

fit training data to K-nearest_neighbour model

```
from sklearn.neighbors import KNeighborsClassifier

kn = KNeighborsClassifier(n_neighbors=1)
kn.fit(training_inputs, training_outputs)

KNeighborsClassifier(algorithm='auto', leaf_size=30, metric='minkowski',
                    metric_params=None, n_jobs=None, n_neighbors=1, p=2,
                    weights='uniform')
```

find predictions on test data

```
for test_input, test_output in zip(testing_inputs, testing_outputs):

    prediction_index = kn.predict([test_input])                #test_input is 1d, enclose it for passing as 2d, ! Important

    predicted_output = targets[prediction_index][0]           # 0 since its a list having single element
    actual_output = targets[test_output]                      #test output is an index

    # {0:>10} stands for {index_of_element_in_format_parameters : right_justified by 10 characters}

    formatted_string = ' {0:>10} --> {1:>10} | {2:>10} --> {3:>10}'.format('actual output', actual_output, 'predcited output', predicted_output)
    print(formatted_string)
```

```
actual output --> setosa | predcited output --> setosa
actual output --> setosa | predcited output --> setosa
actual output --> virginica | predcited output --> virginica
actual output --> setosa | predcited output --> setosa
actual output --> setosa | predcited output --> setosa
actual output --> setosa | predcited output --> setosa
actual output --> virginica | predcited output --> virginica
actual output --> versicolor | predcited output --> versicolor
actual output --> setosa | predcited output --> setosa
actual output --> versicolor | predcited output --> versicolor
actual output --> setosa | predcited output --> setosa
actual output --> versicolor | predcited output --> versicolor
actual output --> virginica | predcited output --> virginica
actual output --> virginica | predcited output --> virginica
actual output --> virginica | predcited output --> virginica
actual output --> virginica | predcited output --> virginica
actual output --> versicolor | predcited output --> versicolor
actual output --> virginica | predcited output --> virginica
actual output --> virginica | predcited output --> virginica
actual output --> virginica | predcited output --> virginica
actual output --> versicolor | predcited output --> versicolor
actual output --> versicolor | predcited output --> versicolor
actual output --> versicolor | predcited output --> versicolor
actual output --> versicolor | predcited output --> versicolor
actual output --> setosa | predcited output --> setosa
actual output --> versicolor | predcited output --> versicolor
actual output --> virginica | predcited output --> virginica
actual output --> virginica | predcited output --> virginica
actual output --> setosa | predcited output --> setosa
actual output --> virginica | predcited output --> virginica
actual output --> versicolor | predcited output --> versicolor
actual output --> versicolor | predcited output --> versicolor
actual output --> versicolor | predcited output --> versicolor
actual output --> virginica | predcited output --> virginica
actual output --> setosa | predcited output --> setosa
actual output --> virginica | predcited output --> virginica
actual output --> setosa | predcited output --> setosa
```

