LAB-6

NAME - SMAIRA PANDITA

CLASS - 2BSC EA

REGISTER NUMBER - 23112314

SUBJECT - DATA ANALYTICS WITH PYTHON

ASSIGNMENT - LAB 6

OBJECTIVE

- Making a Frontend/Backend System using Flask.
- Making predictive model using KNeighborClassifier
- Making HTML file.
- Storing data using a pickle file.
- Checking the created website using Postman app.

In [1]:
```
from sklearn.datasets import load_iris
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.neighbors import KNeighborsClassifier
from sklearn.metrics import accuracy_score
import warnings
warnings.filterwarnings('ignore')
import pickle
```

In [2]:
```
iris = load_iris()
```

In [3]:
```
iris
```

Out[3]:
```
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 'frame': None,
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 'DESCR': '.. _iris_dataset:\n\nIris plants dataset\n--------------------\n\n**Dat
a Set Characteristics:**\n\n    :Number of Instances: 150 (50 in each of three cla
sses)\n    :Number of Attributes: 4 numeric, predictive attributes and the class\n
:Attribute Information:\n        - sepal length in cm\n        - sepal width in cm
\n        - petal length in cm\n        - petal width in cm\n        - class:\n
- Iris-Setosa\n                - Iris-Versicolour\n                - Iris-Virginic
a\n                \n    :Summary Statistics:\n\n    ============== ==== ==== ====
=== ===== ====================\n                    Min  Max   Mean    SD   Class
Correlation\n    ============== ==== ==== ======= ===== ====================\n
sepal length:   4.3  7.9   5.84   0.83    0.7826\n    sepal width:    2.0  4.4
3.05   0.43   -0.4194\n    petal length:   1.0  6.9   3.76   1.76    0.9490  (hig
h!)\n    petal width:    0.1  2.5   1.20   0.76    0.9565  (high!)\n    ==========
==== ==== ==== ======= ===== ====================\n\n    :Missing Attribute Value
s: None\n    :Class Distribution: 33.3% for each of 3 classes.\n    :Creator: R.A.
Fisher\n    :Donor: Michael Marshall (MARSHALL%PLU@io.arc.nasa.gov)\n    :Date: Ju
ly, 1988\n\nThe famous Iris database, first used by Sir R.A. Fisher. The dataset i
s taken\nfrom Fisher\'s paper. Note that it\'s the same as in R, but not as in the
UCI\nMachine Learning Repository, which has two wrong data points.\n\nThis is perh
aps the best known database to be found in the\npattern recognition literature.  F
isher\'s paper is a classic in the field and\nis referenced frequently to this da
y.  (See Duda & Hart, for example.)  The\ndata set contains 3 classes of 50 instan
ces each, where each class refers to a\ntype of iris plant.  One class is linearly
separable from the other 2; the\nlatter are NOT linearly separable from each othe
r.\n\n|details-start|\n**References**\n|details-split|\n\n- Fisher, R.A. "The use
of multiple measurements in taxonomic problems"\n  Annual Eugenics, 7, Part II, 17
9-188 (1936); also in "Contributions to\n  Mathematical Statistics" (John Wiley, N
Y, 1950).\n- Duda, R.O., & Hart, P.E. (1973) Pattern Classification and Scene Anal
ysis.\n  (Q327.D83) John Wiley & Sons.  ISBN 0-471-22361-1.  See page 218.\n- Dasa
rathy, B.V. (1980) "Nosing Around the Neighborhood: A New System\n  Structure and
Classification Rule for Recognition in Partially Exposed\n  Environments".  IEEE T
ransactions on Pattern Analysis and Machine\n  Intelligence, Vol. PAMI-2, No. 1, 6
7-71.\n- Gates, G.W. (1972) "The Reduced Nearest Neighbor Rule".  IEEE Transaction
```

```
s\n  on Information Theory, May 1972, 431-433.\n- See also: 1988 MLC Proceedings,
54-64.  Cheeseman et al"s AUTOCLASS II\n  conceptual clustering system finds 3 cla
sses in the data.\n- Many, many more ...\n\n|details-end|',
 'feature_names': ['sepal length (cm)',
  'sepal width (cm)',
  'petal length (cm)',
  'petal width (cm)'],
 'filename': 'iris.csv',
 'data_module': 'sklearn.datasets.data'}
```

In [1]:
```
from sklearn.datasets import load_iris
```

In [3]:
```
iris=load_iris()
```

In [4]:
```
iris
```

Out[4]:

```
{'data': array([[5.1, 3.5, 1.4, 0.2],
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 'frame': None,
 'target_names': array(['setosa', 'versicolor', 'virginica'], dtype='<U10'),
 'DESCR': '.. _iris_dataset:\n\nIris plants dataset\n--------------------\n\n**Dat
a Set Characteristics:**\n\n    :Number of Instances: 150 (50 in each of three cla
sses)\n    :Number of Attributes: 4 numeric, predictive attributes and the class\n
:Attribute Information:\n        - sepal length in cm\n        - sepal width in cm
\n        - petal length in cm\n        - petal width in cm\n        - class:\n
- Iris-Setosa\n                - Iris-Versicolour\n                - Iris-Virginic
a\n                \n    :Summary Statistics:\n\n    ============== ==== ==== ====
=== ===== ====================\n                    Min  Max   Mean    SD   Class
Correlation\n    ============== ==== ==== ======= ===== ====================\n
sepal length:   4.3  7.9   5.84   0.83    0.7826\n    sepal width:    2.0  4.4
3.05   0.43   -0.4194\n    petal length:   1.0  6.9   3.76   1.76    0.9490  (hig
h!)\n    petal width:    0.1  2.5   1.20   0.76    0.9565  (high!)\n    ==========
==== ==== ==== ======= ===== ====================\n\n    :Missing Attribute Value
s: None\n    :Class Distribution: 33.3% for each of 3 classes.\n    :Creator: R.A.
Fisher\n    :Donor: Michael Marshall (MARSHALL%PLU@io.arc.nasa.gov)\n    :Date: Ju
ly, 1988\n\nThe famous Iris database, first used by Sir R.A. Fisher. The dataset i
s taken\nfrom Fisher\'s paper. Note that it\'s the same as in R, but not as in the
UCI\nMachine Learning Repository, which has two wrong data points.\n\nThis is perh
aps the best known database to be found in the\npattern recognition literature.  F
isher\'s paper is a classic in the field and\nis referenced frequently to this da
y.  (See Duda & Hart, for example.)  The\ndata set contains 3 classes of 50 instan
ces each, where each class refers to a\ntype of iris plant.  One class is linearly
separable from the other 2; the\nlatter are NOT linearly separable from each othe
r.\n\n|details-start|\n**References**\n|details-split|\n\n- Fisher, R.A. "The use
of multiple measurements in taxonomic problems"\n  Annual Eugenics, 7, Part II, 17
9-188 (1936); also in "Contributions to\n  Mathematical Statistics" (John Wiley, N
Y, 1950).\n- Duda, R.O., & Hart, P.E. (1973) Pattern Classification and Scene Anal
ysis.\n  (Q327.D83) John Wiley & Sons.  ISBN 0-471-22361-1.  See page 218.\n- Dasa
rathy, B.V. (1980) "Nosing Around the Neighborhood: A New System\n  Structure and
Classification Rule for Recognition in Partially Exposed\n  Environments".  IEEE T
ransactions on Pattern Analysis and Machine\n  Intelligence, Vol. PAMI-2, No. 1, 6
7-71.\n- Gates, G.W. (1972) "The Reduced Nearest Neighbor Rule".  IEEE Transaction
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```
s\n  on Information Theory, May 1972, 431-433.\n- See also: 1988 MLC Proceedings,
54-64.  Cheeseman et al"s AUTOCLASS II\n  conceptual clustering system finds 3 cla
sses in the data.\n- Many, many more ...\n\n|details-end|',
 'feature_names': ['sepal length (cm)',
  'sepal width (cm)',
  'petal length (cm)',
  'petal width (cm)'],
 'filename': 'iris.csv',
 'data_module': 'sklearn.datasets.data'}
```

In [5]:
```
iris.data
```

Out[5]:
```
array([[5.1, 3.5, 1.4, 0.2],
       [4.9, 3. , 1.4, 0.2],
       [4.7, 3.2, 1.3, 0.2],
       [4.6, 3.1, 1.5, 0.2],
       [5. , 3.6, 1.4, 0.2],
       [5.4, 3.9, 1.7, 0.4],
       [4.6, 3.4, 1.4, 0.3],
       [5. , 3.4, 1.5, 0.2],
       [4.4, 2.9, 1.4, 0.2],
       [4.9, 3.1, 1.5, 0.1],
       [5.4, 3.7, 1.5, 0.2],
       [4.8, 3.4, 1.6, 0.2],
       [4.8, 3. , 1.4, 0.1],
       [4.3, 3. , 1.1, 0.1],
       [5.8, 4. , 1.2, 0.2],
       [5.7, 4.4, 1.5, 0.4],
       [5.4, 3.9, 1.3, 0.4],
       [5.1, 3.5, 1.4, 0.3],
       [5.7, 3.8, 1.7, 0.3],
       [5.1, 3.8, 1.5, 0.3],
       [5.4, 3.4, 1.7, 0.2],
       [5.1, 3.7, 1.5, 0.4],
       [4.6, 3.6, 1. , 0.2],
       [5.1, 3.3, 1.7, 0.5],
       [4.8, 3.4, 1.9, 0.2],
       [5. , 3. , 1.6, 0.2],
       [5. , 3.4, 1.6, 0.4],
       [5.2, 3.5, 1.5, 0.2],
       [5.2, 3.4, 1.4, 0.2],
       [4.7, 3.2, 1.6, 0.2],
       [4.8, 3.1, 1.6, 0.2],
       [5.4, 3.4, 1.5, 0.4],
       [5.2, 4.1, 1.5, 0.1],
       [5.5, 4.2, 1.4, 0.2],
       [4.9, 3.1, 1.5, 0.2],
       [5. , 3.2, 1.2, 0.2],
       [5.5, 3.5, 1.3, 0.2],
       [4.9, 3.6, 1.4, 0.1],
       [4.4, 3. , 1.3, 0.2],
       [5.1, 3.4, 1.5, 0.2],
       [5. , 3.5, 1.3, 0.3],
       [4.5, 2.3, 1.3, 0.3],
       [4.4, 3.2, 1.3, 0.2],
       [5. , 3.5, 1.6, 0.6],
       [5.1, 3.8, 1.9, 0.4],
       [4.8, 3. , 1.4, 0.3],
       [5.1, 3.8, 1.6, 0.2],
       [4.6, 3.2, 1.4, 0.2],
       [5.3, 3.7, 1.5, 0.2],
       [5. , 3.3, 1.4, 0.2],
       [7. , 3.2, 4.7, 1.4],
       [6.4, 3.2, 4.5, 1.5],
       [6.9, 3.1, 4.9, 1.5],
       [5.5, 2.3, 4. , 1.3],
       [6.5, 2.8, 4.6, 1.5],
       [5.7, 2.8, 4.5, 1.3],
       [6.3, 3.3, 4.7, 1.6],
       [4.9, 2.4, 3.3, 1. ],
       [6.6, 2.9, 4.6, 1.3],
       [5.2, 2.7, 3.9, 1.4],
       [5. , 2. , 3.5, 1. ],
       [5.9, 3. , 4.2, 1.5],
       [6. , 2.2, 4. , 1. ],
       [6.1, 2.9, 4.7, 1.4],
```

```
[5.6, 2.9, 3.6, 1.3],
[6.7, 3.1, 4.4, 1.4],
[5.6, 3. , 4.5, 1.5],
[5.8, 2.7, 4.1, 1. ],
[6.2, 2.2, 4.5, 1.5],
[5.6, 2.5, 3.9, 1.1],
[5.9, 3.2, 4.8, 1.8],
[6.1, 2.8, 4. , 1.3],
[6.3, 2.5, 4.9, 1.5],
[6.1, 2.8, 4.7, 1.2],
[6.4, 2.9, 4.3, 1.3],
[6.6, 3. , 4.4, 1.4],
[6.8, 2.8, 4.8, 1.4],
[6.7, 3. , 5. , 1.7],
[6. , 2.9, 4.5, 1.5],
[5.7, 2.6, 3.5, 1. ],
[5.5, 2.4, 3.8, 1.1],
[5.5, 2.4, 3.7, 1. ],
[5.8, 2.7, 3.9, 1.2],
[6. , 2.7, 5.1, 1.6],
[5.4, 3. , 4.5, 1.5],
[6. , 3.4, 4.5, 1.6],
[6.7, 3.1, 4.7, 1.5],
[6.3, 2.3, 4.4, 1.3],
[5.6, 3. , 4.1, 1.3],
[5.5, 2.5, 4. , 1.3],
[5.5, 2.6, 4.4, 1.2],
[6.1, 3. , 4.6, 1.4],
[5.8, 2.6, 4. , 1.2],
[5. , 2.3, 3.3, 1. ],
[5.6, 2.7, 4.2, 1.3],
[5.7, 3. , 4.2, 1.2],
[5.7, 2.9, 4.2, 1.3],
[6.2, 2.9, 4.3, 1.3],
[5.1, 2.5, 3. , 1.1],
[5.7, 2.8, 4.1, 1.3],
[6.3, 3.3, 6. , 2.5],
[5.8, 2.7, 5.1, 1.9],
[7.1, 3. , 5.9, 2.1],
[6.3, 2.9, 5.6, 1.8],
[6.5, 3. , 5.8, 2.2],
[7.6, 3. , 6.6, 2.1],
[4.9, 2.5, 4.5, 1.7],
[7.3, 2.9, 6.3, 1.8],
[6.7, 2.5, 5.8, 1.8],
[7.2, 3.6, 6.1, 2.5],
[6.5, 3.2, 5.1, 2. ],
[6.4, 2.7, 5.3, 1.9],
[6.8, 3. , 5.5, 2.1],
[5.7, 2.5, 5. , 2. ],
[5.8, 2.8, 5.1, 2.4],
[6.4, 3.2, 5.3, 2.3],
[6.5, 3. , 5.5, 1.8],
[7.7, 3.8, 6.7, 2.2],
[7.7, 2.6, 6.9, 2.3],
[6. , 2.2, 5. , 1.5],
[6.9, 3.2, 5.7, 2.3],
[5.6, 2.8, 4.9, 2. ],
[7.7, 2.8, 6.7, 2. ],
[6.3, 2.7, 4.9, 1.8],
[6.7, 3.3, 5.7, 2.1],
[7.2, 3.2, 6. , 1.8],
[6.2, 2.8, 4.8, 1.8],
[6.1, 3. , 4.9, 1.8],
```

```
       [6.4, 2.8, 5.6, 2.1],
       [7.2, 3. , 5.8, 1.6],
       [7.4, 2.8, 6.1, 1.9],
       [7.9, 3.8, 6.4, 2. ],
       [6.4, 2.8, 5.6, 2.2],
       [6.3, 2.8, 5.1, 1.5],
       [6.1, 2.6, 5.6, 1.4],
       [7.7, 3. , 6.1, 2.3],
       [6.3, 3.4, 5.6, 2.4],
       [6.4, 3.1, 5.5, 1.8],
       [6. , 3. , 4.8, 1.8],
       [6.9, 3.1, 5.4, 2.1],
       [6.7, 3.1, 5.6, 2.4],
       [6.9, 3.1, 5.1, 2.3],
       [5.8, 2.7, 5.1, 1.9],
       [6.8, 3.2, 5.9, 2.3],
       [6.7, 3.3, 5.7, 2.5],
       [6.7, 3. , 5.2, 2.3],
       [6.3, 2.5, 5. , 1.9],
       [6.5, 3. , 5.2, 2. ],
       [6.2, 3.4, 5.4, 2.3],
       [5.9, 3. , 5.1, 1.8]])
```

In [7]:
```
iris.feature_names
```

Out[7]:
```
['sepal length (cm)',
 'sepal width (cm)',
 'petal length (cm)',
 'petal width (cm)']
```

In [6]:
```
iris.target
```

Out[6]:
```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2])
```

In [4]:
```
X = pd.DataFrame(data = iris.data, columns = iris.feature_names)
y = pd.DataFrame(data = iris.target, columns = ['Species'])
```

In [5]:
```
X
```

Out[5]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2
...	...	...	...	...
145	6.7	3.0	5.2	2.3
146	6.3	2.5	5.0	1.9
147	6.5	3.0	5.2	2.0
148	6.2	3.4	5.4	2.3
149	5.9	3.0	5.1	1.8

150 rows × 4 columns

In [6]:
```
y
```

Out[6]:

	Species
0	0
1	0
2	0
3	0
4	0
...	...
145	2
146	2
147	2
148	2
149	2

150 rows × 1 columns

In [7]:
```
iris.data
```

Out[7]:
```
array([[5.1, 3.5, 1.4, 0.2],
       [4.9, 3. , 1.4, 0.2],
       [4.7, 3.2, 1.3, 0.2],
       [4.6, 3.1, 1.5, 0.2],
       [5. , 3.6, 1.4, 0.2],
       [5.4, 3.9, 1.7, 0.4],
       [4.6, 3.4, 1.4, 0.3],
       [5. , 3.4, 1.5, 0.2],
       [4.4, 2.9, 1.4, 0.2],
       [4.9, 3.1, 1.5, 0.1],
       [5.4, 3.7, 1.5, 0.2],
       [4.8, 3.4, 1.6, 0.2],
       [4.8, 3. , 1.4, 0.1],
       [4.3, 3. , 1.1, 0.1],
       [5.8, 4. , 1.2, 0.2],
       [5.7, 4.4, 1.5, 0.4],
       [5.4, 3.9, 1.3, 0.4],
       [5.1, 3.5, 1.4, 0.3],
       [5.7, 3.8, 1.7, 0.3],
       [5.1, 3.8, 1.5, 0.3],
       [5.4, 3.4, 1.7, 0.2],
       [5.1, 3.7, 1.5, 0.4],
       [4.6, 3.6, 1. , 0.2],
       [5.1, 3.3, 1.7, 0.5],
       [4.8, 3.4, 1.9, 0.2],
       [5. , 3. , 1.6, 0.2],
       [5. , 3.4, 1.6, 0.4],
       [5.2, 3.5, 1.5, 0.2],
       [5.2, 3.4, 1.4, 0.2],
       [4.7, 3.2, 1.6, 0.2],
       [4.8, 3.1, 1.6, 0.2],
       [5.4, 3.4, 1.5, 0.4],
       [5.2, 4.1, 1.5, 0.1],
       [5.5, 4.2, 1.4, 0.2],
       [4.9, 3.1, 1.5, 0.2],
       [5. , 3.2, 1.2, 0.2],
       [5.5, 3.5, 1.3, 0.2],
       [4.9, 3.6, 1.4, 0.1],
       [4.4, 3. , 1.3, 0.2],
       [5.1, 3.4, 1.5, 0.2],
       [5. , 3.5, 1.3, 0.3],
       [4.5, 2.3, 1.3, 0.3],
       [4.4, 3.2, 1.3, 0.2],
       [5. , 3.5, 1.6, 0.6],
       [5.1, 3.8, 1.9, 0.4],
       [4.8, 3. , 1.4, 0.3],
       [5.1, 3.8, 1.6, 0.2],
       [4.6, 3.2, 1.4, 0.2],
       [5.3, 3.7, 1.5, 0.2],
       [5. , 3.3, 1.4, 0.2],
       [7. , 3.2, 4.7, 1.4],
       [6.4, 3.2, 4.5, 1.5],
       [6.9, 3.1, 4.9, 1.5],
       [5.5, 2.3, 4. , 1.3],
       [6.5, 2.8, 4.6, 1.5],
       [5.7, 2.8, 4.5, 1.3],
       [6.3, 3.3, 4.7, 1.6],
       [4.9, 2.4, 3.3, 1. ],
       [6.6, 2.9, 4.6, 1.3],
       [5.2, 2.7, 3.9, 1.4],
       [5. , 2. , 3.5, 1. ],
       [5.9, 3. , 4.2, 1.5],
       [6. , 2.2, 4. , 1. ],
       [6.1, 2.9, 4.7, 1.4],
```

```
[5.6, 2.9, 3.6, 1.3],
[6.7, 3.1, 4.4, 1.4],
[5.6, 3. , 4.5, 1.5],
[5.8, 2.7, 4.1, 1. ],
[6.2, 2.2, 4.5, 1.5],
[5.6, 2.5, 3.9, 1.1],
[5.9, 3.2, 4.8, 1.8],
[6.1, 2.8, 4. , 1.3],
[6.3, 2.5, 4.9, 1.5],
[6.1, 2.8, 4.7, 1.2],
[6.4, 2.9, 4.3, 1.3],
[6.6, 3. , 4.4, 1.4],
[6.8, 2.8, 4.8, 1.4],
[6.7, 3. , 5. , 1.7],
[6. , 2.9, 4.5, 1.5],
[5.7, 2.6, 3.5, 1. ],
[5.5, 2.4, 3.8, 1.1],
[5.5, 2.4, 3.7, 1. ],
[5.8, 2.7, 3.9, 1.2],
[6. , 2.7, 5.1, 1.6],
[5.4, 3. , 4.5, 1.5],
[6. , 3.4, 4.5, 1.6],
[6.7, 3.1, 4.7, 1.5],
[6.3, 2.3, 4.4, 1.3],
[5.6, 3. , 4.1, 1.3],
[5.5, 2.5, 4. , 1.3],
[5.5, 2.6, 4.4, 1.2],
[6.1, 3. , 4.6, 1.4],
[5.8, 2.6, 4. , 1.2],
[5. , 2.3, 3.3, 1. ],
[5.6, 2.7, 4.2, 1.3],
[5.7, 3. , 4.2, 1.2],
[5.7, 2.9, 4.2, 1.3],
[6.2, 2.9, 4.3, 1.3],
[5.1, 2.5, 3. , 1.1],
[5.7, 2.8, 4.1, 1.3],
[6.3, 3.3, 6. , 2.5],
[5.8, 2.7, 5.1, 1.9],
[7.1, 3. , 5.9, 2.1],
[6.3, 2.9, 5.6, 1.8],
[6.5, 3. , 5.8, 2.2],
[7.6, 3. , 6.6, 2.1],
[4.9, 2.5, 4.5, 1.7],
[7.3, 2.9, 6.3, 1.8],
[6.7, 2.5, 5.8, 1.8],
[7.2, 3.6, 6.1, 2.5],
[6.5, 3.2, 5.1, 2. ],
[6.4, 2.7, 5.3, 1.9],
[6.8, 3. , 5.5, 2.1],
[5.7, 2.5, 5. , 2. ],
[5.8, 2.8, 5.1, 2.4],
[6.4, 3.2, 5.3, 2.3],
[6.5, 3. , 5.5, 1.8],
[7.7, 3.8, 6.7, 2.2],
[7.7, 2.6, 6.9, 2.3],
[6. , 2.2, 5. , 1.5],
[6.9, 3.2, 5.7, 2.3],
[5.6, 2.8, 4.9, 2. ],
[7.7, 2.8, 6.7, 2. ],
[6.3, 2.7, 4.9, 1.8],
[6.7, 3.3, 5.7, 2.1],
[7.2, 3.2, 6. , 1.8],
[6.2, 2.8, 4.8, 1.8],
[6.1, 3. , 4.9, 1.8],
```

```
       [6.4, 2.8, 5.6, 2.1],
       [7.2, 3. , 5.8, 1.6],
       [7.4, 2.8, 6.1, 1.9],
       [7.9, 3.8, 6.4, 2. ],
       [6.4, 2.8, 5.6, 2.2],
       [6.3, 2.8, 5.1, 1.5],
       [6.1, 2.6, 5.6, 1.4],
       [7.7, 3. , 6.1, 2.3],
       [6.3, 3.4, 5.6, 2.4],
       [6.4, 3.1, 5.5, 1.8],
       [6. , 3. , 4.8, 1.8],
       [6.9, 3.1, 5.4, 2.1],
       [6.7, 3.1, 5.6, 2.4],
       [6.9, 3.1, 5.1, 2.3],
       [5.8, 2.7, 5.1, 1.9],
       [6.8, 3.2, 5.9, 2.3],
       [6.7, 3.3, 5.7, 2.5],
       [6.7, 3. , 5.2, 2.3],
       [6.3, 2.5, 5. , 1.9],
       [6.5, 3. , 5.2, 2. ],
       [6.2, 3.4, 5.4, 2.3],
       [5.9, 3. , 5.1, 1.8]])
```

In [8]:
```
iris.target
```

Out[8]:
```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
       2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2])
```

In [9]:
```
iris.feature_names
```

Out[9]:
```
['sepal length (cm)',
 'sepal width (cm)',
 'petal length (cm)',
 'petal width (cm)']
```

In [10]:
```
iris.filename
```

Out[10]:
```
'iris.csv'
```

In [11]:
```
iris.data_module
```

Out[11]:
```
'sklearn.datasets.data'
```

In [12]:
```
X_train,X_test,y_train,y_test=train_test_split(X,y)
```

In [13]:
```
model=KNeighborsClassifier()
```

In [14]:
```
model.fit(X_train,y_train)
```

Out[14]:
```
▾ KNeighborsClassifier
KNeighborsClassifier()
```

In [15]:
```
KNeighborsClassifier()
```

Out[15]:
```
▾ KNeighborsClassifier

KNeighborsClassifier()
```

In [16]:
```
y_pred=model.predict(X_test)
```

In [17]:
```
y_pred
```

Out[17]:
```
array([0, 2, 0, 1, 0, 2, 1, 1, 2, 2, 0, 0, 0, 0, 2, 1, 2, 0, 0, 1, 2, 2,
       1, 0, 0, 2, 1, 2, 0, 2, 0, 1, 1, 1, 1, 1, 1, 2])
```

In [18]:
```
accuracy_score(y_pred,y_test)
```

Out[18]:
```
0.9473684210526315
```

In [24]:
```
with open ('irisknnmodel.pkl','wb') as file:
    pickle.dump(model,file)
```

In [20]:
```
X_test
```

Out[20]:

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
27	5.2	3.5	1.5	0.2
126	6.2	2.8	4.8	1.8
42	4.4	3.2	1.3	0.2
94	5.6	2.7	4.2	1.3
15	5.7	4.4	1.5	0.4
146	6.3	2.5	5.0	1.9
72	6.3	2.5	4.9	1.5
61	5.9	3.0	4.2	1.5
120	6.9	3.2	5.7	2.3
119	6.0	2.2	5.0	1.5
8	4.4	2.9	1.4	0.2
23	5.1	3.3	1.7	0.5
18	5.7	3.8	1.7	0.3
19	5.1	3.8	1.5	0.3
116	6.5	3.0	5.5	1.8
60	5.0	2.0	3.5	1.0
125	7.2	3.2	6.0	1.8
36	5.5	3.5	1.3	0.2
6	4.6	3.4	1.4	0.3
58	6.6	2.9	4.6	1.3
127	6.1	3.0	4.9	1.8
83	6.0	2.7	5.1	1.6
69	5.6	2.5	3.9	1.1
20	5.4	3.4	1.7	0.2
21	5.1	3.7	1.5	0.4
113	5.7	2.5	5.0	2.0
73	6.1	2.8	4.7	1.2
70	5.9	3.2	4.8	1.8
3	4.6	3.1	1.5	0.2
132	6.4	2.8	5.6	2.2
46	5.1	3.8	1.6	0.2
56	6.3	3.3	4.7	1.6
64	5.6	2.9	3.6	1.3
63	6.1	2.9	4.7	1.4
90	5.5	2.6	4.4	1.2
55	5.7	2.8	4.5	1.3

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
78	6.0	2.9	4.5	1.5
143	6.8	3.2	5.9	2.3

In [28]:
```
with open("irisknnmodel.pkl","rb") as file:
    knn_model=pickle.load(file)
```

In [26]:
```
knn_model.predict(X_test)
```

Out[26]:
```
array([0, 2, 0, 1, 0, 2, 1, 1, 2, 2, 0, 0, 0, 0, 2, 1, 2, 0, 0, 1, 2, 2,
       1, 0, 0, 2, 1, 2, 0, 2, 0, 1, 1, 1, 1, 1, 1, 2])
```

In [ ]:

In [27]:
```
sep_len, sep_wid, pet_len, pet_wid = 6.4,2.9,4.3,1.3

x = [sep_len, sep_wid, pet_len, pet_wid]
y_predicted = knn_model.predict([x])[0]
print(y_predicted)

if y_predicted==0:
    print("IRSI SETOSA")
elif y_predicted==1:
    print("IRIS VIRSICOLOUR")
else:
    print("IRIS VIRGINICA")
```

```
1
IRIS VIRSICOLOUR
```

In [ ]:

In [ ]: