In [1]:

```
from sklearn.datasets import load_iris

iris = load_iris()
iris
```

Out[1]:

```
{'data': array([[5.1, 3.5, 1.4, 0.2],
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```

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```

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        2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2]),
 'frame': None,
 'target_names': array(['setosa', 'versicolor', 'virginica'], dtype='<U10'),
 'DESCR': '.. _iris_dataset:\n\nIris plants dataset\n--------------------\n\n**Data Set C
haracteristics:**\n\n    :Number of Instances: 150 (50 in each of three classes)\n    :Nu
mber of Attributes: 4 numeric, predictive attributes and the class\n    :Attribute Inform
ation:\n        - sepal length in cm\n        - sepal width in cm\n        - petal lengt
h in cm\n        - petal width in cm\n        - class:\n                - Iris-Setosa\n
- Iris-Versicolour\n                - Iris-Virginica\n                \n    :Summary Sta
tistics:\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  (
high!)\n    petal width:    0.1  2.5   1.20   0.76    0.9565  (high!)\n    ==============
==== ==== ======= ===== ====================\n\n    :Missing Attribute Values: 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: July, 1988\n\nThe famous Iris
database, first used by Sir R.A. Fisher. The dataset is taken\nfrom Fisher\'s paper. Note
that it\'s the same as in R, but not as in the UCI\nMachine Learning Repository, which ha
s two wrong data points.\n\nThis is perhaps the best known database to be found in the\np
attern recognition literature.  Fisher\'s paper is a classic in the field and\nis referen
ced frequently to this day.  (See Duda & Hart, for example.)  The\ndata set contains 3 cl
asses of 50 instances 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
other.\n\n.. topic:: References\n\n   - Fisher, R.A. "The use of multiple measurements in
taxonomic problems"\n     Annual Eugenics, 7, Part II, 179-188 (1936); also in "Contribut
ions to\n     Mathematical Statistics" (John Wiley, NY, 1950).\n   - Duda, R.O., & Hart,
P.E. (1973) Pattern Classification and Scene Analysis.\n     (Q327.D83) John Wiley & Sons
.  ISBN 0-471-22361-1.  See page 218.\n   - Dasarathy, B.V. (1980) "Nosing Around the Nei
ghborhood: A New System\n     Structure and Classification Rule for Recognition in Partia
lly Exposed\n     Environments".  IEEE Transactions on Pattern Analysis and Machine\n
Intelligence, Vol. PAMI-2, No. 1, 67-71.\n   - Gates, G.W. (1972) "The Reduced Nearest Ne
ighbor Rule".  IEEE Transactions\n     on Information Theory, May 1972, 431-433.\n   - Se
e also: 1988 MLC Proceedings, 54-64.  Cheeseman et al"s AUTOCLASS II\n     conceptual clu
stering system finds 3 classes in the data.\n   - Many, many more ...',
 'feature_names': ['sepal length (cm)',
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  'petal width (cm)'],
 'filename': 'C:\\ProgramData\\Anaconda3\\lib\\site-packages\\sklearn\\datasets\\data\\ir
is.csv'}
```

In [2]:

```
iris.keys()
```

Out[2]:

```
dict_keys(['data', 'target', 'frame', 'target_names', 'DESCR', 'feature_names', 'filename
```

'])

In [3]:

```
print(iris.DESCR)
```

```
.. _iris_dataset:

Iris plants dataset
--------------------

**Data Set Characteristics:**

    :Number of Instances: 150 (50 in each of three classes)
    :Number of Attributes: 4 numeric, predictive attributes and the class
    :Attribute Information:
        - sepal length in cm
        - sepal width in cm
        - petal length in cm
        - petal width in cm
        - class:
                - Iris-Setosa
                - Iris-Versicolour
                - Iris-Virginica

    :Summary Statistics:

    ============== ==== ==== ======= ===== ====================
                    Min  Max   Mean    SD   Class Correlation
    ============== ==== ==== ======= ===== ====================
    sepal length:   4.3  7.9   5.84   0.83    0.7826
    sepal width:    2.0  4.4   3.05   0.43   -0.4194
    petal length:   1.0  6.9   3.76   1.76    0.9490  (high!)
    petal width:    0.1  2.5   1.20   0.76    0.9565  (high!)
    ============== ==== ==== ======= ===== ====================

    :Missing Attribute Values: None
    :Class Distribution: 33.3% for each of 3 classes.
    :Creator: R.A. Fisher
    :Donor: Michael Marshall (MARSHALL%PLU@io.arc.nasa.gov)
    :Date: July, 1988

The famous Iris database, first used by Sir R.A. Fisher. The dataset is taken
from Fisher's paper. Note that it's the same as in R, but not as in the UCI
Machine Learning Repository, which has two wrong data points.

This is perhaps the best known database to be found in the
pattern recognition literature.  Fisher's paper is a classic in the field and
is referenced frequently to this day.  (See Duda & Hart, for example.)  The
data set contains 3 classes of 50 instances each, where each class refers to a
type of iris plant.  One class is linearly separable from the other 2; the
latter are NOT linearly separable from each other.

.. topic:: References

   - Fisher, R.A. "The use of multiple measurements in taxonomic problems"
     Annual Eugenics, 7, Part II, 179-188 (1936); also in "Contributions to
     Mathematical Statistics" (John Wiley, NY, 1950).
   - Duda, R.O., & Hart, P.E. (1973) Pattern Classification and Scene Analysis.
     (Q327.D83) John Wiley & Sons.  ISBN 0-471-22361-1.  See page 218.
   - Dasarathy, B.V. (1980) "Nosing Around the Neighborhood: A New System
     Structure and Classification Rule for Recognition in Partially Exposed
     Environments".  IEEE Transactions on Pattern Analysis and Machine
     Intelligence, Vol. PAMI-2, No. 1, 67-71.
   - Gates, G.W. (1972) "The Reduced Nearest Neighbor Rule".  IEEE Transactions
     on Information Theory, May 1972, 431-433.
   - See also: 1988 MLC Proceedings, 54-64.  Cheeseman et al"s AUTOCLASS II
     conceptual clustering system finds 3 classes in the data.
   - Many, many more ...
```

In [4]:

```
x = iris.data
x.shape
```

Out[4]:

```
(150, 4)
```

In [5]:

```
y = iris.target
y.shape
```

Out[5]:

```
(150,)
```

In [7]:

```
feature_names = iris.feature_names
feature_names
```

Out[7]:

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

In [9]:

```
target_names = iris.target_names
target_names
```

Out[9]:

```
array(['setosa', 'versicolor', 'virginica'], dtype='<U10')
```

In [20]:

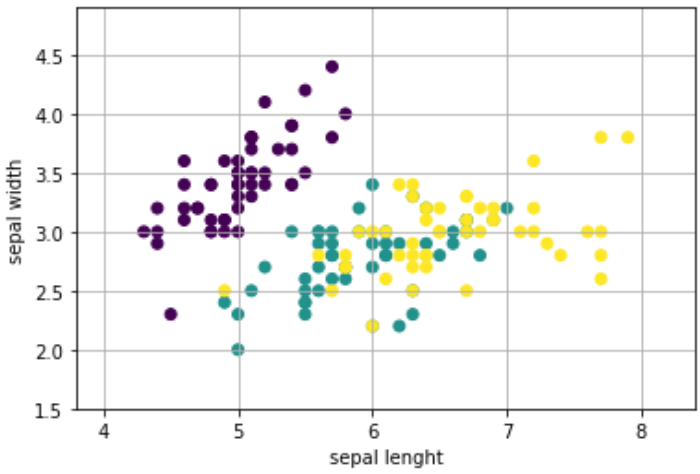
```
import matplotlib.pyplot as plt

X = X[:, :2]

x_min, x_max = X[:, 0].min() - 0.5, X[:, 0].max() + 0.5
y_min, y_max = X[:, 1].min() - 0.5, X[:, 1].max() + 0.5

plt.scatter(X[:, 0], X[:, 1], c=y)
plt.xlabel('sepal lenght')
plt.ylabel('sepal width')

plt.xlim(x_min, x_max)
plt.ylim(y_min, y_max)
plt.grid(True)
plt.show()
```



In [22]:

```
from sklearn.model_selection import train_test_split

x_train, x_test, y_train, y_test = train_test_split(x,
                                                    y,
                                                    test_size=0.3,
                                                    random_state=3)
print(f'x train: {x_train.shape}')
print(f'x test: {x_test.shape}')
print(f'y train: {y_train.shape}')
print(f'y tets: {y_train.shape}')
```

```
x train: (105, 2)
x test: (45, 2)
y train: (105,)
y tets: (105,)
```

In [23]:

```
iris = load_iris(as_frame=True)

iris_features_df = iris.data
iris_features_df
```

Out[23]:

	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 [ ]:

```

```