```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
import warnings
warnings.filterwarnings("ignore")


from sklearn.datasets import load_iris
irisdataset = load_iris()


irisdataset.target_names
```

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

```
irisdataset.feature_names
```

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

```
irisdataset
```

```
            [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]]),
     'target': 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, 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, 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, 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 Characteristics:**\n\n    :Number of Instances:
    150 (50 in each of three classes)\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-Virginica\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  (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 has two wrong
    data points.\n\nThis is perhaps the best known database to be found in the\npattern recognition literature.  Fisher\'s paper is a classic
    in the field and\nis referenced frequently to this day.  (See Duda & Hart, for example.)  The\ndata set contains 3 classes 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 "Contributions 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 Neighborhood: A New System\n     Structure and Classification Rule for Recognition in
    Partially 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 Neighbor Rule".  IEEE Transactions\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 classes in the data.\n   -
    Many, many more ...',
     'feature_names': ['sepal length (cm)',
      'sepal width (cm)',
      'petal length (cm)',
      'petal width (cm)'],
     'filename': 'iris.csv',
     'data_module': 'sklearn.datasets.data'}
```

converting irisdataset into dataframe

```
df = pd.DataFrame(irisdataset.data,columns=irisdataset.feature_names)
```

```
df['target'] = irisdataset.target
```

```
df
```

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

150 rows × 5 columns

```
df['flower_name'] =df.target.apply(lambda x: irisdataset.target_names[x])
```

```
df
```

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

150 rows × 6 columns

```
df[df['flower_name']=="setosa"].head()
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target	flower_name
0	5.1	3.5	1.4	0.2	0	setosa
1	4.9	3.0	1.4	0.2	0	setosa
2	4.7	3.2	1.3	0.2	0	setosa
3	4.6	3.1	1.5	0.2	0	setosa
4	5.0	3.6	1.4	0.2	0	setosa

```
df[df['flower_name']=="virginica"].head()
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target	flower_name
100	6.3	3.3	6.0	2.5	2	virginica
101	5.8	2.7	5.1	1.9	2	virginica
102	7.1	3.0	5.9	2.1	2	virginica

```
df['flower_name'].unique()
```

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

```
df[df['flower_name']=="versicolor"].head()
```

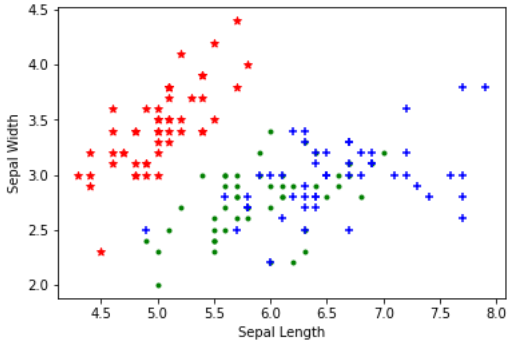
	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	target	flower_name
50	7.0	3.2	4.7	1.4	1	versicolor
51	6.4	3.2	4.5	1.5	1	versicolor
52	6.9	3.1	4.9	1.5	1	versicolor
53	5.5	2.3	4.0	1.3	1	versicolor
54	6.5	2.8	4.6	1.5	1	versicolor

```
df0 = df[:50] #setosa
df1 = df[50:100] #versicolor
df2 = df[100:] #virginica
```

SETOSA VS versicolor VS virginica IN SEPAL LENGTH AND SEPAL WIDTH

```
plt.scatter(df0['sepal length (cm)'], df0['sepal width (cm)'],color="red",marker='*')
plt.scatter(df1['sepal length (cm)'], df1['sepal width (cm)'],color="green",marker='.')
plt.scatter(df2['sepal length (cm)'], df2['sepal width (cm)'],color="blue",marker='+')
plt.xlabel('Sepal Length')
plt.ylabel('Sepal Width')
```

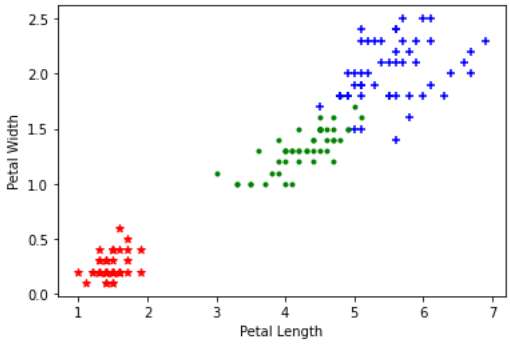
```
Text(0, 0.5, 'Sepal Width')
```



SETOSA VS versicolor VS virginica IN PETAL LENGTH AND PETAL WIDTH

```
plt.scatter(df0['petal length (cm)'], df0['petal width (cm)'],color="red",marker='*')
plt.scatter(df1['petal length (cm)'], df1['petal width (cm)'],color="green",marker='.')
plt.scatter(df2['petal length (cm)'], df2['petal width (cm)'],color="blue",marker='+')
plt.xlabel('Petal Length')
plt.ylabel('Petal Width')
```

```
Text(0, 0.5, 'Petal Width')
```




```
x = df.drop(['target','flower_name'], axis='columns')
y = df.target
```

x

	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

y

```
0      0
1      0
2      0
3      0
4      0
      ..
145    2
146    2
147    2
148    2
149    2
Name: target, Length: 150, dtype: int64
```

```
from sklearn.model_selection import train_test_split
xtrain,xtest,ytrain,ytest = train_test_split(x,y,test_size=0.3)
```

kernal = rbf

```
from sklearn.svm import SVC
model = SVC(kernel="rbf")
model.fit(xtrain,ytrain)
```

```
SVC()
```

```
#Accuracy
model.score(xtest,ytest)
```

```
0.9333333333333333
```

Kernal = Linear

```
from sklearn.svm import SVC
model = SVC(kernel="linear")
model.fit(xtrain,ytrain)
```

```
SVC(kernel='linear')
```

```
#Accuracy
model.score(xtest,ytest)
```

```
0.9777777777777777
```

0s completed at 4:24 PM