```
import pandas as pd
from sklearn.datasets import load_iris

iris = load_iris()

dir(iris)
```

```
['DESCR',
 'data',
 'data_module',
 'feature_names',
 'filename',
 'frame',
 'target',
 'target_names']
```

```
iris.feature_names
```

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

```
iris.target_names
```

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

```
data = pd.DataFrame(iris.data , columns = iris.feature_names)
data["target"] = iris.target

data
```

```
     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

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

[150 rows x 5 columns]
```

```
iris.target_names
```

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

```
# if target == 0 then it's setosa else if target == 1 then it's
versicolor else (2) then it's  virginica
```

```
data[data.target == 0].head()  #setosa
```

```
   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

   target
0       0
1       0
2       0
3       0
4       0
```

```
data[data.target == 1].head()  #versicolor
```

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

    target
50       1
51       1
52       1
53       1
54       1
```

```
data[data.target == 1].head() # virginica
```

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

    target
50       1
51       1
52       1
53       1
54       1
```

```
data["flower_name"] = data.target.apply(lambda x:
iris.target_names[x])
data.head()
```

```
   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

   target flower_name
0       0      setosa
1       0      setosa
2       0      setosa
3       0      setosa
4       0      setosa
```

```
data.to_csv("iris_dataset.csv",index = False)
```

```
dataz = pd.read_csv("iris_dataset.csv")
dataz.head()
```

```
   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

   target flower_name
0       0      setosa
1       0      setosa
2       0      setosa
3       0      setosa
4       0      setosa
```

```
data0 =dataz[dataz.target ==0]
data1 =dataz[dataz.target ==1]
data2 =dataz[dataz.target ==2]
```

```
data2.head(5)
```

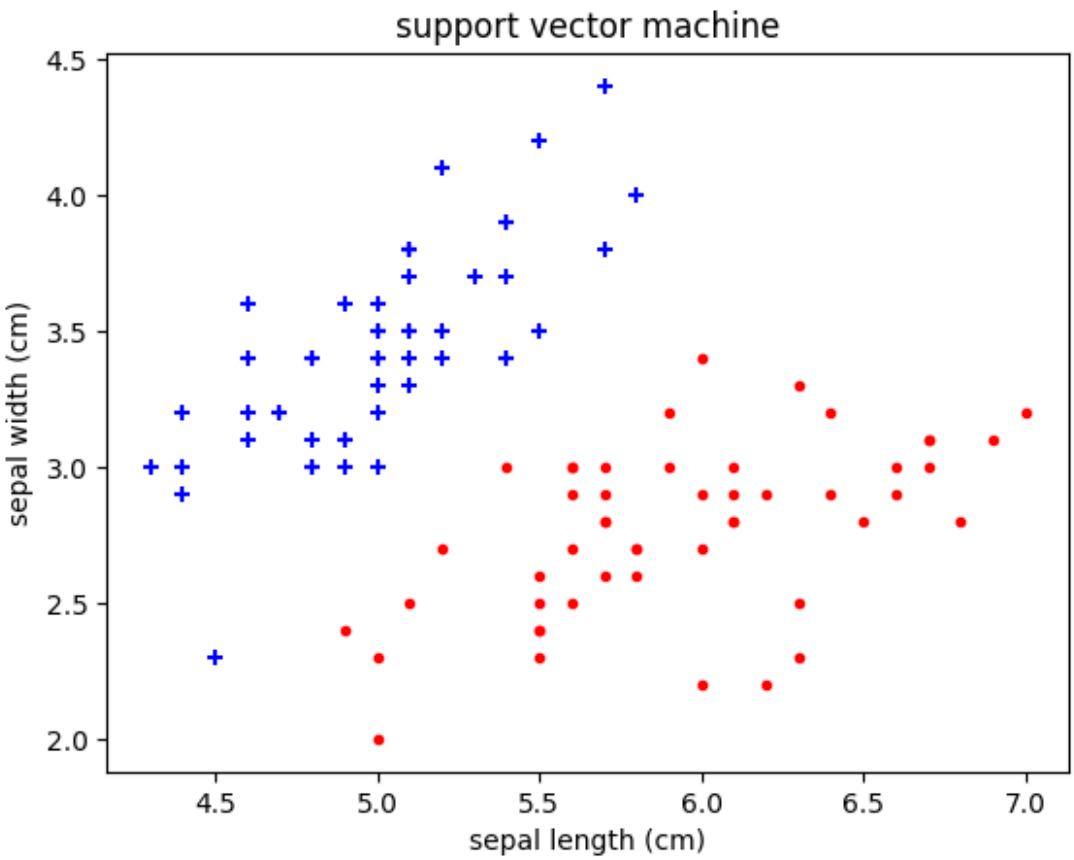
```
     sepal length (cm)  sepal width (cm)  petal length (cm)  petal
width (cm)  \
100                6.3               3.3                6.0
2.5
```

```
101                5.8               2.7                5.1
1.9
102                7.1               3.0                5.9
2.1
103                6.3               2.9                5.6
1.8
104                6.5               3.0                5.8
2.2
```

```
     target flower_name
100       2   virginica
101       2   virginica
102       2   virginica
103       2   virginica
104       2   virginica
```

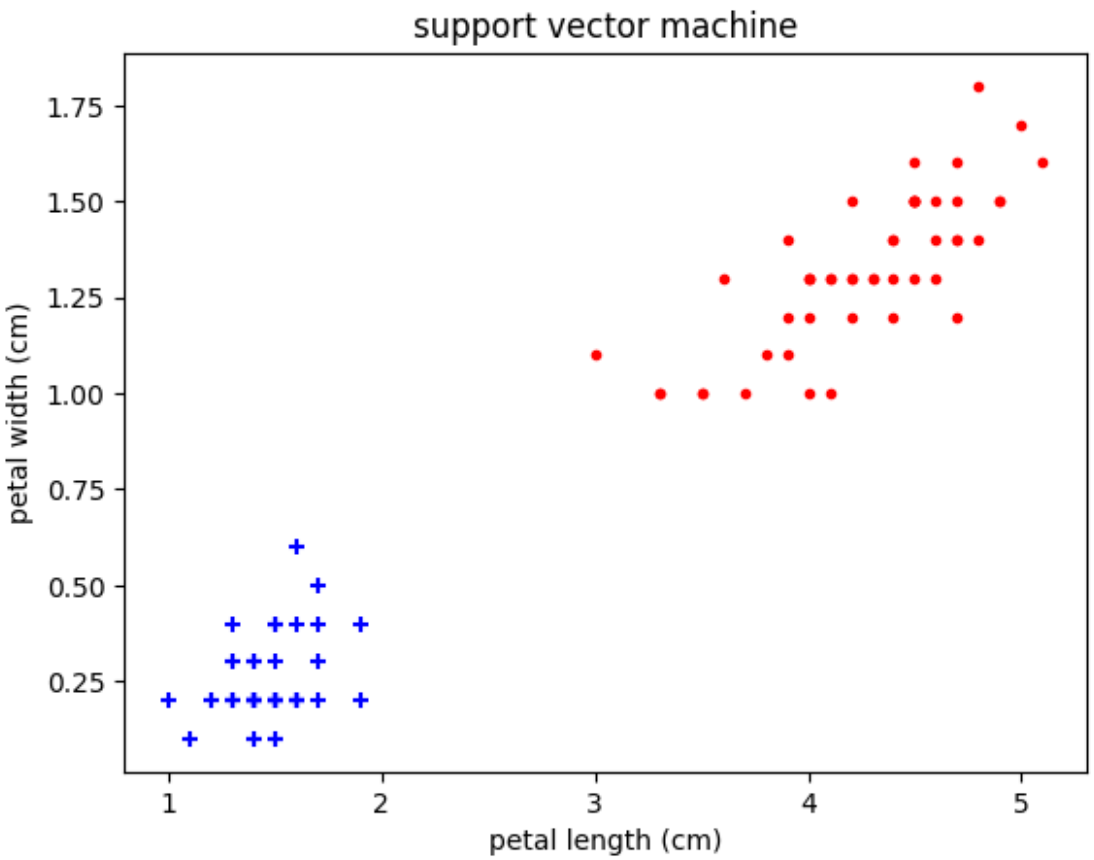
```
import  matplotlib.pyplot  as plt
%matplotlib inline

plt.title("support vector machine")
plt.xlabel("sepal length (cm)")
plt.ylabel("sepal width (cm)")
plt.scatter(data0["sepal length (cm)"],data0["sepal width
(cm)"],marker ="+",color ="blue")
plt.scatter(data1["sepal length (cm)"],data1["sepal width
(cm)"],marker =".",color ="red")
```

```
<matplotlib.collections.PathCollection at 0x19ba6eaffe0>
```




```
plt.title("support vector machine")
plt.xlabel("petal length (cm)")
plt.ylabel("petal width (cm)")
plt.scatter(data0["petal length (cm)"],data0["petal width
(cm)"],marker ="+",color ="blue")
plt.scatter(data1["petal length (cm)"],data1["petal width
(cm)"],marker =".",color ="red")
```

```
<matplotlib.collections.PathCollection at 0x19b8229e9f0>
```




```
## training the data using sklearn module

from sklearn.model_selection import train_test_split

x=  dataz.drop(["target","flower_name"],axis ="columns")
x.head()
```

	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

```
y = dataz.target
y.head()
```

```
0    0
1    0
2    0
3    0
4    0
Name: target, dtype: int64
```

```
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size = 0.2)
```

```
len(x_train)
```

```
120
```

```
from sklearn.svm import SVC
```

```
model = SVC()
```

```
model.fit(x_train,y_train)
```

```
SVC()
```

```
y_pred = model.predict(x_test)
```

```
y_pred
```

```
array([0, 1, 1, 0, 0, 2, 2, 1, 0, 2, 0, 1, 1, 2, 0, 2, 2, 2, 0, 2, 0,
1,
       0, 1, 1, 1, 2, 0, 1, 2])
```

```
from sklearn.metrics import confusion_matrix
```

```
confusion_matrix(y_test,y_pred)
```

```
array([[10,  0,  0],
       [ 0, 10,  0],
       [ 0,  0, 10]])
```

```
from sklearn.metrics import accuracy_score
```

```
accuracy_score(y_test,y_pred)*100
```

```
100.0
```

```
###### manual prediction
```

```
model.predict([[5.9 ,3.0   ,5.1  ,1.8 ]])
```

```
C:\Users\suvas\AppData\Local\Programs\Python\Python312\Lib\site-
packages\sklearn\base.py:493: UserWarning: X does not have valid
feature names, but SVC was fitted with feature names
  warnings.warn(
```

```
array([2])
```

```
import numpy as np
x = int(input("tell me the above prdicted value 1 or 2 or 3 : "))


if np.array([x]) == 0 :
    print("setosa")
elif np.array([x]) ==1 :
    print("versicolor")
elif np.array([x]) == 2:
    print("virginica")
```

```
tell me the above prdicted value 1 or 2 or 3 :  2

virginica
```