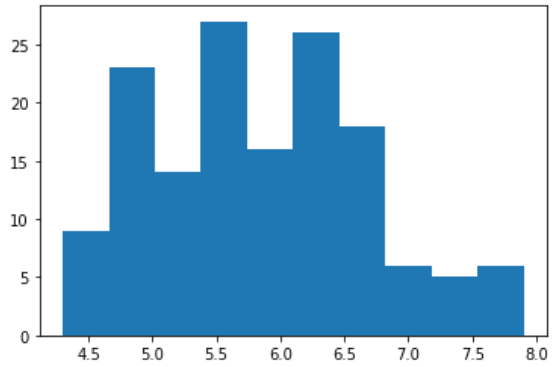
```
import numpy as np
import pandas as pd
from sklearn import preprocessing
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split


data = pd.read_csv('iris.csv')
data.head()
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

```
plt.hist(data.sepal_length)
```

```
(array([ 9., 23., 14., 27., 16., 26., 18.,  6.,  5.,  6.]),
 array([4.3 , 4.66, 5.02, 5.38, 5.74, 6.1 , 6.46, 6.82, 7.18, 7.54, 7.9 ]),
 <a list of 10 Patch objects>)
```




```
encoder = preprocessing.LabelEncoder()


data['species'] = encoder.fit_transform(data['species'])
data.head()
```

	sepal_length	sepal_width	petal_length	petal_width	species
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

```
scaler = preprocessing.StandardScaler()


x = data.drop('species',axis=1)
y = data.species

x = scaler.fit_transform(x)


x_train,x_test, y_train, y_test = train_test_split(x,y, test_size = 0.2, random_state=0)


x_train
```

```
       [ 2.24968346e+00, -5.87763531e-01,  1.67260991e+00,
         1.05353673e+00],
       [-9.00681170e-01,  1.72626612e+00, -1.28440670e+00,
        -1.18150376e+00],
       [-1.38535265e+00,  3.37848329e-01, -1.22754100e+00,
        -1.31297673e+00],
       [ 1.88617985e+00, -5.87763531e-01,  1.33141568e+00,
         9.22063763e-01],
       [-1.02184904e+00,  5.69251294e-01, -1.34127240e+00,
        -1.31297673e+00],
       [ 5.53333275e-01,  8.00654259e-01,  1.04708716e+00,
         1.57942861e+00],
       [-1.73673948e-01, -5.87763531e-01,  1.94101603e-01,
         1.33225943e-01],
       [-5.25060772e-02, -8.19166497e-01,  8.03701950e-02,
         1.75297293e-03],
       [-1.73673948e-01, -1.05056946e+00, -1.47092621e-01,
        -2.61192967e-01],
       [ 6.74501145e-01,  3.37848329e-01,  8.76490051e-01,
         1.44795564e+00],
       [ 1.03800476e+00, -1.24957601e-01,  8.19624347e-01,
         1.44795564e+00],
       [ 5.53333275e-01, -1.28197243e+00,  6.49027235e-01,
         3.96171883e-01],
       [ 1.03800476e+00, -1.24957601e-01,  7.05892939e-01,
         6.59117823e-01],
       [-1.02184904e+00, -1.24957601e-01, -1.22754100e+00,
        -1.31297673e+00],
       [-4.16009689e-01, -1.51337539e+00, -3.33612130e-02,
        -2.61192967e-01],
       [ 1.03800476e+00,  1.06445364e-01,  1.04708716e+00,
         1.57942861e+00],
       [-5.25060772e-02, -8.19166497e-01,  7.62758643e-01,
         9.22063763e-01],
       [-9.00681170e-01,  8.00654259e-01, -1.28440670e+00,
        -1.31297673e+00],
       [ 9.16836886e-01, -3.56360566e-01,  4.78430123e-01,
         1.33225943e-01],
       [-2.94841818e-01, -1.24957601e-01,  1.94101603e-01,
         1.33225943e-01],
       [ 6.86617933e-02,  3.37848329e-01,  5.92161531e-01,
         7.90590793e-01],
       [ 5.53333275e-01, -1.74477836e+00,  3.64698715e-01,
         1.33225943e-01],
       [-4.16009689e-01,  1.03205722e+00, -1.39813811e+00,
        -1.31297673e+00],
       [-9.00681170e-01,  1.49486315e+00, -1.28440670e+00,
        -1.05003079e+00],
       [-1.14301691e+00,  1.06445364e-01, -1.28440670e+00,
        -1.44444970e+00],
       [ 5.53333275e-01, -3.56360566e-01,  1.04708716e+00,
         7.90590793e-01],
       [-5.25060772e-02, -8.19166497e-01,  1.94101603e-01,
        -2.61192967e-01],
       [ 2.24968346e+00,  1.72626612e+00,  1.67260991e+00,
         1.31648267e+00],
       [-1.50652052e+00,  3.37848329e-01, -1.34127240e+00,
        -1.31297673e+00]])
```

```
y_train
```

```
137    2
84     1
27     0
127    2
132    2
      ..
9      0
103    2
67     1
117    2
47     0
Name: species, Length: 120, dtype: int64
```

```
from sklearn.svm import SVC
svc = SVC(kernel = "linear", random_state=0)
```

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

```
SVC(kernel='linear', random_state=0)
```

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

```
y_pred
```

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

```
y_pred == y_test
```

```
114    True
62     True
33     True
107    True
7      True
100    True
40     True
86     True
76     True
71     True
134    True
51     True
73     True
54     True
63     True
37     True
78     True
90     True
45     True
16     True
121    True
66     True
24     True
8      True
126    True
22     True
44     True
97     True
93     True
26     True
Name: species, dtype: bool
```

```
from sklearn.metrics import accuracy_score, confusion_matrix
print("Accuracy : ",(accuracy_score(y_test,y_pred)*100),"%",sep="")
```

```
Accuracy : 100.0%
```

```
cm = confusion_matrix(y_test,y_pred, labels = (2,1,0))
cm
```

```
array([[ 6,  0,  0],
       [ 0, 13,  0],
       [ 0,  0, 11]])
```

```
tr_positive = 0
fl_positive = 0

for r in range(len(cm)):
  for c in range(len(cm[0])):
    if r==c:
      tr_positive+=cm[r][c]
    else:
      fl_positive+=cm[r][c]
```

```
print("Correct Predictions : ",tr_positive)
print("Wrong Predictions : ",fl_positive)
```

```
Correct Predictions :  30
Wrong Predictions :  0
```

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