```
from sklearn import datasets
import matplotlib.pyplot as plt
iris=datasets.load_iris()
x=iris.data
y=iris.target
print(x)
```

```
[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.  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]]
```

```
print(y)
plt.figure(2, figsize=(8, 6))
plt.clf()
```

```
[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
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 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]
<Figure size 576x432 with 0 Axes>
```

```
color=['blue','green','pink']
for k in range(0,3):
    data=iris.data[iris.target==k]
    plt.scatter(data[:, 0], data[:, 1],c=color[k] )
plt.xlabel('Sepal length')
plt.ylabel('Sepal width')
plt.show()
```
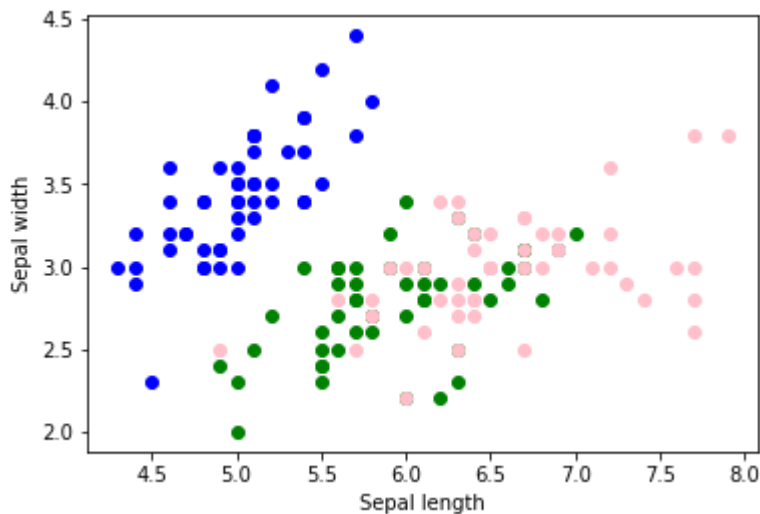


```
from sklearn.cluster import KMeans
import pandas as pd
```

```
kmeans = KMeans(n_clusters=3)
kmeans.fit(x)
pred = kmeans.predict(x)
print(pred)
frame=pd.DataFrame(iris.data)
frame.columns = ['sep_len','sep_wid','pet_len','pet_wid']
print(frame)
frame['cluster'] = pred
print(frame)
plt.figure(2, figsize=(8, 6))
plt.clf()
```

```
[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 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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 2 2 1 1 2 2 2 2 1 2 1 2 1 2 2 1 1 2 2 2 2 2 1 2 2 2 2 1 2 2 2 1 2 2 2 1 2
 2 1]
       sep_len  sep_wid  pet_len  pet_wid
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 x 4 columns]
       sep_len  sep_wid  pet_len  pet_wid  cluster
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        1
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        1

[150 rows x 5 columns]
<Figure size 576x432 with 0 Axes>
```
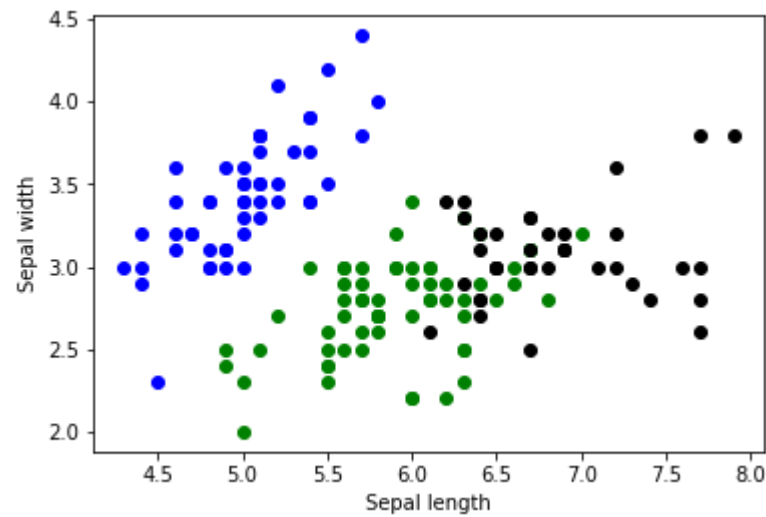
```
color=['blue','green','black']
for k in range(0,3):
    data = frame[frame["cluster"]==k]
    plt.scatter(data["sep_len"],data["sep_wid"],c=color[k])
plt.xlabel('Sepal length')
plt.ylabel('Sepal width')
plt.show()
```

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