

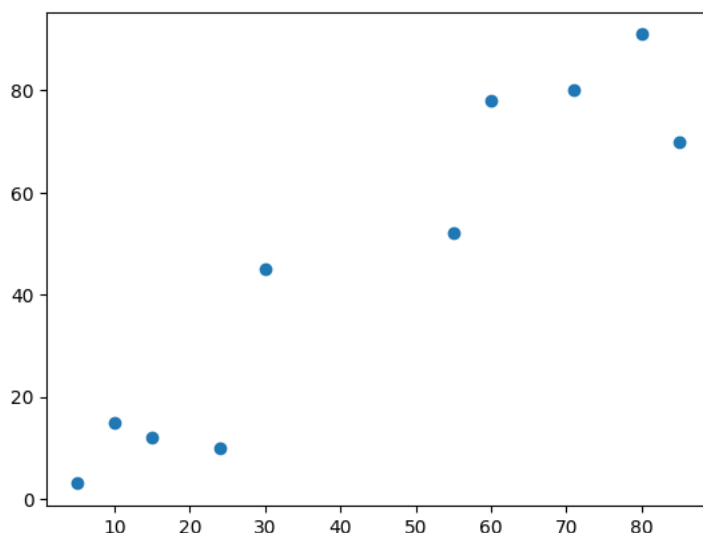
```
import matplotlib.pyplot as plt
import numpy as np
from sklearn.cluster import KMeans
```

```
x=np.array([[5,3],[10,15],[15,12],[24,10],[30,45],[85,70], [71,80], [60,78], [55,52], [80,91]])
print(x)
```

```
[[ 5  3]
 [10 15]
 [15 12]
 [24 10]
 [30 45]
 [85 70]
 [71 80]
 [60 78]
 [55 52]
 [80 91]]
```

```
plt.scatter(x[:,0], x[:,1], label='True Position')
```

↳ <matplotlib.collections.PathCollection at 0x7fade2099ab0>



```
kmeans = KMeans(n_clusters=2)
kmeans.fit(x)
```

/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: The default value of `n_init` will change from 10 to 1 in the future. You should set `n_init` to the number of iterations for which the algorithm should run.

```
warnings.warn(
  KMeans
  KMeans(n_clusters=2)
```

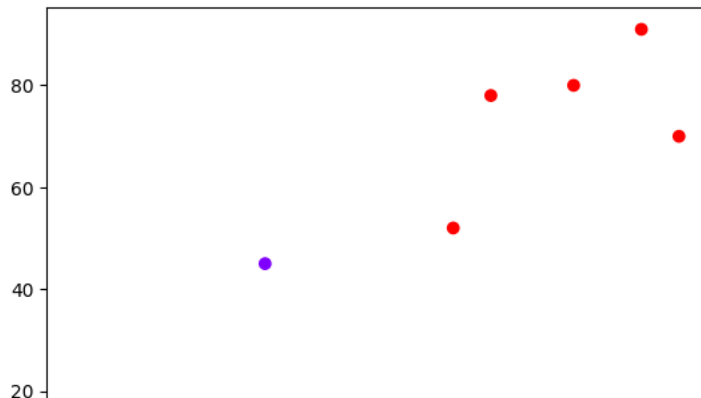
```
print(kmeans.cluster_centers_)
print()
print(kmeans.labels_)
print()
```

```
[[16.8 17. ]
 [70.2 74.2]]

[0 0 0 0 0 1 1 1 1 1]
```

```
plt.scatter(x[:,0], x[:,1], c=kmeans.labels_, cmap='rainbow')
```

<matplotlib.collections.PathCollection at 0x7fade1f36b30>



```
kmeans = KMeans(n_clusters=3)
kmeans.fit(x)
```

/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: 1
warnings.warn(

▼ KMeans
KMeans(n_clusters=3)

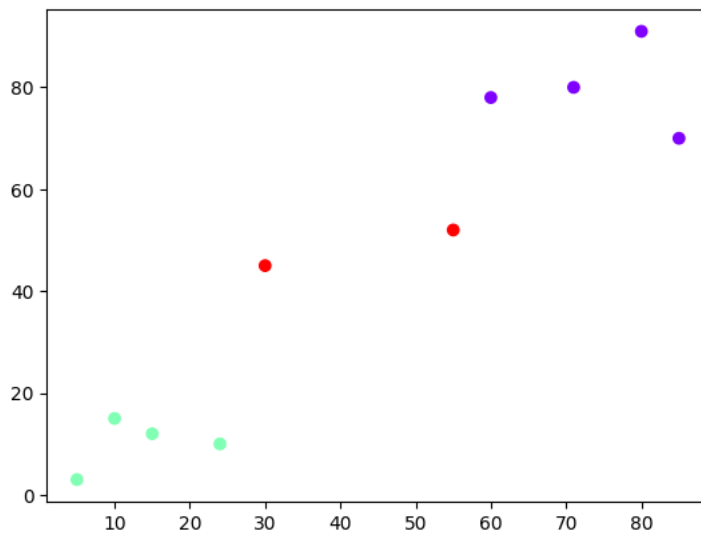
```
print(kmeans.cluster_centers_)
print()
print(kmeans.labels_)
print()
```

```
[[74.    79.75]
 [13.5   10.  ]
 [42.5   48.5  ]]
```

```
[1 1 1 1 2 0 0 0 2 0]
```

```
plt.scatter(x[:,0], x[:,1], c=kmeans.labels_, cmap='rainbow')
```

<matplotlib.collections.PathCollection at 0x7fade1f37820>



```
kmeans= KMeans(n_clusters=4)
kmeans.fit(x)
```

/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: 1
warnings.warn(

▼ KMeans
KMeans(n_clusters=4)

```
print(kmeans.cluster_centers_)
print()
print(kmeans.labels_)
print()
```

```
[[13.5  10.  ]
 [74.   79.75]
 [30.   45.  ]
 [55.   52.  ]]
```

```
[0 0 0 0 2 1 1 1 3 1]
```

```
plt.scatter(x[:,0], x[:,1], c=kmeans.labels_, cmap='rainbow')
```

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