

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

Out[3]:

```
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       [6.9, 3.1, 4.9, 1.5],
       [5.5, 2.3, 4. , 1.3],
       [5.5, 2.8, 4.6, 1.5]]
```

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[5.5, 2.6, 4.4, 1.2],  
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[6.3, 2.7, 4.9, 1.8],  
[6.7, 3.3, 5.7, 2.1],  
[7.2, 3.2, 6. , 1.8],  
[5.6, 2.8, 4.9, 1.5]

```
[6.2, 2.8, 4.8, 1.8],
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[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]])
```

In [4]:

```
print(iris.data.shape)
```

```
(150, 4)
```

In [5]:

```
iris.feature_names
```

Out[5]:

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

In [6]:

```
iris.target
```

Out[6]:

```
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, 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])
```

In [7]:

```
iris.target_names
```

Out[7]:

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

In [11]:

```
x = pd.DataFrame(iris.data, columns = ['Sepal_Lenght', 'Sepal_Width', 'Petal_Lenght', 'pet
al_Width'])
y = pd.DataFrame(iris.target, columns = ['Target'])
```

In [12]:

```
x
```

Out [12]:

	Sepal_Lenght	Sepal_Width	Petal_Lenght	petal_Width
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

In [13]:

```
y
```

Out [13]:

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

150 rows × 1 columns

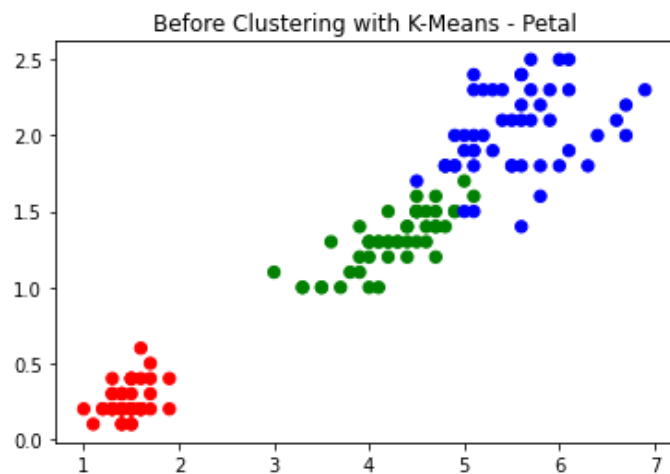
In [18]:

```
model = KMeans(n_clusters = 8)
model.fit(x)
print(model.labels_)
```

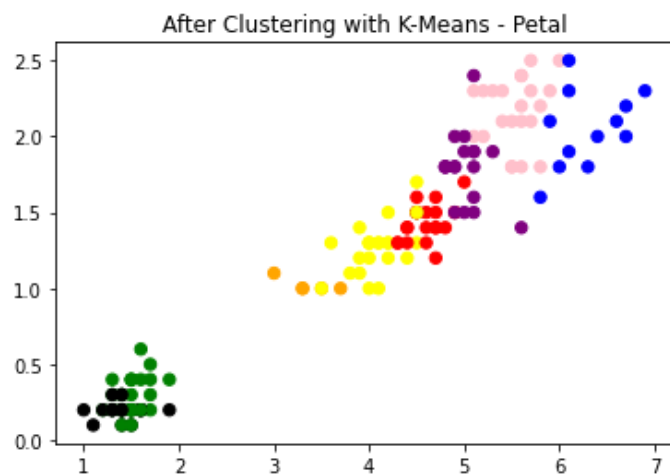
```
[1 5 5 5 1 1 5 1 5 5 1 5 5 5 1 1 1 1 1 1 1 5 1 5 5 1 1 1 5 5 1 1 1 5 5 1
 1 5 1 1 5 5 1 1 5 1 5 1 5 0 0 0 3 0 3 0 7 0 3 7 3 3 0 3 0 3 3 6 3 6 3 6 0
 0 0 0 0 0 3 3 7 3 6 3 0 0 0 3 3 3 0 3 7 3 3 3 0 7 3 4 6 2 4 4 2 3 2 4 2 4
 6 4 6 6 4 4 2 2 6 4 6 2 6 4 2 6 6 4 2 2 2 4 6 6 2 4 4 6 4 4 4 6 4 4 4 6 4
 4 6]
```

In [22]:

```
colormap = np.array(['Red', 'Green', 'blue', 'yellow', 'pink', 'black', 'purple', 'orange'])
plt.scatter(x.Petal_Lenght, x.petal_Width, c=colormap[iris.target],s=40)
plt.title('Before Clustering with K-Means - Petal')
plt.show()
```



```
In [23]:
colormap = np.array(['Red', 'Green', 'blue', 'yellow', 'pink', 'black', 'purple', 'orange'])
plt.scatter(x.Petal_Lenght, x.petal_Width, c=colormap[model.labels_],s=40)
plt.title('After Clustering with K-Means - Petal')
plt.show()
```



```
In [24]:
pd.crosstab(iris.target, model.labels_)
```

Out[24]:

col_0	0	1	2	3	4	5	6	7
row_0								
0	0	28	0	0	0	22	0	0
1	19	0	0	22	0	0	4	5
2	0	0	12	1	22	0	15	0

```
In [25]:
from sklearn.metrics import confusion_matrix
```

```
In [26]:
result = confusion_matrix(iris.target, model.labels_)
print(result)
```

```
[[ 0 28  0  0  0 22  0  0]
 [19  0  0 22  0  0  4  5]
 [ 0  0 12  1 22  0 15  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]]
```

In [ ]: