

```
import matplotlib.pyplot as plt
import pandas as pd
import seaborn as sns
```

```
iris = sns.load_dataset('iris')
labels = iris.species.unique()
iris.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

```
iris["species"] = pd.Categorical(iris["species"])
iris["species"] = iris["species"].cat.codes
iris.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

```
X = iris[['sepal_length', 'sepal_width']].values
y = iris.species
```

```
from sklearn.cluster import KMeans
model = KMeans(n_clusters = 3).fit(X)
centers = model.cluster_centers_
new_labels = model.labels_
```

```
print('Centroids :',centers)
print("\nLabels :",new_labels)
```

```
Centroids : [[5.77358491 2.69245283]
[6.81276596 3.07446809]
[5.006      3.428      ]]
```

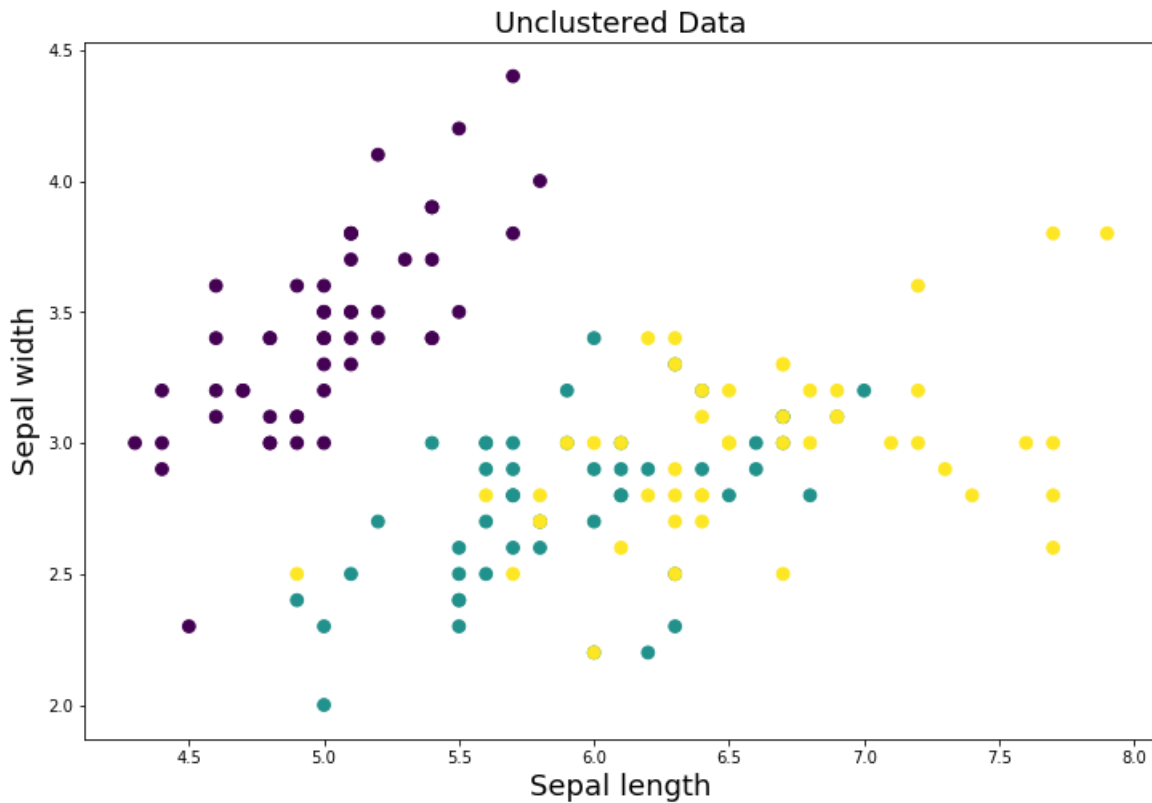
```
Labels : [2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2  
2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 0 1 0 1 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0  
1 1 1 1 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 1 1 1 0 1 1 1  
1 1 0 0 1 1 1 1 0 1 0 1 0 1 1 0 0 1 1 1 1 1 0 0 1 1 1 0 1 1 1 0 1 1 1 0 1  
1 0]
```

In [19]:

```
plt.figure(figsize=(12,8))
plt.scatter(X[:, 0], X[:, 1],c=y, s=60)
plt.xlabel('Sepal length', fontsize=18)
plt.ylabel('Sepal width', fontsize=18)
plt.title('Unclustered Data',fontsize=18)
```

Out[19]:

Text(0.5, 1.0, 'Unclustered Data')

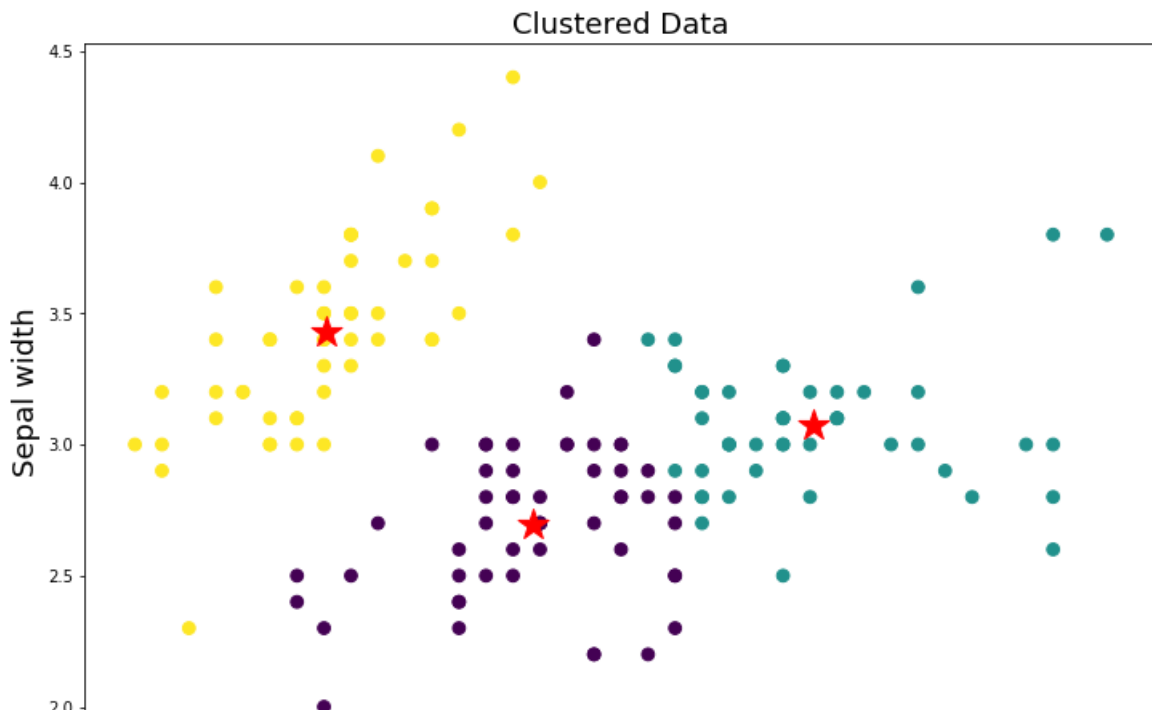


In [20]:

```
plt.figure(figsize=(12,8))
plt.scatter(X[:, 0], X[:, 1], c=new_labels,s=60)
plt.scatter(centers[:, 0], centers[:, 1], c='r', s=400, marker = '*');
plt.xlabel('Sepal length', fontsize=18)
plt.ylabel('Sepal width', fontsize=18)
plt.title('Clustered Data',fontsize=18)
```

Out[20]:

Text(0.5, 1.0, 'Clustered Data')



Sepal length

In [21]:

```
y_pred = model.predict([[2.3,5.6]])  
print("Result :",labels[y_pred[0]])
```

Result : virginica

In []: