K-MeanClustering ¶

In [16]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import matplotlib.cm as cm
from sklearn.datasets import load_iris
from sklearn.cluster import KMeans
```

In [17]:
```
x, y = load_iris(return_X_y=True)
```

In [18]:
```
#Find optimum number of cluster
sse = [] #SUM OF SQUARED ERROR
for k in range(1,11):
    km = KMeans(n_clusters=k, random_state=2)
    km.fit(x)
    sse.append(km.inertia_)
```

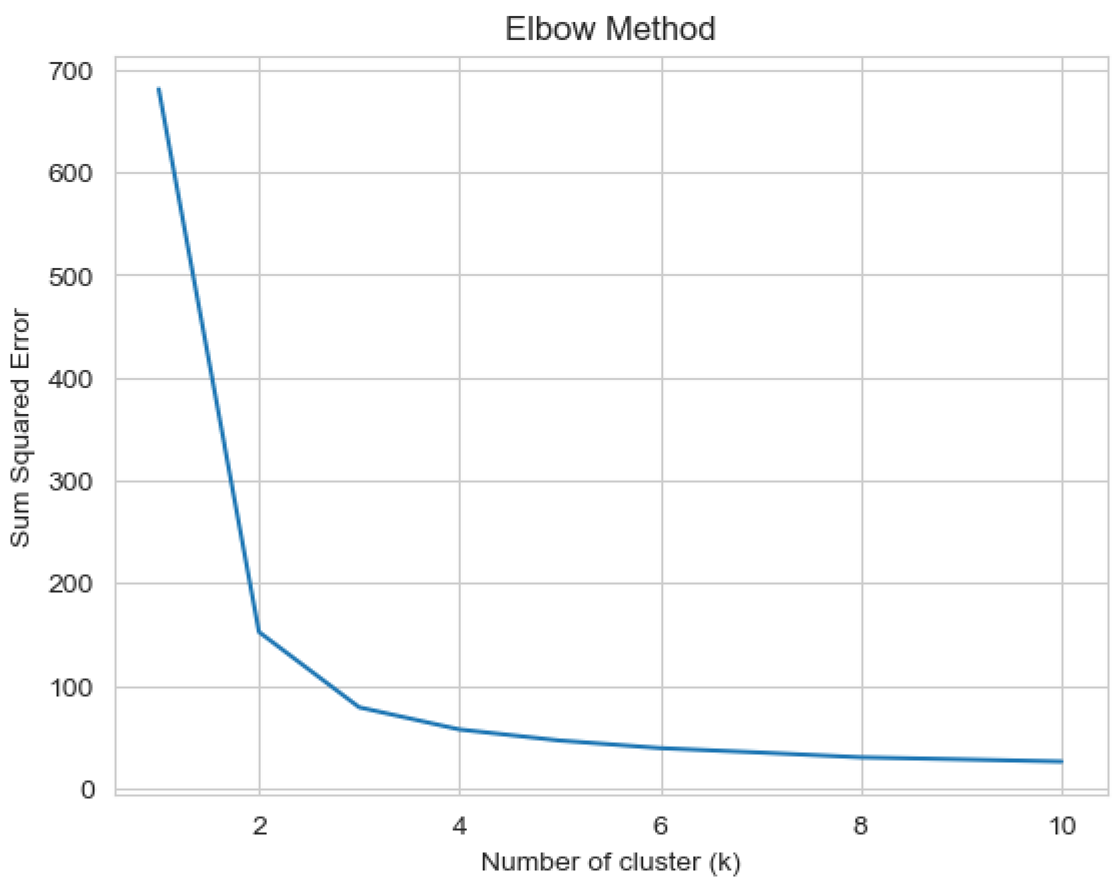
```
C:\ProgramData\Anaconda3\lib\site-packages\sklearn\cluster\_kmeans.py:103
6: UserWarning: KMeans is known to have a memory leak on Windows with MKL,
when there are less chunks than available threads. You can avoid it by set
ting the environment variable OMP_NUM_THREADS=1.
  warnings.warn(
```

Plot the Elbow graph to find the optimum number of cluster

In [19]:
```
sns.set_style("whitegrid")
g=sns.lineplot(x=range(1,11), y=sse)

g.set(xlabel ="Number of cluster (k)",
      ylabel = "Sum Squared Error",
      title ='Elbow Method')

plt.show()
```



In [20]:
```
#Build the Kmeans clustering model

model = KMeans(n_clusters = 3, random_state = 2)
model.fit(x)
```

Out[20]:
```
KMeans(n_clusters=3, random_state=2)
```

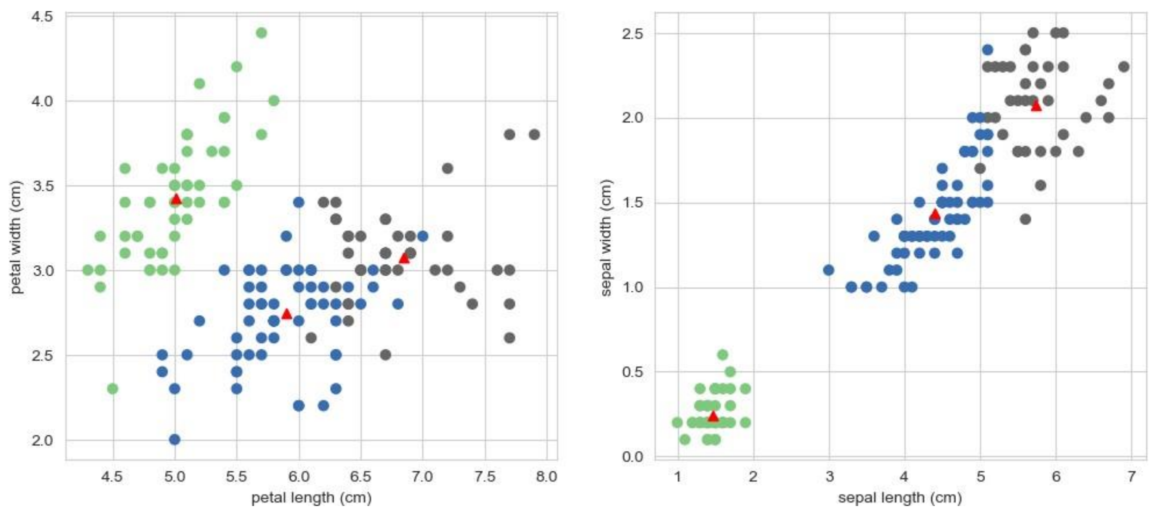
In [21]:
```
pred = model.fit_predict(x)
pred
```

Out[21]:
```
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, 2, 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, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 1, 2, 2, 2, 2, 1, 2, 2, 2,
       2, 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])
```

In [22]:
```
#Plot the cluster center with data points

plt.figure(figsize=(12,5))
plt.subplot(1,2,1)
plt.scatter(x[:,0],x[:,1],c = pred, cmap=cm.Accent)
plt.grid(True)
for center in model.cluster_centers_:
    center = center[:2]
    plt.scatter(center[0],center[1],marker = '^',c = 'red')
plt.xlabel("petal length (cm)")
plt.ylabel("petal width (cm)")

plt.subplot(1,2,2)
plt.scatter(x[:,2],x[:,3],c = pred, cmap=cm.Accent)
plt.grid(True)
for center in model.cluster_centers_:
    center = center[2:4]
    plt.scatter(center[0],center[1],marker = '^',c = 'red')
plt.xlabel("sepal length (cm)")
plt.ylabel("sepal width (cm)")
plt.show()
```



In [ ]:

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