```
import matplotlib.pyplot as plt
from sklearn.datasets import load_breast_cancer
x = [4, 5, 10, 4, 3, 11, 14, 6, 10, 12]
y = [21, 19, 24, 17, 16, 25, 24, 22, 21, 21]
#turn the data into a set of points
data=list(zip(x,y))
print(data)
```

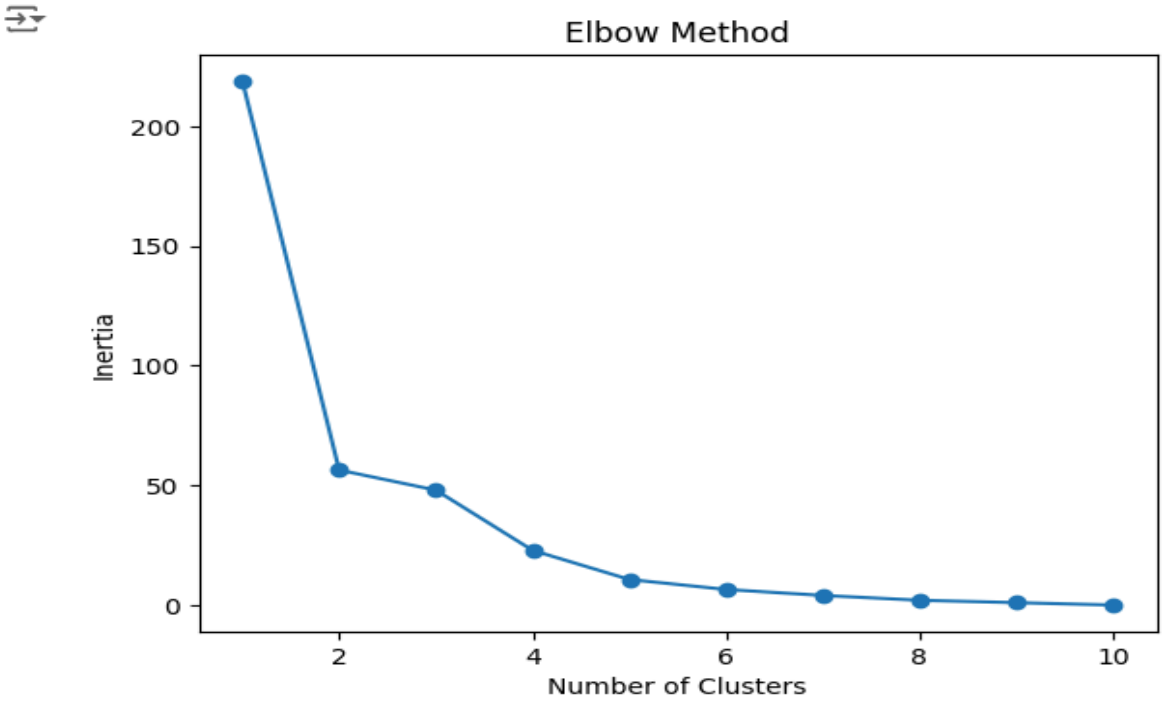
```
[(4, 21), (5, 19), (10, 24), (4, 17), (3, 16), (11, 25), (14, 24), (6, 22), (10, 21), (12, 21)]
```

K-Means is an unsupervised learning method for clustering data points. The algorithm iteratively divides data points into K clusters by minimizing the variance in each cluster.

Here, we will show you how to estimate the best value for K using the elbow method, then use K-means clustering to group the data points into clusters.

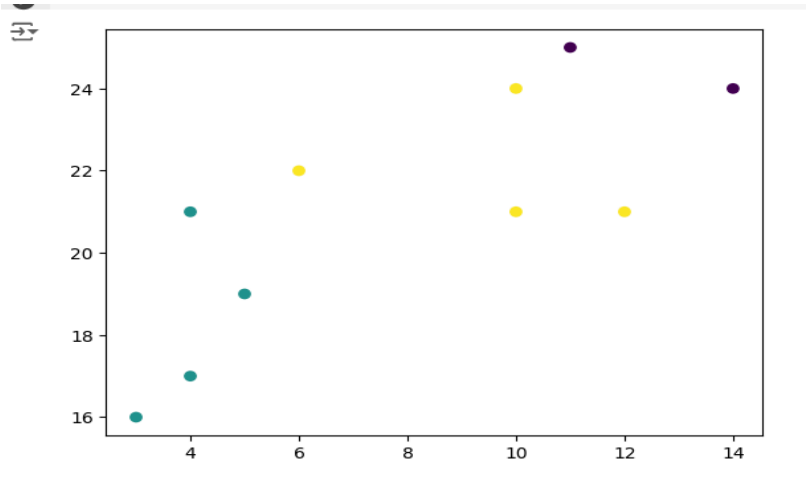
In order to find the best value for K, we need to run K-means across our data for a range of possible values. We only have 10 data points, so the maximum number of clusters is 10. So for each value K in ranges (1,11), we train a K-means model and plot the inertia at that number of clusters:

```
from sklearn.cluster import KMeans
inertias = []
for i in range (1,11):
    kmeans = KMeans(n_clusters=i)
    kmeans.fit(data)
    inertias.append(kmeans.inertia_)
plt.plot(range (1,11), inertias, marker='o')
plt.title('Elbow Method')
plt.xlabel('Number of Clusters')
plt.ylabel('Inertia')
plt.show()
```



We can see that the "elbow" on the graph above (where the inertia become more linear) is at k-2, We can then fit our K-means algorithm one more time and plot the different clusters assigned to the data:

```
kmeans = KMeans(n_clusters=3)
kmeans.fit(data)
plt.scatter(x, y, c=kmeans.labels_)
plt.show()
```



Colab link :-
https://colab.research.google.com/drive/1KOhIvb1DuEKBOU2EcLd-ea9IRmFvEb_2