Experiment 8

Student Name: Dhanuj Tomar   **UID:20BCS1201**
Branch: CSE   **Section/Group:701-B**
Semester: 5
Subject Name: Machine learning lab   **Subject Code:20CSP-317**
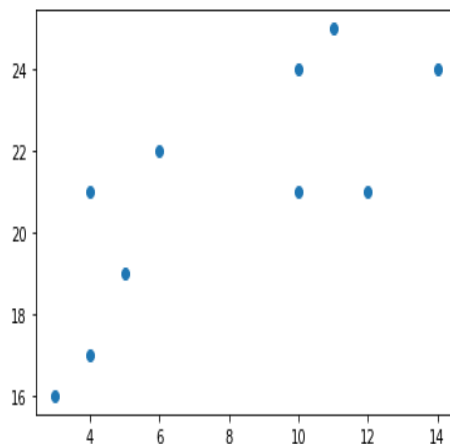
1. Aim:
Implement K-means clustering algorithm (cluster some sample data set into disjoint clusters using K-means).

2. Result and output:

➔Importing warnings and supplying a dataset.

```
In [1]: import matplotlib.pyplot as plt
        import warnings
        warnings.filterwarnings('ignore')
        x = [4, 5, 10, 4, 3, 11, 14 , 6, 10, 12]
        y = [21, 19, 24, 17, 16, 25, 24, 22, 21, 21]
        plt.scatter(x, y)
        plt.show()
```

➔ Creating a clustered graph using elbow method

```
In [2]: from sklearn.cluster import KMeans
        data = list(zip(x, y))
        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()
```
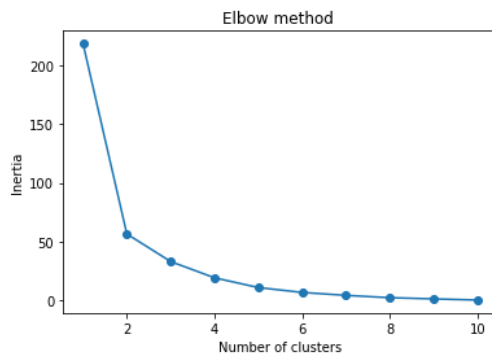

➔ Printing the clusters,labels and centers

```
In [8]: kmeans = KMeans(n_clusters=2)
        kmeans.fit(data)
        print(kmeans.labels_)
```
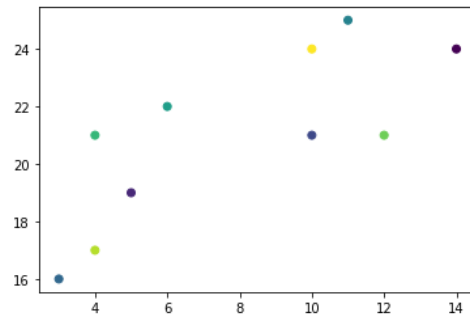
```
[0 0 1 0 0 1 1 0 1 1]
```

```
In [9]: print(kmeans.cluster_centers_)
```

```
[[ 4.4 19. ]
 [11.4 23. ]]
```

➔Printing scatter plot for klabels

```
In [3]: plt.scatter(x, y, c=kmeans.labels_)
        plt.show()
```


LEARNING OUTCOMES-:

1-Database provided -: x = [14, 25, 6, 4, 3, 11, 14 , 6, 10, 12]
                      y = [11, 29, 32, 17, 16, 25, 24, 22, 21, 21]

2-Method used -:Elbow method.

3-Clusters used in this experiment -: 2

4-Graph plotted for k-means shows clustered groups in different colors.