K-means clustering.

Use the k-means algorithm and Euclidean distance to cluster the following **8 points into 3 clusters**: A0=(2,10), A1=(2,5), A2=(8,4), A3=(5,8), A4=(7,5), A5=(6,4), A6=(1,2), A7=(4,9).

Suppose that the initial seeds (centers of each cluster) are A0, A3 and A6. Run the k-means algorithm for 1 epoch only. At the end of this epoch show: a) Clusters are updated b) The centers of the new clusters are computed.
Then run it until the result converges when there is no further change in the distribution of points in the clusters.

After 1st epoch : new clusters: 1: {A0}, 2: {A2, A3, A4, A5, A7}, 3: {A1, A6}
After the 2nd epoch the results would be: 1: {A0, A7}, 2: {A2, A3, A4, A5}, 3: {A1, A6}
After the 3rd epoch, the results would be: 1: {A1, A4, A8}, 2: {A3, A5, A6}, 3: {A2, A7}
And after the results converge and hence we stop.

The screenshots display the iterations:

```
Enter the value of k
3
Enter number of 5D points
8
Enter 5D points
2 10
2 5
8 4
5 8
7 5
6 4
1 2
4 9

Points are
Point(0) : 2 10
Point(1) : 2 5
Point(2) : 8 4
Point(3) : 5 8
Point(4) : 7 5
Point(5) : 6 4
Point(6) : 1 2
Point(7) : 4 9

Initial Centroids are
2 10
5 8
1 2

Clusters are
0
2 3 4 5 7
1 6

New Clusters are
0
2 3 4 5 7
1 6

New Centroids are
2 10
6 6
1.5 3.5
```

Continued in below image

```
Clusters are
0 7
2 3 4 5
1 6

New Clusters are
0 7
2 3 4 5
1 6

New Centroids are
3 9.5
6.5 5.25
1.5 3.5

Clusters are
0 3 7
2 4 5
1 6

New Clusters are
0 3 7
2 4 5
1 6

New Centroids are
3.66667 9
7 4.33333
1.5 3.5

Clusters are
0 3 7
2 4 5
1 6

New Clusters are
0 3 7
2 4 5
1 6
 Stop!!!
```