LAB-12 k-mean clustering

Example

Sr.	X	Y
1	1	1
2	1.5	2
3	3	4
4	5	7
5	3.5	5
6	4.5	5
7	3.5	4.5

→ Here k=2 and we assume center is (1, 1) for cluster 1 and (5, 7) for cluster 2

DataPoints		Distance to center		Cluster
X	Y	1 1	5 7	
1	1	0	7.21	1
1.5	2	1.11	6.1	1
3	4	3.6	3.6	1
5	7	7.2	0	2
3.5	5	4.7	2.5	2
4.5	5	5.3	2.06	2
3.5	4.5	3	2.9	2

→ New centroid :-

$M_1 = (1.83, 2.33)$

$M_2 = (4.12, 5.375)$

$\left[\frac{1 + 1.5 + 3}{3}\right]$ x Points in cluster 1

Data Points		Distance to center		clusters	New clusters
x	y	1.83 2.33	4.12 5.375		
1	1	1.97	5.4	1	1
1.5	2	0.46	4.22	1	1
3	4	2.03	1.77	1	2
5	7	5.64	1.85	2	2
3.5	5	3.14	0.12	2	2
4.5	5	3.22	0.53	2	2
3.5	4.5	2.74	1.07	2	2

→ New centroid :-

$M_1 = (1.25, 1.5)$

$M_2 = (3.9, 5.1)$

Data Points		Distance to center		cluster	New cluster
X	Y	1.25, 1.5	3.9, 5.1		
1	1	0.55	5.02	1	1
1.5	2	0.56	3.92	1	1
3	4	3.05	1.42	2	2
5	7	6.66	2.19	2	2
3.5	5	4.15	0.141	2	2
4.5	5	4.77	0.6	2	2
3.5	4.5	3.75	0.72	2	2

→ Here we will stop as there is no change in the clusters.