LAB-9

K-Means Algorithm

For the given data compute two clusters using K-means algorithm for clustering where initial cluster centres are (1.0, 1.0) and (5.0, 7.0)

Record number	A	B
R1	1.0	1.0
R2	1.5	2.0
R3	3.0	4.0
R4	5.0	7.0
R5	3.5	5.0
R6	4.5	5.0
R7	3.5	4.5

Assign points to nearest cluster iteration - 1

Point	Dist to C1	Dist to C2	Assigned cluster
R1	0	7.21	C1
R2	1.12	6.10	C1
R3	3.61	4.24	C1
R4	7.21	0.00	C2
R5	4.72	2.50	C2
R6	5.32	2.00	C2
R7	4.3	2.50	C2

Cluster 1 :- R1, R2, R3

Cluster 2 :- R4, R5, R6, R7

Recompute cluster centres

new C1 ⇒ $x = (1 + 1.5 + 3)/3 = 1.83$

$y = (1 + 2 + 4)/3 = 2.33$

new C1 = (1.83, 2.33)

new C2 ⇒ $x = (5 + 3.5 + 4.5 + 3.5)/4 = 4.13$

$y = (7 + 5 + 5 + 4.5)/4 = 5.38$

new C2 = (4.13, 5.38)

Assign points to nearest clusters Iteration - 2

Point	Dist to C1	Dist to C2	Assigned cluster
R1	1.87	5.67	C1
R2	0.47	4.53	C1
R3	2.03	1.92	C2
R4	5.67	1.89	C2
R5	2.63	0.71	C2
R6	3.25	0.47	C2
R7	2.73	0.94	C2

Cluster 1 :- R1, R2

Cluster 2 :- R3, R4, R5, R6, R7

Final cluster assignments

C1 centre = (1.25, 1.5)

C2 centre = (3.9, 5.1)