Lab - 9

K-Means Algorithm

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

			(1,1) C_1	(5,7) C_2	
Record No.	A	B			Assigned Cluster
R1	1.0	1.0	0.0	7.21	C_1
R2	1.5	2.0	1.12	6.10	C_1
R3	3.0	4.0	3.61	4.24	C_1
R4	5.0	7.0	7.21	0.0	C_2
R5	3.5	5.0	4.72	2.5	C_2
R6	4.5	5.0	5.32	2.0	C_2
R7	3.5	4.5	4.30	2.5	C_2

Cluster 1: R1, R2, R3
Cluster 2: R4, R5, R6, R7

Step2: Recompute cluster centers

$C_1 = (X, Y)$ $X = (1 + 1.5 + 3)/3 = 1.83$

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

New $C_1 = (1.83, 2.33)$

New $C_2 = (4.13, 5.38)$

$X = (5 + 3.5 + 4.5 + 3.5)/4 = 4.13$

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

* Iteration - 2: $(1.83, 2.33)$ $(4.13, 5.38)$

Record No.	A	B	C_1	C_2	Assigned Cluster
R_1	1.0	1.0	1.87	5.62	C_1
R_2	1.5	2.0	0.47	4.53	C_1
R_3	3.0	4.0	2.03	1.92	C_2
R_4	5.0	7.0	5.67	1.89	C_2
R_5	3.5	5.0	2.63	0.71	C_2
R_6	4.5	5.0	3.25	0.47	C_2
R_7	3.5	4.5	2.73	0.94	C_2

$C_1 = R_1, R_2$

$C_2 = R_3, R_4, R_5, R_6, R_7$

* Final Centers:

$C_1 = (1.25, 1.5)$

$C_2 = (3.9, 5.1)$