Lab - 1

7/5/25

K-Means Algorithm

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

Record No	A	B	(1,1) C_1	(5,7) C_2	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	0.00	C_2
R5	3.5	5.0	4.72	2.50	C_2
R6	4.5	5.0	5.32	2.00	C_2
R7	3.5	4.5	4.30	2.50	C_2

cluster 1: R1, R2, R3

cluster 2: R4, R5, R6, R7

Step 2: Recompute cluster centers

$C1 = (x, y)$

$x = (1.0 + 1.5 + 3.0)/3 = 1.83$

$y = (1.0 + 2.0 + 4.0)/3 = 2.33$

New $C1 = (1.83, 2.33)$

New $C2 = (4.13, 5.38)$

$X = (5.0 + 3.5 + 4.5 + 3.5)/4 = 4.13$

$Y = (7.0 + 5.0 + 5.0 + 4.5)/4 = 5.38$

Iteration 2:

Record No	A	B	C_1 (1.83, 2.33)	C_2 (4.13, 5.38)	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

$C_1 = R1, R2$

$C_2 = R3, R4, R5, R6, R7$

Find centres:

$c_1 = (1.25, 1.5)$

$c_2 = (3.9, 5.1)$