Lab - 9 k-means algorithm

For the given data, compute two clusters using k-means algorithm for clustering cobers initial cluster centers (1.0, 1.0) & (5.0, 7.0). Execute two iterations

Record Number	A	B
P_1	1.0	1.0
R_2	1.5	2.0
R_3	3.0	4.0
P_4	5.0	7.0
R_5	3.5	5.0
R_6	4.5	5.0
R_7	3.5	4.5

$C_1 = (1.0, 1.0)$ $C_2 = (5.0, 7.0)$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Record	Point (A, B)	distance $C_1(1.0, 1.0)$	distance $C_2(5.0, 7.0)$	Cluster
R_1	(1.0, 1.0)	0.0	7.21	C1
R_2	(1.5, 2.0)	1.12	6.10	C1
R_3	(3.0, 4.0)	3.61	4.24	C1
P_4	(5.0, 7.0)	7.21	0.0	C2
R_5	(3.5, 5.0)	5.00	2.50	C2
R_6	(4.5, 5.0)	5.32	2.24	C2
R_7	(3.5, 4.5)	4.30	3.20	C2

Cluster C1 : R_1, R_2, R_3

Cluster C2 : R_4, R_5, R_6, R_7

C_1 (1.0, 1.0), (1.5, 2.0) (3.0, 4.0)

$$C_1 = \left(\frac{1.0 + 1.5 + 3.0}{3}, \frac{1.0 + 2.0 + 4.0}{3} \right) = (1.83, 2.33)$$

C_2 (5.0, 7.0), (3.5, 5.0), (4.5, 5.0), (3.5, 4.5)

$$C_2 = \left(\frac{5.0 + 3.5 + 4.5 + 3.5}{4}, \frac{7.0 + 5.0 + 5.0 + 4.5}{4} \right) = (4.125, 5.375)$$

Ans:

Record Point (A,B)	distance (1.83, 2.33)	distance (4.125, 5.375)	Cluster
R_1 (1.0, 1.0)	1.57	5.62	C_1
R_2 (1.5, 2.0)	0.47	4.52	C_1
R_3 (3.0, 4.0)	2.12	1.63	C_2
R_4 (5.0, 7.0)	5.71	1.85	C_2
R_5 (3.5, 5.0)	3.53	0.78	C_2
R_6 (4.5, 5.0)	3.92	0.53	C_2
R_7 (3.5, 4.5)	3.07	1.01	C_2

Cluster C_1 = R_1 (1.0, 1.0) R_2 (1.5, 2.0)

Cluster C_2 = R_3 (3.0, 4.0) R_4 (5.0, 7.0) R_5 (3.5, 5.0)
R_6 (4.5, 5.0) R_7 (3.5, 4.5)