

Question

Lets Consider Cluster Point

P1(1, 3) P2(2, 2) P3(5, 8) P4(8, 5)

P5(3, 9) P6(10, 6) P7(3, 3) P8(9, 4)

P9(3, 7)

* let $K=3$ assume our initial clusters are C_1 C_2 C_3
 $P_7(3,3)$ $P_9(3,7)$ $P_8(9,4)$

* find out new centroids after 2 iterations from above data point.

Solution:

use euclidean distance formula : $\sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

find distance b/w all the points and the centroids (C_1, C_2, C_3)

P	C1(P7)	C2(P9)	C3(P8)	C (Smaller one)
P1	2	4.47	8.06	C1
P2	1.414	5.09	7.28	C1
P3	5.38	2.23	5.6	C2
P4	5.38	5.38	1.414	C3
P5	6	2	7.81	C2
P6	7.61	7.07	2.23	C3
P7	0	4	6.08	C1
P8	6.08	6.70	0	C3
P9	5	0	6.70	C2

* a point will belong to that cluster which is closest to it.

*

Cluster 1 = P_1 P_2 P_7

Cluster 2 = P_3 P_5 P_9

Cluster 3 = P_4 P_6 P_8

* now computing new clusters :-

new center of C_1 = $(\frac{1+2+3}{3}, \frac{3+2+3}{3})$

$C_1(2, 2.7)$

$C_2(3.7, 8)$

$C_3(9, 5)$

Iteration 1 is over *

for iteration 2 do the same procedure