No.

Date

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Prodi : Sistem Informasi

∴ Gunakan metode K-Means Cluster untuk mengelompokkan data berikut

No	Y_1	Y_2
1	2	2
2	3	2
3	1	1
4	3	1
5	1,5	0,5

Jawab :

Initial Centroid

Cluster	Y_1	Y_2
K_1	2	2
K_2	3	2

$k = 2$

Calculate

$d(K_1, K_1) = \sqrt{(2-2)^2 + (2-2)^2} = 0$

$d(K_1, K_2) = \sqrt{(2-3)^2 + (2-2)^2} = 1+0 = 1$

↓

Cluster	Centroid		
	Y_1	Y_2	Assignment
K_1	0	1	1
K_2	1	0	0

$K = 2$

Calculate

$d(K_1, n_3) = \sqrt{(2-1)^2 + (2-1)^2}$
$= \sqrt{1+1} = \sqrt{2}$
$= 1,414$

$d(K_2, n_3) = \sqrt{(3-1)^2 + (2-1)^2}$
$= \sqrt{2^2 + 1} = \sqrt{5}$
$= 2,236$

Dataset	Euclidean			
	cluster 1	cluster 2	[redacted]	→ Assigment
3	1,414	2,236	1	

↓ update cluster 2 (K_2)

Cluster	Y_1	Y_2
K_1	2	2
K_2	2	1,5

$K_2(y_1) = \frac{(3+1)}{2} = 2$

$K_2(y_2) = \frac{(1+2)}{2} = 1,5$

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K = 2

calculate

$d(k_1, n_4) = \sqrt{(2-3)^2 + (2-1)^2}$

$= \sqrt{1+1} = \sqrt{2}$

$= 1,414$

$d(k_2, n_4) = \sqrt{(2-3)^2 + (1,5-1)^2}$

$= \sqrt{1+0,25}$

$= 1,118$

Dataset	Euclidean		
	cluster 1	cluster 2	Assigment
3	1,414	2,236	**2**
4	1,414	1,118	2

↓ update cluster 2 (k_2)

Cluster	Y_1	Y_2
k_1	2,5	0,5
k_2	2	1,5

$k_1(y_1) = \frac{(2+3)}{2} = 2,5$

$k_2(y_2) = \frac{(2-1)}{2} = 0,5$

K = 2

$d(k_1, n_5) = \sqrt{(2,5-1,5)^2 + (0,5-0,5)^2}$

$= \sqrt{1} = 1$

$d(k_2, n_5) = \sqrt{(2-1,5)^2 + (1,5-0,5)^2}$

$= \sqrt{0,25+1}$

$= 1,118$

Dataset	Euclidean		
	Cluster 1	cluster 2	Assigment
3	1,414	2,236	**2**
4	1,414	1,118	2
5	1	1,118	2

↓ update cluster 2 (k_2)

Cluster	Y_1	Y_2
k_1	2	0,5
k_2	2	1,5

$k_1(y_1) = \frac{(2,5+1,5)}{2} = 2$

$k_2(y_2) = \frac{(0,5+0,5)}{2} = 0,5$

- Final

No	Y_1	Y_2	Assignment
1	2	2	1
2	3	2	0
3	1	1	**2**
4	3	1	2
5	1,5	0,5	2