No.

Date

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Kelompok	: A11.43UG1	Prodi	: S1 Teknik Informatika

Pertemuan 10 Klastering dengan K-Means

Tentukan anggota klasternya, jika dikelompokkan menjadi 2 klaster?

M1 = (1 , 4,5)
M2 = (3 , 6,5)
M3 = (4 , 4,5)
M4 = (7.5, 3,2)
M5 = (6 , 2,3)
M6 = (2.5 , 3,8)
M7 = (5 , 5,5)

Titik pusat cluster C1 (3,4) C2 (6,4)

Jawab

-> Menghitung Euclidean Distance setiap data dengan titik pusat pertama

D(1,1) = $\sqrt{(1-3)^2 + (4,5-4)^2}$ = 2,06155
D(1,2) = $\sqrt{(3-3)^2 + (6,5-4)^2}$ = 2,5
D(1,3) = $\sqrt{(4-3)^2 + (4,5-4)^2}$ = 1,11803
D(1,4) = $\sqrt{(7.5-3)^2 + (3,2-4)^2}$ = 4,57056
D(1,5) = $\sqrt{(6-3)^2 + (2,3-4)^2}$ = 3,44819
D(1,6) = $\sqrt{(2.5-3)^2 + (3,8-4)^2}$ = 0,53852
D(1,7) = $\sqrt{(5-3)^2 + (5,5-4)^2}$ = 2,5

-> Menghitung Euclidean Distance setiap data dengan titik pusat kedua

D(2,1) = $\sqrt{(1-6)^2 + (4,5-4)^2}$ = 5,02494
D(2,2) = $\sqrt{(3-6)^2 + (6,5-4)^2}$ = 3,90512
D(2,3) = $\sqrt{(4-6)^2 + (4,5-4)^2}$ = 2,06155
D(2,4) = $\sqrt{(7.5-6)^2 + (3,2-4)^2}$ = 1,7
D(2,5) = $\sqrt{(6-6)^2 + (2,3-4)^2}$ = 1,7
D(2,6) = $\sqrt{(2.5-6)^2 + (3,8-4)^2}$ = 3,50571
D(2,7) = $\sqrt{(5-6)^2 + (5,5-4)^2}$ = 1,80278

-> Membandingkan jarak ke C1 dan jarak ke C2

	M1	M2	M3	M4	M5	M6	M7
Jarak ke C1	2,06155	2,5	1,11803	4,50756	3,44819	0,53852	2,5
Jarak ke C2	5,02494	3,90512	2,06155	1,7	1,7	3,50571	1,80278

C1 = { M1, M2, M3, M6 }
C2 = { M4, M5, M7 }

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•) Menghitung titik pusat baru

$C_1 = \left(\frac{1+3+4+2{,}5}{4}, \frac{4{,}5+6{,}5+4{,}5+3{,}8}{4} \right) = (2{,}63 , 4{,}83)$

$C_2 = \left(\frac{7{,}5+6+5}{3}, \frac{3{,}2+2{,}3+5{,}5}{3} \right) = (6{,}17 , 3{,}67)$

•) Menghitung Euclidean distance setiap data dengan C_1

$D(1,1) = \sqrt{(1-2{,}63)^2 + (4{,}5-4{,}83)^2} = 1{,}66307$

$D(1,2) = \sqrt{(3-2{,}63)^2 + (6{,}5-4{,}83)^2} = 1{,}7105$

$D(1,3) = \sqrt{(4-2{,}63)^2 + (4{,}5-4{,}83)^2} = 1{,}40918$

$D(1,4) = \sqrt{(7{,}5-2{,}63)^2 + (3{,}2-4{,}83)^2} = 5{,}13554$

$D(1,5) = \sqrt{(6-2{,}63)^2 + (2{,}3-4{,}83)^2} = 4{,}214$

$D(1,6) = \sqrt{(2{,}5-2{,}63)^2 + (3{,}8-4{,}83)^2} = 1{,}03817$

$D(1,7) = \sqrt{(5-2{,}63)^2 + (5{,}5-4{,}83)^2} = 2{,}46288$

•) Menghitung Euclidean distance setiap data dengan C_2

$D(2,1) = \sqrt{(1-6{,}17)^2 + (4{,}5-3{,}67)^2} = 5{,}2362$

$D(2,2) = \sqrt{(3-6{,}17)^2 + (6{,}5-3{,}67)^2} = 4{,}24945$

$D(2,3) = \sqrt{(4-6{,}17)^2 + (4{,}5-3{,}67)^2} = 2{,}32332$

$D(2,4) = \sqrt{(7{,}5-6{,}17)^2 + (3{,}2-3{,}67)^2} = 1{,}4106$

$D(2,5) = \sqrt{(6-6{,}17)^2 + (2{,}3-3{,}67)^2} = 1{,}38051$

$D(2,6) = \sqrt{(2{,}5-6{,}17)^2 + (3{,}8-3{,}67)^2} = 3{,}6723$

$D(2,7) = \sqrt{(5-6{,}17)^2 + (5{,}5-3{,}67)^2} = 2{,}17205$

•) Membandingkan jarak ke C_1 dan jarak ke C_2

	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Jarak ke C_1	1,66307	1,7105	1,40918	5,13554	4,214	1,03817	2,46288
Jarak ke C_2	5,2362	4,24945	2,32332	1,4106	1,38051	3,6723	2,17205

•) Kesimpulan

Anggota Klaster 1 = { M_1, M_2, M_3, M_6 }

Anggota Klaster 2 = { M_4, M_5, M_7 }

Implementasi Python

Link GitHub : https://github.com/adeliaputriw/ClusteringKMeans-43UG1-A11.2022.14426.git

Link GColab : https://colab.research.google.com/drive/1fv-X7XRkvJx1W8O0HPrXP0hHpAozukbx?usp=sharing