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A11.4508

Penambangan Data

$M_1 = (1, 4.5)$
$M_2 = (3, 6.5)$
$M_3 = (4, 4.5)$
$M_4 = (7.5, 3.2)$
$M_5 = (6, 2.3)$
$M_6 = (2.5, 3.8)$
$M_7 = (5, 5.5)$

Tentukan anggota klasternya, jika dikelompokan menjadi 2 klaster?
Titik pusat klaster → $C_1(3,4)$, $C_2(6,4)$

Iterasi 1

a) $D_{11} = \sqrt{(M_{1x} - C_{1x})^2 + (M_{1y} - C_{1y})^2} = \sqrt{(1-3)^2 + (4,5-4)^2} = \sqrt{4+0,25} = 2,06$
$D_{12} = \sqrt{(M_{2x} - C_{1x})^2 + (M_{2y} - C_{1y})^2} = \sqrt{(3-3)^2 + (6,5-4)^2} = \sqrt{0+6,25} = 2,50$
$D_{13} = \sqrt{(4-3)^2 + (4,5-4)^2} = \sqrt{1+0,25} = 1,12$
$D_{14} = \sqrt{(7.5-3)^2 + (3,2-4)^2} = \sqrt{4,5^2 + (-0,8)^2} = \sqrt{20,25+0,64} = \sqrt{20,89} = 4,57$
$D_{15} = \sqrt{(6-3)^2 + (2,3-4)^2} = \sqrt{3^2 + (-1,7)^2} = \sqrt{9+2,89} = \sqrt{11,89} = 3,45$
$D_{16} = \sqrt{(2,5-3)^2 + (3,8-4)^2} = \sqrt{(-0,5)^2 + (-0,2)^2} = \sqrt{0,25+0,04} = \sqrt{0,29} = 0,54$
$D_{17} = \sqrt{(5-3)^2 + (5,5-4)^2} = \sqrt{2^2 + 1,5^2} = \sqrt{4+2,25} = \sqrt{6,25} = 2,50$

$D_{21} = \sqrt{(1-6)^2 + (4,5-4)^2} = \sqrt{-5^2 + 0,5^2} = \sqrt{25+0,25} = \sqrt{25,25} = 5,02$
$D_{22} = \sqrt{(3-6)^2 + (6,5-4)^2} = \sqrt{-3^2 + 2,5^2} = \sqrt{9+6,25} = \sqrt{15,25} = 3,90$
$D_{23} = \sqrt{(4-6)^2 + (4,5-4)^2} = \sqrt{-2^2 + 0,5^2} = \sqrt{4+0,25} = \sqrt{4,25} = 2,06$
$D_{24} = \sqrt{(7,5-6)^2 + (3,2-4)^2} = \sqrt{1,5^2 + (-0,8)^2} = \sqrt{2,25+0,64} = \sqrt{2,89} = 1,70$
$D_{25} = \sqrt{(6-6)^2 + (2,3-4)^2} = \sqrt{0^2 + (-1,7)^2} = \sqrt{0+2,89} = 1,70$
$D_{26} = \sqrt{(2,5-6)^2 + (3,8-4)^2} = \sqrt{(-3,5)^2 + (-0,2)^2} = \sqrt{12,25+0,04} = \sqrt{12,29} = 3,50$
$D_{27} = \sqrt{(5-6)^2 + (5,5-4)^2} = \sqrt{(-1)^2 + 1,5^2} = \sqrt{1+2,25} = \sqrt{3,25} = 1,80$

b)

	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Jarak ke C_1	2,06	2,50	1,12	4,57	3,45	0,54	2,50
Jarak ke C_2	5,02	3,90	2,06	1,70	1,70	3,50	1,80

{M_1, M_2, M_3, M_6} anggota C_1 dan {M_4, M_5, M_7} anggota C_2

c) $C_1 = \left(\frac{1+3+4+2,5}{4}, \frac{4,5+6,5+4,5+3,8}{4}\right) = \frac{10,5}{4}, \frac{19,3}{4} = (2,62, 4,82)$

$C_2 = \left(\frac{7,5+6+5}{3}, \frac{3,2+2,3+5,5}{3}\right) = \frac{18,5}{3} + \frac{11}{3} = (6,17, 3,67)$

$C_1 = (2,62 , 1,82)$ $C_2 = (6,17 , 3,67)$

Iterasi 2

a) $D_{11} = \sqrt{(1-2,62)^2 + (1,5-1,82)^2} = \sqrt{(-1,62)^2 + (-0,32)^2} = \sqrt{2,62 + 0,10}$
$= \sqrt{2,72} = 1,65$

$D_{12} = \sqrt{(3-2,62)^2 + (6,5-1,82)^2} = \sqrt{0,38^2 + 1,68^2} = \sqrt{0,14 + 2,82}$
$= \sqrt{2,96} = 1,72$

$D_{13} = \sqrt{(1-2,62)^2 + (1,5-1,82)^2} = \sqrt{1,38^2 + (-0,32)^2} = \sqrt{1,90 + 0,10}$
$= \sqrt{2} = 1,41$

$D_{14} = \sqrt{(7,5-2,62)^2 + (3,2-1,82)^2} = \sqrt{7,88^2 + (-1,62)^2} = \sqrt{23,81 + 2,62}$
$= \sqrt{26,43} = 5,14$

$D_{15} = \sqrt{(6-2,62)^2 + (2,3-1,82)^2} = \sqrt{3,38^2 + (-2,52)^2} = \sqrt{11,42 + 6,35}$
$= \sqrt{17,77} = 4,21$

$D_{16} = \sqrt{(2,5-2,62)^2 + (3,8-1,82)^2} = \sqrt{(-0,12)^2 + (-1,02)^2} = \sqrt{0,01 + 1,04}$
$= \sqrt{1,05} = 1,02$

$D_{17} = \sqrt{(5-2,62)^2 + (5,5-1,82)^2} = \sqrt{2,38^2 + 0,68^2} = \sqrt{5,66 + 0,46}$
$= \sqrt{6,12} = 2,47$

$D_{21} = \sqrt{(1-6,17)^2 + (1,5-3,67)^2} = \sqrt{(-5,17)^2 + (0,83)^2} = \sqrt{26,73 + 0,69}$
$= \sqrt{27,42} = 5,27$

$D_{22} = \sqrt{(3-6,17)^2 + (6,5-3,67)^2} = \sqrt{(-3,17)^2 + (2,83)^2} = \sqrt{10,05 + 8,01}$
$= \sqrt{18,06} = 4,25$

$D_{23} = \sqrt{(1-6,17)^2 + (1,5-3,67)^2} = \sqrt{(-2,17)^2 + (0,83)^2} = \sqrt{9,71 + 0,69}$
$= \sqrt{5,4} = 2,32$

$D_{24} = \sqrt{(7,5-6,17)^2 + (3,2-3,67)^2} = \sqrt{(1,33)^2 + (-0,47)^2} = \sqrt{1,77 + 0,22}$
$= \sqrt{1,99} = 1,41$

$D_{25} = \sqrt{(6-6,17)^2 + (2,3-3,67)^2} = \sqrt{(-0,17)^2 + (-1,37)^2} = \sqrt{0,03 + 1,88}$
$= \sqrt{1,91} = 1,38$

$D_{26} = \sqrt{(2,5-6,17)^2 + (3,8-3,67)^2} = \sqrt{(-3,67)^2 + (0,13)^2} = \sqrt{13,47 + 0,02}$
$= \sqrt{13,49} = 3,67$

$D_{27} = \sqrt{(5-6,17)^2 + (5,5-3,67)^2} = \sqrt{(-1,17)^2 + (1,83)^2} = \sqrt{1,37 + 3,35}$
$= \sqrt{4,72} = 2,17$

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b)	M_1	M_2	M_3	M_4	M_5	M_6	M_7
Jarak ke C_1	1,65	1,72	1,41	5,19	4,21	1,02	2,47
Jarak ke C_2	5,27	4,25	2,32	1,41	1,38	3,67	2,17

{ M_1, M_2, M_3, M_6 } anggota C_1 dan { M_4, M_5, M_7 }

c) Jadi karena anggota kelompok tidak ada yang berubah maka titik pusat pun tidak akan berubah