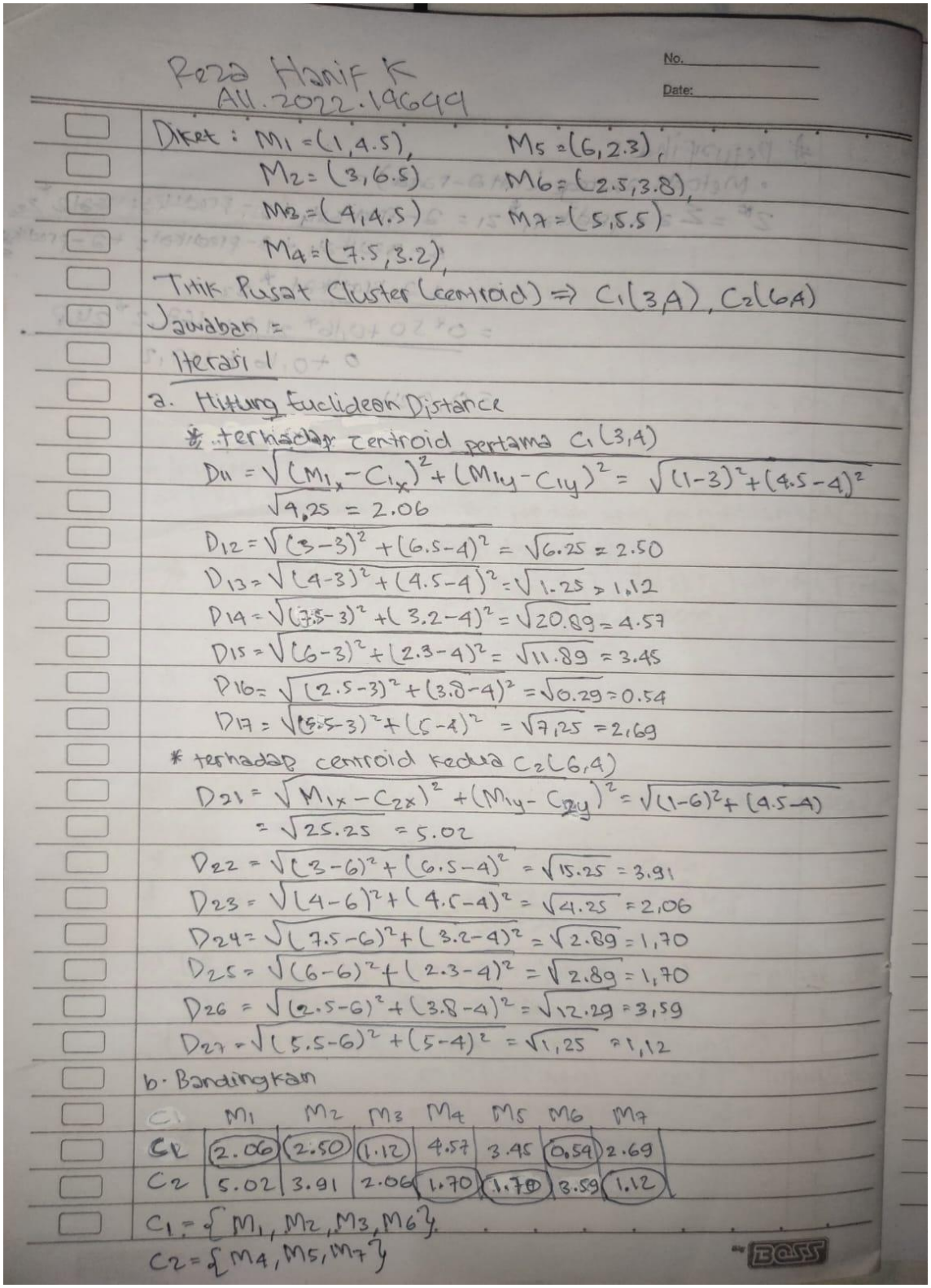
REZA HANIF KURNIAWAN
A11.2022.14644
Tugas 10 – Klastering dengan K-Means



Reza Hanif K
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No.
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Dikrt : $M_1 = (1, 4.5)$, $M_5 = (6, 2.3)$,
$M_2 = (3, 6.5)$ $M_6 = (2.5, 3.8)$,
$M_3 = (4, 4.5)$ $M_7 = (5, 5.5)$
$M_4 = (7.5, 3.2)$,

Titik Pusat Cluster (centroid) $\Rightarrow C_1(3,4), C_2(6,4)$

Jawaban =

Iterasi 1

a. Hitung Euclidean Distance

* terhadap centroid pertama $C_1(3,4)$

$D_{11} = \sqrt{(M_{1x} - C_{1x})^2 + (M_{1y} - C_{1y})^2} = \sqrt{(1-3)^2 + (4.5-4)^2}$
$\sqrt{4.25} = 2.06$

$D_{12} = \sqrt{(3-3)^2 + (6.5-4)^2} = \sqrt{6.25} = 2.50$

$D_{13} = \sqrt{(4-3)^2 + (4.5-4)^2} = \sqrt{1.25} = 1.12$

$D_{14} = \sqrt{(7.5-3)^2 + (3.2-4)^2} = \sqrt{20.89} = 4.57$

$D_{15} = \sqrt{(6-3)^2 + (2.3-4)^2} = \sqrt{11.89} = 3.45$

$D_{16} = \sqrt{(2.5-3)^2 + (3.8-4)^2} = \sqrt{0.29} = 0.54$

$D_{17} = \sqrt{(5.5-3)^2 + (5-4)^2} = \sqrt{7.25} = 2.69$

* terhadap centroid kedua $C_2(6,4)$

$D_{21} = \sqrt{(M_{1x} - C_{2x})^2 + (M_{1y} - C_{2y})^2} = \sqrt{(1-6)^2 + (4.5-4)}$
$= \sqrt{25.25} = 5.02$

$D_{22} = \sqrt{(3-6)^2 + (6.5-4)^2} = \sqrt{15.25} = 3.91$

$D_{23} = \sqrt{(4-6)^2 + (4.5-4)^2} = \sqrt{4.25} = 2.06$

$D_{24} = \sqrt{(7.5-6)^2 + (3.2-4)^2} = \sqrt{2.89} = 1.70$

$D_{25} = \sqrt{(6-6)^2 + (2.3-4)^2} = \sqrt{2.89} = 1.70$

$D_{26} = \sqrt{(2.5-6)^2 + (3.8-4)^2} = \sqrt{12.29} = 3.59$

$D_{27} = \sqrt{(5.5-6)^2 + (5-4)^2} = \sqrt{1.25} = 1.12$

b. Bandingkan

	M_1	M_2	M_3	M_4	M_5	M_6	M_7
C_1	(2.06)	(2.50)	(1.12)	4.57	3.45	(0.54)	2.69
C_2	5.02	3.91	2.06	(1.70)	(1.70)	3.59	(1.12)

$C_1 = \{M_1, M_2, M_3, M_6\}$
$C_2 = \{M_4, M_5, M_7\}$

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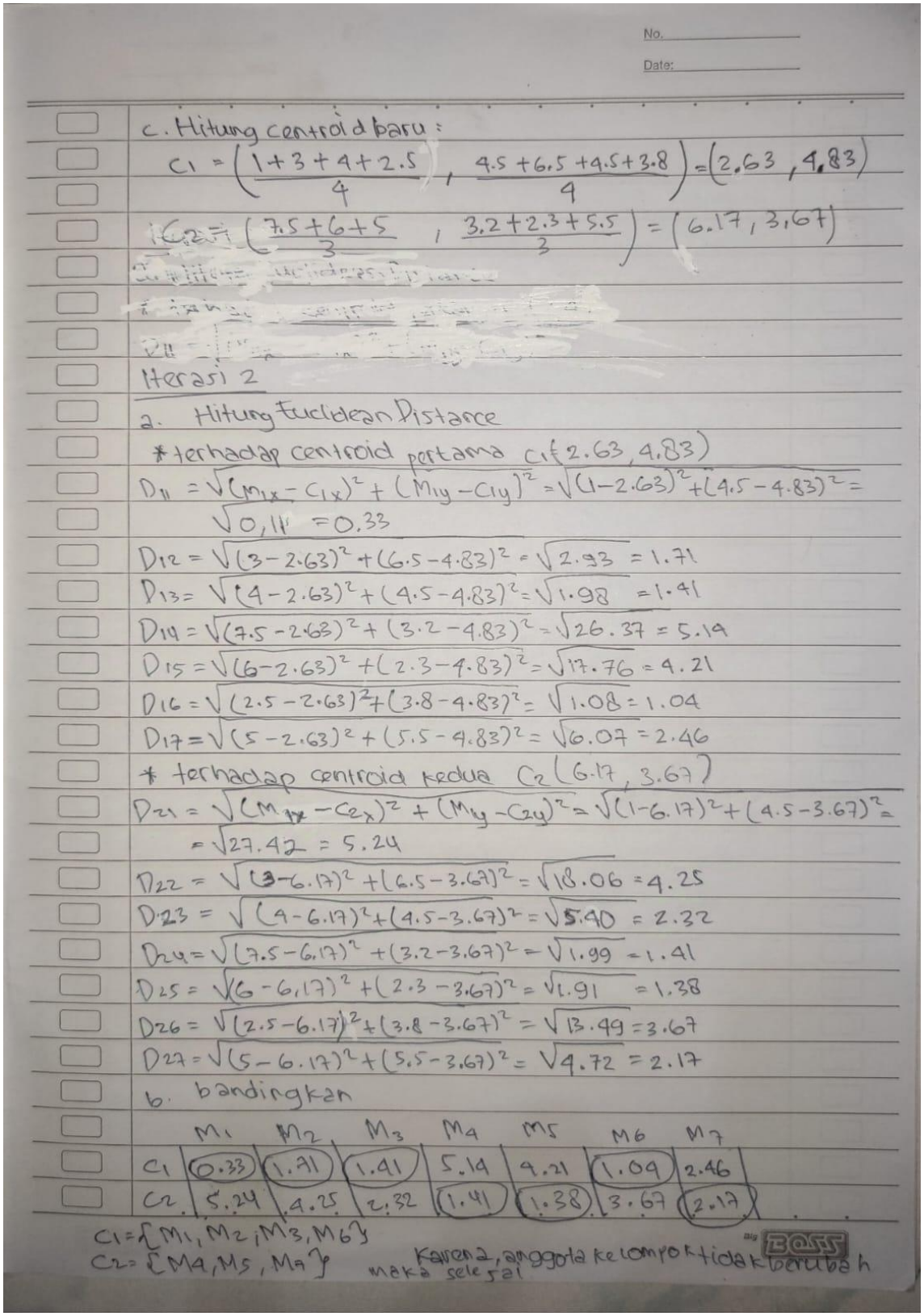

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c. Hitung centroid baru :

$C_1 = \left(\frac{1+3+4+2.5}{4}, \frac{4.5+6.5+4.5+3.8}{4}\right) = (2.63, 4.83)$

$C_2 = \left(\frac{7.5+6+5}{3}, \frac{3.2+2.3+5.5}{3}\right) = (6.17, 3.67)$

Iterasi 2

2. Hitung Euclidean Distance

* terhadap centroid pertama $C_1(2.63, 4.83)$

$D_{11} = \sqrt{(M_{1x} - C_{1x})^2 + (M_{1y} - C_{1y})^2} = \sqrt{(1-2.63)^2 + (4.5-4.83)^2} = \sqrt{0,11} = 0.33$

$D_{12} = \sqrt{(3-2.63)^2 + (6.5-4.83)^2} = \sqrt{2.93} = 1.71$

$D_{13} = \sqrt{(4-2.63)^2 + (4.5-4.83)^2} = \sqrt{1.98} = 1.41$

$D_{14} = \sqrt{(7.5-2.63)^2 + (3.2-4.83)^2} = \sqrt{26.37} = 5.14$

$D_{15} = \sqrt{(6-2.63)^2 + (2.3-4.83)^2} = \sqrt{17.76} = 4.21$

$D_{16} = \sqrt{(2.5-2.63)^2 + (3.8-4.83)^2} = \sqrt{1.08} = 1.04$

$D_{17} = \sqrt{(5-2.63)^2 + (5.5-4.83)^2} = \sqrt{6.07} = 2.46$

* terhadap centroid kedua $C_2(6.17, 3.67)$

$D_{21} = \sqrt{(M_{1x} - C_{2x})^2 + (M_{1y} - C_{2y})^2} = \sqrt{(1-6.17)^2 + (4.5-3.67)^2} = \sqrt{27.42} = 5.24$

$D_{22} = \sqrt{(3-6.17)^2 + (6.5-3.67)^2} = \sqrt{18.06} = 4.25$

$D_{23} = \sqrt{(4-6.17)^2 + (4.5-3.67)^2} = \sqrt{5.40} = 2.32$

$D_{24} = \sqrt{(7.5-6.17)^2 + (3.2-3.67)^2} = \sqrt{1.99} = 1.41$

$D_{25} = \sqrt{(6-6.17)^2 + (2.3-3.67)^2} = \sqrt{1.91} = 1.38$

$D_{26} = \sqrt{(2.5-6.17)^2 + (3.8-3.67)^2} = \sqrt{13.49} = 3.67$

$D_{27} = \sqrt{(5-6.17)^2 + (5.5-3.67)^2} = \sqrt{4.72} = 2.17$

b. bandingkan

	M_1	M_2	M_3	M_4	M_5	M_6	M_7
C_1	0.33	1.71	1.41	5.14	4.21	1.09	2.46
C_2	5.24	4.25	2.32	1.41	1.38	3.67	2.17

$C_1 = \{M_1, M_2, M_3, M_6\}$

$C_2 = \{M_4, M_5, M_7\}$

Karena anggota kelompok tidak berubah maka selesai