FAKULTAS ILMU KOMPUTER
UNIVERSITAS BRAWIJAYA

Tgl. Ujian : 22, April 2025
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Mata Kuliah : kAL
Kelas : kAL-D
Dosen :
Tanda Tangan

- Dataset

Data	Fitur x	Fitur y
1	1	1
2	4	1
3	1	2
4	3	4
5	5	4

- Average linkage

	1	2	3	4	5
1	0	3	1	5	7
2	3	0	4	4	4
3	1	4	0	4	6
4	5	4	4	0	2
5	7	4	6	2	0

D(Data 1, Data 2) = |1-4| + |1-1| = 3
D(Data 1, Data 3) = |1-1| + |1-2| = 1
D(Data 1, Data 4) = |1-5| + |1-4| = 5
D(Data 1, Data 5) = |1-5| + |1-4| = 7
D(Data 2, Data 3) = |4-1| + |1-2| = 4
D(Data 2, Data 4) = |4-3| + |1-4| = 4
D(Data 2, Data 5) = |4-5| + |1-4| = 1+3 = 4

- Data(Data 3, Data 4) = |1-3| + |2-4| = 4
  D(Data 3, Data 5) = |1-5| + |2-4| = 6
- D(Data 4, Data 5) = |3-5| + |4-4| = 2

- Lalu kita cari jarak terkecil yaitu Data 1-3 = 1 Jadi C1 = (1, 3)

$$D(C_1, Data_2) = \frac{d(1,2) + d(2,3)}{2} = \frac{(3+4)}{2} = 3,5$$

$$D(C_1, Data_4) = \frac{d(1,4) + d(3,4)}{2} = \frac{(5+4)}{2} = 4,5$$

$$D(C_1, Data_5) = \frac{d(1,5) + d(3,5)}{2} = \frac{(7+6)}{2} = 6,5$$

- Selanjutnya cari jarak paling kecil yaitu Data 4-5 = 2 Jadi C_2 (4,5)

$$D(C_1, C_2) = \frac{d(1,4) + d(1,5) + d(3,4) + d(3,5)}{2} = \frac{(5+7+4+6)}{2} = 5,5$$

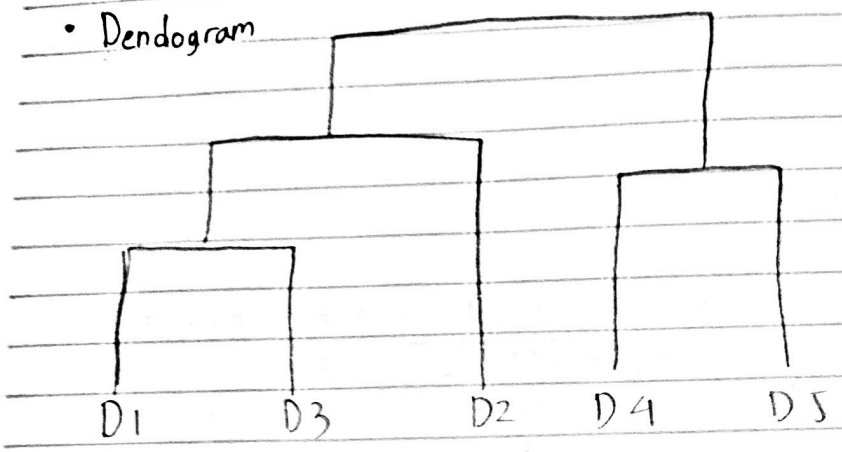
$$D(C_2, Data_2) = \frac{d(4,2) + d(5,2)}{2} = \frac{(4+4)}{2} = 4$$

- Cari jarak paling kecil kembali yaitu C1-2 = 3,5 Jadi C_3 = (1,3,2)

$D(C_3, C_2) = \frac{d(1,4) + d(1,5) + d(3,4) + d(3,5) + d(2,4) + d(2,5)}{2} = \frac{(5+7+4+6+4+4)}{6} = 5$

Jadi final Cluster
$C_3 = (1,2,3)$ dan $C_2 = (4,5)$
- Menjadi satu cluster dengan average linkage = 5

- Dendogram



- Complete Linkage

Dman	1	2	3	4	5
1	0	3	1	5	7
2	3	0	4	4	4
3	1	4	0	4	6
4	5	4	4	0	2
5	7	4	6	2	0

- Lalu pilih jarak paling terkecil yaitu $d_{13} = 1$ Jadi $C_1 = (1,3)$
$D(C_1,2) = \max(d_{12}, d_{32}) = \max(3,4) = 4$
$D(C_1,4) = \max(d_{14}, d_{34}) = \max(5,4) = 5$
$D(C_1,5) = \max(d_{15}, d_{35}) = \max(7,6) = 7$

Dman	(1,3)	2	4	5
C1(1,3)	0	4	5	7
2	4	0	4	4
4	5	4	0	2
5	7	4	2	0

- Selanjutnya jarak terkecil yaitu $d_{45} = 2$ Jadi $C_2 = (4,5)$
$D(C_2, C_1) = \max(d_{41}, d_{43}, d_{51}, d_{53}) = \max(5,4,7,6) = 7$
$D(C_2,2) = \max(d_{42}, d_{52}) = \max(4,4) = 4$

Dman	$C_2(4,5)$	$C_1(1,3)$	2
$C_2(4,5)$	0	7	4
$C_1(1,3)$	7	0	4
2	4	4	0

$D(C_1, C_2) = \max(d_{14}, d_{15}, d_{34}, d_{35}, d_{24}, d_{25}) = \max(5, 7, 4, 6, 4, 4) = 7$

- Selanjutnya paling kecil $C_1, C_2 = 4$ jadi $C_3 = (C_1, d_2) / (d_1, d_2, d_3)$

Dman	$C_3(1,3;2)$	$(2)(4,5)$
$C_3(1,32)$	0	7
$C_2(4,5)$	7	0

- Dendogram