Complete Linkage Clustering

- This is a part of hyrachical clustering

	2	6	9	11	3
2,3	0	4	7	9	①1
6	4	0	3	5	3
9	7	3	0	2	6
11	9	5	2	0	8
3	1	3	6	8	0

Since there is no Y we do ony x

formula:-

$$\sqrt{(x_1 - x_2)^2}$$

$$\sqrt{(2-6)^2} = 4$$

	(2,3)	6	9	11
(2,3)	0	4	7	9
6	4	0	3	5
9	7	3	0	②2
11	9	5	2	0

	(1,3)	6	(9,11)
(1,3)	0	4	9
6	(4)	0	5
(9,11)	9	5	0

Now we should find Maximum cluster among

⇒ (2,3)∧(3,4), 2(9,1)

3(9,11)

⇒ 9 9 , 8

= 9   (9,11)

$(cx-p)^2$

$(p-s)^2$

(2,3)6	(2,3)6	(9,11)	
(2,3)6	0	9	
(9,11)	9	0	

(2,3)6

(2,0)   (3,6)

(2,3) (9,11)

: (9,11),6

= 5

Top of page shows dendrogram diagrams with labels: 2, 3 9 11 and below 6 2 3 9 11
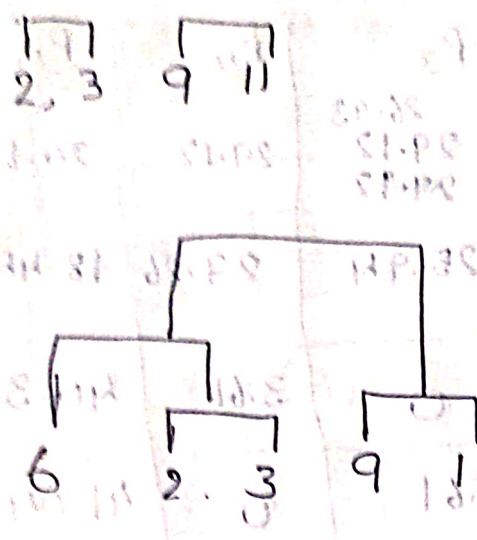
Example:-

Scenario: A medical researcher is Studying Patient health profiles based on two Critical Phylogical indicators:

'Blood Pressure' and 'Resting Hart Rate'. The researcher has collected data from 5 Patients and want to Group them into Clusters to Identify Potential Patients Segments that might require Similar medical attention or lifeStyle advice.

Data: of 5 Patients

Patient	Blood Pressure index	Heart Rate
P1	120	70
P2	122	72
P3	145	60
P4	148	62
P5	118	90

	P₁	P₂	P₃	P₄	P₅
P₁	2-82 0	26·93 (2·82)	26·93 29·12 29·12	29.12	20.10
P₂	2.82	0	25.94	27·86	18·44
P₃	26·93	25·94	0	3.61	40·36
P₄	29·12	27·86	3·61	0	41·04
P₅	20·10	18·44	40·36	41·04	0

Now find Minimum :-

	(P_1,P_2)	P₃	P₄	P₅
(P_1,P_2)	0	26·93	29.12	20·10
P₃	26·93	0	3·61	40·36
P₄	29·12	3·61	0	41·04
P₅	20·10	40·36	41·04	0

$(P_1, P_2) = 2.82$

	(P_1,P_2)	(P_3,P_4)	P₅
(P_1,P_2)	0	26·93	20·10
(P_3,P_4)	26·93	0	40·36
P₅	20·10	40·36	0

29.12, 27·8

$P_1(P_3, P_4) = 26·12$

$P_2(P_3, P_4) = $

$(P_1, P_2), (P_3, P_4) = (P_1, P_3), (P_1, P_4)$

$\Rightarrow (29·12) \Rightarrow 29·12$

$(P_2, P_3) (P_2, P_4)$

$\Rightarrow 26·93, 29·12 = (29·12, 27·86)$

$\Rightarrow 25·94, 27·86 = $

$\Rightarrow (29·12) -$

P_2, P_5

	$(P_1, P_2)P_5$	(P_3, P_4)
$(P_1, P_2) P_5$	0	26.93
(P_3, P_4)	26.93	0

$(P_3, P_4) \ (P_1, P_2)P_5$

$\Rightarrow (P_1, P_5), (P_2, P_5) \Rightarrow (20.10, \ 18.44)$

$\Rightarrow (20.10)$

$\Rightarrow (P_3, P_5) \ (P_1, P_2)$

$\Rightarrow (P_3, P_1), (P_5, P_2)$

$\Rightarrow (26.93), (18.44)$

$\Rightarrow (26.93)$

$\Rightarrow (26.93), (20.10)$

$\Rightarrow (26.93)$

(29.12)

$P_1 \ P_2 \quad P_3 \ P_4 \quad P_5$

(26.93)

(29.12)

$P_1 \ P_2 \quad P_3 \ P_4 \quad P_5$