

256. Assignment \rightarrow Hierarchical Clustering
 (Agglomerative) Single Link

A) Points

P ₁	3	7
P ₂	2	6
P ₃	2	2
P ₄	5	8
P ₅	5	5
P ₆	5	2
P ₇	6	6
P ₈	8	4
P ₉	7	3
P ₁₀	10	6
P ₁₁	12	8

	P ₁	P ₂	P ₃	P ₄	P ₅	P ₆	P ₇	P ₈	P ₉	P ₁₀	P ₁₁
P ₁	0	1.41	5.1	2.24	2.83	5.39	3.16	5.83	5.66	7.07	9.06
P ₂	1.41	0	4.0	3.16	3.16	5.0	4.0	6.32	5.83	8.0	10.20
P ₃	5.10	4.0	0	6.71	4.24	3.0	5.66	6.3	5.10	8.94	11.66
P ₄	2.24	3.61	6.71	0	3.0	6.0	2.24	5.39	5.39	7.0	
P ₅	2.83	3.16	4.23	3.0	0	3.0	1.41	3.16	2.83	5.10	7.62
P ₆	5.39	5.0	3.0	6.0	3.0	0	4.12	3.61	2.24	6.40	9.22
P ₇	3.16	4	5.66	2.24	1.41	4.12	0	2.83	3.46	4.0	6.32
P ₈	5.83	6.32	6.32	5	3.61	3.61	2.83	0	1.41	5.10	8.94
P ₉	5.66	5.83	5.10	5.39	2.83	2.24	3.16	1.41	0	4.24	7.0
P ₁₀	7.07	8.0	8.94	5.39	5.10	6.40	4	2.83	4.24	6.4	2.03
P ₁₁	9.06	10.2	11.66	7	7.62	9.2	6.32	5.66	7.07	2.83	0

minimum value is 1.41 ($P_4 \cup P_5 / P_3$)
 Merging (P₁, P₂)

	P ₁ , P ₂	P ₃	P ₄	P ₅	P ₆	P ₇	P ₈	P ₉	P ₁₀	P ₁₁
P ₁ , P ₂	0	4.0	2.24	2.83	5	3.16	5.83	5.66	7.07	9.06
P ₃	4.0	0	6.71	4.24	3	5.66	6.32	5.10	8.94	11.66
P ₄	2.24	6.71	0	3	6	2.24	3.0	5.39	5.39	7
P ₅	2.83	4.24	3.0	0	3	1.41	3.16	2.83	5.10	7.62
P ₆	5.0	3.0	6.0	3	0	4.12	3.61	2.24	6.40	9.22
P ₇	3.16	5.66	2.24	1.41	4.12	0	2.83	3.46	4.0	6.32
P ₈	5.83	6.32	5.0	3.61	3.61	2.83	0	1.41	2.83	5.66
P ₉	5.66	5.10	5.39	2.83	2.24	1.41	0	4.24	7.07	9.06
P ₁₀	7.07	8.94	5.39	4	6.4	2.03	4.24	0	2.83	0
P ₁₁	9.06	11.66	7	6.32	5.66	7.07	2.83	5.66	7.07	0

Merging P₅, P₇ (1.41) \rightarrow Min. distance

	P ₁ , P ₂	P ₃	P ₄	P ₅ , P ₇	P ₆	P ₈	P ₉	P ₁₀	P ₁₁
P ₁ , P ₂	0	4	2.24	2.83	5	5.83	5.66	7.07	9.06
P ₃	4	0	6.71	4.24	3	6.32	5.10	8.94	11.66
P ₄	2.24	6.71	0	2.24	6	5	5.39	5.39	7
P ₅ , P ₇	2.83	4.24	2.24	0	3	2.83	2.83	4	6.32
P ₆	5	3	6	3	0	3.61	2.24	6.40	9.22
P ₈	5.83	6.32	5	2.83	3.6	0	1.41	2.83	5.66
P ₉	5.66	5.10	5.39	2.83	2.24	1.41	0	4.24	7.07
P ₁₀	7.07	8.94	5.39	4	6.4	2.03	4.24	0	2.83
P ₁₁	9.06	11.66	7	6.32	5.66	7.07	2.83	5.66	7.07

Merging P_8, P_9 (2.24) - Min distance

	P_1, P_2	P_3	P_4	P_5, P_7	P_6	P_8, P_9	P_{10}	P_{11}
P_1, P_2	0	4	2.24	2.83	5	5.66	7.07	9.06
P_3	4	0	6.71	4.24	3	5.10	8.94	11.11
P_4	2.24	6.71	0	2.24	6.	5	5.39	7
P_5, P_7	2.83	4.24	2.24	0	3	2.83	4	6.32
P_6	5	3	6	3	0	2.24	6.40	9.22
P_8, P_9	5.66	5.10	5	2.83	2.24	0	2.83	5.66
P_{10}	7.07	8.94	5.39	4.0	6.40	2.83	0	2.83
P_{11}	9.06	11.66	7	6.32	9.22	5.66	2.83	0

Merging P_1, P_2, P_4 (2.24) - Min distance

	P_1, P_2, P_4	P_3	P_5, P_7	P_6, P_8, P_9	P_{10}	P_{11}
P_1, P_2, P_4	0	4	2.24	5	5.39	7
P_3	4	0	4.24	3	8.94	11.66
P_5, P_7	2.24	4.24	0	2.83	4	6.32
P_6, P_8, P_9	5	3	2.83	0	2.83	5.66
P_{10}	5.39	8.94	4	2.83	0	2.83
P_{11}	7	11.66	6.32	5.66	2.83	0

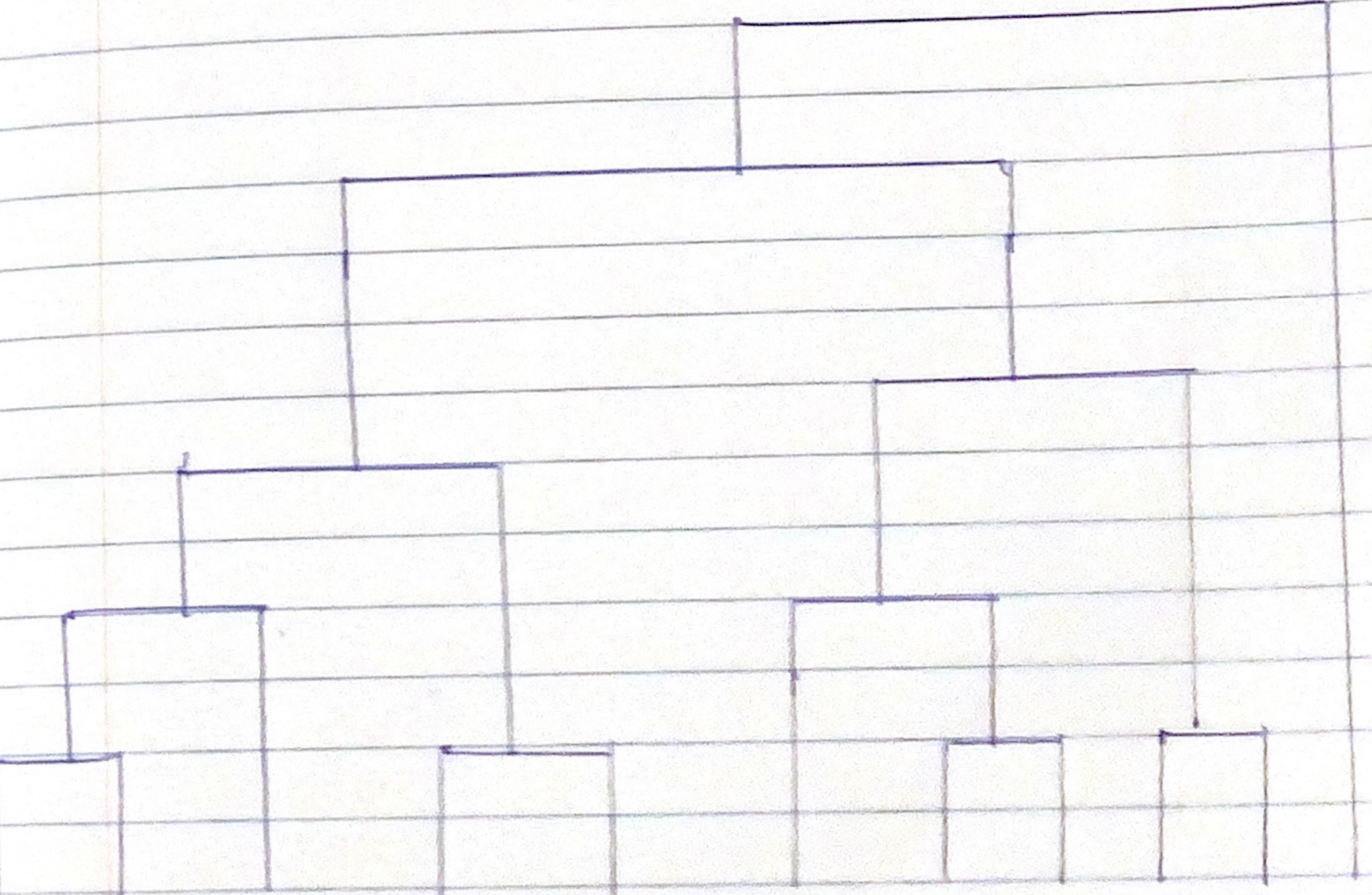
Merging P_1, P_2, P_4, P_5, P_7 (2.24) - Min distance

	P_1, P_2, P_4, P_5, P_7	P_3	P_6, P_8, P_9	P_{10}	P_{11}
P_1, P_2, P_4, P_5, P_7	0	4	2.83	4	6.32
P_3	4	0	3	8.94	11.94
P_6, P_8, P_9	2.83	3	0	2.83	5.66
P_{10}	4	8.94	2.83	0	2.83
P_{11}	6.32	11.94	5.66	2.83	0

Now, Merging P_{10}, P_{11} (2.83) - Min distance.

	P ₁ P ₂ P ₄ P ₅ P ₇	P ₃	P ₆ P ₈ P ₉ P ₁₀ P ₁₁
P ₁ P ₂ P ₄ P ₅ P ₇	0	4	2.83
P ₃	4	0	3
P ₆ P ₈ P ₉ P ₁₀ P ₁₁	2.83	0	2.83
P ₁₀ P ₁₁	4	0.9	2.83
		0	

Dendogram .



Merging P₆ P₈ P₉ P₁₀ P₁₁ (2.83) - Min. dist.

P ₁ P ₂ P ₄ P ₅ P ₇	P ₃	P ₆ P ₈ P ₉ P ₁₀ P ₁₁
P ₁ P ₂ P ₄ P ₅ P ₇	0	4
P ₃	4	0
P ₆ P ₈ P ₉ P ₁₀ P ₁₁	2.83	0

Min distance is 2.83

Finally Merging P₁ P₂ P₄ P₅ P₇ P₆ P₈ P₉ P₁₀ P₁₁

P ₁ P ₂ P ₄ P ₅ P ₇ P ₆ P ₈ P ₉ P ₁₀ P ₁₁	P ₃
P ₁ P ₂ P ₄ P ₅ P ₆	0
P ₇ P ₈ P ₉ P ₁₀ P ₁₁	3
P ₃	0