Problem (2)

Given dissimilarity Matrix

	①	②	③	④
①	—	0.3	0.4	0.7
②	0.3	—	0.5	0.8
③	0.4	0.5	—	0.45
④	0.7	0.8	0.45	—

a) Hierarchial Clustering (Using Complete Linkage)

Step①: minimum dissimilarity is 0.3 between ① & ②.

⇒ So Combine them to form a cluster at height 0.3.

new dissimilarity matrix

	(①,②)	③	④
(①,②)	—	0.5	0.8
③	0.5	—	0.45
④	0.8	0.45	—

Step②: minimum dissimilarity is 0.45 between ③ & ④

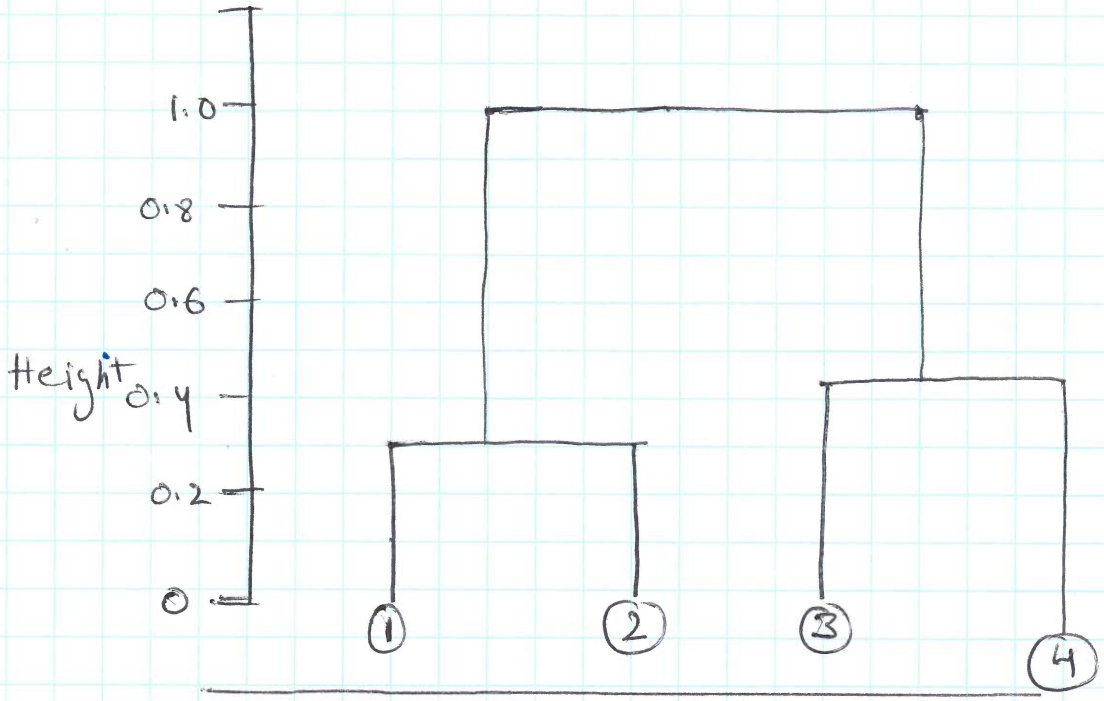
Combine them to form a cluster at height = 0.45.

Reduced dissimilarity matrix

	(①,②)	(③,④)
(①,②)	—	0.8
(③,④)	0.8	—

final step: Combine (①,②) & (③,④) at height at 0.8.

Cluster dendrogram [Complete Linkage]



b) Hierarchical Clustering [Single Linkage]

Step①: minum dissimilarity is 0.3 between ① & ② combine them to form a Cluster at hight = 0.3

⇒ New dissimilarity matrix

	(①,②)	③	④
(①,②)	–	0.4	0.7
③	0.4	–	0.45
④	0.7	0.45	–

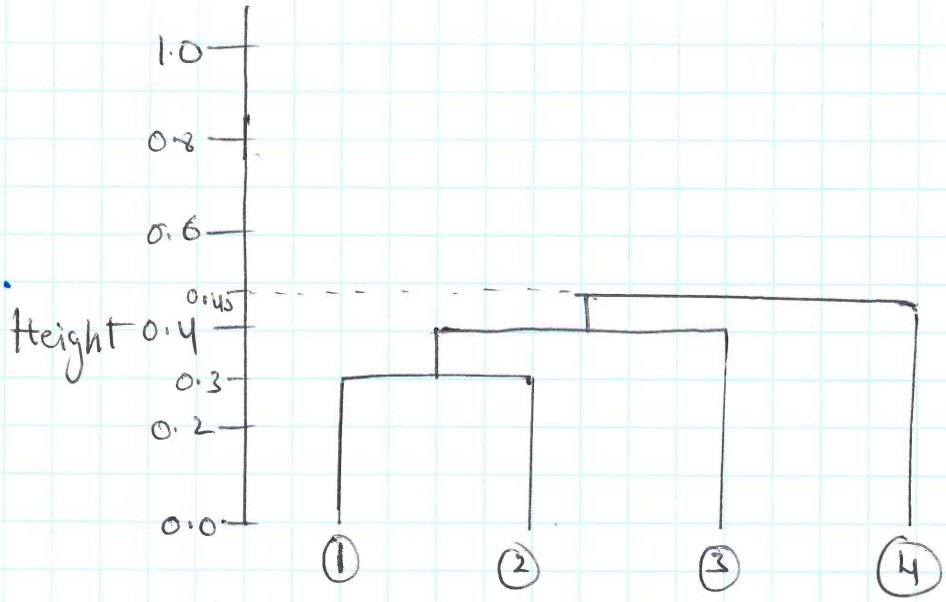
(①,②) ③, ④

⇒ Similarly Clusters will Created with

[(①, ②), ③] at height = 0.4 and

[{(①, ②), ③}, ④] at height = 0.45 .

Cluster dendrogram [Single Linkage]



c) Cut Dendogram from (a) to form two Clusters.

⇒ we have clusters & two Clusters with

(①, ②) & (③, ④)

d) Cut Dendogram from (b) to form two Clusters.

⇒ we have two Clusters with

[(①, ②), ③] and ④

e) Swap observations such that no meaning is changed in dendogram with Complete linkage.

e) Cluster diagram with Swapped Observations [in Complete Linkage Case]