3. ISLR 12.6.2

a) We have dissimilarity matrix. Let A, B, C, D be the datapoints

	A	B	C	D
A	0			
B	0.3	0		
C	0.4	0.5	0	
D	0.7	0.8	0.45	0

After clustering, the first points to cluster are A & B with smallest distance of 0.3 and we get AB

Let us remove A & B entries and add AB. Since we are using complete linkage clustering, the distance b/w 'AB' and every other item is max distance b/w A & B.

$d(C, B) = 0.5$ $d(A, C) = 0.4$ $d(C, AB) = 0.5$

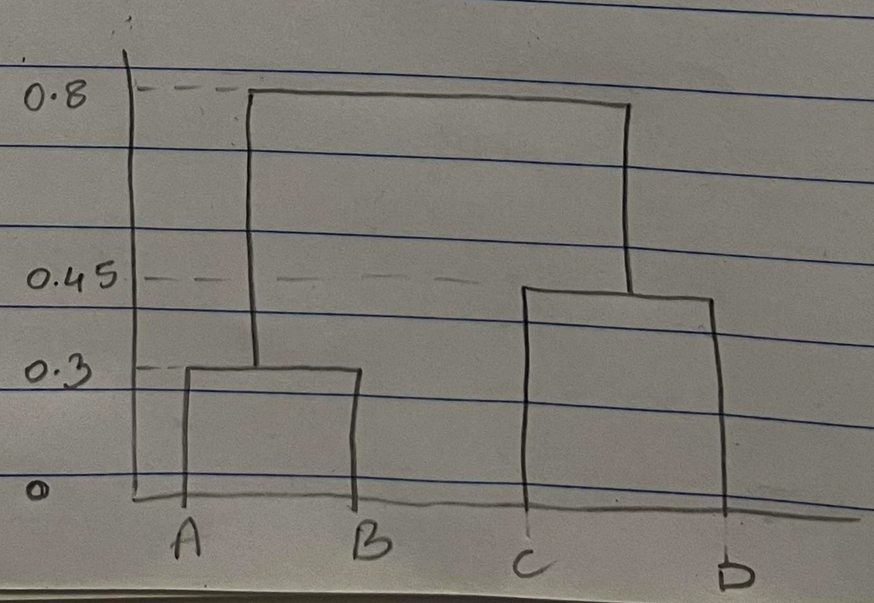
Let us continue till we have 1 cluster.

	AB	C	D
AB	0		
C	0.5	0	
D	0.8	0.45	0

→

	CD	AB
CD	0	
AB	0.8	0

Dendogram.



b) Repeat a) using single linkage clustering [minimum distance b/w clusters]

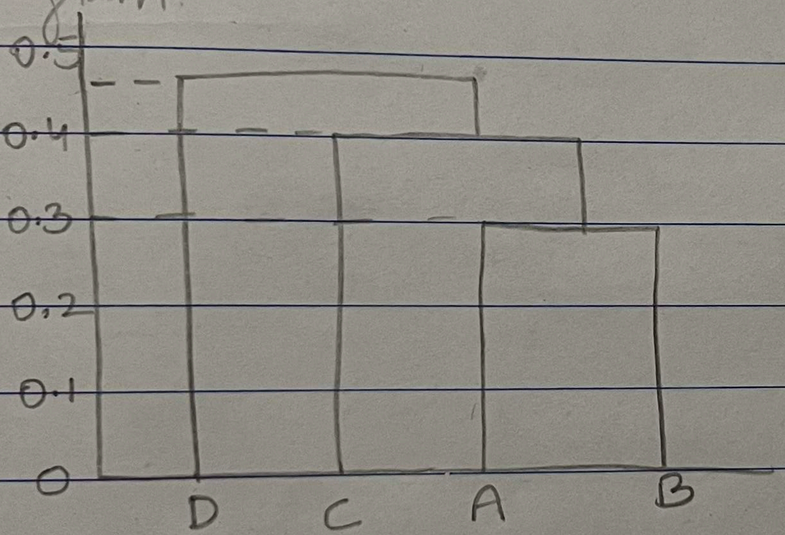
	A	B	C	D
A	0			
B	0.3	0		
C	0.4	0.5	0	
D	0.7	0.8	0.45	0

	AB	C	D
AB	0		
C	0.4	0	
D	0.7	0.45	0

→

	ABC	D
ABC	0	
D	0.45	0

Dendrogram



c) If we cut dendogram in a) into 2 clusters.
cluster 1 : A, B
cluster 2 : C, D

d) If we cut dendogram in b) into 2 clusters
cluster 1 : D
cluster 2 : A, B, C

3. c)