a)

$$\begin{pmatrix} & 0.3 & 0.4 & 0.7 \\ 0.3 & & 0.5 & 0.8 \\ 0.4 & 0.5 & & 0.45 \\ 0.7 & 0.8 & 0.45 & \end{pmatrix}$$

0.3 is minimum., fuse (1,2) at 0.3
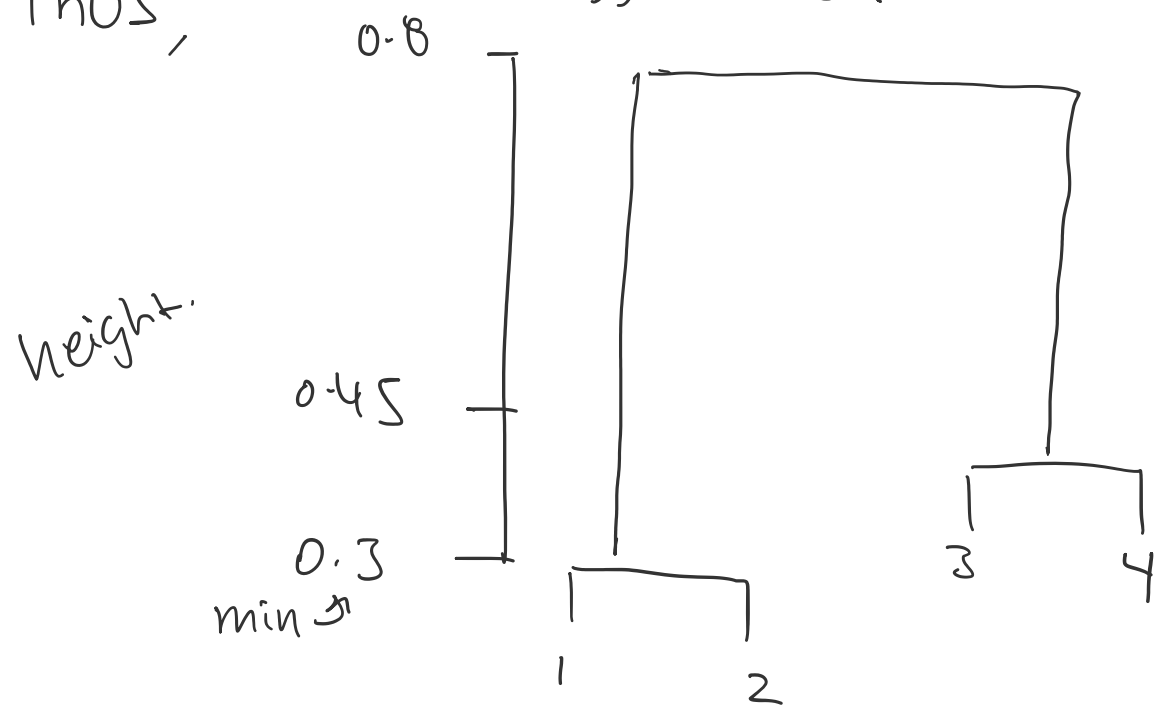Dissimilarity,

$$\begin{pmatrix} & 0.5 & 0.8 \\ 0.5 & & 0.45 \\ 0.8 & 0.45 & \end{pmatrix}$$

— Dissimilarity Matrix.

Min = 0.45, fuse (3,4) at 0.45.
Dissimilarity

$$\begin{pmatrix} & 0.8 \\ 0.8 & \end{pmatrix}$$

Thus, ((1,2), (3,4)) at 0.8.   <cluster Diagram>

height.
0.45
0.3
min

b) single linkage clustering.

$$\begin{pmatrix} & 0.3 & 0.4 & 0.7 \\ 0.3 & & 0.5 & 0.8 \\ 0.4 & 0.5 & & 0.45 \\ 0.7 & 0.8 & & \end{pmatrix}$$
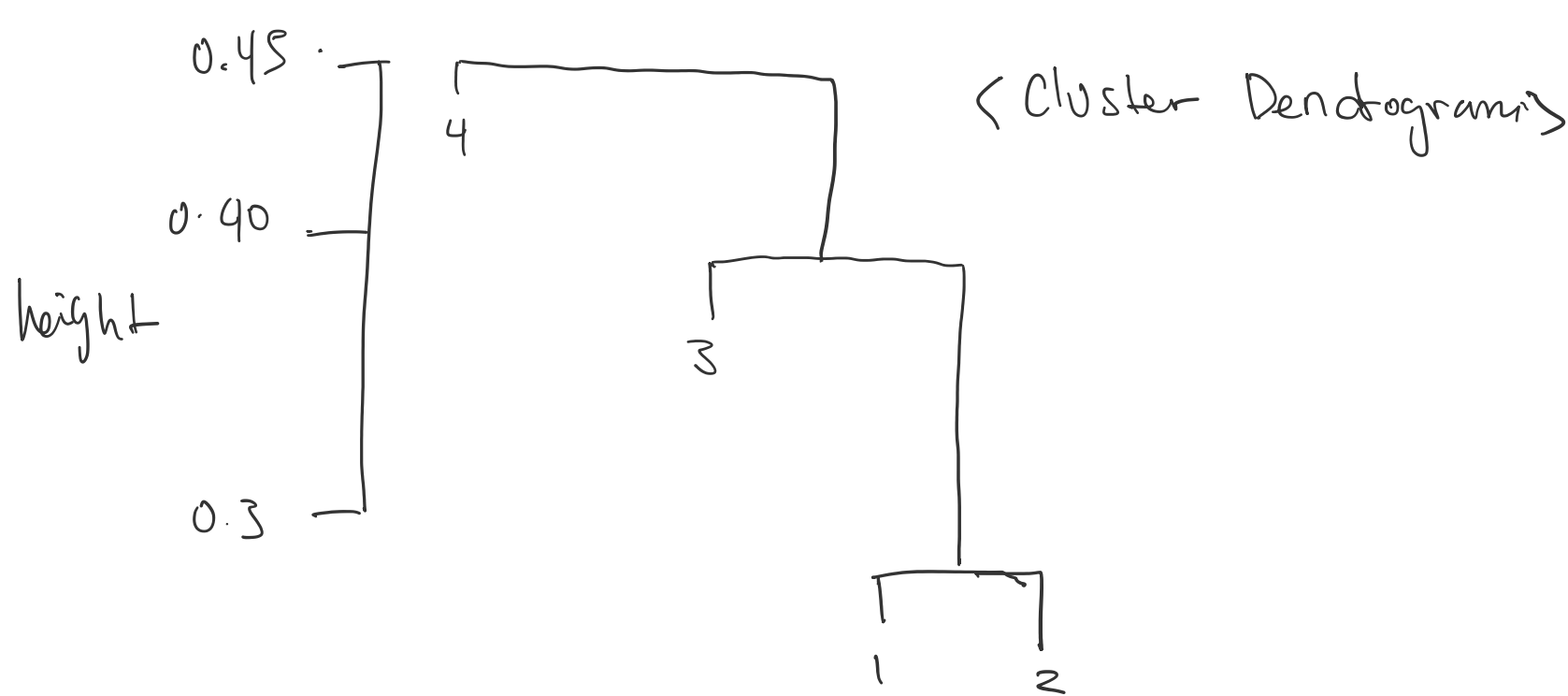
0.3 is min-dissimilarity fuse (1,2) at 0.3.

$$\begin{pmatrix} & 0.4 & 0.7 \\ 0.4 & & 0.45 \\ 0.7 & 0.45 & \end{pmatrix}$$

0.4 is minimum dissimilarity, fuse (1,2)
and cluster 3. ((1,2),3) at height 0.4.

$$\begin{pmatrix} & 0.45 \\ 0.45 & \end{pmatrix}$$

(((1,2), 3), 4) at 0.45.

<Cluster Dendrogram>

0.45
0.40
height
0.3

c) We have clusters (1,2) and (3,4)
                                    from (a).

d) We have clusters ((1,2),3) and (4)
                                    from (b).

e)

Cluster Dendrogram.

height.
0.8
0.45
0.3