

Single link: $\odot \circ \circ \circ$

To protect against potentially merging clusters that have any two observations that are very dissimilar, we can do opposite essentially

"we can look at pairwise combinations of obs. b/w clusters, computing their similarities."

we use min. of those values"

- ~~we~~ this protects us against merging clusters that have anything that is very dissimilar.

Single link - we look at the similarity of maximum diff element
↓ prob; we can merge dissimilar clusters
sol?

complete link - we look at similarity of min. diff element
as final similarity, we just use minimal of those values

(You're using min. similarity as similarity b/w 2 clusters [or max dist b/w 2 clusters] then you merge 2 clusters with largest similarity (or with smallest distance))

* HAC Pseudocode

- $C^{(k)}$ = set of clusters at level k in our tree
- $C_i^{(k)}$ = i^{th} cluster in cluster set $C^{(k)}$
- we start at cluster level $k=N$, & cluster set $C_i^{(k)} = \{x_i\}$ for $i=1, \dots, N$
- while $k \geq 1$
 - find closest clusters $C_a^{(k)}, C_b^{(k)}$
 - Create New Cluster set $C^{(k-1)} = C^{(k)} - \{C_a^{(k)}, C_b^{(k)}\} \cup \{C_{ab}^{(k-1)}\}$
 - Remove $C_a^{(k-1)}, C_b^{(k-1)}$ & add $C_{ab}^{(k-1)}$

* - Now we can find clustering at any k