\[ f(z, w) \] is symmetric in \( w, z \)
02) Use geodesic distance instead of $L_2$ distance

$D(i,j) = ||u_i - u_j||_2$

[same as before]

2) Construct a graph $A$ → adjacency matrix $G$

$G_{ij} = \text{Edge from } i \rightarrow j$ if $j$ is a k-nearest neighbour of $i$

write the distance in $D$

3) Need a distance metric $G$ for Dijkstra code

$G_{ij}$: compute the shortest distance $d_{ij}$ from $i \rightarrow j$ on the graph

Input to Dijkstra code → matrix $G$

$G_{ij} = \infty$ if $i$ is not connected to $j$

else $G_{ij} = d_{ij}$

4) Use distance $d_{ij}$ [output from Dijkstra] instead of $D_{ij}$ in the MOS code.

Subtleties

$G$ needs to be symmetric (graph needs to be undirected)

Don't include the point $i$ in its nearest neighbours $\Rightarrow D(i,i) = \infty$

if graph is disconnected, there might be $(i,j)$ s.t. $d_{ij} = \infty$ in this case just $d_{ij}$ → maximum finite distance across $(i,j)$