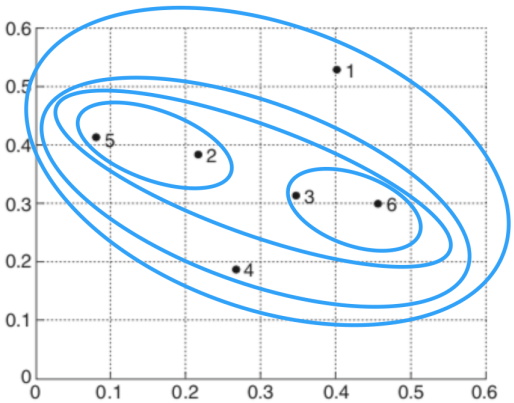
Consider the following points in the 6-dimensional space and the corresponding pairwise distance between these points.



	p1	p2	p3	p4	p5	p6
p1	0.00	0.24	0.22	0.37	0.34	0.23
p2	0.24	0.00	0.15	0.20	0.14	0.25
p3	0.22	0.15	0.00	0.15	0.28	0.11
p4	0.37	0.20	0.15	0.00	0.29	0.22
p5	0.34	0.14	0.28	0.29	0.00	0.39
p6	0.23	0.25	0.11	0.22	0.39	0.00

Apply agglomerative hierarchical clustering on this example using the min distance as a cluster similarity. Compute the proximity matrix over each iteration.

We notice that the smallest distance in the above matrix is between points 3 and 6, therefore we will assign the two in the same cluster and update the distance matrix as follows:

	1	2	$\{3,6\}$	4	5
1	0	0.24	0.22	0.37	0.34
2	0.24	0	0.15	0.20	0.14
$\{3,6\}$	0.22	0.15	0	0.15	0.28
4	0.37	0.20	0.15	0	0.29
5	0.34	0.14	0.28	0.29	0

Points 2 and 5 have the smallest distance, therefore the new distance matrix becomes as follows:

	1	$\{2,5\}$	$\{3,6\}$	4
1	0	0.24	0.22	0.37
$\{2,5\}$	0.24	0	0.15	0.20
$\{3,6\}$	0.22	0.15	0	0.15
4	0.37	0.20	0.15	0

Cluster $\{2,5\}$ and cluster $\{3,6\}$ have the smallest distance, therefore the new distance matrix becomes as follows:

	1	$\{2,5,3,6\}$	4
1	0	0.22	0.37
$\{2,5,3,6\}$	0.22	0	0.15
4	0.37	0.15	0

Cluster $\{2,5\}$ and cluster $\{3,6\}$ have the smallest distance, therefore the new distance matrix becomes as follows:

	1	$\{2,5,3,6\}$	4
1	0	0.22	0.37
$\{2,5,3,6\}$	0.22	0	0.15
4	0.37	0.15	0

We finally merge cluster $\{2,5,3,6\}$ with point 4:

	1	$\{2,5,3,6,4\}$
1	0	0.22
$\{2,5,3,6,4\}$	0.22	0

Below is the resulting dendrogram for this example: