Set of points:

1, 4, 9, 16, 25, 36, 49, 64, 81

Algorithm:

WHILE it is not time to stop DO
    pick the best two clusters to merge;
    combine those two clusters into one cluster;
END;

Start:

Cluster centroid pair	1 – 4	4 - 9	9 - 16	16 -25	25 - 36	36 - 49	49 -64	64 -81	
Distance	3	5	7	9	11	13	15	17	
Cluster	1	4	9	16	25	36	49	64	81
Centroid	1	4	9	16	25	36	49	64	81

Iteration 1:

Pair 1 and 4 has the shortest distance, merge them,

Cluster centroid pair	2.5 – 9	9 - 16	16 -25	25 - 36	36 - 49	49 -64	64 -81		
Distance	6.5	7	9	11	13	15	17		
Cluster	(1, 4)		9	16	25	36	49	64	81
Centroid	2.5		9	16	25	36	49	64	81

Iteration 2:

Pair 2.5 and 9 has the shortest distance, merge them,

Cluster centroid pair	4.67 – 16	16 - 25	25 - 36	36 - 49	49 -64	64 -81			
Distance	11.3	9	11	13	15	17			
Cluster	(1, 4, 9)			16	25	36	49	64	81
Centroid	4.67			16	25	36	49	64	81

Iteration 3:

Pair 16 and 25 has the shortest distance, merge them,

Cluster centroid pair	4.67 – 20.5	20.5 - 36	36 - 49	49 -64	64 -81				
Distance	15.8	15.5	13	15	17				
Cluster	(1, 4, 9)			(16, 25)		36	49	64	81
Centroid	4.67			20.5		36	49	64	81

Iteration 4:

Pair 36 and 49 has the shortest distance, merge them,

Cluster centroid pair	4.67 – 20.5	20.5 - 42.5	42.5 - 64	64 -81				
Distance	15.8	22	21.5	17				
Cluster	(1, 4, 9)		(16, 25)		(36, 49)		64	81
Centroid	4.67		20.5		42.5		64	81

Iteration 5:

Pair 4.67 and 20.5 has the shortest distance, merge them,

Cluster centroid pair	11 – 42.5	42.5 - 64	64 -81				
Distance	31.5	21.5	17				
Cluster	(1, 4, 9, 16, 25)			(36, 49)		64	81
Centroid	11			42.5		64	81

Iteration 6:

Pair 64 and 81 has the shortest distance, merge them,

Cluster centroid pair	11 – 42.5	42.5 – 72.5		
Distance	31.5	30		
Cluster	(1, 4, 9, 16, 25)		(36, 49)	(64, 81)
Centroid	11		42.5	72.5

Iteration 7:

Pair 42.5 and 72.5 has the shortest distance, merge them,

Cluster centroid pair	11 – 57.5		
Distance	46.5		
Cluster	(1, 4, 9, 16, 25)		(36, 49, 64, 81)
Centroid	11		57.5

Iteration 8:

Pair 11and 57.5 has the shortest distance, merge them,

Cluster centroid pair	
Distance	
Cluster	(1, 4, 9, 16, 25, 36, 49, 64, 81)
Centroid	31.7