3. Solution:

Given data,

Point	A	B
1	1.0	1.0
2	1.5	2.0
3	3.0	4.0
4	5.0	7.0
5	3.5	5.0
6	4.5	5.0
7	3.5	4.5

Let us consider the initial means as point 1,2.

	Point	Mean Vector (centroid)
Group 1	1	(1.0, 1.0)
Group 2	2	(1.5, 2.0)

The remaining points are now examined in sequence and allocated to the cluster to which they are closest, in terms of Euclidean distance to the cluster mean. The mean vector is recalculated each time a new member is added. This leads to the following series of steps

	Cluster 1		Cluster 2	
Step	Point	Mean Vector (centroid)	Point(s)	Mean Vector (centroid)
1	1	(1.0, 1.0)	2	(1.5, 2.0)
2	1	(1.0, 1.0)	2,3	(2.25, 3)
3	1	(1.0, 1.0)	2,3,4	(3.625, 5)
4	1	(1.0, 1.0)	2,3,4,5	(3.5625, 5)
5	1	(1.0, 1.0)	2,3,4,5,6	(4.03125, 5)
6	1	(1.0, 1.0)	2,3,4,5,6,7	(3.765625,4.75)

Now the initial partition has changed, and the two clusters at this stage having the following characteristics:

	Point(s)	Mean Vector (centroid)
Cluster 1	1	(1.0, 1.0)
Cluster 2	2,3,4, 5, 6, 7	(3.765625, 4.75)

But we cannot yet be sure that each point has been assigned to the right cluster. So, we compare each point's distance to its own cluster mean and to that of the opposite cluster. And we find:

Point	Distance to mean (centroid) of Cluster 1	Distance to mean (centroid) of Cluster 2
1	0	2.5525
2	1.118	3.563
3	3.6055	1.0717
4	7.2110	2.5663
5	4.7169	0.36476
6	5.315	0.7757
7	4.3	0.36476

From the above table we can observe that point 2's distance from its own cluster mean is greater than the other cluster's mean. Thus, point 2 is relocated to Cluster 1 resulting in the new partition:

	Point	Mean Vector (centroid)
Cluster 1	1, 2	(1.25, 1.5)
Cluster 2	3, 4, 5, 6, 7	(3.9, 5.1)

The iterative relocation would now continue from this new partition until no more relocations occur. However, in this example each point is now nearer its own cluster mean than that of the other cluster and the iteration stops, choosing the latest partitioning as the final cluster solution.