

**Answer:**

Step 1:

Select the data points p6 and p7. Merge them into single cluster. The modified proximity matrix is,

	p1	p2	p3	p4	p5	p6, p7	p8
p1	0	10	14	2	5	13	15
p2	10	0	3	10	12	10	6
p3	14	3	0	13	16	12	6
p4	2	10	13	0	4	9	12
p5	5	12	16	4	0	7	14
p6, p7	13	10	12	9	7	1	8
p8	15	6	6	12	14	8	0

Step 2:

Select data points p4, p5. Merge them into single cluster. The modified proximity matrix is,

	p1	p2	p3	p4, p5	p6, p7	p8
p1	0	10	14	5	13	15
p2	10	0	3	12	10	6
p3	14	3	0	16	12	6
p4, p5	5	12	16	0	9	14
p6, p7	13	10	12	9	1	8
p8	15	6	6	14	8	0

Step 3:

Select data points p2, p3. Merge them into single cluster. The modified proximity matrix is,

	p1	p2, p3	p4, p5	p6, p7	p8
p1	0	14	5	13	15
p2, p3	14	0	16	12	6
p4, p5	5	16	0	9	14
p6, p7	13	12	9	1	8
p8	15	6	14	8	0

Step 4:

Select data points p8 and merge it with cluster (p2, p3). The modified proximity matrix is,

	p1	p4, p5	p6, p7	p2, p3, p8
p1	0	5	13	15
p4, p5	5	0	9	16
p6, p7	13	9	1	12
p2, p3, p8	15	14	8	0

Step 5:

Merge cluster (p6, p7) with cluster (p2, p3, p8). The modified proximity matrix is,

	p1	p4, p5	p2, p3, p6, p7, p8
p1	0	5	15
p4, p5	5	0	16
p2, p3, p6, p7, p8	13	9	0

Step 6:

Merge p1 with cluster (p4, p5). The modified proximity matrix is,

	p1, p4, p5	p2, p3, p6, p7, p8
p1, p4, p5	0	16
p2, p3, p6, p7, p8	16	0