1. A set of one-dimensional data points is given to you: 5, 10, 15, 20, 25, 30, 35. Assume that k = 2 and that the first set of random centroid is 15, 32, and that the second set is 12, 30.

a) Using the k-means method, create two clusters for each set of centroid described above.

b) For each set of centroid values, calculate the SSE.

2. Describe how the Market Basket Research makes use of association analysis concepts.

3. Give an example of the Apriori algorithm for learning association rules.

4. In hierarchical clustering, how is the distance between clusters measured? Explain how this metric is used to decide when to end the iteration.

5. In the k-means algorithm, how do you recompute the cluster centroids?

6. At the start of the clustering exercise, discuss one method for determining the required number of clusters.

7. Discuss the k-means algorithm's advantages and disadvantages.

8. Draw a diagram to demonstrate the principle of clustering.

9. During your study, you discovered seven findings, which are listed in the data points below. Using the K-means algorithm, you want to build three clusters from these observations. The clusters C1, C2, and C3 have the following findings after the first iteration:

C1: (2,2), (4,4), (6,6); C2: (2,2), (4,4), (6,6); C3: (2,2), (4,4),

C2: (0,4), (4,0), (0,4), (0,4), (0,4), (0,4), (0,4), (0,4), (0,

C3: (5,5) and (9,9)

What would the cluster centroids be if you were to run a second iteration? What would this clustering's SSE be?

10. In a software project, the team is attempting to determine if software flaws discovered during testing are identical. Based on the text analytics of the defect details, they decided to build 5 clusters of related defects. Any new defect formed after the 5 clusters of defects have been identified must be listed as one of the forms identified by clustering. A simple diagram can be used to explain this process. Assume you have 20 defect data points that are clustered into 5 clusters and you used the k-means algorithm.