

❖ **Question 4:**

➤ Part (a) :

- Output of the algorithm for initial seeds {1,11,28} :

```
Number of iterations = 1
Cluster #0
-----
[[1], [2], [3], [4], [5]]
-----
Cluster #1
-----
[[8], [9], [10], [11], [12]]
-----
Cluster #2
-----
[[24], [28], [32], [36], [40]]
-----
```

- Yes, the algorithm is working correctly.

➤ Part (b) :

- Output of the algorithm for initial seeds {1,2,3} :

```
Number of iterations = 4
Cluster #0
-----
[[1], [2], [3], [4], [5]]
-----
Cluster #1
-----
[[8], [9], [10], [11], [12]]
-----
Cluster #2
-----
[[24], [28], [32], [36], [40]]
-----
```

- Yes, the algorithm is working correctly.

➤ Part (c) :

- The initial seeds should be well separated from each other. This results in lower iterations required for clustering and thus, saves computing time for achieving the same result.
- Therefore, we should choose initial seeds uniformly at random from the entire data space.