K = 3

Center K

1. Randomly any point
2. Randomly select k point from dataset
3. Distance of all cluster and assign that point to cluster which is minimum
4. Calculate new center
5. If changed repeat from 3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 1, 2 | 2, 10 | 8, 4 |  |
| 1, 2 | 0 | 8.06 | 7.28 | C1 |
| 2, 5 | 3.16 | 5 | 6.06 | C1 |
| 4, 9 | 7.61 | 2.23 | 6.4 | C2 |
| 2, 10 | 8.06 | 0 | 8.48 | C2 |
| 5, 6 | 5.65 | 5 | 3.6 | C3 |
| 6, 4 | 5,38 | 7.21 | 2 | C3 |
| 7, 5 | 6.71 | 7.07 | 1.414 | C3 |
| 8, 4 | 7.28 | 8.48 | 0 | C3 |

C1 = (((1 + 2) / 2), ((2 + 5) / 2)) = (1.5, 3.5)

C2 = (3, 9.5)

C3 = (6.5, 4.75)

There is no train, test and validation in the K means clustering

Elbow point