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CS 1675

Assignment 9 Report

Due: 4/4/2019

1a)

|  |  |  |
| --- | --- | --- |
| Initial | Group | Mean |
| (0,0) | (0,0), (0,5) | (0,2.5) |
| (7,0) | (7,0), (6,7) | (6.5,3.5) |

1b)

|  |  |  |
| --- | --- | --- |
| Initial | Group | Mean |
| (3,3) | (0,0), (0,5), (6,7) | (2,4) |
| (7,0) | (7,0) | (7,0) |

2a)



2b)



2c)



2d) ∑i=1:k ∑x∈S ||xj – ui||2 ; ui = center of cluster Si

2e)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Run Number | Cluster sizes | | | | Squared center-point distance |
| 1 | 98 | 13 | 23 | 66 | 83.25532 |
| 2 | 54 | 36 | 50 | 60 | 82.28501 |
| 3 | 53 | 36 | 26 | 85 | 84.28826 |
| 4 | 61 | 42 | 36 | 61 | 93.50957 |
| 5 | 66 | 26 | 98 | 10 | 82.76624 |
| 6 | 18 | 66 | 98 | 18 | 96.06501 |
| 7 | 36 | 52 | 49 | 63 | 83.25532 |
| 8 | 36 | 61 | 63 | 40 | 82.26381 |
| 9 | 36 | 64 | 61 | 39 | 83.39203 |
| 10 | 36 | 85 | 26 | 53 | 82.76624 |
| 11 | 36 | 89 | 29 | 46 | 84.28826 |
| 12 | 65 | 36 | 39 | 60 | 82.26381 |
| 13 | 36 | 46 | 89 | 29 | 96.74932 |
| 14 | 69 | 32 | 36 | 63 | 82.28501 |
| 15 | 39 | 64 | 61 | 36 | 81.7123 |
| **16** | **85** | **26** | **36** | **53** | **81.64533 (min)** |
| 17 | 98 | 66 | 24 | 12 | 82.76624 |
| 18 | 36 | 63 | 69 | 32 | 96.57665 |
| 19 | 49 | 36 | 52 | 63 | 83.18148 |
| 20 | 52 | 49 | 63 | 36 | 82.28501 |
| 21 | 10 | 66 | 98 | 26 | 83.18148 |
| 22 | 26 | 36 | 51 | 87 | 96.57665 |
| 23 | 61 | 52 | 36 | 51 | 83.25532 |
| 24 | 36 | 64 | 61 | 39 | 96.57665 |
| 25 | 52 | 36 | 61 | 51 | 83.39203 |
| 26 | 40 | 36 | 61 | 63 | 83.18148 |
| 27 | 96 | 40 | 36 | 28 | 94.96022 |
| 28 | 18 | 66 | 98 | 18 | 96.57665 |
| 29 | 49 | 36 | 52 | 63 | 82.26381 |
| 30 | 51 | 50 | 36 | 63 | 82.26381 |



3a)



3b)



The clusters in problem 2e are different than the above clusters found using the linkage and cluster functions. Using the kmeans function can make different sets of clusters but have the same squared center-point distance, however.