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CS 1675

Assignment 9 Report

Due: 4/4/2019

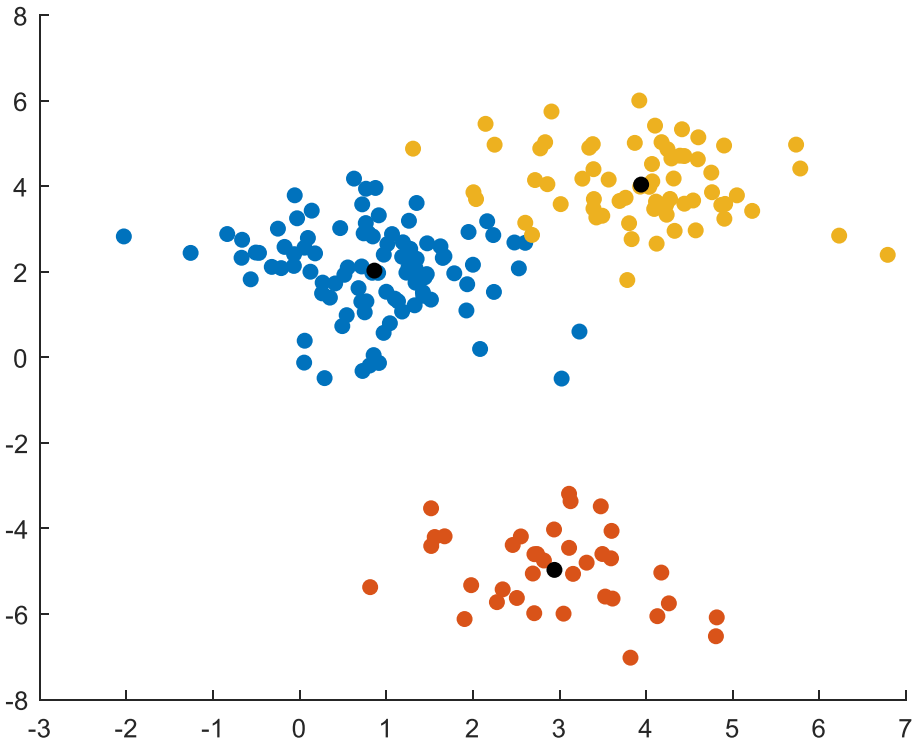
1a)

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

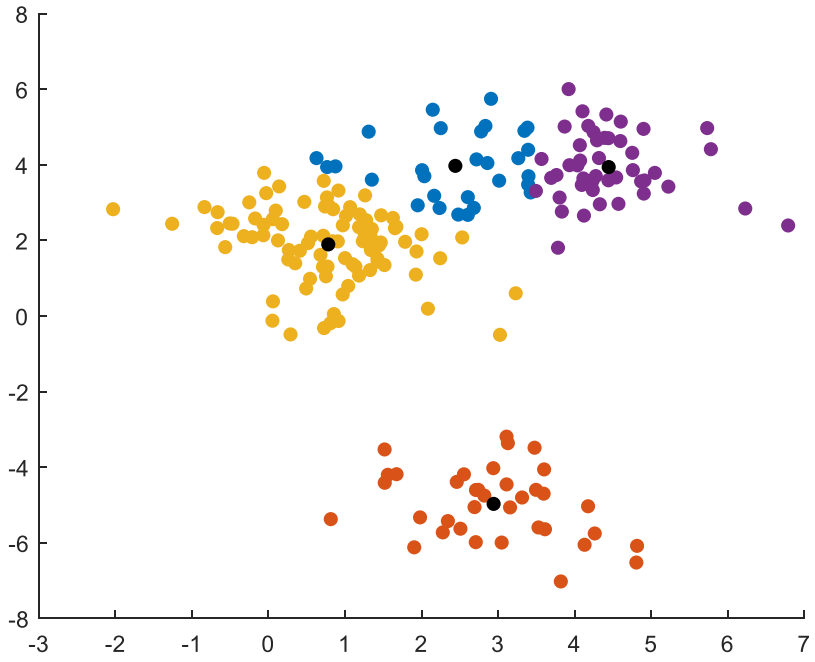
1b)

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

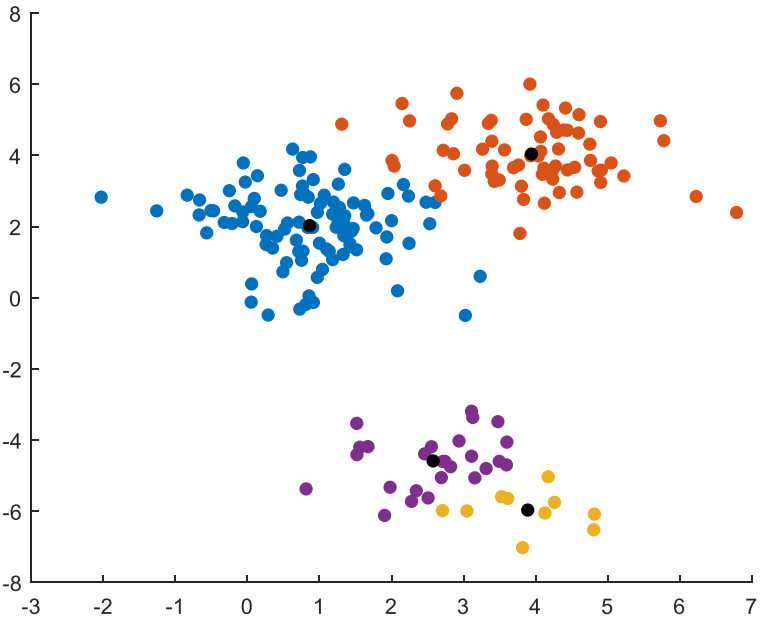
2a)



2b)



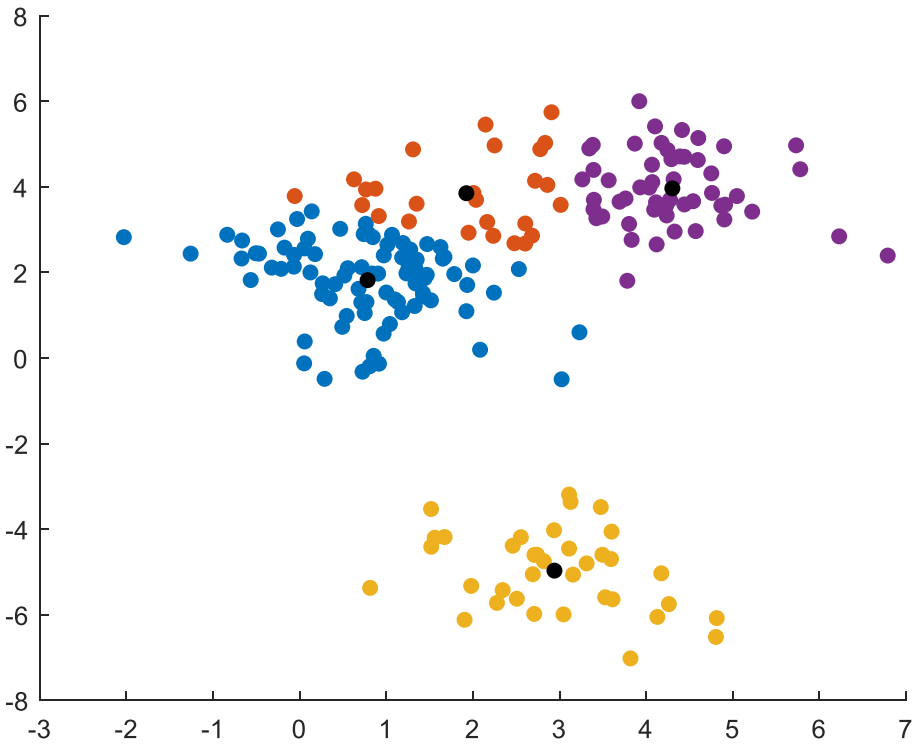
2c)



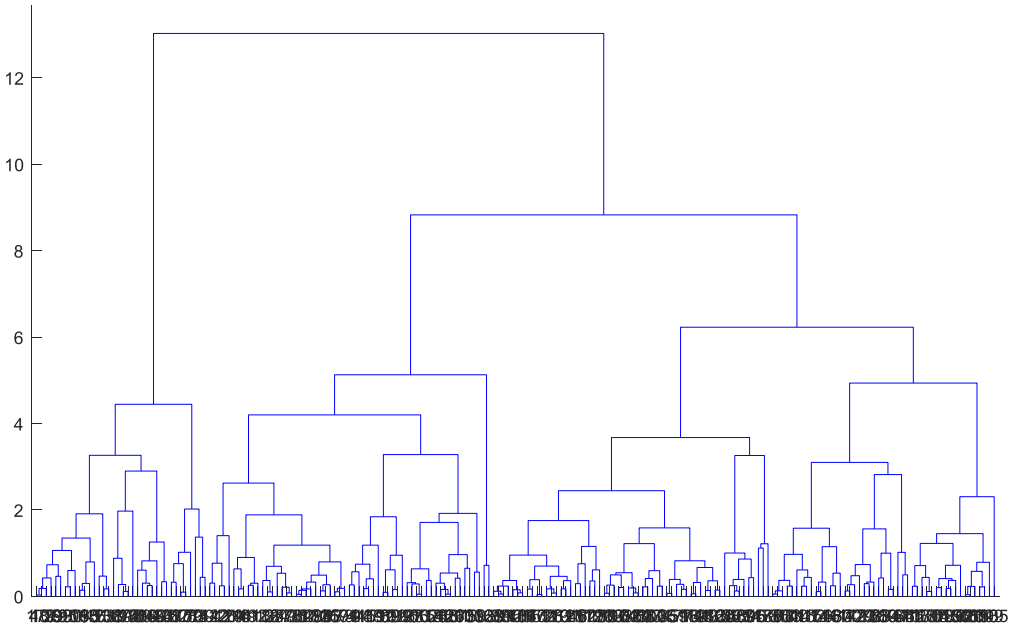
2d) $\sum_{i=1:k} \sum_{x \in S} ||x_j - u_i||^2$; u_i = center of cluster S_i

2e)

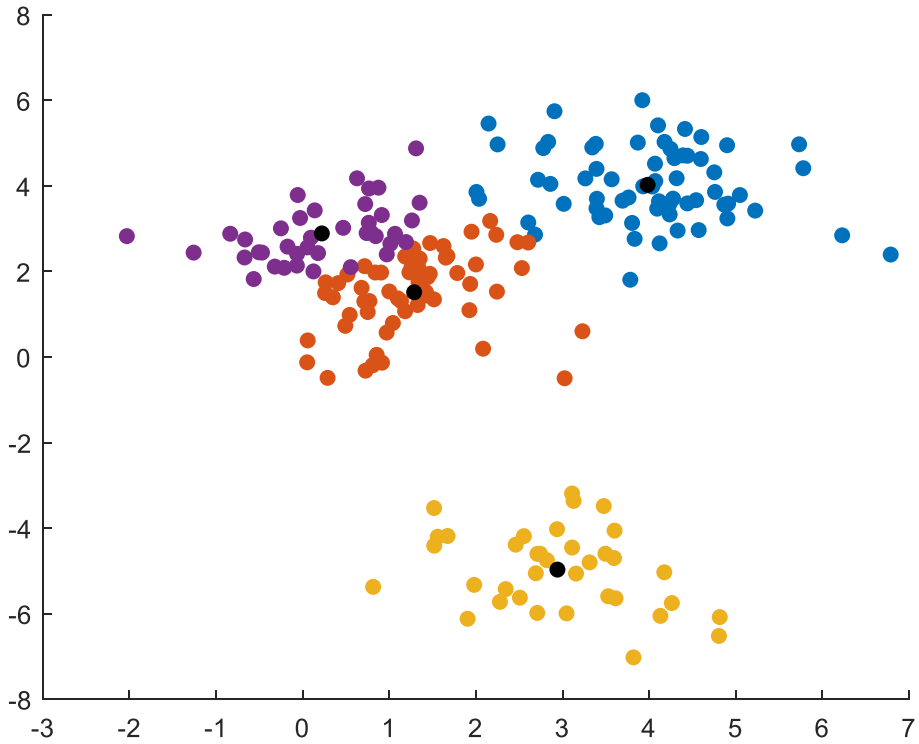
Run Number	Cluster sizes				Squared center-point distance
1	98	13	23	66	83.25532
2	54	36	50	60	82.28501
3	53	36	26	85	84.28826
4	61	42	36	61	93.50957
5	66	26	98	10	82.76624
6	18	66	98	18	96.06501
7	36	52	49	63	83.25532
8	36	61	63	40	82.26381
9	36	64	61	39	83.39203
10	36	85	26	53	82.76624
11	36	89	29	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.