

```

1 C:\Users\nguye\.virtualenvs\lab4_clustering\Scripts\
  python.exe "C:/Users/nguye/OneDrive/Documents/
  HpSepctrex360/GeneralClassDownloads/CSC 466/
  lab4_clustering/clustering/hclustering.py" ./data/
  iris.csv 0.4438313346836665
2      sepal_length  sepal_width  petal_length
  petal_width
3 0              0.0              0.0              0.0              0.
  375
4
5      sepal_length  sepal_width  petal_length
  petal_width
6 16      0.681159      1.000000      0.084746      0.
  125000
7 17      0.637681      0.852941      0.050847      0.
  125000
8 19      0.681159      0.823529      0.118644      0.
  083333
9 11      0.637681      0.794118      0.084746      0.
  041667
10 49      0.623188      0.794118      0.084746      0.
  041667
11 20      0.594203      0.823529      0.084746      0.
  083333
12 47      0.594203      0.823529      0.101695      0.
  041667
13 22      0.594203      0.794118      0.084746      0.
  125000
14 6       0.637681      0.852941      0.118644      0.
  125000
15 45      0.594203      0.823529      0.152542      0.
  125000
16 15      0.695652      0.882353      0.033898      0.
  041667
17 33      0.608696      0.911765      0.084746      0.
  000000
18 34      0.652174      0.941176      0.067797      0.
  041667
19 42      0.507246      0.382353      0.050847      0.
  083333
20 14      0.478261      0.588235      0.016949      0.

```

20	000000				
21	9	0.492754	0.558824	0.067797	0.
	041667				
22	39	0.492754	0.588235	0.050847	0.
	041667				
23	23	0.521739	0.764706	0.000000	0.
	041667				
24	44	0.579710	0.735294	0.101695	0.
	208333				
25	32	0.637681	0.705882	0.084746	0.
	125000				
26	24	0.594203	0.676471	0.118644	0.
	166667				
27	27	0.579710	0.705882	0.101695	0.
	125000				
28	21	0.637681	0.705882	0.118644	0.
	041667				
29	37	0.652174	0.735294	0.050847	0.
	041667				
30	5	0.579710	0.764706	0.067797	0.
	041667				
31	18	0.594203	0.735294	0.067797	0.
	083333				
32	41	0.579710	0.735294	0.050847	0.
	083333				
33	1	0.594203	0.735294	0.067797	0.
	041667				
34	28	0.608696	0.735294	0.084746	0.
	041667				
35	29	0.608696	0.705882	0.067797	0.
	041667				
36	8	0.579710	0.705882	0.084746	0.
	041667				
37	40	0.594203	0.705882	0.084746	0.
	041667				
38	36	0.579710	0.647059	0.033898	0.
	041667				
39	50	0.579710	0.676471	0.067797	0.
	041667				
40	46	0.550725	0.588235	0.067797	0.
	083333				

41	4	0.521739	0.617647	0.084746	0.
	041667				
42	30	0.536232	0.647059	0.101695	0.
	041667				
43	31	0.550725	0.617647	0.101695	0.
	041667				
44	43	0.492754	0.647059	0.050847	0.
	041667				
45	3	0.536232	0.647059	0.050847	0.
	041667				
46	48	0.521739	0.647059	0.067797	0.
	041667				
47	2	0.565217	0.588235	0.067797	0.
	041667				
48	26	0.579710	0.588235	0.101695	0.
	041667				
49	38	0.565217	0.617647	0.084746	0.
	000000				
50	35	0.565217	0.617647	0.084746	0.
	000000				
51	10	0.565217	0.617647	0.084746	0.
	000000				
52	13	0.550725	0.588235	0.067797	0.
	000000				
53	7	0.521739	0.705882	0.067797	0.
	083333				
54	12	0.550725	0.705882	0.101695	0.
	041667				
55	25	0.550725	0.705882	0.152542	0.
	041667				
56					
57	sepal_length	sepal_width	petal_length		
	petal_width				
58	107	0.565217	0.441176	0.593220	0.
	666667				
59	88	0.768116	0.382353	0.576271	0.
	500000				
60	69	0.753623	0.352941	0.593220	0.
	583333				
61	120	0.724638	0.352941	0.677966	0.
	583333				

62	135 541667	0.739130	0.470588	0.779661	0.
63	73 583333	0.768116	0.441176	0.661017	0.
64	84 625000	0.724638	0.500000	0.694915	0.
65	134 583333	0.768116	0.529412	0.694915	0.
66	74 458333	0.739130	0.529412	0.627119	0.
67	55 583333	0.797101	0.529412	0.610169	0.
68	59 500000	0.811594	0.558824	0.610169	0.
69	77 541667	0.840580	0.529412	0.644068	0.
70	66 541667	0.826087	0.617647	0.576271	0.
71	76 541667	0.811594	0.588235	0.576271	0.
72	51 541667	0.869565	0.647059	0.627119	0.
73	53 583333	0.855072	0.617647	0.661017	0.
74	87 583333	0.826087	0.617647	0.627119	0.
75	52 583333	0.782609	0.647059	0.593220	0.
76	57 625000	0.768116	0.676471	0.627119	0.
77	86 625000	0.724638	0.705882	0.593220	0.
78	67 583333	0.666667	0.588235	0.593220	0.
79	85 583333	0.637681	0.588235	0.593220	0.
80	62 583333	0.710145	0.588235	0.542373	0.
81	79 583333	0.724638	0.558824	0.593220	0.
82	64	0.739130	0.558824	0.627119	0.

82	541667				
83	92	0.739130	0.588235	0.610169	0.
	541667				
84	60	0.608696	0.500000	0.491525	0.
	541667				
85	65	0.666667	0.558824	0.440678	0.
	500000				
86	54	0.652174	0.382353	0.508475	0.
	500000				
87	90	0.652174	0.441176	0.508475	0.
	500000				
88	80	0.681159	0.470588	0.423729	0.
	375000				
89	82	0.652174	0.411765	0.457627	0.
	375000				
90	70	0.666667	0.441176	0.491525	0.
	416667				
91	81	0.652174	0.411765	0.474576	0.
	416667				
92	68	0.695652	0.500000	0.525424	0.
	375000				
93	91	0.652174	0.470588	0.576271	0.
	458333				
94	83	0.695652	0.500000	0.491525	0.
	458333				
95	93	0.695652	0.470588	0.508475	0.
	458333				
96	72	0.739130	0.529412	0.508475	0.
	500000				
97	75	0.782609	0.558824	0.559322	0.
	500000				
98	98	0.753623	0.558824	0.559322	0.
	500000				
99	89	0.666667	0.588235	0.525424	0.
	500000				
100	96	0.681159	0.588235	0.542373	0.
	458333				
101	56	0.681159	0.529412	0.593220	0.
	500000				
102	95	0.666667	0.500000	0.542373	0.
	500000				

103	97	0.681159	0.558824	0.542373	0.
	500000				
104	100	0.681159	0.529412	0.525424	0.
	500000				
105	63	0.724638	0.352941	0.508475	0.
	375000				
106	61	0.579710	0.294118	0.423729	0.
	375000				
107	99	0.594203	0.441176	0.338983	0.
	416667				
108	58	0.565217	0.411765	0.389831	0.
	375000				
109	94	0.579710	0.382353	0.389831	0.
	375000				
110					
111	sepal_length	sepal_width	petal_length		
	petal_width				
112	115	0.695652	0.529412	0.694915	0.
	958333				
113	103	0.884058	0.588235	0.830508	0.
	833333				
114	105	0.797101	0.588235	0.813559	0.
	875000				
115	129	0.782609	0.529412	0.779661	0.
	833333				
116	133	0.782609	0.529412	0.779661	0.
	875000				
117	125	0.826087	0.676471	0.796610	0.
	833333				
118	113	0.840580	0.588235	0.762712	0.
	833333				
119	140	0.855072	0.617647	0.745763	0.
	833333				
120	111	0.797101	0.647059	0.694915	0.
	791667				
121	148	0.797101	0.588235	0.711864	0.
	791667				
122	142	0.855072	0.617647	0.694915	0.
	916667				
123	146	0.826087	0.588235	0.711864	0.
	916667				

124	116	0.782609	0.647059	0.728814	0.
	916667				
125	137	0.768116	0.705882	0.779661	0.
	958333				
126	149	0.753623	0.705882	0.745763	0.
	916667				
127	141	0.826087	0.617647	0.779661	0.
	958333				
128	121	0.855072	0.647059	0.796610	0.
	916667				
129	144	0.840580	0.647059	0.830508	0.
	916667				
130	101	0.768116	0.676471	0.847458	1.
	000000				
131	145	0.826087	0.676471	0.796610	1.
	000000				
132	114	0.681159	0.441176	0.677966	0.
	791667				
133	143	0.695652	0.500000	0.694915	0.
	750000				
134	102	0.695652	0.500000	0.694915	0.
	750000				
135	122	0.666667	0.529412	0.661017	0.
	791667				
136	124	0.768116	0.500000	0.661017	0.
	708333				
137	127	0.753623	0.529412	0.644068	0.
	708333				
138	112	0.782609	0.500000	0.728814	0.
	750000				
139	147	0.768116	0.441176	0.677966	0.
	750000				
140	71	0.710145	0.647059	0.644068	0.
	708333				
141	150	0.710145	0.588235	0.694915	0.
	708333				
142	128	0.739130	0.588235	0.661017	0.
	708333				
143	139	0.724638	0.588235	0.644068	0.
	708333				
144	78	0.826087	0.588235	0.677966	0.

144	666667				
145	104	0.768116	0.558824	0.779661	0.
	708333				
146	117	0.797101	0.588235	0.762712	0.
	708333				
147	138	0.782609	0.617647	0.762712	0.
	708333				
148	109	0.826087	0.441176	0.813559	0.
	708333				
149	108	0.913043	0.558824	0.898305	0.
	708333				
150	131	0.927536	0.529412	0.864407	0.
	750000				
151	126	0.898551	0.647059	0.847458	0.
	708333				
152	130	0.898551	0.588235	0.813559	0.
	625000				
153	119	0.971014	0.470588	1.000000	0.
	916667				
154	136	0.971014	0.588235	0.864407	0.
	916667				
155	106	0.956522	0.588235	0.949153	0.
	833333				
156	123	0.971014	0.529412	0.966102	0.
	791667				
157	110	0.898551	0.764706	0.864407	1.
	000000				
158	118	0.971014	0.823529	0.966102	0.
	875000				
159	132	1.000000	0.823529	0.915254	0.
	791667				
160					
161	cluster sse: 0.07758193313899323 , cluster length: 4 threshold: 0.4438313346836665				
162					
163					
164					
165	Process finished with exit code 0				
166					