

```
1 /Users/adamtharani/Library/Java/
  JavaVirtualMachines/openjdk-19.0.1/
  Contents/Home/bin/java -javaagent:/Users
  /adamtharani/Library/Application Support
  /JetBrains/Toolbox/apps/apps/IDEA-U/ch-0
  /223.8836.41/IntelliJ IDEA.app/Contents/
  lib/idea_rt.jar=50613:/Users/adamtharani
  /Library/Application Support/JetBrains/
  Toolbox/apps/apps/IDEA-U/ch-0/223.8836.
  41/IntelliJ IDEA.app/Contents/bin -Dfile
  .encoding=UTF-8 -Dsun.stdout.encoding=
  UTF-8 -Dsun.stderr.encoding=UTF-8 -
  classpath /Users/adamtharani/Developer/
  TestDesignAssignments/Clustering/
  Clustering/Clustering/target/classes:/
  Users/adamtharani/.m2/repository/net/
  sourceforge/javaml/0.1.7/javaml-0.1.7.
  jar:/Users/adamtharani/.m2/repository/be
  /abeel/ajt/2.9/ajt-2.9.jar com.
  adamtharani.clustering.App
2 KMeans
3 Cluster 0
4 {[5.1, 3.5, 1.4, 0.2];Iris-setosa}
5 {[4.9, 3.0, 1.4, 0.2];Iris-setosa}
6 {[4.7, 3.2, 1.3, 0.2];Iris-setosa}
7 {[4.6, 3.1, 1.5, 0.2];Iris-setosa}
8 {[5.0, 3.6, 1.4, 0.2];Iris-setosa}
9 {[5.4, 3.9, 1.7, 0.4];Iris-setosa}
10 {[4.6, 3.4, 1.4, 0.3];Iris-setosa}
11 {[5.0, 3.4, 1.5, 0.2];Iris-setosa}
12 {[4.4, 2.9, 1.4, 0.2];Iris-setosa}
13 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
14 {[5.4, 3.7, 1.5, 0.2];Iris-setosa}
```

```
15 {[4.8, 3.4, 1.6, 0.2];Iris-setosa}
16 {[4.8, 3.0, 1.4, 0.1];Iris-setosa}
17 {[4.3, 3.0, 1.1, 0.1];Iris-setosa}
18 {[5.8, 4.0, 1.2, 0.2];Iris-setosa}
19 {[5.7, 4.4, 1.5, 0.4];Iris-setosa}
20 {[5.4, 3.9, 1.3, 0.4];Iris-setosa}
21 {[5.1, 3.5, 1.4, 0.3];Iris-setosa}
22 {[5.7, 3.8, 1.7, 0.3];Iris-setosa}
23 {[5.1, 3.8, 1.5, 0.3];Iris-setosa}
24 {[5.4, 3.4, 1.7, 0.2];Iris-setosa}
25 {[5.1, 3.7, 1.5, 0.4];Iris-setosa}
26 {[4.6, 3.6, 1.0, 0.2];Iris-setosa}
27 {[5.1, 3.3, 1.7, 0.5];Iris-setosa}
28 {[4.8, 3.4, 1.9, 0.2];Iris-setosa}
29 {[5.0, 3.0, 1.6, 0.2];Iris-setosa}
30 {[5.0, 3.4, 1.6, 0.4];Iris-setosa}
31 {[5.2, 3.5, 1.5, 0.2];Iris-setosa}
32 {[5.2, 3.4, 1.4, 0.2];Iris-setosa}
33 {[4.7, 3.2, 1.6, 0.2];Iris-setosa}
34 {[4.8, 3.1, 1.6, 0.2];Iris-setosa}
35 {[5.4, 3.4, 1.5, 0.4];Iris-setosa}
36 {[5.2, 4.1, 1.5, 0.1];Iris-setosa}
37 {[5.5, 4.2, 1.4, 0.2];Iris-setosa}
38 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
39 {[5.0, 3.2, 1.2, 0.2];Iris-setosa}
40 {[5.5, 3.5, 1.3, 0.2];Iris-setosa}
41 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
42 {[4.4, 3.0, 1.3, 0.2];Iris-setosa}
43 {[5.1, 3.4, 1.5, 0.2];Iris-setosa}
44 {[5.0, 3.5, 1.3, 0.3];Iris-setosa}
45 {[4.5, 2.3, 1.3, 0.3];Iris-setosa}
46 {[4.4, 3.2, 1.3, 0.2];Iris-setosa}
47 {[5.0, 3.5, 1.6, 0.6];Iris-setosa}
```

```
48 {[5.1, 3.8, 1.9, 0.4];Iris-setosa}
49 {[4.8, 3.0, 1.4, 0.3];Iris-setosa}
50 {[5.1, 3.8, 1.6, 0.2];Iris-setosa}
51 {[4.6, 3.2, 1.4, 0.2];Iris-setosa}
52 {[5.3, 3.7, 1.5, 0.2];Iris-setosa}
53 {[5.0, 3.3, 1.4, 0.2];Iris-setosa}
54 Cluster 1
55 {[6.3, 3.3, 6.0, 2.5];Iris-virginica}
56 {[7.1, 3.0, 5.9, 2.1];Iris-virginica}
57 {[6.5, 3.0, 5.8, 2.2];Iris-virginica}
58 {[7.6, 3.0, 6.6, 2.1];Iris-virginica}
59 {[7.3, 2.9, 6.3, 1.8];Iris-virginica}
60 {[6.7, 2.5, 5.8, 1.8];Iris-virginica}
61 {[7.2, 3.6, 6.1, 2.5];Iris-virginica}
62 {[6.8, 3.0, 5.5, 2.1];Iris-virginica}
63 {[6.4, 3.2, 5.3, 2.3];Iris-virginica}
64 {[6.5, 3.0, 5.5, 1.8];Iris-virginica}
65 {[7.7, 3.8, 6.7, 2.2];Iris-virginica}
66 {[7.7, 2.6, 6.9, 2.3];Iris-virginica}
67 {[6.9, 3.2, 5.7, 2.3];Iris-virginica}
68 {[7.7, 2.8, 6.7, 2.0];Iris-virginica}
69 {[6.7, 3.3, 5.7, 2.1];Iris-virginica}
70 {[7.2, 3.2, 6.0, 1.8];Iris-virginica}
71 {[6.4, 2.8, 5.6, 2.1];Iris-virginica}
72 {[7.2, 3.0, 5.8, 1.6];Iris-virginica}
73 {[7.4, 2.8, 6.1, 1.9];Iris-virginica}
74 {[7.9, 3.8, 6.4, 2.0];Iris-virginica}
75 {[6.4, 2.8, 5.6, 2.2];Iris-virginica}
76 {[7.7, 3.0, 6.1, 2.3];Iris-virginica}
77 {[6.3, 3.4, 5.6, 2.4];Iris-virginica}
78 {[6.9, 3.1, 5.4, 2.1];Iris-virginica}
79 {[6.7, 3.1, 5.6, 2.4];Iris-virginica}
80 {[6.9, 3.1, 5.1, 2.3];Iris-virginica}
```

```
81 {[6.8, 3.2, 5.9, 2.3];Iris-virginica}
82 {[6.7, 3.3, 5.7, 2.5];Iris-virginica}
83 {[6.7, 3.0, 5.2, 2.3];Iris-virginica}
84 {[6.2, 3.4, 5.4, 2.3];Iris-virginica}
85 Cluster 2
86 {[5.5, 2.3, 4.0, 1.3];Iris-versicolor}
87 {[5.7, 2.8, 4.5, 1.3];Iris-versicolor}
88 {[4.9, 2.4, 3.3, 1.0];Iris-versicolor}
89 {[5.2, 2.7, 3.9, 1.4];Iris-versicolor}
90 {[5.0, 2.0, 3.5, 1.0];Iris-versicolor}
91 {[5.9, 3.0, 4.2, 1.5];Iris-versicolor}
92 {[6.0, 2.2, 4.0, 1.0];Iris-versicolor}
93 {[5.6, 2.9, 3.6, 1.3];Iris-versicolor}
94 {[5.6, 3.0, 4.5, 1.5];Iris-versicolor}
95 {[5.8, 2.7, 4.1, 1.0];Iris-versicolor}
96 {[5.6, 2.5, 3.9, 1.1];Iris-versicolor}
97 {[6.1, 2.8, 4.0, 1.3];Iris-versicolor}
98 {[5.7, 2.6, 3.5, 1.0];Iris-versicolor}
99 {[5.5, 2.4, 3.8, 1.1];Iris-versicolor}
100 {[5.5, 2.4, 3.7, 1.0];Iris-versicolor}
101 {[5.8, 2.7, 3.9, 1.2];Iris-versicolor}
102 {[5.4, 3.0, 4.5, 1.5];Iris-versicolor}
103 {[5.6, 3.0, 4.1, 1.3];Iris-versicolor}
104 {[5.5, 2.5, 4.0, 1.3];Iris-versicolor}
105 {[5.5, 2.6, 4.4, 1.2];Iris-versicolor}
106 {[5.8, 2.6, 4.0, 1.2];Iris-versicolor}
107 {[5.0, 2.3, 3.3, 1.0];Iris-versicolor}
108 {[5.6, 2.7, 4.2, 1.3];Iris-versicolor}
109 {[5.7, 3.0, 4.2, 1.2];Iris-versicolor}
110 {[5.7, 2.9, 4.2, 1.3];Iris-versicolor}
111 {[5.1, 2.5, 3.0, 1.1];Iris-versicolor}
112 {[5.7, 2.8, 4.1, 1.3];Iris-versicolor}
113 {[4.9, 2.5, 4.5, 1.7];Iris-virginica}
```

## 114 Cluster 3

```
115 {[7.0, 3.2, 4.7, 1.4];Iris-versicolor}
116 {[6.4, 3.2, 4.5, 1.5];Iris-versicolor}
117 {[6.9, 3.1, 4.9, 1.5];Iris-versicolor}
118 {[6.5, 2.8, 4.6, 1.5];Iris-versicolor}
119 {[6.3, 3.3, 4.7, 1.6];Iris-versicolor}
120 {[6.6, 2.9, 4.6, 1.3];Iris-versicolor}
121 {[6.1, 2.9, 4.7, 1.4];Iris-versicolor}
122 {[6.7, 3.1, 4.4, 1.4];Iris-versicolor}
123 {[6.2, 2.2, 4.5, 1.5];Iris-versicolor}
124 {[5.9, 3.2, 4.8, 1.8];Iris-versicolor}
125 {[6.3, 2.5, 4.9, 1.5];Iris-versicolor}
126 {[6.1, 2.8, 4.7, 1.2];Iris-versicolor}
127 {[6.4, 2.9, 4.3, 1.3];Iris-versicolor}
128 {[6.6, 3.0, 4.4, 1.4];Iris-versicolor}
129 {[6.8, 2.8, 4.8, 1.4];Iris-versicolor}
130 {[6.7, 3.0, 5.0, 1.7];Iris-versicolor}
131 {[6.0, 2.9, 4.5, 1.5];Iris-versicolor}
132 {[6.0, 2.7, 5.1, 1.6];Iris-versicolor}
133 {[6.0, 3.4, 4.5, 1.6];Iris-versicolor}
134 {[6.7, 3.1, 4.7, 1.5];Iris-versicolor}
135 {[6.3, 2.3, 4.4, 1.3];Iris-versicolor}
136 {[6.1, 3.0, 4.6, 1.4];Iris-versicolor}
137 {[6.2, 2.9, 4.3, 1.3];Iris-versicolor}
138 {[5.8, 2.7, 5.1, 1.9];Iris-virginica}
139 {[6.3, 2.9, 5.6, 1.8];Iris-virginica}
140 {[6.5, 3.2, 5.1, 2.0];Iris-virginica}
141 {[6.4, 2.7, 5.3, 1.9];Iris-virginica}
142 {[5.7, 2.5, 5.0, 2.0];Iris-virginica}
143 {[5.8, 2.8, 5.1, 2.4];Iris-virginica}
144 {[6.0, 2.2, 5.0, 1.5];Iris-virginica}
145 {[5.6, 2.8, 4.9, 2.0];Iris-virginica}
146 {[6.3, 2.7, 4.9, 1.8];Iris-virginica}
```

```
147 {[6.2, 2.8, 4.8, 1.8];Iris-virginica}
148 {[6.1, 3.0, 4.9, 1.8];Iris-virginica}
149 {[6.3, 2.8, 5.1, 1.5];Iris-virginica}
150 {[6.1, 2.6, 5.6, 1.4];Iris-virginica}
151 {[6.4, 3.1, 5.5, 1.8];Iris-virginica}
152 {[6.0, 3.0, 4.8, 1.8];Iris-virginica}
153 {[5.8, 2.7, 5.1, 1.9];Iris-virginica}
154 {[6.3, 2.5, 5.0, 1.9];Iris-virginica}
155 {[6.5, 3.0, 5.2, 2.0];Iris-virginica}
156 {[5.9, 3.0, 5.1, 1.8];Iris-virginica}
157 FarthestFirst
158 Cluster 0
159 {[7.0, 3.2, 4.7, 1.4];Iris-versicolor}
160 {[6.4, 3.2, 4.5, 1.5];Iris-versicolor}
161 {[5.5, 2.3, 4.0, 1.3];Iris-versicolor}
162 {[6.5, 2.8, 4.6, 1.5];Iris-versicolor}
163 {[5.7, 2.8, 4.5, 1.3];Iris-versicolor}
164 {[6.3, 3.3, 4.7, 1.6];Iris-versicolor}
165 {[4.9, 2.4, 3.3, 1.0];Iris-versicolor}
166 {[6.6, 2.9, 4.6, 1.3];Iris-versicolor}
167 {[5.2, 2.7, 3.9, 1.4];Iris-versicolor}
168 {[5.0, 2.0, 3.5, 1.0];Iris-versicolor}
169 {[5.9, 3.0, 4.2, 1.5];Iris-versicolor}
170 {[6.0, 2.2, 4.0, 1.0];Iris-versicolor}
171 {[6.1, 2.9, 4.7, 1.4];Iris-versicolor}
172 {[5.6, 2.9, 3.6, 1.3];Iris-versicolor}
173 {[6.7, 3.1, 4.4, 1.4];Iris-versicolor}
174 {[5.6, 3.0, 4.5, 1.5];Iris-versicolor}
175 {[5.8, 2.7, 4.1, 1.0];Iris-versicolor}
176 {[6.2, 2.2, 4.5, 1.5];Iris-versicolor}
177 {[5.6, 2.5, 3.9, 1.1];Iris-versicolor}
178 {[6.1, 2.8, 4.0, 1.3];Iris-versicolor}
179 {[6.3, 2.5, 4.9, 1.5];Iris-versicolor}
```

```
180 {[6.1, 2.8, 4.7, 1.2];Iris-versicolor}
181 {[6.4, 2.9, 4.3, 1.3];Iris-versicolor}
182 {[6.6, 3.0, 4.4, 1.4];Iris-versicolor}
183 {[6.8, 2.8, 4.8, 1.4];Iris-versicolor}
184 {[6.0, 2.9, 4.5, 1.5];Iris-versicolor}
185 {[5.7, 2.6, 3.5, 1.0];Iris-versicolor}
186 {[5.5, 2.4, 3.8, 1.1];Iris-versicolor}
187 {[5.5, 2.4, 3.7, 1.0];Iris-versicolor}
188 {[5.8, 2.7, 3.9, 1.2];Iris-versicolor}
189 {[6.0, 2.7, 5.1, 1.6];Iris-versicolor}
190 {[5.4, 3.0, 4.5, 1.5];Iris-versicolor}
191 {[6.0, 3.4, 4.5, 1.6];Iris-versicolor}
192 {[6.7, 3.1, 4.7, 1.5];Iris-versicolor}
193 {[6.3, 2.3, 4.4, 1.3];Iris-versicolor}
194 {[5.6, 3.0, 4.1, 1.3];Iris-versicolor}
195 {[5.5, 2.5, 4.0, 1.3];Iris-versicolor}
196 {[5.5, 2.6, 4.4, 1.2];Iris-versicolor}
197 {[6.1, 3.0, 4.6, 1.4];Iris-versicolor}
198 {[5.8, 2.6, 4.0, 1.2];Iris-versicolor}
199 {[5.0, 2.3, 3.3, 1.0];Iris-versicolor}
200 {[5.6, 2.7, 4.2, 1.3];Iris-versicolor}
201 {[5.7, 3.0, 4.2, 1.2];Iris-versicolor}
202 {[5.7, 2.9, 4.2, 1.3];Iris-versicolor}
203 {[6.2, 2.9, 4.3, 1.3];Iris-versicolor}
204 {[5.1, 2.5, 3.0, 1.1];Iris-versicolor}
205 {[5.7, 2.8, 4.1, 1.3];Iris-versicolor}
206 {[4.9, 2.5, 4.5, 1.7];Iris-virginica}
207 {[6.0, 2.2, 5.0, 1.5];Iris-virginica}
208 {[6.2, 2.8, 4.8, 1.8];Iris-virginica}
209 Cluster 1
210 {[7.6, 3.0, 6.6, 2.1];Iris-virginica}
211 {[7.3, 2.9, 6.3, 1.8];Iris-virginica}
212 {[7.7, 3.8, 6.7, 2.2];Iris-virginica}
```

```
213 {[7.7, 2.6, 6.9, 2.3];Iris-virginica}
214 {[7.7, 2.8, 6.7, 2.0];Iris-virginica}
215 {[7.4, 2.8, 6.1, 1.9];Iris-virginica}
216 {[7.9, 3.8, 6.4, 2.0];Iris-virginica}
217 {[7.7, 3.0, 6.1, 2.3];Iris-virginica}
218 Cluster 2
219 {[5.1, 3.5, 1.4, 0.2];Iris-setosa}
220 {[4.9, 3.0, 1.4, 0.2];Iris-setosa}
221 {[4.7, 3.2, 1.3, 0.2];Iris-setosa}
222 {[4.6, 3.1, 1.5, 0.2];Iris-setosa}
223 {[5.0, 3.6, 1.4, 0.2];Iris-setosa}
224 {[5.4, 3.9, 1.7, 0.4];Iris-setosa}
225 {[4.6, 3.4, 1.4, 0.3];Iris-setosa}
226 {[5.0, 3.4, 1.5, 0.2];Iris-setosa}
227 {[4.4, 2.9, 1.4, 0.2];Iris-setosa}
228 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
229 {[5.4, 3.7, 1.5, 0.2];Iris-setosa}
230 {[4.8, 3.4, 1.6, 0.2];Iris-setosa}
231 {[4.8, 3.0, 1.4, 0.1];Iris-setosa}
232 {[4.3, 3.0, 1.1, 0.1];Iris-setosa}
233 {[5.8, 4.0, 1.2, 0.2];Iris-setosa}
234 {[5.7, 4.4, 1.5, 0.4];Iris-setosa}
235 {[5.4, 3.9, 1.3, 0.4];Iris-setosa}
236 {[5.1, 3.5, 1.4, 0.3];Iris-setosa}
237 {[5.7, 3.8, 1.7, 0.3];Iris-setosa}
238 {[5.1, 3.8, 1.5, 0.3];Iris-setosa}
239 {[5.4, 3.4, 1.7, 0.2];Iris-setosa}
240 {[5.1, 3.7, 1.5, 0.4];Iris-setosa}
241 {[4.6, 3.6, 1.0, 0.2];Iris-setosa}
242 {[5.1, 3.3, 1.7, 0.5];Iris-setosa}
243 {[4.8, 3.4, 1.9, 0.2];Iris-setosa}
244 {[5.0, 3.0, 1.6, 0.2];Iris-setosa}
245 {[5.0, 3.4, 1.6, 0.4];Iris-setosa}
```



```
246 {[5.2, 3.5, 1.5, 0.2];Iris-setosa}
247 {[5.2, 3.4, 1.4, 0.2];Iris-setosa}
248 {[4.7, 3.2, 1.6, 0.2];Iris-setosa}
249 {[4.8, 3.1, 1.6, 0.2];Iris-setosa}
250 {[5.4, 3.4, 1.5, 0.4];Iris-setosa}
251 {[5.2, 4.1, 1.5, 0.1];Iris-setosa}
252 {[5.5, 4.2, 1.4, 0.2];Iris-setosa}
253 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
254 {[5.0, 3.2, 1.2, 0.2];Iris-setosa}
255 {[5.5, 3.5, 1.3, 0.2];Iris-setosa}
256 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
257 {[4.4, 3.0, 1.3, 0.2];Iris-setosa}
258 {[5.1, 3.4, 1.5, 0.2];Iris-setosa}
259 {[5.0, 3.5, 1.3, 0.3];Iris-setosa}
260 {[4.5, 2.3, 1.3, 0.3];Iris-setosa}
261 {[4.4, 3.2, 1.3, 0.2];Iris-setosa}
262 {[5.0, 3.5, 1.6, 0.6];Iris-setosa}
263 {[5.1, 3.8, 1.9, 0.4];Iris-setosa}
264 {[4.8, 3.0, 1.4, 0.3];Iris-setosa}
265 {[5.1, 3.8, 1.6, 0.2];Iris-setosa}
266 {[4.6, 3.2, 1.4, 0.2];Iris-setosa}
267 {[5.3, 3.7, 1.5, 0.2];Iris-setosa}
268 {[5.0, 3.3, 1.4, 0.2];Iris-setosa}
269 Cluster 3
270 {[6.9, 3.1, 4.9, 1.5];Iris-versicolor}
271 {[5.9, 3.2, 4.8, 1.8];Iris-versicolor}
272 {[6.7, 3.0, 5.0, 1.7];Iris-versicolor}
273 {[6.3, 3.3, 6.0, 2.5];Iris-virginica}
274 {[5.8, 2.7, 5.1, 1.9];Iris-virginica}
275 {[7.1, 3.0, 5.9, 2.1];Iris-virginica}
276 {[6.3, 2.9, 5.6, 1.8];Iris-virginica}
277 {[6.5, 3.0, 5.8, 2.2];Iris-virginica}
278 {[6.7, 2.5, 5.8, 1.8];Iris-virginica}
```

```
279 {[7.2, 3.6, 6.1, 2.5];Iris-virginica}
280 {[6.5, 3.2, 5.1, 2.0];Iris-virginica}
281 {[6.4, 2.7, 5.3, 1.9];Iris-virginica}
282 {[6.8, 3.0, 5.5, 2.1];Iris-virginica}
283 {[5.7, 2.5, 5.0, 2.0];Iris-virginica}
284 {[5.8, 2.8, 5.1, 2.4];Iris-virginica}
285 {[6.4, 3.2, 5.3, 2.3];Iris-virginica}
286 {[6.5, 3.0, 5.5, 1.8];Iris-virginica}
287 {[6.9, 3.2, 5.7, 2.3];Iris-virginica}
288 {[5.6, 2.8, 4.9, 2.0];Iris-virginica}
289 {[6.3, 2.7, 4.9, 1.8];Iris-virginica}
290 {[6.7, 3.3, 5.7, 2.1];Iris-virginica}
291 {[7.2, 3.2, 6.0, 1.8];Iris-virginica}
292 {[6.1, 3.0, 4.9, 1.8];Iris-virginica}
293 {[6.4, 2.8, 5.6, 2.1];Iris-virginica}
294 {[7.2, 3.0, 5.8, 1.6];Iris-virginica}
295 {[6.4, 2.8, 5.6, 2.2];Iris-virginica}
296 {[6.3, 2.8, 5.1, 1.5];Iris-virginica}
297 {[6.1, 2.6, 5.6, 1.4];Iris-virginica}
298 {[6.3, 3.4, 5.6, 2.4];Iris-virginica}
299 {[6.4, 3.1, 5.5, 1.8];Iris-virginica}
300 {[6.0, 3.0, 4.8, 1.8];Iris-virginica}
301 {[6.9, 3.1, 5.4, 2.1];Iris-virginica}
302 {[6.7, 3.1, 5.6, 2.4];Iris-virginica}
303 {[6.9, 3.1, 5.1, 2.3];Iris-virginica}
304 {[5.8, 2.7, 5.1, 1.9];Iris-virginica}
305 {[6.8, 3.2, 5.9, 2.3];Iris-virginica}
306 {[6.7, 3.3, 5.7, 2.5];Iris-virginica}
307 {[6.7, 3.0, 5.2, 2.3];Iris-virginica}
308 {[6.3, 2.5, 5.0, 1.9];Iris-virginica}
309 {[6.5, 3.0, 5.2, 2.0];Iris-virginica}
310 {[6.2, 3.4, 5.4, 2.3];Iris-virginica}
311 {[5.9, 3.0, 5.1, 1.8];Iris-virginica}
```

312 SOM

313 Cluster 0

```
314 {[5.1, 3.5, 1.4, 0.2];Iris-setosa}
315 {[4.9, 3.0, 1.4, 0.2];Iris-setosa}
316 {[4.7, 3.2, 1.3, 0.2];Iris-setosa}
317 {[4.6, 3.1, 1.5, 0.2];Iris-setosa}
318 {[5.0, 3.6, 1.4, 0.2];Iris-setosa}
319 {[5.4, 3.9, 1.7, 0.4];Iris-setosa}
320 {[4.6, 3.4, 1.4, 0.3];Iris-setosa}
321 {[5.0, 3.4, 1.5, 0.2];Iris-setosa}
322 {[4.4, 2.9, 1.4, 0.2];Iris-setosa}
323 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
324 {[5.4, 3.7, 1.5, 0.2];Iris-setosa}
325 {[4.8, 3.4, 1.6, 0.2];Iris-setosa}
326 {[4.8, 3.0, 1.4, 0.1];Iris-setosa}
327 {[4.3, 3.0, 1.1, 0.1];Iris-setosa}
328 {[5.8, 4.0, 1.2, 0.2];Iris-setosa}
329 {[5.7, 4.4, 1.5, 0.4];Iris-setosa}
330 {[5.4, 3.9, 1.3, 0.4];Iris-setosa}
331 {[5.1, 3.5, 1.4, 0.3];Iris-setosa}
332 {[5.7, 3.8, 1.7, 0.3];Iris-setosa}
333 {[5.1, 3.8, 1.5, 0.3];Iris-setosa}
334 {[5.4, 3.4, 1.7, 0.2];Iris-setosa}
335 {[5.1, 3.7, 1.5, 0.4];Iris-setosa}
336 {[4.6, 3.6, 1.0, 0.2];Iris-setosa}
337 {[5.1, 3.3, 1.7, 0.5];Iris-setosa}
338 {[4.8, 3.4, 1.9, 0.2];Iris-setosa}
339 {[5.0, 3.0, 1.6, 0.2];Iris-setosa}
340 {[5.0, 3.4, 1.6, 0.4];Iris-setosa}
341 {[5.2, 3.5, 1.5, 0.2];Iris-setosa}
342 {[5.2, 3.4, 1.4, 0.2];Iris-setosa}
343 {[4.7, 3.2, 1.6, 0.2];Iris-setosa}
344 {[4.8, 3.1, 1.6, 0.2];Iris-setosa}
```

```
345 {[5.4, 3.4, 1.5, 0.4];Iris-setosa}
346 {[5.2, 4.1, 1.5, 0.1];Iris-setosa}
347 {[5.5, 4.2, 1.4, 0.2];Iris-setosa}
348 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
349 {[5.0, 3.2, 1.2, 0.2];Iris-setosa}
350 {[5.5, 3.5, 1.3, 0.2];Iris-setosa}
351 {[4.9, 3.1, 1.5, 0.1];Iris-setosa}
352 {[4.4, 3.0, 1.3, 0.2];Iris-setosa}
353 {[5.1, 3.4, 1.5, 0.2];Iris-setosa}
354 {[5.0, 3.5, 1.3, 0.3];Iris-setosa}
355 {[4.5, 2.3, 1.3, 0.3];Iris-setosa}
356 {[4.4, 3.2, 1.3, 0.2];Iris-setosa}
357 {[5.0, 3.5, 1.6, 0.6];Iris-setosa}
358 {[5.1, 3.8, 1.9, 0.4];Iris-setosa}
359 {[4.8, 3.0, 1.4, 0.3];Iris-setosa}
360 {[5.1, 3.8, 1.6, 0.2];Iris-setosa}
361 {[4.6, 3.2, 1.4, 0.2];Iris-setosa}
362 {[5.3, 3.7, 1.5, 0.2];Iris-setosa}
363 {[5.0, 3.3, 1.4, 0.2];Iris-setosa}
364 {[4.9, 2.4, 3.3, 1.0];Iris-versicolor}
365 {[5.0, 2.0, 3.5, 1.0];Iris-versicolor}
366 {[5.7, 2.6, 3.5, 1.0];Iris-versicolor}
367 {[5.0, 2.3, 3.3, 1.0];Iris-versicolor}
368 {[5.1, 2.5, 3.0, 1.1];Iris-versicolor}
369 Cluster 1
370 {[5.5, 2.3, 4.0, 1.3];Iris-versicolor}
371 {[5.2, 2.7, 3.9, 1.4];Iris-versicolor}
372 {[5.6, 2.9, 3.6, 1.3];Iris-versicolor}
373 {[5.8, 2.7, 4.1, 1.0];Iris-versicolor}
374 {[5.6, 2.5, 3.9, 1.1];Iris-versicolor}
375 {[5.5, 2.4, 3.8, 1.1];Iris-versicolor}
376 {[5.5, 2.4, 3.7, 1.0];Iris-versicolor}
377 {[5.8, 2.7, 3.9, 1.2];Iris-versicolor}
```

```
378 {[5.6, 3.0, 4.1, 1.3];Iris-versicolor}
379 {[5.5, 2.5, 4.0, 1.3];Iris-versicolor}
380 {[5.8, 2.6, 4.0, 1.2];Iris-versicolor}
381 Cluster 2
382 {[7.0, 3.2, 4.7, 1.4];Iris-versicolor}
383 {[6.4, 3.2, 4.5, 1.5];Iris-versicolor}
384 {[6.9, 3.1, 4.9, 1.5];Iris-versicolor}
385 {[6.5, 2.8, 4.6, 1.5];Iris-versicolor}
386 {[5.7, 2.8, 4.5, 1.3];Iris-versicolor}
387 {[6.3, 3.3, 4.7, 1.6];Iris-versicolor}
388 {[6.6, 2.9, 4.6, 1.3];Iris-versicolor}
389 {[5.9, 3.0, 4.2, 1.5];Iris-versicolor}
390 {[6.0, 2.2, 4.0, 1.0];Iris-versicolor}
391 {[6.1, 2.9, 4.7, 1.4];Iris-versicolor}
392 {[6.7, 3.1, 4.4, 1.4];Iris-versicolor}
393 {[5.6, 3.0, 4.5, 1.5];Iris-versicolor}
394 {[6.2, 2.2, 4.5, 1.5];Iris-versicolor}
395 {[5.9, 3.2, 4.8, 1.8];Iris-versicolor}
396 {[6.1, 2.8, 4.0, 1.3];Iris-versicolor}
397 {[6.3, 2.5, 4.9, 1.5];Iris-versicolor}
398 {[6.1, 2.8, 4.7, 1.2];Iris-versicolor}
399 {[6.4, 2.9, 4.3, 1.3];Iris-versicolor}
400 {[6.6, 3.0, 4.4, 1.4];Iris-versicolor}
401 {[6.8, 2.8, 4.8, 1.4];Iris-versicolor}
402 {[6.7, 3.0, 5.0, 1.7];Iris-versicolor}
403 {[6.0, 2.9, 4.5, 1.5];Iris-versicolor}
404 {[6.0, 2.7, 5.1, 1.6];Iris-versicolor}
405 {[5.4, 3.0, 4.5, 1.5];Iris-versicolor}
406 {[6.0, 3.4, 4.5, 1.6];Iris-versicolor}
407 {[6.7, 3.1, 4.7, 1.5];Iris-versicolor}
408 {[6.3, 2.3, 4.4, 1.3];Iris-versicolor}
409 {[5.5, 2.6, 4.4, 1.2];Iris-versicolor}
410 {[6.1, 3.0, 4.6, 1.4];Iris-versicolor}
```

```
411 {[5.6, 2.7, 4.2, 1.3];Iris-versicolor}
412 {[5.7, 3.0, 4.2, 1.2];Iris-versicolor}
413 {[5.7, 2.9, 4.2, 1.3];Iris-versicolor}
414 {[6.2, 2.9, 4.3, 1.3];Iris-versicolor}
415 {[5.7, 2.8, 4.1, 1.3];Iris-versicolor}
416 {[6.3, 3.3, 6.0, 2.5];Iris-virginica}
417 {[5.8, 2.7, 5.1, 1.9];Iris-virginica}
418 {[7.1, 3.0, 5.9, 2.1];Iris-virginica}
419 {[6.3, 2.9, 5.6, 1.8];Iris-virginica}
420 {[6.5, 3.0, 5.8, 2.2];Iris-virginica}
421 {[7.6, 3.0, 6.6, 2.1];Iris-virginica}
422 {[4.9, 2.5, 4.5, 1.7];Iris-virginica}
423 {[7.3, 2.9, 6.3, 1.8];Iris-virginica}
424 {[6.7, 2.5, 5.8, 1.8];Iris-virginica}
425 {[7.2, 3.6, 6.1, 2.5];Iris-virginica}
426 {[6.5, 3.2, 5.1, 2.0];Iris-virginica}
427 {[6.4, 2.7, 5.3, 1.9];Iris-virginica}
428 {[6.8, 3.0, 5.5, 2.1];Iris-virginica}
429 {[5.7, 2.5, 5.0, 2.0];Iris-virginica}
430 {[5.8, 2.8, 5.1, 2.4];Iris-virginica}
431 {[6.4, 3.2, 5.3, 2.3];Iris-virginica}
432 {[6.5, 3.0, 5.5, 1.8];Iris-virginica}
433 {[7.7, 3.8, 6.7, 2.2];Iris-virginica}
434 {[7.7, 2.6, 6.9, 2.3];Iris-virginica}
435 {[6.0, 2.2, 5.0, 1.5];Iris-virginica}
436 {[6.9, 3.2, 5.7, 2.3];Iris-virginica}
437 {[5.6, 2.8, 4.9, 2.0];Iris-virginica}
438 {[7.7, 2.8, 6.7, 2.0];Iris-virginica}
439 {[6.3, 2.7, 4.9, 1.8];Iris-virginica}
440 {[6.7, 3.3, 5.7, 2.1];Iris-virginica}
441 {[7.2, 3.2, 6.0, 1.8];Iris-virginica}
442 {[6.2, 2.8, 4.8, 1.8];Iris-virginica}
443 {[6.1, 3.0, 4.9, 1.8];Iris-virginica}
```

```
444 {[6.4, 2.8, 5.6, 2.1];Iris-virginica}
445 {[7.2, 3.0, 5.8, 1.6];Iris-virginica}
446 {[7.4, 2.8, 6.1, 1.9];Iris-virginica}
447 {[7.9, 3.8, 6.4, 2.0];Iris-virginica}
448 {[6.4, 2.8, 5.6, 2.2];Iris-virginica}
449 {[6.3, 2.8, 5.1, 1.5];Iris-virginica}
450 {[6.1, 2.6, 5.6, 1.4];Iris-virginica}
451 {[7.7, 3.0, 6.1, 2.3];Iris-virginica}
452 {[6.3, 3.4, 5.6, 2.4];Iris-virginica}
453 {[6.4, 3.1, 5.5, 1.8];Iris-virginica}
454 {[6.0, 3.0, 4.8, 1.8];Iris-virginica}
455 {[6.9, 3.1, 5.4, 2.1];Iris-virginica}
456 {[6.7, 3.1, 5.6, 2.4];Iris-virginica}
457 {[6.9, 3.1, 5.1, 2.3];Iris-virginica}
458 {[5.8, 2.7, 5.1, 1.9];Iris-virginica}
459 {[6.8, 3.2, 5.9, 2.3];Iris-virginica}
460 {[6.7, 3.3, 5.7, 2.5];Iris-virginica}
461 {[6.7, 3.0, 5.2, 2.3];Iris-virginica}
462 {[6.3, 2.5, 5.0, 1.9];Iris-virginica}
463 {[6.5, 3.0, 5.2, 2.0];Iris-virginica}
464 {[6.2, 3.4, 5.4, 2.3];Iris-virginica}
465 {[5.9, 3.0, 5.1, 1.8];Iris-virginica}
466 The score using KMeans is: 114.
    68984761904744
467 The score using farthestFirstscore is:
    133.50744285714276
468 The score using SOM is: 258.
    96998701298634
469
470 Process finished with exit code 0
471
```