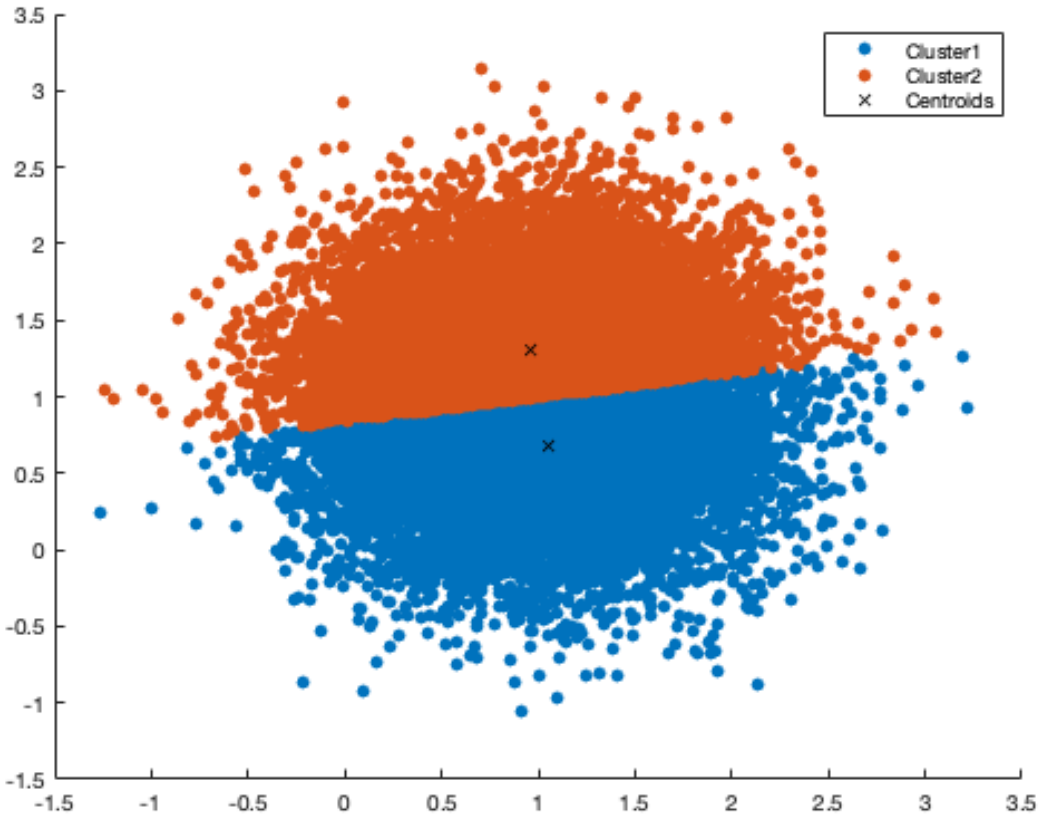
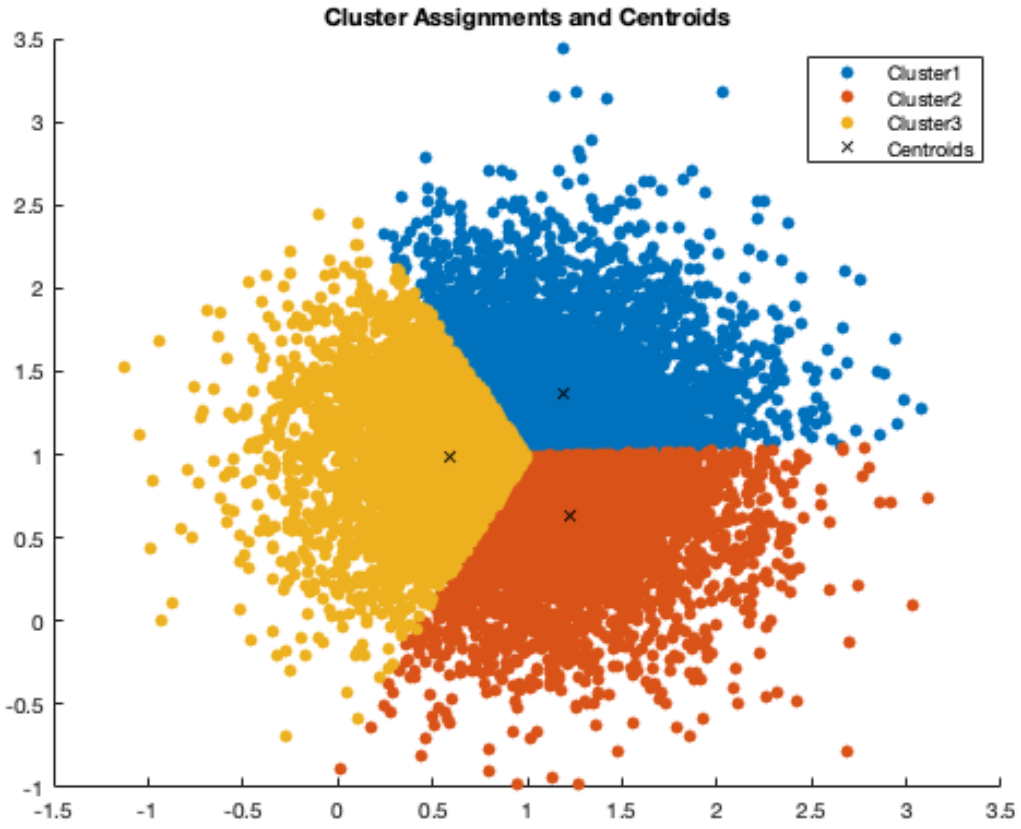
1. Plots for the first data set:

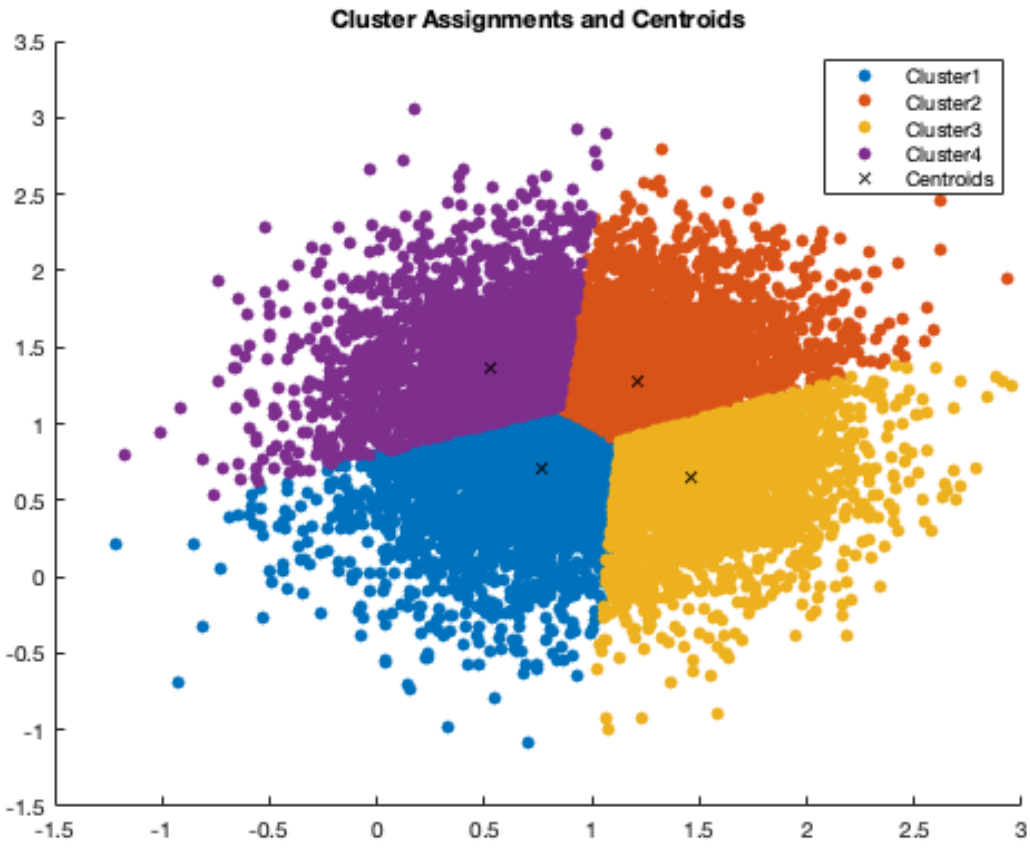
```
N = 10000;
X = [randn(N, 2) * 0.55 + ones(N, 2); randn(N, 2) * 0.25 + ones(N, 2)];

k = 2
```



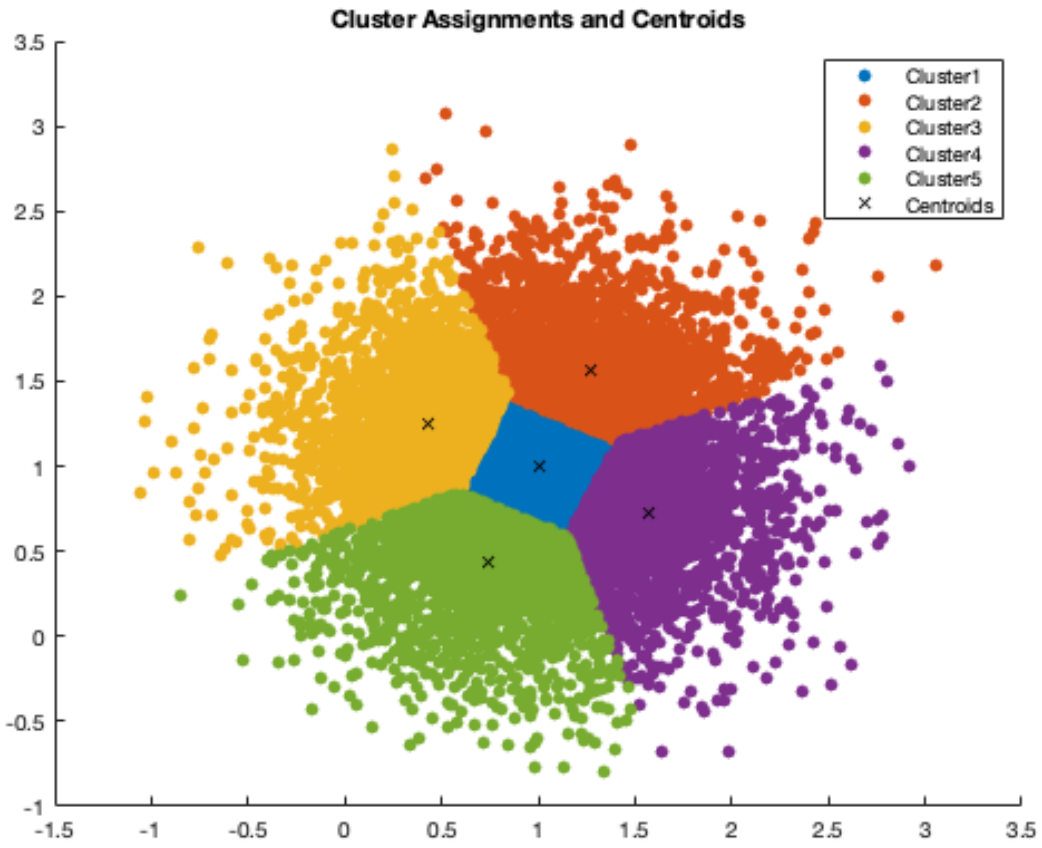
```
k = 3
```


Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Centroids
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3
3.5

k = 4

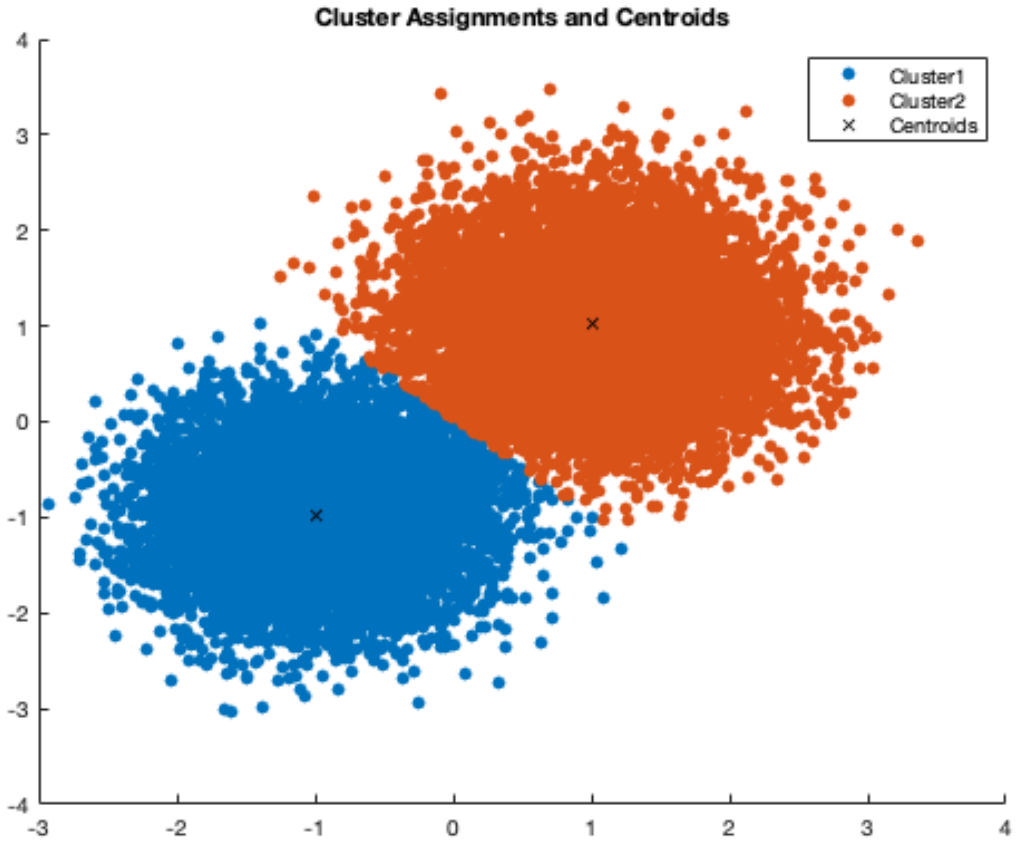

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Centroids
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3

k = 5

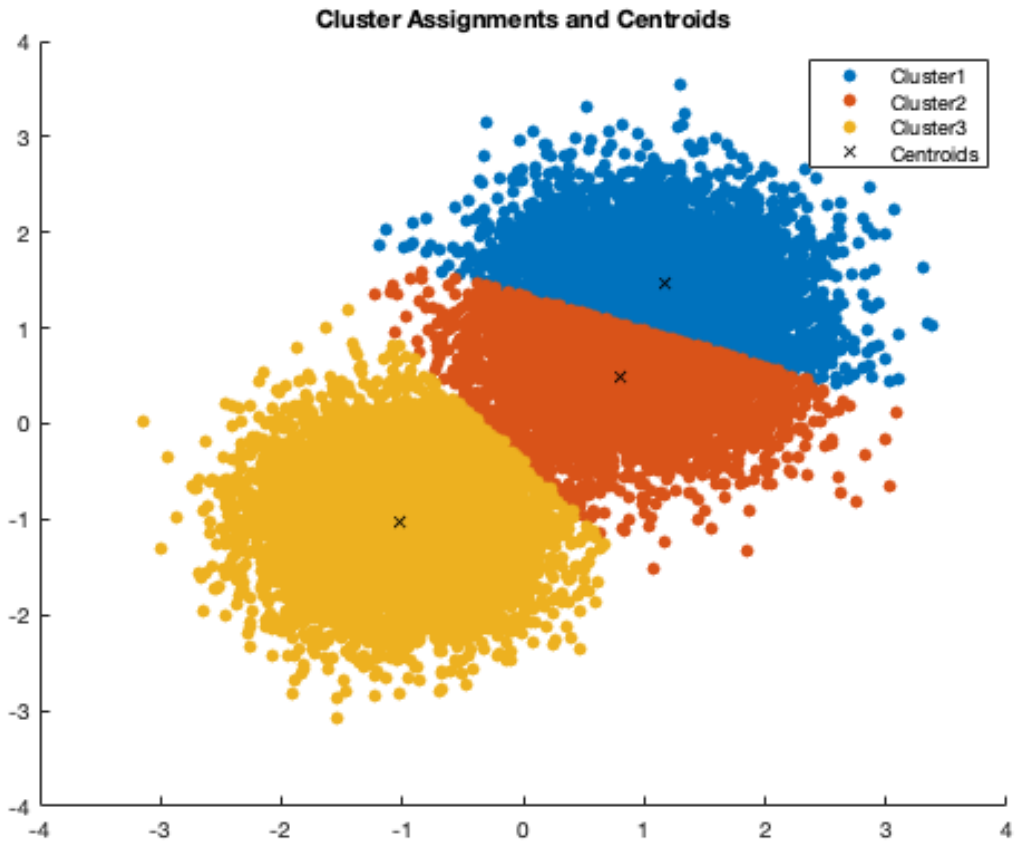

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Cluster5
Centroids
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3
3.5

1. Plots for the first data set:

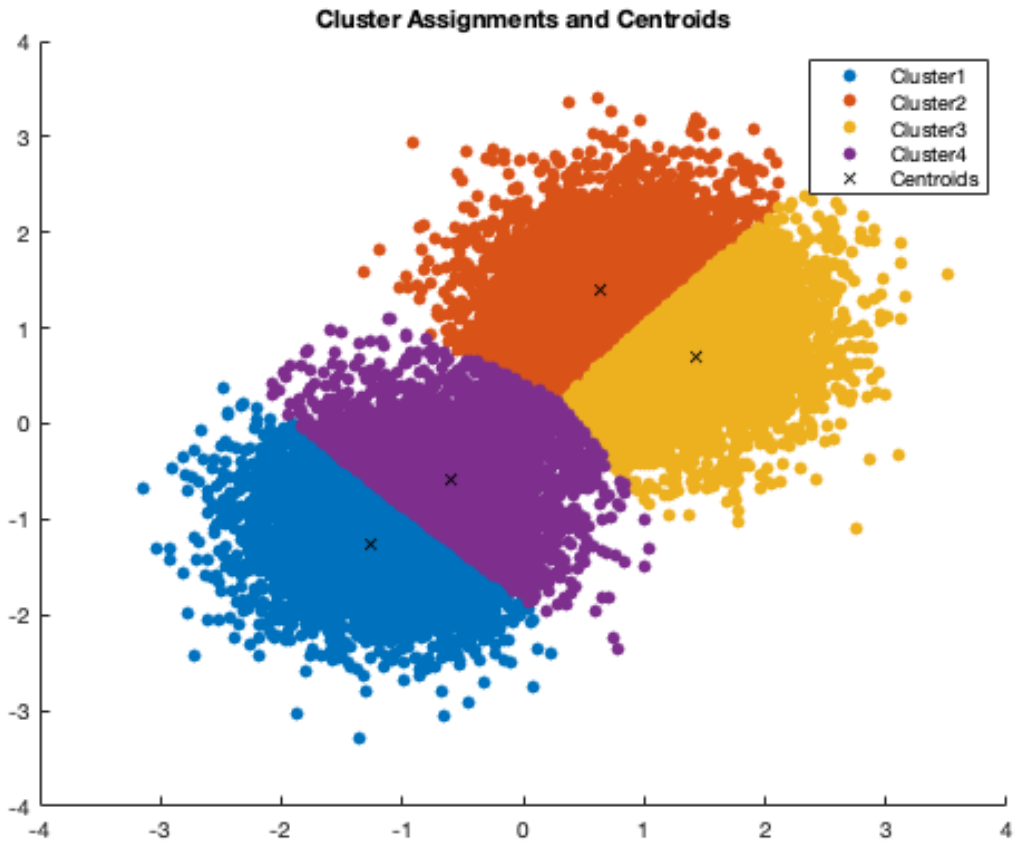
```
N = 20000;
X = [randn(N, 2) * 0.55 - ones(N, 2); randn(N, 2) * 0.65 + ones(N, 2)];

k = 2
```



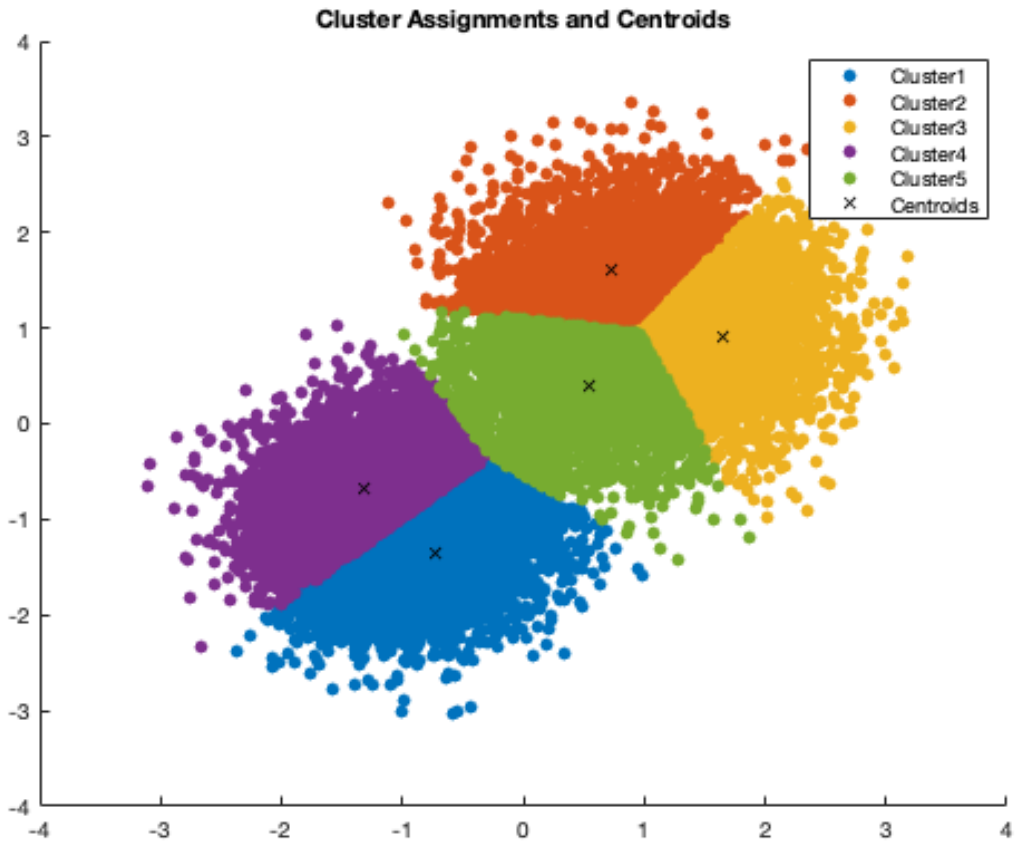
k = 3


Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Centroids
4
3
2
1
0
-1
-2
-3
-4
-4
-3
-2
-1
0
1
2
3
4

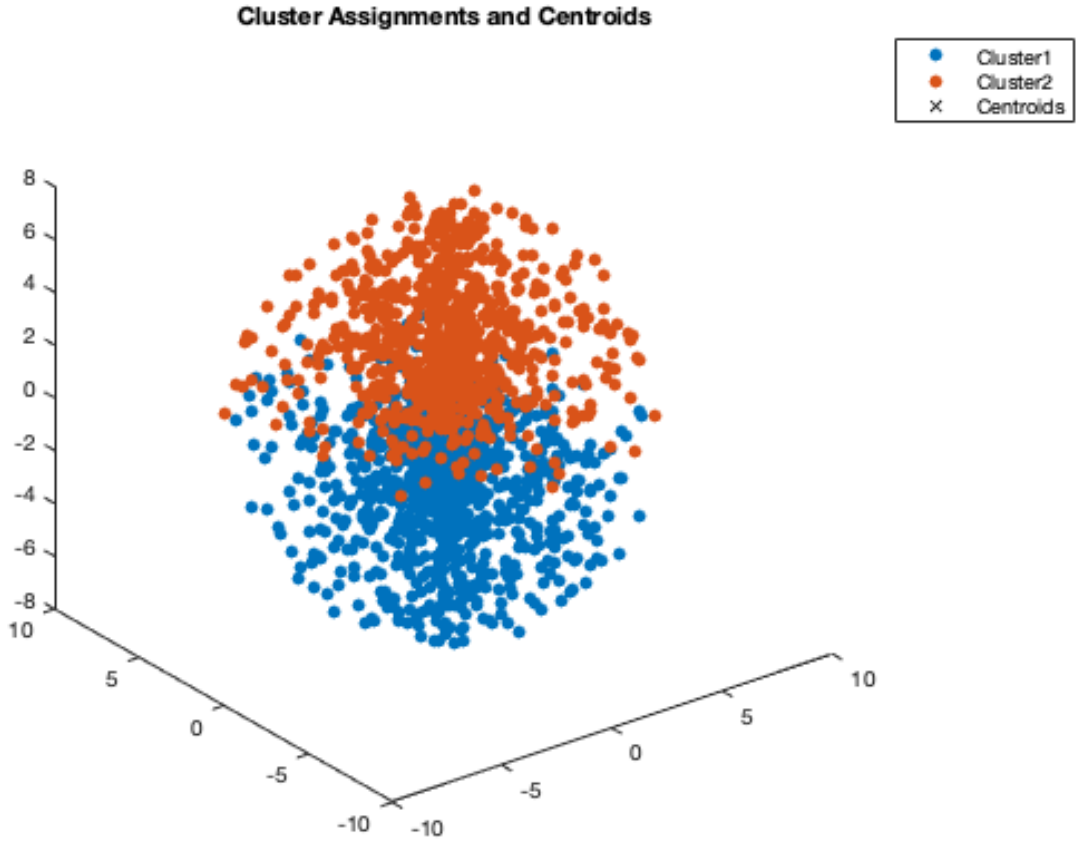
k = 4

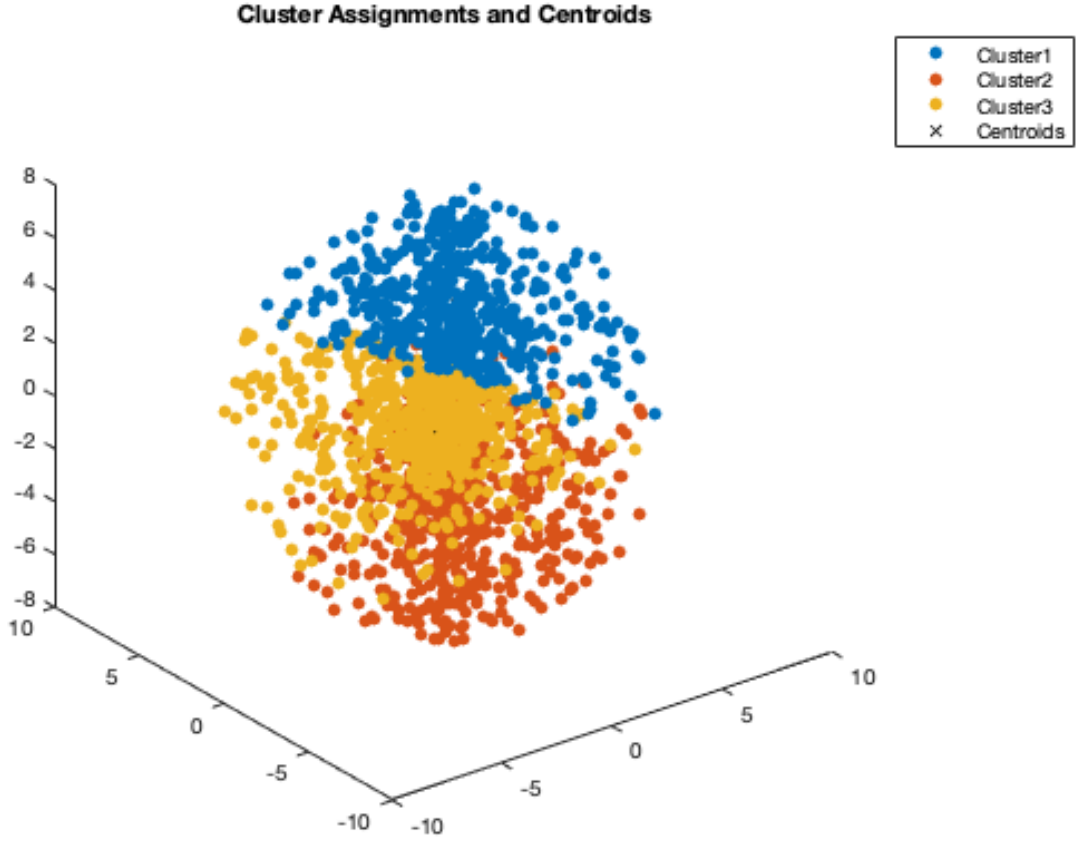

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Centroids
4
3
2
1
0
-1
-2
-3
-4
-4
-3
-2
-1
0
1
2
3
4

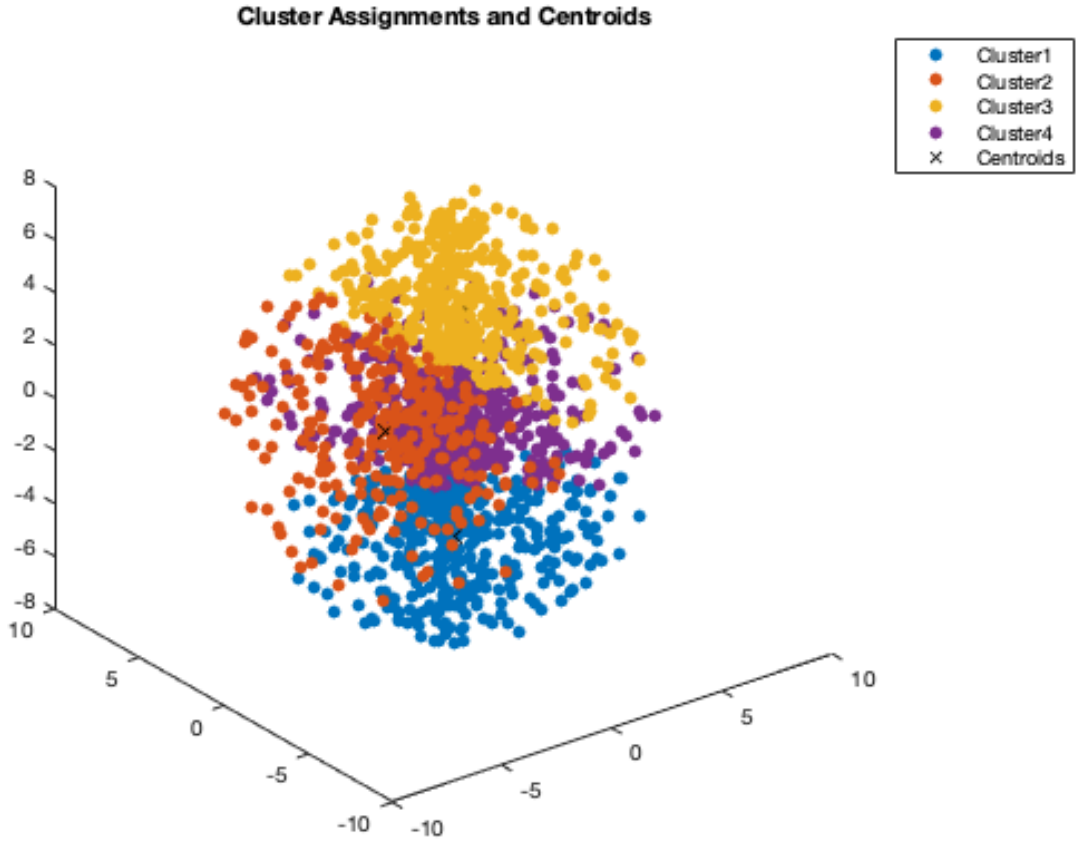
k = 5

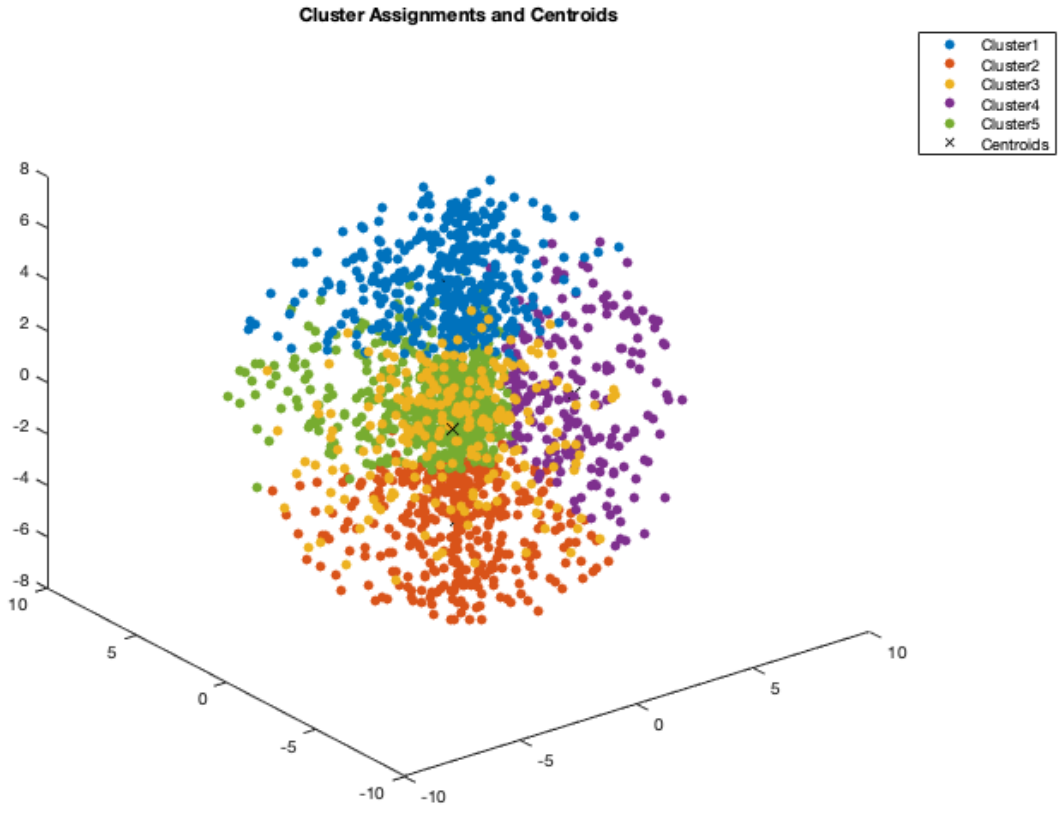

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Cluster5
Centroids
4
3
2
1
0
-1
-2
-3
-4
-4
-3
-2
-1
0
1
2
3
4

3. 3d_sphere.mat

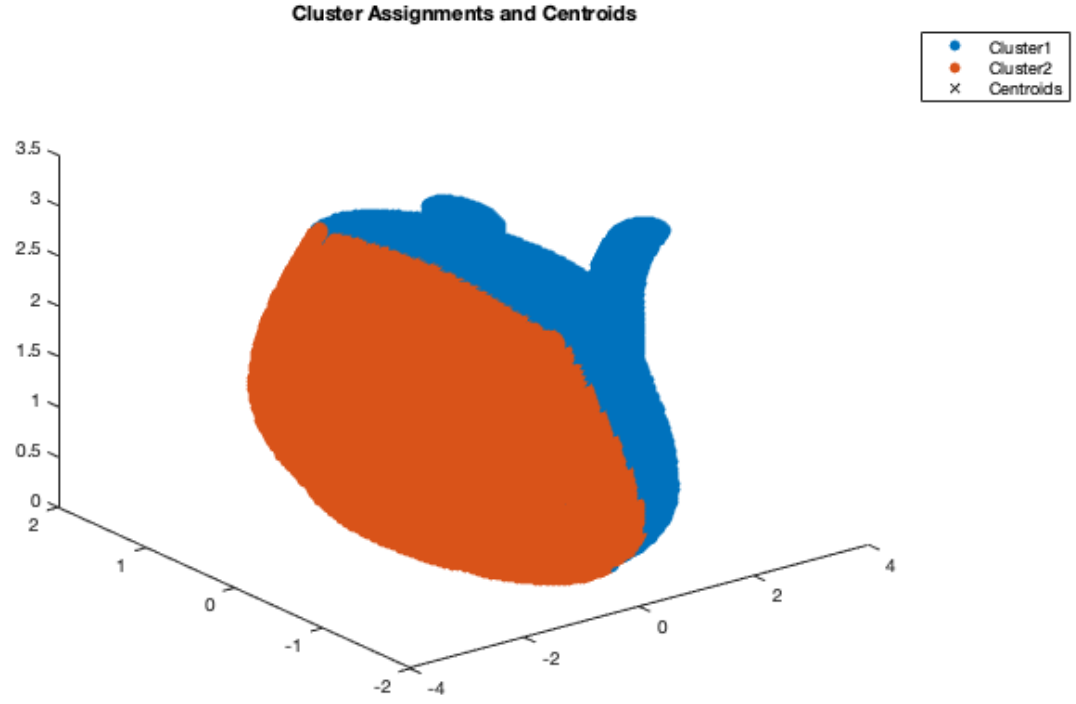

Cluster Assignments and Centroids
Cluster1
Cluster2
Centroids
8
6
4
2
0
-2
-4
-6
-8
10
5
0
-5
-10
-10
-5
0
5
10

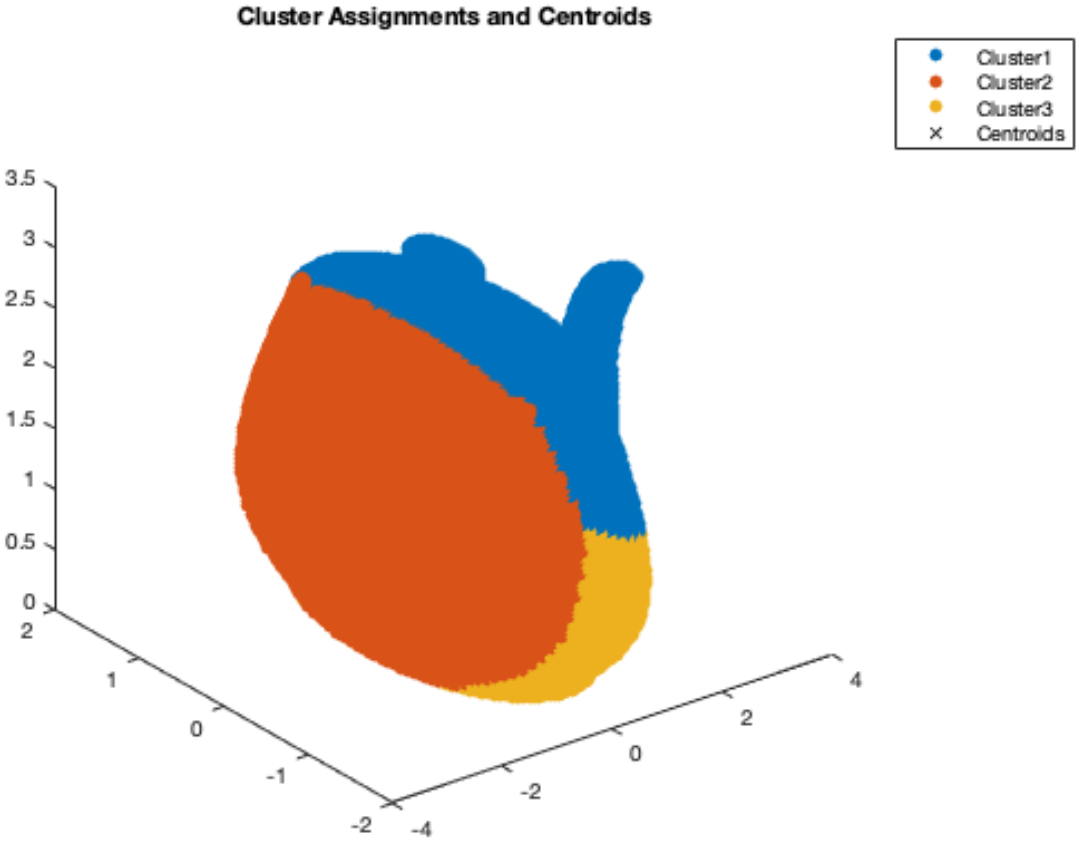

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Centroids
8
6
4
2
0
-2
-4
-6
-8
10
5
0
-5
-10
-10
-5
0
5
10

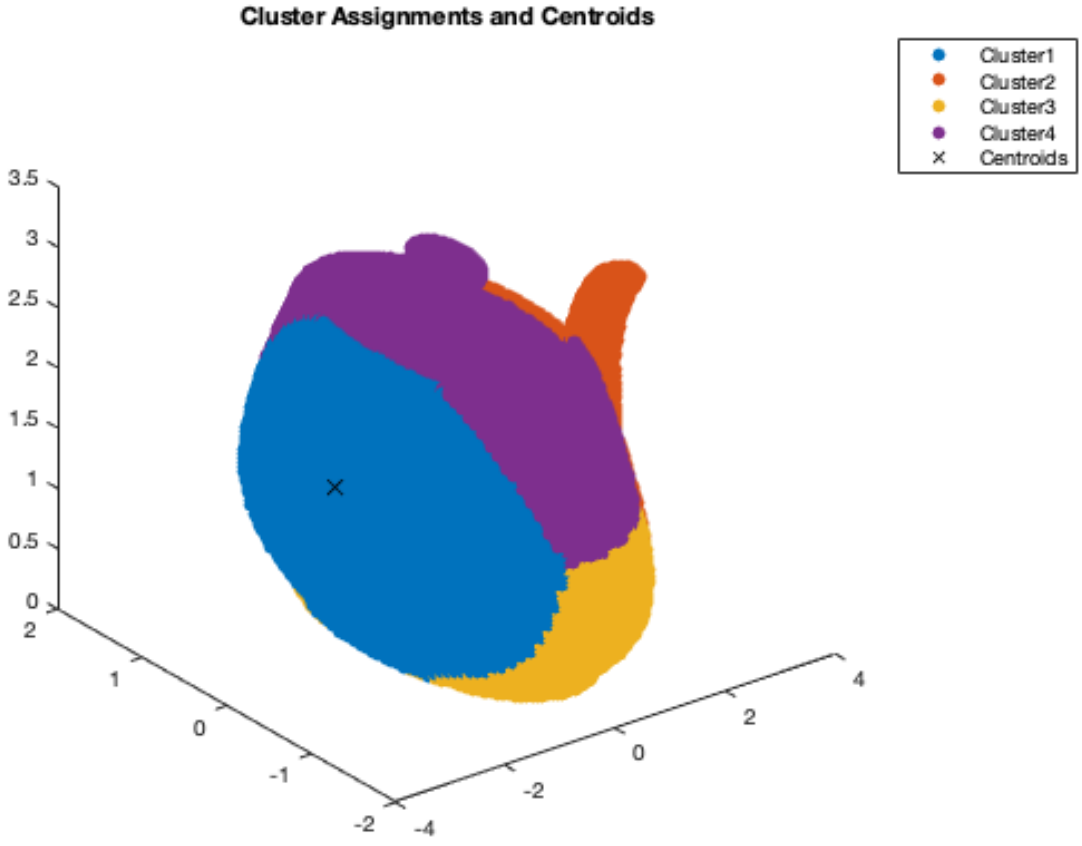

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Centroids
8
6
4
2
0
-2
-4
-6
-8
10
5
0
-5
-10
-10
-5
0
5
10

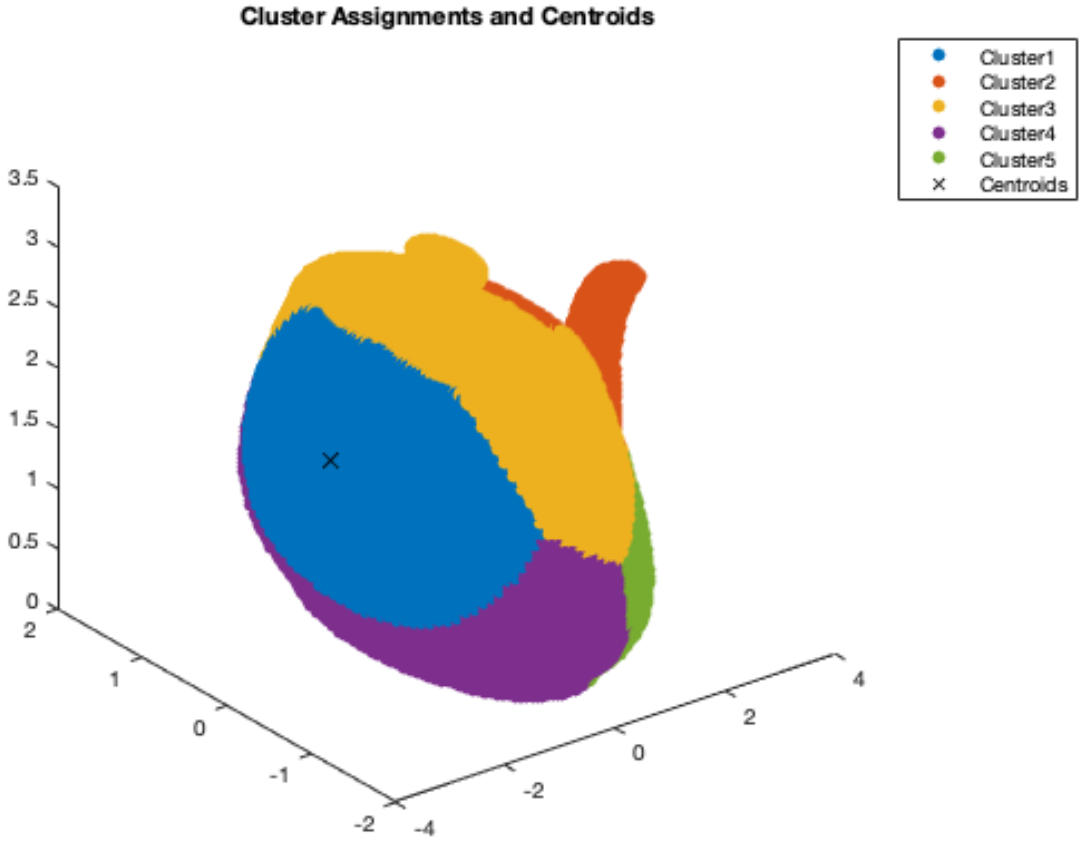

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Cluster5
Centroids
8
6
4
2
0
-2
-4
-6
-8
10
5
0
-5
-10
-10
-5
0
5
10

4. teapot.mat

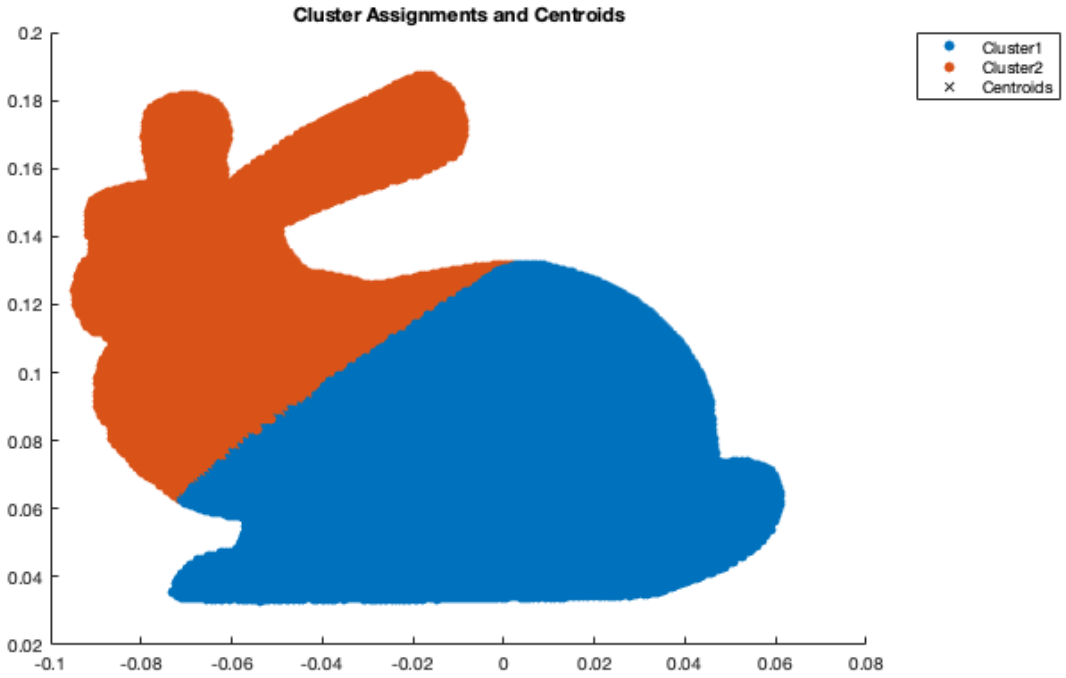

Cluster Assignments and Centroids
Cluster1
Cluster2
Centroids
3.5
3
2.5
2
1.5
1
0.5
0
2
1
0
-1
-2
-4
-2
0
2
4

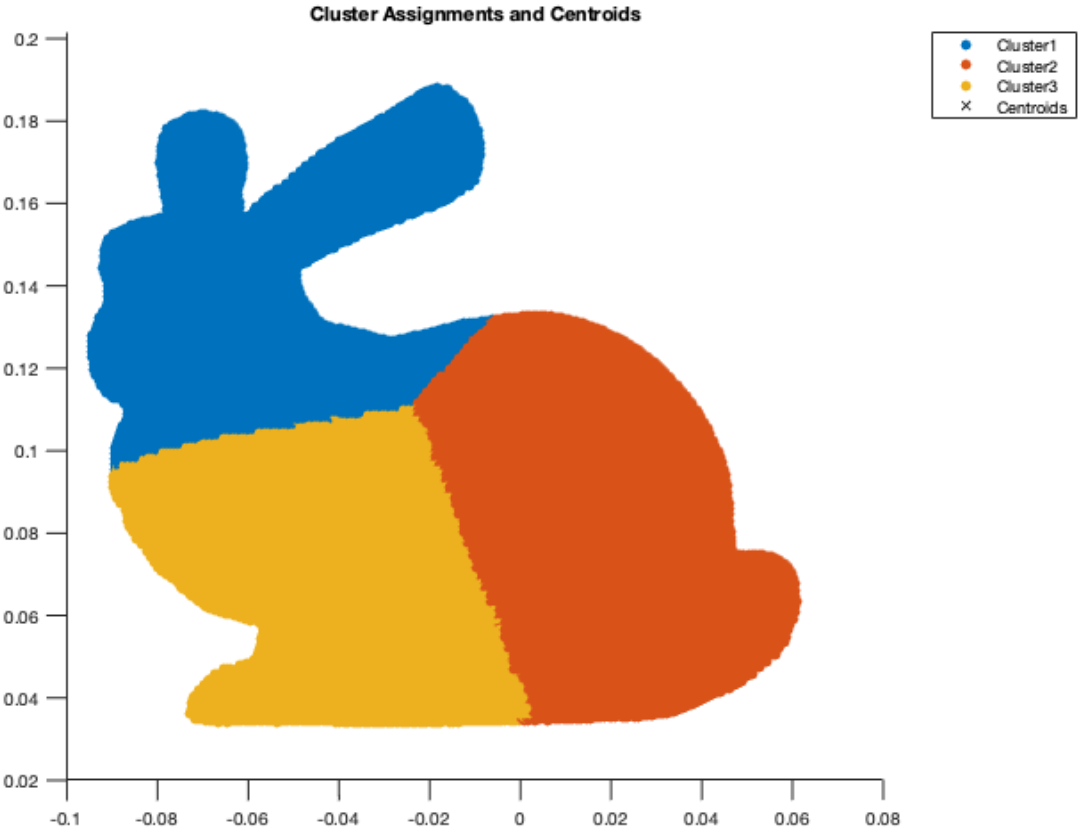

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Centroids
3.5
3
2.5
2
1.5
1
0.5
0
2
1
0
-1
-2
-4
-2
0
2
4

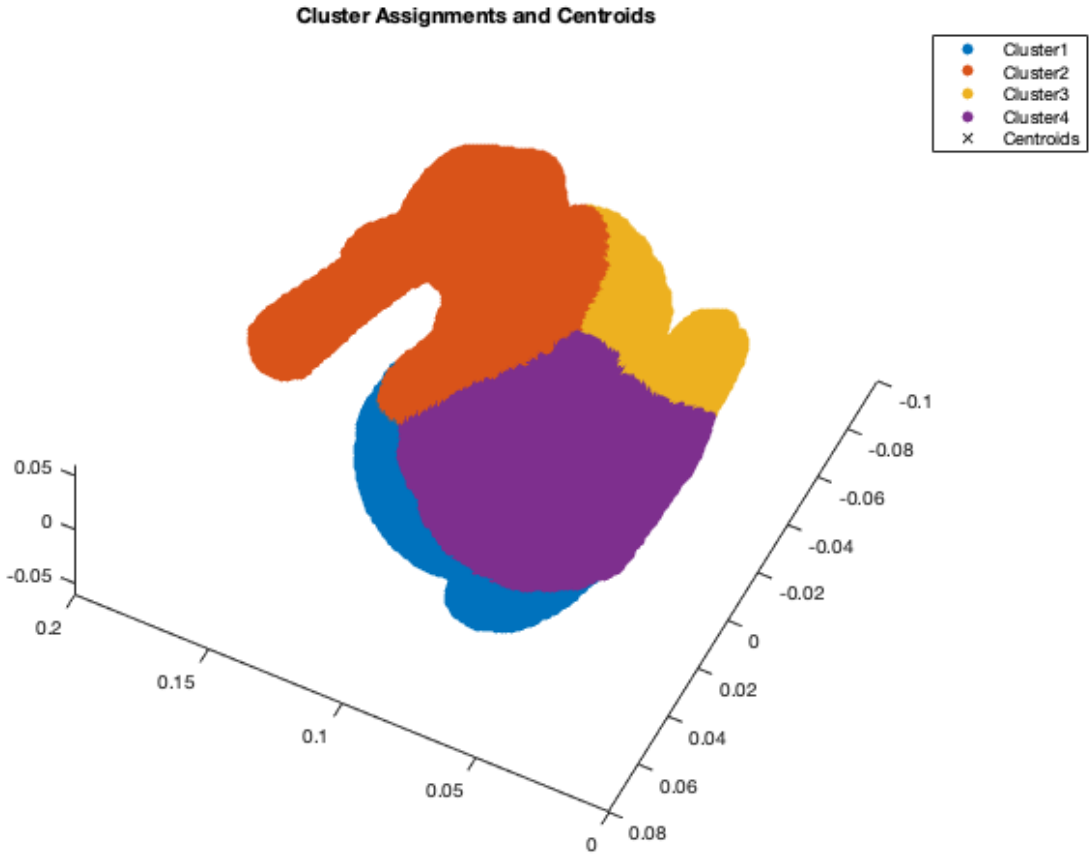

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Centroids
3.5
3
2.5
2
1.5
1
0.5
0
2
1
0
-1
-2
4
2
0
-2
-4

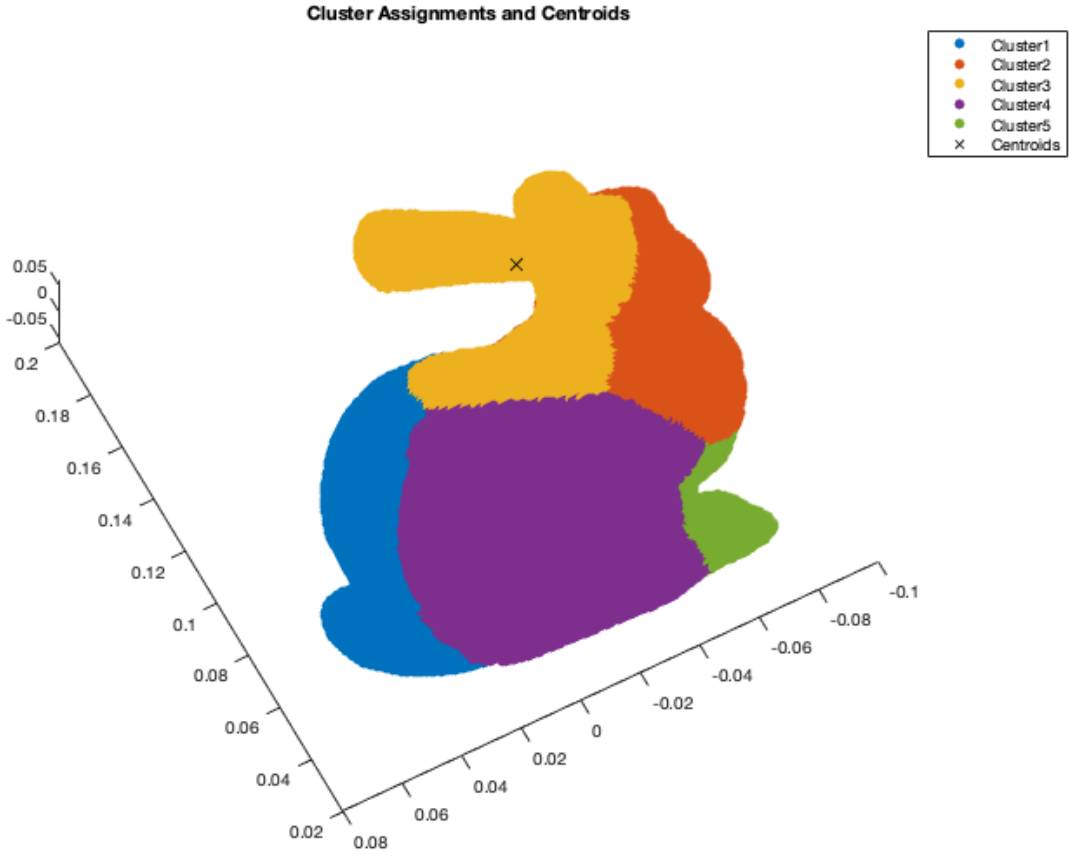

Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Cluster5
Centroids
3.5
3
2.5
2
1.5
1
0.5
0
2
1
0
-1
-2
4
2
0
-2
-4

5. bun_zipper. mat


Cluster Assignments and Centroids
Cluster1
Cluster2
Centroids
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
-0.1
-0.08
-0.06
-0.04
-0.02
0
0.02
0.04
0.06
0.08


Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Centroids
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
-0.1
-0.08
-0.06
-0.04
-0.02
0
0.02
0.04
0.06
0.08


Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Centroids
0.05
0
-0.05
0.2
0.15
0.1
0.05
0
-0.1
-0.08
-0.06
-0.04
-0.02
0
0.02
0.04
0.06
0.08


Cluster Assignments and Centroids
Cluster1
Cluster2
Cluster3
Cluster4
Cluster5
Centroids
0.05
0
-0.05
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
-0.1