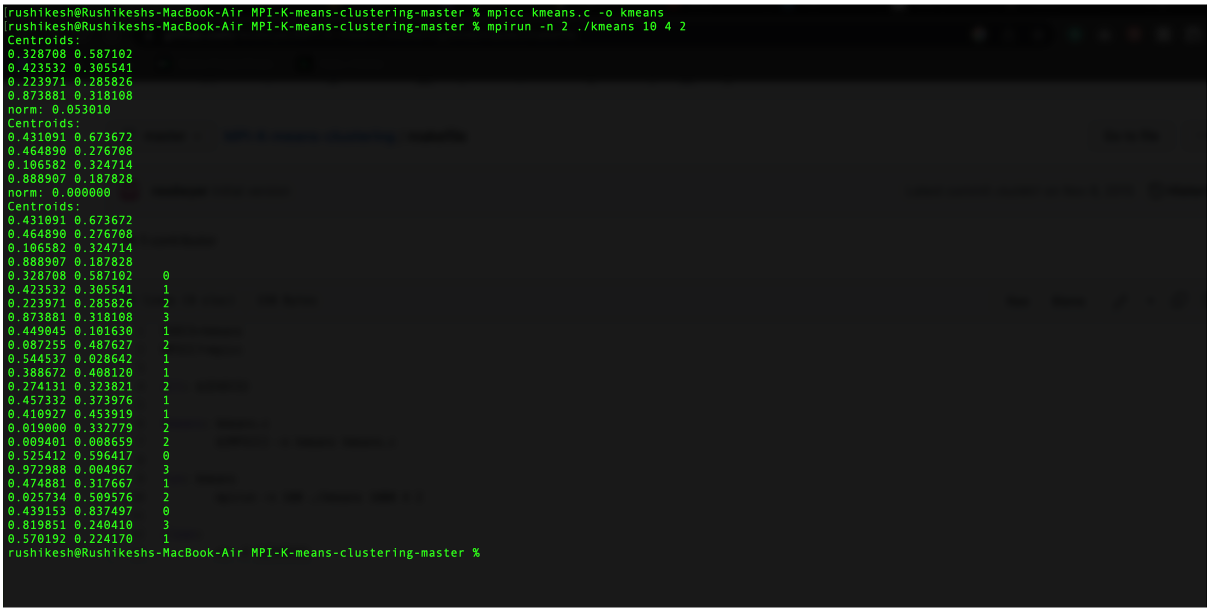
# **Assignment 3** – K-Means with MPI

## **Output File** –



```
rushikesh@Rushikeshs-MacBook-Air MPI-K-means-clustering-master % mpicc kmeans.c -o kmeans
rushikesh@Rushikeshs-MacBook-Air MPI-K-means-clustering-master % mpirun -n 2 ./kmeans 10 4 2
Centroids:
0.328708 0.587102
0.423532 0.305541
0.223971 0.285826
0.873881 0.318108
norm: 0.053010
Centroids:
0.431091 0.673672
0.464890 0.276708
0.106582 0.324714
0.888907 0.187828
norm: 0.000000
Centroids:
0.431091 0.673672
0.464890 0.276708
0.106582 0.324714
0.888907 0.187828
0.328708 0.587102    0
0.423532 0.305541    1
0.223971 0.285826    2
0.873881 0.318108    3
0.449045 0.101630    1
0.087255 0.487627    2
0.544537 0.028642    1
0.388672 0.408120    1
0.274131 0.323821    2
0.457332 0.373976    1
0.410927 0.453919    1
0.019000 0.332779    2
0.009401 0.008659    2
0.525412 0.596417    0
0.972988 0.004967    3
0.474881 0.317667    1
0.025734 0.509576    2
0.439153 0.837497    0
0.819851 0.240410    3
0.570192 0.224170    1
rushikesh@Rushikeshs-MacBook-Air MPI-K-means-clustering-master %
```

## **Notes** –

1. We have explained our code using comments in our c file. We have mentioned our comments for almost each method or statements in our code.
2. We have calculated centroid for the randomly generate data and then calculated nearest neighbour points and form a cluster.
3. We have shown each data points with their cluster numbers which we have found while K-means calculation.
4. For Screenshot purpose, we just have shown 2 dimensional data with size 10 and consider 2 K-clusters only. But, we can calculate data for 16-dimensional data with 10000 data size.

## **Steps -**

1. For C Code compilation - mpicc kmeans.c -o kmeans
2. For execution, you need to hit below command line in terminal –
   mpirun -n 2 ./kmeans 10 4 2

   **mpirun -n 2 –** indicates how many processors, we are going to use for execution
   **./kmeans 10 4 2** – indicates 10 (total number of data points), 4 (K- clusters for computation) and 2 (n-dimensional data)

Thank you for such thoughtful assignment.