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Implementation Project 2(Option 1)

Project Description/Objectives: Project Implements Clustering Algorithm on 3 different datasets. The algorithm takes user input for the maximum distance allowed between any two points and the number of such instances allowed. Also, the user decides the number of clusters the dataset is clustered into.

Software used:
IDE: Netbeans.
Language: JAVA.

Source Code:

```
*
 * Source code to implement clustering algorithm
 *
 */

/**
 *
 * @author kijit
 */
public class Clustering {


   public static void main(String[] args) {

      int x[]= new int[500];
      int y[]= new int[500];
      int z[]= new int[500];

      for(int i=0;i<500;i++)
      {
      x[i]= 0 + (int)(Math.random()* 500);
      y[i]= 0 + (int)(Math.random()* 500);
      z[i]= 0 + (int)(Math.random()* 500);
      //System.out.println("x:"+x[i]+" y:"+y[i]+" z:"+z[i]);
      }

      outlier test1= new outlier();
      test1.outlier(x, y, z);
   }
}



import java.lang.* ;
import java.util.ArrayList;
```

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```
import java.util.Scanner;
/*
 * Calculaing the outliers and printing them.
 */

/**
 *
 * @author kijit
 */
public class outlier {

   public static void outlier(int x[],int y[], int z[])
   {

      Scanner scan= new Scanner(System.in);
      System.out.println("Enter the Maximum Distance allowed");
      int mindist=scan.nextInt();
      System.out.println("Enter the maximum points allowed more than threshold
");
      int a=scan.nextInt();
      int dist=0 ;
      ArrayList db = new ArrayList();
      int count2=0;

      for(int i=0;i<500;i++)
      {
        int count=0;
         for(int j=1;j<500;j++)
         {
            double temp= (x[i]-x[j])*(x[i]-x[j])+(y[i]-y[j])*(y[i]-y[j])+(z[i]-z[j])*(z[i]-
z[j]);
            dist = (int)Math.sqrt(temp) ;
            if(dist>mindist)
            {
               count++ ;
            }
         }
         if(count>=a)
         {
            System.out.println("outlier: "+"x:"+x[i]+" y:"+y[i]+" z:"+z[i]);
            count2++ ;
         }
         else
         {
            ArrayList temp = new ArrayList();
            temp.add(x[i]);
            temp.add(y[i]);
            temp.add(z[i]);
            db.add(temp);
            /*int temp[]= new int[3];
            temp[0]=x[i];
```

```
            temp[1]=y[i];
            temp[2]=z[i];
            db.add(temp);*/

          }

        }

        if(count2==0)
        {
           System.out.println(" No Outliers found");
        }
        cluster test2= new cluster();
        test2.cluster(db);

     }

}


import java.util.ArrayList;
import java.util.Scanner;
/*
 * Clustering the points
 */

/**
 *
 * @author kijit
 */
public class cluster {

    public static void cluster(ArrayList db)
    {

        Scanner scan= new Scanner(System.in);

        ArrayList dbnew= new ArrayList() ;
        dbnew.addAll(db) ;

        int one = 0;
        int two = 0 ;
        System.out.println("Enter Number of clusters");
        int count =scan.nextInt() ;

        for(int l=0;db.size()>count;l++)
        {
           //System.out.println(db.size());
           double mindist = 10000;
        for(int i=0;i<db.size();i++)
        {
```

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```
        for(int j=i+1;j<db.size();j++)
        {
           //for(int k=0;k<((ArrayList)db.get(i)).size();k++)
           //{
              double temp=0 ;
              int x= Integer.parseInt(((ArrayList)db.get(i)).get(0).toString())-
Integer.parseInt(((ArrayList)db.get(j)).get(0).toString());
              int y= Integer.parseInt(((ArrayList)db.get(i)).get(1).toString())-
Integer.parseInt(((ArrayList)db.get(j)).get(1).toString());
              int z= Integer.parseInt(((ArrayList)db.get(i)).get(2).toString())-
Integer.parseInt(((ArrayList)db.get(j)).get(2).toString());
              temp= Math.sqrt(x*x+y*y+z*z);
              if(temp<mindist)
              {
                 mindist=temp;
                 one=i ;
                 two=j;

              }
           //}
        }
     }

     //System.out.println(one+" "+two);
     ArrayList newtemp= new ArrayList();
     newtemp.add(dbnew.get(one));
     newtemp.add(dbnew.get(two));
     //System.out.println(db.get(two));

     dbnew.remove(two);
     dbnew.set(one, newtemp);

     db.remove(two);

      }
     //System.out.println(dbnew.size());

     for(int i=1;i<=dbnew.size();i++)
     {
        System.out.println();
        System.out.println("Cluster "+i);

        System.out.println(dbnew.get(i-1));
        System.out.println();
     }

   }
}
```

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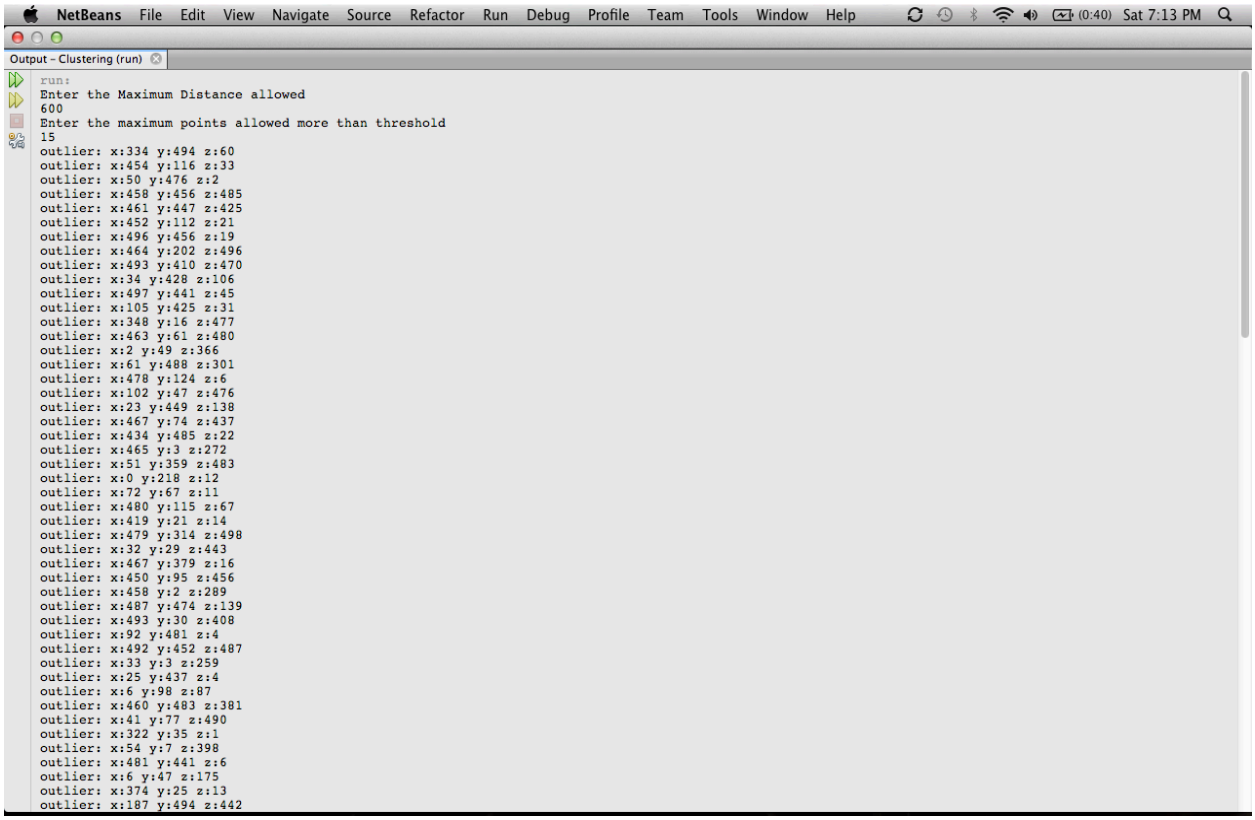
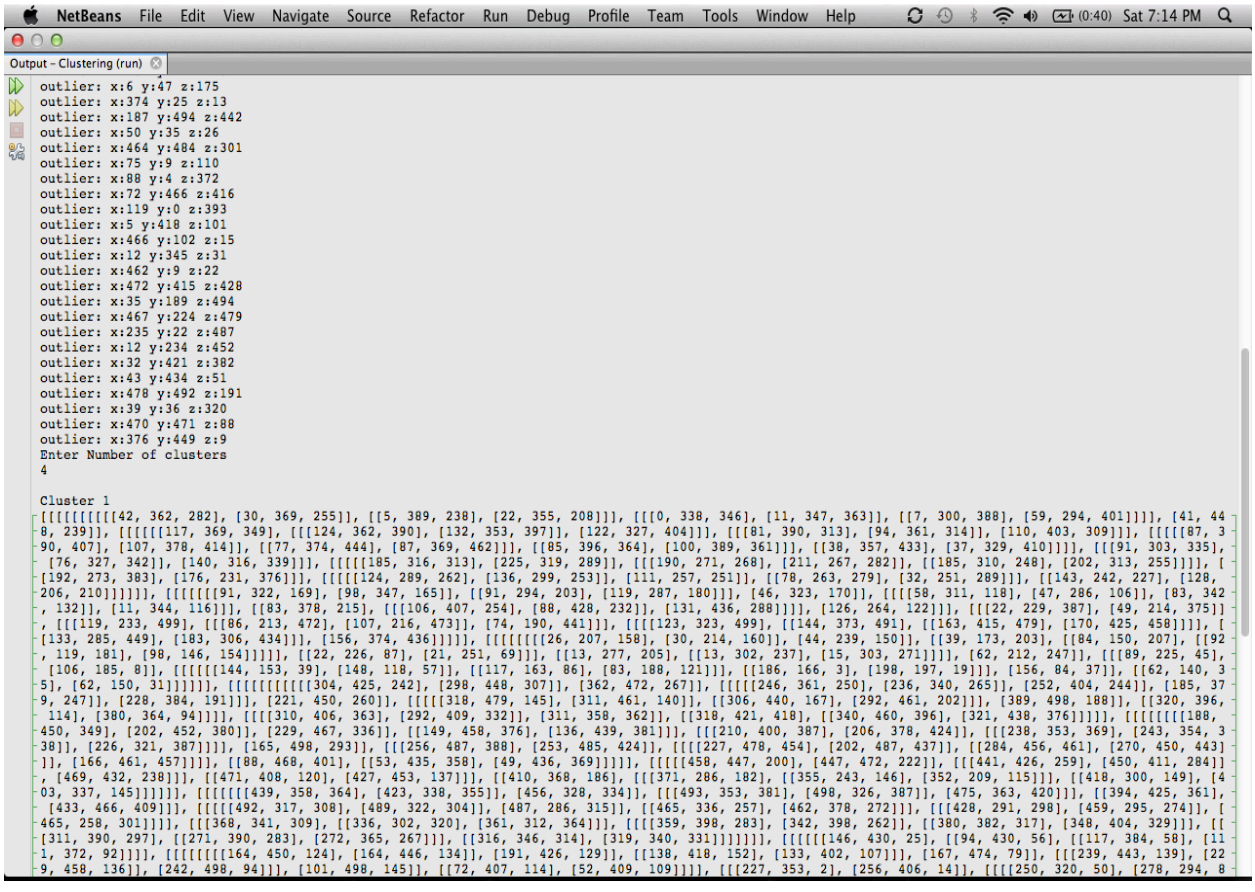
Screenshot of execution of first data set:





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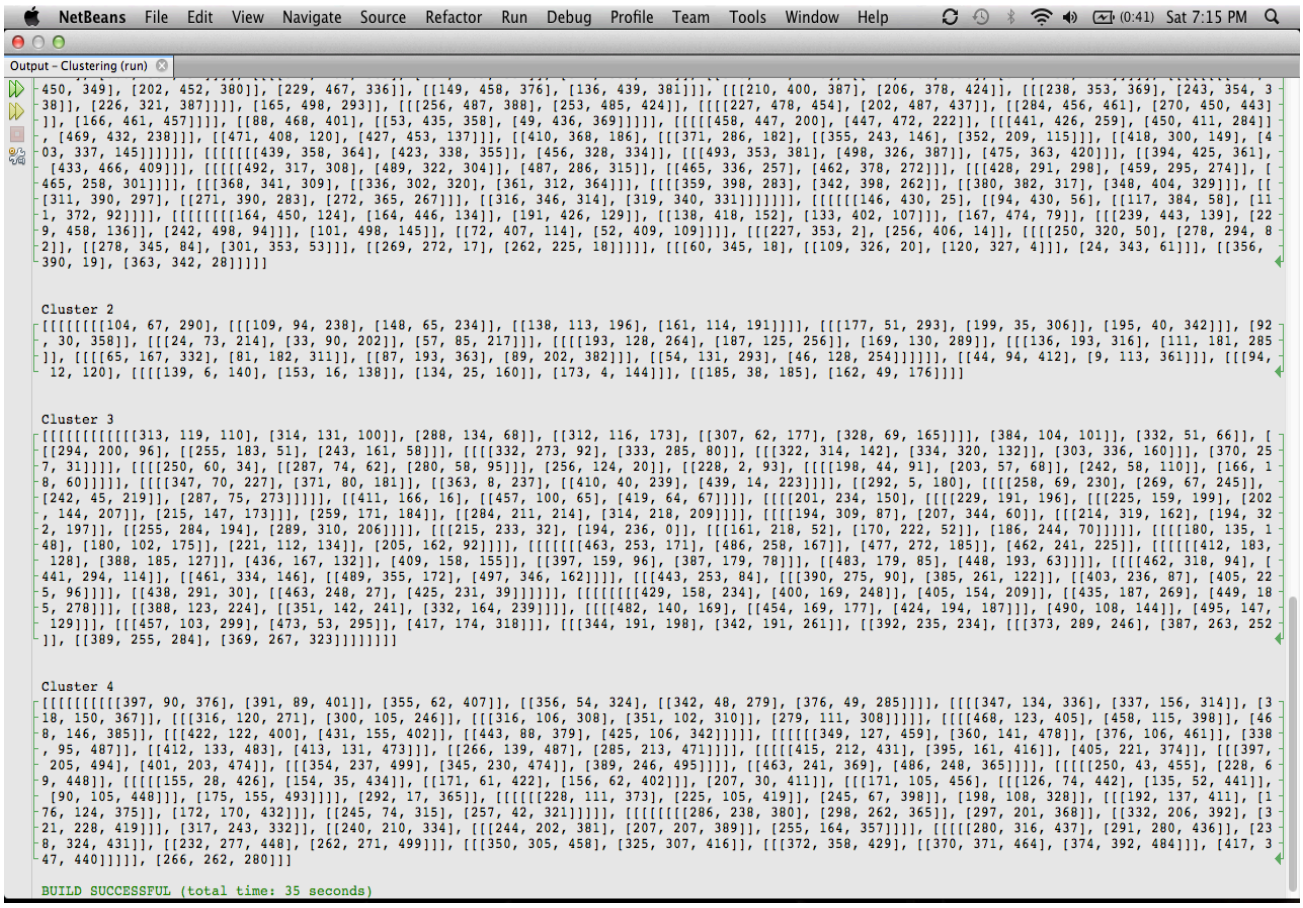

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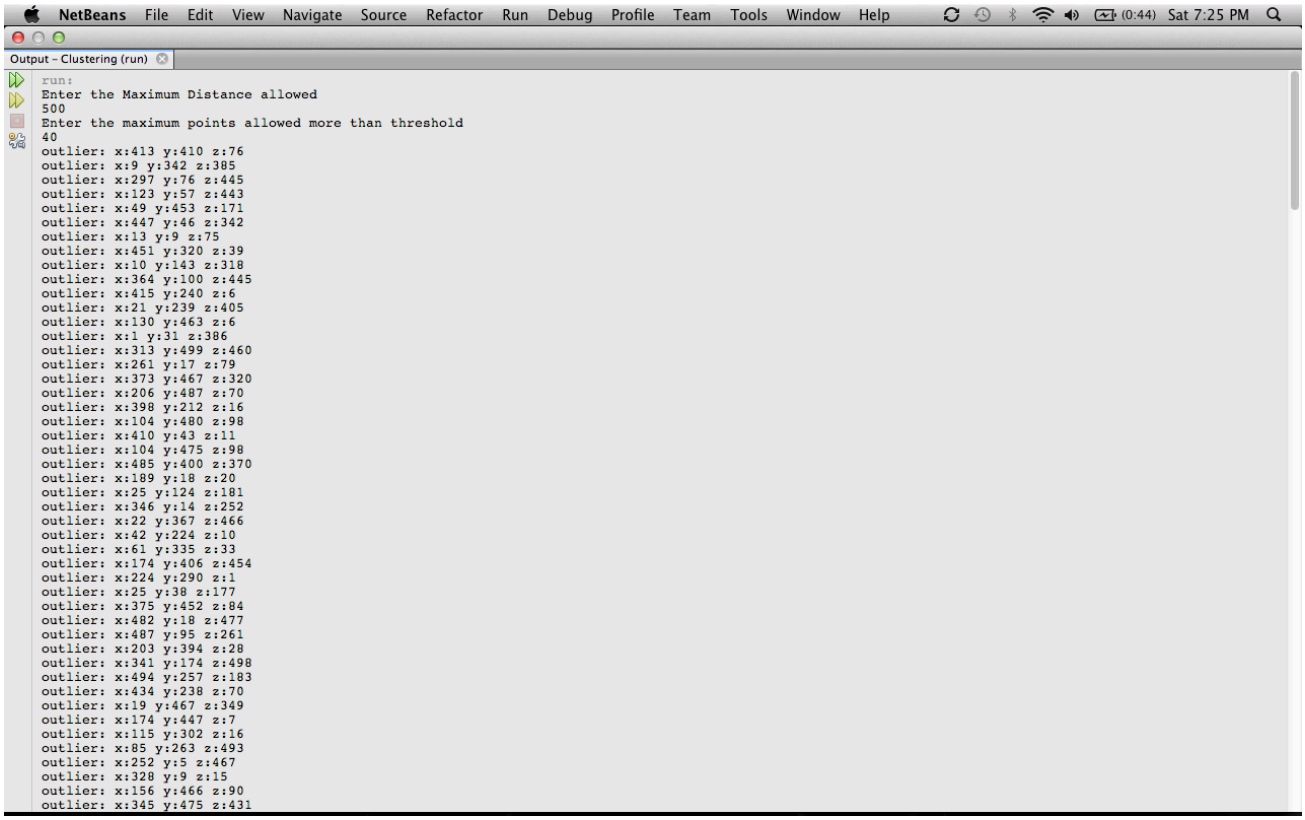
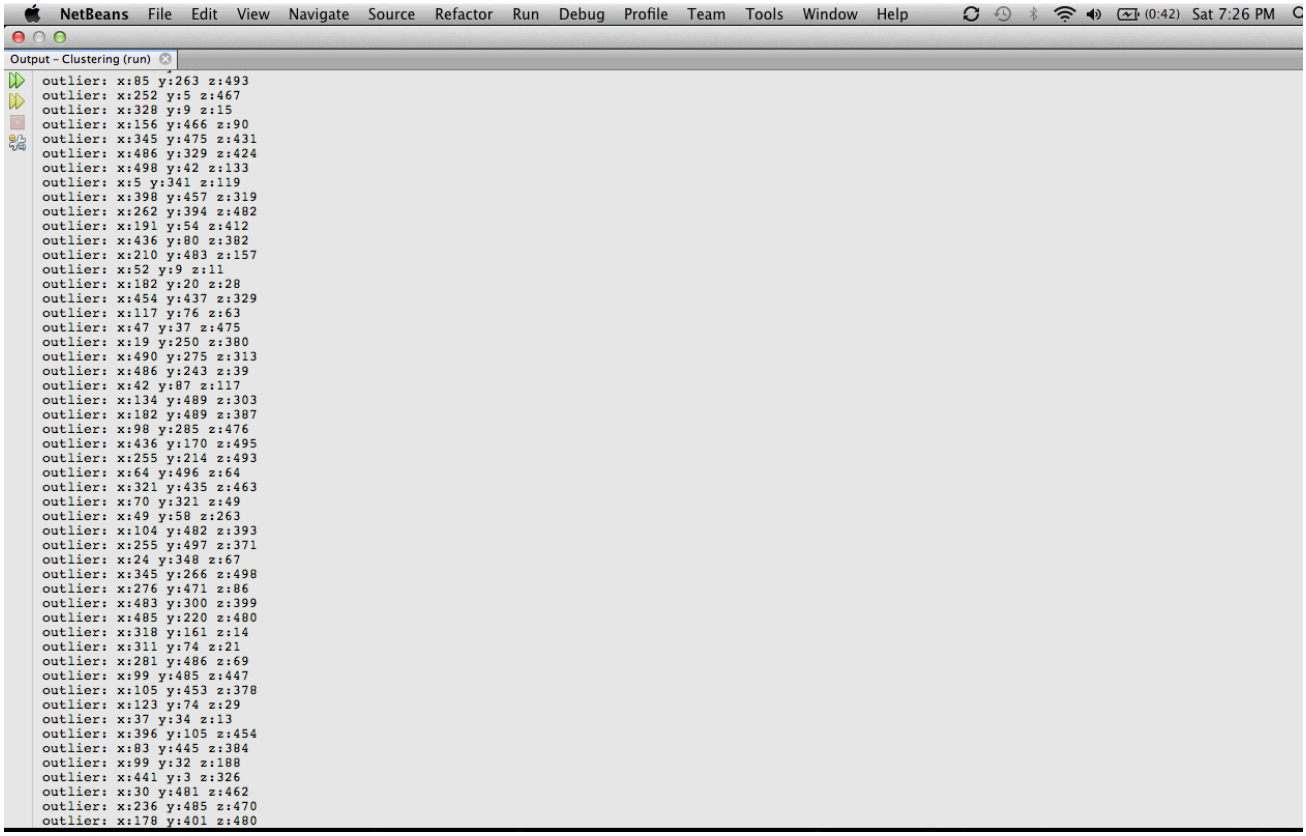
Screenshots for execution of second dataset:





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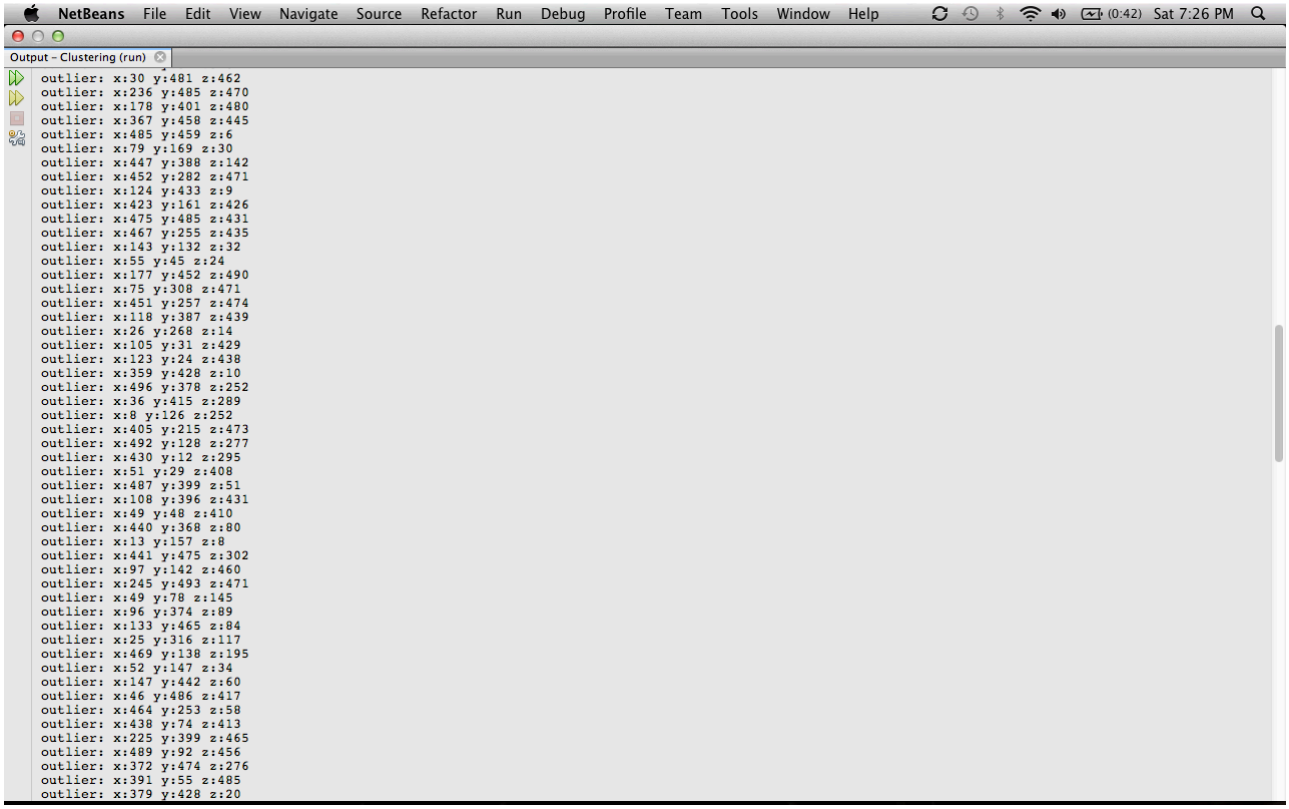

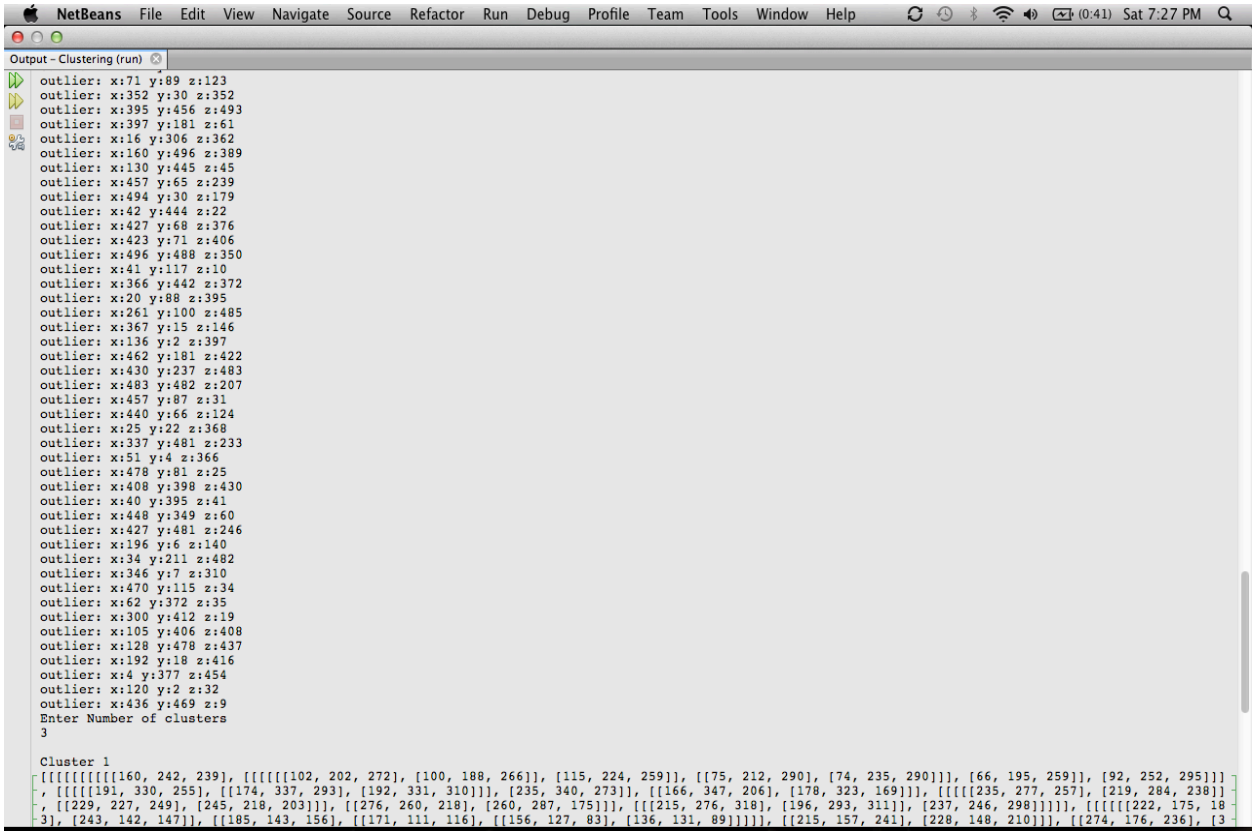

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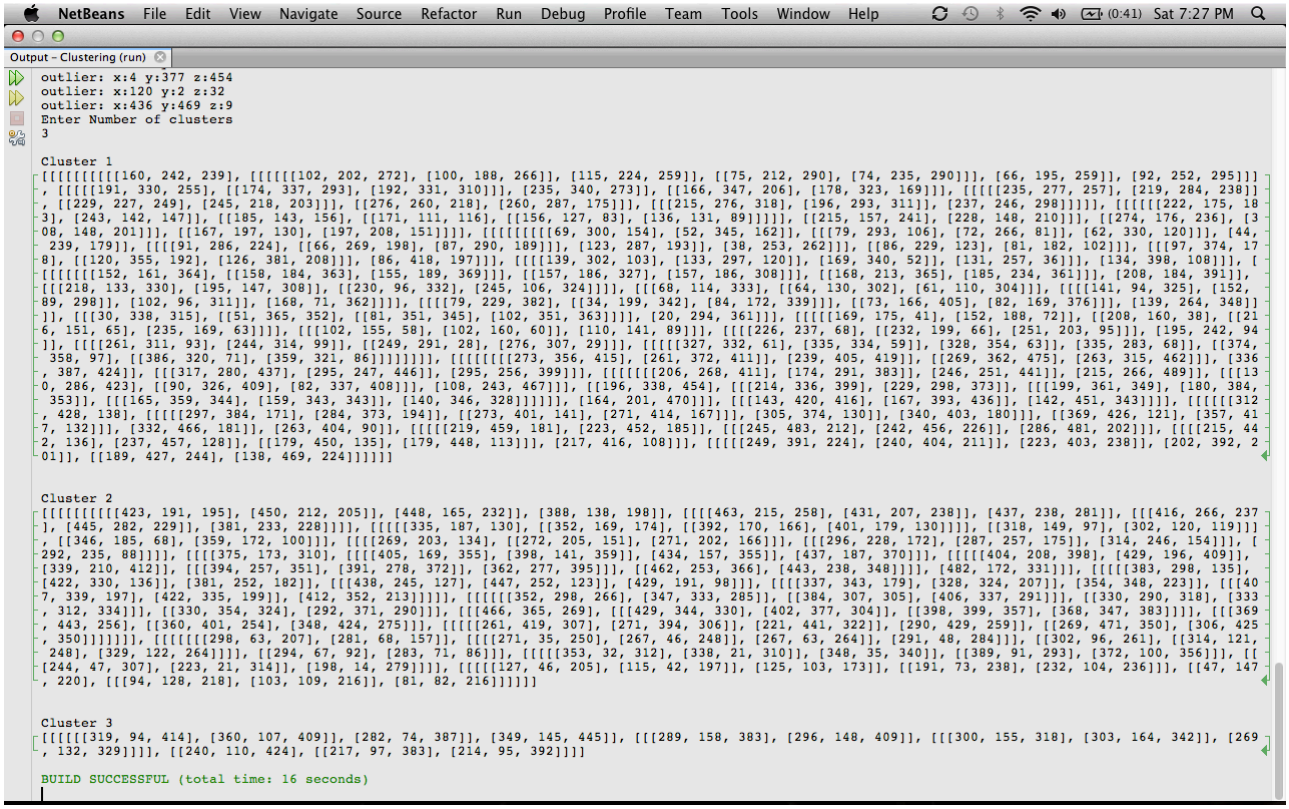

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Screenshots for execution of third dataset: