APRIORI

```
import java.io.*;
import java.sql.*;
class  Apriori1
{
      public static void main(String[] args)
      {
try
{
Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
Connection con = DriverManager.getConnection("jdbc:odbc:test1");

Statement st_t,st_l1,st_l2,st_l3,st_del;
ResultSet rs_t,rs_l1,rs_l2,rs_l3;

st_t = con.createStatement();
st_l1 = con.createStatement();
st_l2 = con.createStatement();
st_l3 = con.createStatement();
st_del = con.createStatement();

st_del.executeUpdate("delete * from l1");
st_del.executeUpdate("delete * from l2");
st_del.executeUpdate("delete * from l3");

for (int i=1;i<=5 ;i++ )
{
int count1=0,val=0;
rs_t = st_t.executeQuery("select * from trans");

while (rs_t.next())
{
      val = Integer.parseInt(rs_t.getString(""+i+""));
      if (val == 1)
      {
            ++count1;
      }

}//while

//write to l1 file
st_l1.executeUpdate("insert into l1(item,support)
values('"+i+"','"+count1+"')");


}//for
//----L1 done----

//Construct l2

rs_l1 = st_l1.executeQuery("select * from l1");
```

```
int a[] = new int[20];
int i=0;
while (rs_l1.next())
{
a[i]= Integer.parseInt(rs_l1.getString("item"));
++i;
}//while
int len =i;
int fst,snd,val1=0,val2=0;
for (i=0;i<len ;i++ )
for (int j=i+1;j<len ;j++ )
{
fst = a[i];
snd=a[j];
int count2=0;
rs_t = st_t.executeQuery("select * from trans");
while (rs_t.next())
{

val1 = Integer.parseInt(rs_t.getString(""+fst+""));
val2 = Integer.parseInt(rs_t.getString(""+snd+""));

if (val1 == 1 && val2 == 1)
{
     ++count2;
}//if
}//while
//write to l2
if (count2 >=2)
{
     st_l2.executeUpdate("insert into l2(item1,item2,support)
values('"+fst+"','"+snd+"','"+count2+"')");
}
}//for inner

//create to l3

rs_l2 = st_l2.executeQuery("select item1,item2 from l2");
int b[][] = new int [10][2];
int p=0;
while (rs_l2.next())
{
b[p][0] = Integer.parseInt(rs_l2.getString("item1"));
b[p][1] = Integer.parseInt(rs_l2.getString("item2"));
++p;
}//while

len = p;
int val3=0;
for (int m=0;m<len ;m++)
     for (int n=m+1;n<len ;n++ )
     {
```

```
if (b[m][0] == b[n][0])
{
rs_t = st_t.executeQuery("select * from trans");
int count3=0;
while (rs_t.next())
{
val1 = Integer.parseInt(rs_t.getString(""+b[m][0]+""));
val2 = Integer.parseInt(rs_t.getString(""+b[m][1]+""));
val3 = Integer.parseInt(rs_t.getString(""+b[n][1]+""));

if (val1 == 1 && val2 == 1 && val3 ==1)
{
++count3;
}//if
}//while

if (count3>=0)
{
     st_l3.executeUpdate("insert into l3(item1,item2,item3,support)
values('"+val1+"','"+val2+"','"+val3+"','"+count3+"')");
}

}//if

     }//for outer



con.close();
}//try
catch (Exception e1)
{
     System.out.println(e1);
}

     }//main
}//class
```

KMEANS – 1D

```
import java.io.*;
class Kmeans1d{
public static void main(String args[]){
int input[] ={3,4,6,9,2,1,5,7,10,22};
int cluster1[]=new int[10];
int cluster2[]=new int[10];
int cluster3[]=new int[10];
int cnt1=0,cnt2=0,cnt3=0;
int sum1=0,sum2=0,sum3=0;
float mean1=input[0],mean2=input[1],mean3=input[2];
String str1=null,str2=null;
float k1=0,k2=0,k3=0;
for(int iter=1;iter<=5;iter++)
{
for(int i=0;i<10;i++){
k1 = Math.abs(mean1-input[i]);
k2 = Math.abs(mean2-input[i]);
k3 = Math.abs(mean3-input[i]);

if(k1<k2){
if(k1<k3)
{str1 ="c1";}
else
str1 ="c3";
}//if
else{
if(k2<k3)
str1 = "c2";
else
str1 = "c3";
}//else

if(str1 == "c1")
{cluster1[cnt1]=input[i];++cnt1;}

if(str1 == "c2")
{cluster2[cnt2]=input[i];++cnt2;}

if(str1 == "c3")
{cluster3[cnt3]=input[i];++cnt3;}
}//for inner


//calculate means and change center to this mean
for(int i=0;i<cnt1;i++)
{sum1+=cluster1[i];}
mean1= (float)sum1/cnt1;

for(int i=0;i<cnt2;i++)
sum2 +=cluster2[i];
```

```
mean2=(float)sum2/cnt2;

for(int i=0;i<cnt3;i++)
sum3+=cluster3[i];
mean3=(float)sum3/cnt3;

System.out.println("----Iteration "+iter+" ----");
for(int j=0;j<cnt1;j++)
System.out.print(cluster1[j]+"  ");
System.out.println("\nMean:"+mean1);

for(int j=0;j<cnt2;j++)
System.out.print(cluster2[j]+"  ");
System.out.println("\nMean:"+mean2);

for(int j=0;j<cnt3;j++)
System.out.print(cluster3[j]+"  ");
System.out.println("\nMean:"+mean3);
System.out.println("----------------");

cnt1=0;cnt2=0;cnt3=0;
sum1=0;sum2=0;sum3=0;

}//iterator for
}//main
}//class
```

KMEANS – 2D

```
import java.io.*;
import java.util.*;
class Kmeans2d{
public static void main(String[] args){
Random rm = new Random();
int a[][] = new int[10][2];

int cnt1=0,cnt2=0,cnt3=0;
int cluster1[][] = new int[10][2];
int cluster2[][] = new int[10][2];
int cluster3[][] = new int[10][2];

//Fill input array
for(int i=0;i<8;i++)
for(int j=0;j<2;j++)
a[i][j] = 1+rm.nextInt(15);

//show input array
for(int i=0;i<8;i++){
for(int j=0;j<2;j++)
System.out.print(a[i][j]+"  ");
System.out.println();
}
float mean1[][] = new float[10][2];
float mean2[][] = new float[10][2];
float mean3[][] = new float[10][2];

//set initial centers
for(int i=0;i<2;i++)
{
mean1[0][i] = a[0][i];
mean2[0][i] = a[1][i];
mean3[0][i] = a[2][i];
}
String str1;
int sum10=0,sum11=0,sum20=0,sum21=0,sum30=0,sum31=0;
for(int iter=1;iter<5;iter++){
float k1=0,k2=0,k3=0;

for(int i=0;i<8;i++){
k1 = ((mean1[0][0]-a[i][0]) * (mean1[0][0]-a[i][0])) + ((mean1[0][1]-
a[i][1])*(mean1[0][1]-a[i][1]));
k2 = ((mean2[0][0]-a[i][0]) * (mean2[0][0]-a[i][0])) + ((mean2[0][1]-
a[i][1])*(mean2[0][1]-a[i][1]));
k3 = ((mean3[0][0]-a[i][0]) * (mean3[0][0]-a[i][0])) + ((mean3[0][1]-
a[i][1])*(mean3[0][1]-a[i][1]));

if (k1<k2){
if(k1<k3) str1 ="c1";
else str1 ="c3";
```

```
}//if

else{
if(k2<k3) str1="c2";
else str1="c3";
}//else

if(str1 == "c1"){
for(int j=0;j<2;j++){
cluster1[cnt1][j] = a[i][j];
}//for c1
++cnt1;
}

if(str1 == "c2"){
for(int j=0;j<2;j++){
cluster2[cnt2][j] = a[i][j];
}//for c2
++cnt2;
}

if(str1 == "c3"){
for(int j=0;j<2;j++){
cluster3[cnt3][j] = a[i][j];
}//for c3
++cnt3;
}

}//for inner

//calculate mean for each cluster and keep this mean as next center
sum10=0;sum11=0;sum20=0;sum21=0;sum30=0;sum31=0;
for(int i=0;i<cnt1;i++)
{
sum10 += cluster1[i][0];
sum11 += cluster1[i][0];
}
mean1[0][0] = (float) sum10/cnt1;
mean1[0][1] = (float) sum11/cnt1;

for(int i=0;i<cnt2;i++)
{
sum20 += cluster2[i][0];
sum21 += cluster2[i][0];
}
mean2[0][0] = (float) sum20/cnt2;
mean2[0][1] = (float) sum21/cnt2;

for(int i=0;i<cnt3;i++)
{
sum30 += cluster3[i][0];
sum31 += cluster3[i][0];
```

```
}
mean3[0][0] = (float) sum30/cnt3;
mean3[0][1] = (float) sum31/cnt3;

System.out.println("----Iteration: "+iter+" ----");
System.out.println("Cluster1");
for(int i=0;i<cnt1;i++)
System.out.println("["+cluster1[i][0]+", "+cluster1[i][1]+"]");
System.out.println("Mean: "+mean1[0][0]+","+mean1[0][1]);

System.out.println("Cluster2");
for(int i=0;i<cnt2;i++)
System.out.println("["+cluster2[i][0]+", "+cluster2[i][1]+"]");
System.out.println("Mean: "+mean2[0][0]+","+mean2[0][1]);

System.out.println("Cluster3");
for(int i=0;i<cnt3;i++)
System.out.println("["+cluster3[i][0]+", "+cluster3[i][1]+"]");
System.out.println("Mean: "+mean3[0][0]+","+mean3[0][1]);

System.out.println("--------\n");

cnt1=0;cnt2=0;cnt3=0;

}//for iter
}//main
}//class
```

KMEDOIDS

```
import java.io.*;
class Kmedoids
{
      static int input[] = {3,4,6,9,2,1,5,7,10,22};
      public static void main(String[] args) throws Exception
      {

int c1[] = new int[3]; //centers
int c2[] = new int[3];

int cluster1[] = new int[10];
int cluster2[] = new int[10];
int cluster3[] = new int[10];
int n;
int count1=0,count2=0,count3=0,total1=0;
int total2=0;
int k1,k2,k3;
String str1,str2;

BufferedReader br = new BufferedReader(new
InputStreamReader(System.in));
System.out.println("Enter 3 Centers For Iter1");
for(int i=0;i<3;i++)
      c1[i]=Integer.parseInt(br.readLine());

System.out.println("Enter 3 Centers For Iter2");
for(int i=0;i<3;i++)
      c2[i]=Integer.parseInt(br.readLine());
int inc1=0,inc2=0,inc3=0;

for (int i=0;i<10 ;i++ )
{
k1 = Math.abs(c1[0]-input[i]);
k2 = Math.abs(c1[1]-input[i]);
k3 = Math.abs(c1[2]-input[i]);

if (k1<k2)
{
      if (k1<k3)
            {str1 = "c1";   cluster1[inc1] = input[i];++inc1;}
      else
            {str1="c3";     cluster3[inc3] = input[i];++inc3;}

}
else
      {
            if (k2<k3)
                  {str1 ="c2";    cluster2[inc2] = input[i];++inc2;}
            else
                  {str1 = "c3";   cluster3[inc3] = input[i];++inc3;}
```

```
     }//else

if(str1 == "c1")
     count1+=k1;
if(str1 == "c2")
     count2+= k2;
if(str1 == "c3")
     count3+= k3;

}//for
total1 = count1+count2 +count3;

//Display cluster after 1st iter
System.out.println("Clusters 1,2,3 are: After Iter1:");
for (int i=0;i<inc1;i++)
System.out.print(cluster1[i]+"\t");
System.out.println("");
for (int i=0;i<inc2;i++)
System.out.print(cluster2[i]+"\t");
System.out.println("");
for (int i=0;i<inc3;i++)
System.out.print(cluster3[i]+"\t");


//Displayed!!!!

count1 =0;count2=0;count3=0;
inc1=0;inc2=0;inc3=0;
cluster1 = new int[10];
cluster2 = new int[10];
cluster3 = new int[10];
for (int i =0;i<10 ;i++ )
{
k1 = Math.abs(c2[0]-input[i]);
k2 = Math.abs(c2[1]-input[i]);
k3 = Math.abs(c2[2]-input[i]);

if (k1<k2)
{
     if(k1<k3)
          {str2 = "c1";cluster1[inc1] = input[i];++inc1;}
     else
          {str2="c3";cluster3[inc3] = input[i];++inc3;}
}
else
{
     if(k2<k3)
          {str2 = "c2";cluster2[inc2] = input[i];++inc2;}
     else
          {str2 = "c3";cluster3[inc3] = input[i];++inc3;}
}
```

```
if(str2 == "c1")
     count1 += k1;
if(str2 == "c2")
     count2+=k2;
if(str2 == "c3")
     count3 +=k2;

}//for
total2 = count1 + count2 +count3 ;

System.out.println("");

System.out.println("Clusters 1,2,3 After iter 2 are:");
for (int i=0;i<inc1;i++)
System.out.print(cluster1[i]+"\t");
System.out.println("");
for (int i=0;i<inc2;i++)
System.out.print(cluster2[i]+"\t");
System.out.println("");
for (int i=0;i<inc3;i++)
System.out.print(cluster3[i]+"\t");
System.out.println("");

//summary
System.out.println("Cluster1 Cost: "+total1);
System.out.println("Cluster2 Cost: "+total2);

if(total1<total2)
     System.out.println("Cluster1 has minimum cost");
if(total1 == total2)
     System.out.println("Botha have same cost");
if (total2<total1)
     System.out.println("Cluster2 has minimum cost");

     }//main
}//class
```