**Practical 2:**

**Write a program to perform data transformation using various transformation techniques.**

import java.util.Scanner;

public class dataNormalization

{

public static void minMax(int arr[],int n)

{

int new\_min=0,new\_max=1,i,min=arr[0],max=arr[n-1];

double m[]=new double[n];

double v,temp;

for(i=0;i<n;i++)

{

temp=(double)(arr[i]-min)/(max-min);

v=(double)(temp\*(new\_max-new\_min)+new\_min);

m[i]=v;

}

System.out.print("\nNormalized data by min-max normalization method : ");

for(i=0;i<n;i++)

{

// System.out.format(" %.2f", m[i]);

System.out.print(" "+m[i]);

}

}

public static void zscore(int arr[],int n)

{

int i,sum=0;

double z[]=new double[n];

double mean,sd = 0,temp = 0;

for(i=0;i<n;i++)

{

sum=sum+arr[i];

}

mean=sum/n;

for(i=0;i<n;i++)

{

temp=temp+Math.pow((arr[i]-mean), 2);

sd=Math.sqrt(temp/n);

}

System.out.print("\nNormalized data by Z-Score normalization method : ");

for(i=0;i<n;i++)

{

z[i]=(arr[i]-mean)/sd;

System.out.format(" %.2f",z[i]);

// System.out.print(" "+z[i]);

}

}

public static void decimalScaling(int arr[],int n)

{

int i,c=0,j,temp,min =100;

double d[]=new double[n];

int count[]=new int[n];

for(i=0;i<n;i++)

{

temp=arr[i];

while(temp>0)

{

temp=temp/10;

c++;

}

if(c<min)

min=c;

// count[i]=c;

c=0;

}

// min=count[0];

// for(i=0;i<n;i++)

// {

// if(count[i]<min)

// min=count[i];

// }

j=min;

System.out.print("\nNormalized data by Decimal Scaling Normalization method : ");

for(i=0;i<n;i++)

{

d[i]=arr[i]/Math.pow(10,j);

System.out.print(" "+d[i]);

}

}

public static void main(String[] args)

{

int n,j,temp,i;

Scanner scan=new Scanner(System.in);

System.out.print("Enter the dataset size:");

n=scan.nextInt();

int arr[]=new int[n];

for(i=0;i<n;i++)

{

System.out.print("Enter arr["+i+"]:");

arr[i]=scan.nextInt();

}

for(i=0;i<n;i++)

{

System.out.print("\narr["+i+"]: "+arr[i]);

}

for(i=0;i<n-1;i++)

{

for(j=i+1;j<n;j++)

{

if(arr[i]>arr[j])

{

temp=arr[i];

arr[i]=arr[j];

arr[j]=temp;

}

}

}

System.out.println("\n\nSorted Array(dataset) is:\n");

for(i=0;i<n;i++)

{

System.out.println("arr["+i+"]: "+arr[i]);

}

minMax(arr,n);

zscore(arr,n);

decimalScaling(arr,n);

}

}

**Output:-**

