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* **Exp-5**
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* **Class – S.Y.B.tech(B)**
* **Batch – B2**

**Problem Statement –**

Develop a mathematical package for Statistical operations like Mean, Median, Average, Standard deviation. Create a sub package in the math package -convert. In “convert” package provide classes to convert decimal to octal, binary, hex and vice-versa. Develop application program to use this package, and build executable jar file of it.

**Program –**

**Package -convert-**

package convert;

import java.util.\*;

import maths.\*;

public class Conversion{

String convertToBinary(int a){

return Integer.toBinaryString(a);

}

String convertToOctal(int a){

return Integer.toOctalString(a);

}

String convertToHexadecimal(int a){

return Integer.toHexString(a);

}

public static void main(String[] args) {

Conversion c=new Conversion();

Scanner sc=new Scanner(System.in);

System.out.println("Enter number : ");

int a=sc.nextInt();

System.out.println("Enter choice \n1.Convert to Binary\n2.Convert to Octal\n3.Convert to Hexadecimal");

int choice=sc.nextInt();

switch (choice) {

case 1:

System.out.println("Binary number is " + c.convertToBinary(a));

break;

case 2:

System.out.println("Octal number is " + c.convertToOctal(a));

break;

case 3:

System.out.println("Hexa decimal number is " + c.convertToHexadecimal(a));

break;

default:

System.out.println("Invalid Choice");

}

StatisticalOperation s1 = new StatisticalOperation();

System.out.print("Enter Size of array : ");

int size = sc.nextInt();

int []arr=new int[size];

System.out.println("Enter array : ");

for(int i=0;i<size;i++){

arr[i]=sc.nextInt();

}

System.out.println("Enter choice \n1.Mean\n2.Median\n3.Standard Deviation");

choice=sc.nextInt();

switch (choice) {

case 1:

System.out.print("Mean is : ");

System.out.println(s1.mean(arr));

break;

case 2:

System.out.println(s1.median(arr));

break;

case 3:

System.out.println(s1.standardDeviation(arr));

break;

default:

System.out.println("Invalid Choice");

}

}

}

**Package maths—**

package maths;

import java.util.\*;

public class StatisticalOperation{

public double mean(int []arr){

int sum=0;

for(int i=0;i<arr.length;i++)

sum+=arr[i];

return (sum/ arr.length);

}

public double median(int []arr){

Arrays.sort(arr);

int n=arr.length;

if(n%2==0){

return (arr[n/2] + arr[n/2+1])/2.0;

}

else{

return arr[(n+1)/2];

}

}

public double standardDeviation(int []arr){

int meanAns=(int)mean(arr);

long ans=0;

int square;

for(int i=0;i<arr.length;i++){

square=(arr[i]-meanAns)\*(arr[i]-meanAns);

ans+=square;

}

double res= Math.sqrt(ans/arr.length);

return res;

}

}

**Output –**

C:\Users\HP\OneDrive\Desktop\java\jar files\jar file with package execution>javac -d . StatisticalOperation.java

C:\Users\HP\OneDrive\Desktop\java\jar files\jar file with package execution>javac -d . Conversion.java

C:\Users\HP\OneDrive\Desktop\java\jar files\jar file with package execution>jar -cvmf manifest.txt out.jar convert/\*.class maths/\*.class

added manifest

adding: convert/Conversion.class(in = 2357) (out= 1283)(deflated 45%)

adding: maths/StatisticalOperation.class(in = 757) (out= 537)(deflated 29%)

C:\Users\HP\OneDrive\Desktop\java\jar files\jar file with package execution>java -jar out.jar

Enter number :

12

Enter choice

1.Convert to Binary

2.Convert to Octal

3.Convert to Hexadecimal

2

Octal number is 14

Enter Size of array : 5

Enter array :

1 2 3 4 5

Enter choice

1.Mean

2.Median

3.Standard Deviation

3

1.4142135623730951