

**Ahsanullah University of Science and Technology (AUST)**

**Department of Computer Science and Engineering**

**Course No. : CSE2202**

**Course Title : Numerical Methods Lab**

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**Section : A2**

Online 3:Implementation of ModifiedBisection Method

package modifiedbisectiontest;

import java.util.Scanner;

public class ModifiedBisectionTest {

public static double hornersMethod(double equation[],double value)

{

double result=equation[0];

for(int i=1;i<equation.length;i++)

{

result=result\*value+equation[i];

}

return result;}

public static void modifiedbisectionmethod(double equation[],double low,double high)

{

double e=0.000000001;

double dx=0.01;

double x0,x1,x2;

double f0,f1,f2;

x2=low;

while(x2<high)

{

low=x2;

x1=low;

x2=x1+dx;

f1=hornersMethod(equation,x1);

f2=hornersMethod(equation,x2);

while(Math.abs((x2-x1)/x2)>e)

{

if((f1\*f2)>0)

{

break;

}

x0=(x1+x2)/2.0;

f0=hornersMethod(equation,x0);

if(f0==0)

{

}

else if((f1\*f0)<0)

{

x2=x0;

f2=f0;

}

else{

x1=x0;

f1=f0;

}

}

if(Math.abs((x2-x1)/x2)<e)

{

System.out.println("Root: "+(x1+x2)/2.0);

}}}

public static void main(String[] args) {

Scanner input=new Scanner(System.in);

System.out.println("Enter the number of degree: ");

int degree=input.nextInt();

double equation[]=new double[degree+1];

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

{

double data=input.nextDouble();

equation[i]=data; }

System.out.println("Enter the lower value: ");

double lower=input.nextDouble();

System.out.println("Enter the higher value: ");

double higher=input.nextDouble();

modifiedbisectionmethod(equation,lower,higher);

}

}