



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 Modified Bisection 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=hornerMethod(equation,x1);
        f2=hornerMethod(equation,x2);
        while(Math.abs((x2-x1)/x2)>e)
        {
            if((f1*f2)>0)
            {
                break;
            }
            x0=(x1+x2)/2.0;
            f0=hornerMethod(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);
}
}

```

