**MARKS AWARDED: 100**

Well done ☺

/\*\*

\* CS1010 AY2011/2 Semester 2 Lab3 Ex2

\*

\* bisection.c

\* Description: Asks the user to enter integer cofficients of

\* a polynomial of degree 3 and two end points.

\* Compute the root of a continuous function

\*

\* Name: Loh Wan Xin

\* Discussion Group: B02

\*/

#include <stdio.h>

#include <math.h>

#define THRESHOLD 0.0001

double polynomial(double, int, int, int, int);

int main(void)

{

int c3, c2, c1, c0; // coefficients of polynomial

// int i=1; Use for checking

double a, b, // endpoints

pA, pB; // function values at endpoints

double m, pM; // midpoint and function value at midpoint

printf("Enter coefficients (c3,c2,c1,c0) of polynomial: ");

scanf("%d %d %d %d", &c3, &c2, &c1, &c0);

printf("Enter endpoints a and b: ");

scanf("%lf %lf", &a, &b);

do

{

m=(a+b)\*0.5;

pM = polynomial(m,c3,c2,c1,c0);

pA = polynomial(a,c3,c2,c1,c0);

pB = polynomial(b,c3,c2,c1,c0);

/\* For checking purposes

printf("#%d: a = %f; b = %f; m = %f\n"

"\t p(a) = %f; p(b) = %f; p(m) = %f\n", i,a,b,m,pA,pB,pM);

i++;

\*/

if ( fabs(a-b)<THRESHOLD || pM==0 )

break;

if (pB>0){

if (pM>0)

b=m;

else

a=m;

}

else{

if (pM>0)

a=m;

else

b=m;

}

} while (1);

printf("root = %f\n", m);

printf("p(root) = %f\n", pM);

return 0;

}

// Compute the polynomial function value given x

double polynomial (double x, int c3, int c2, int c1, int c0)

{

double funcValue;

funcValue = c3\*pow(x,3)+c2\*pow(x,2)+c1\*x+c0;

return funcValue;

}