#include<stdio.h>

#include<conio.h>

#include<math.h>

/\* Creating a function Bisection \*/

void bisection()

{ int a, b, e1, e2, temp1, temp2, temp0, choice, j;

float c, x1, x2, x0, func1, func2, func0, temp3, p, q, root;

char choice1;

/\* Takeing equation from the user \*/

printf("\n---------------------------------BISECTON METHOD IN C----------------------------------------");

printf("\nEnter the Coefficient and Exponents of the x \nIn the equation:- ax^e1 - bx^e2 + c =0 \n Press enter...... ");

getch();

printf("\nEnter the value of a:- ");

scanf("%d", &a);

printf("\nEnter the value of e1:- ");

scanf("%d", &e1);

printf("\nEnter the value of b:- ");

scanf("%d", &b);

printf("\nEnter the value of e2:- ");

scanf("%d", &e2);

printf("\nEnter the value of c:- ");

scanf("%f", &c);

/\* Taking the value of x1 and applying in the equation \*/

printf("\n\nIn the Equation %dx^%d - %dx^%d + %f =0,\nThere is at least 1 real root in the interval between p and q \nPress Enter to continue.....\n", a, e1,b,e2,c);

getch();

printf("\nEnter the value of p :-");

scanf("%f", &p);

func1= a\* pow(p,e1)- b\* pow(p,e2)+ c;

/\* Output the function is <0 or >0 \*/

if(func1<0)

{ printf("For the value of %f, Value of the function is= %f, That is less than 0", p, func1);

temp1=1;

x2=p;

}

else

{ printf("For the value of %f, Value of the function is= %f, That is greater than 0", p, func1);

temp1=0;

x1=p;

}

/\* Taking the value of x2 and applying in the equation \*/

do

{ x1=p;

x2=p;

printf("\nEnter the value of q:-");

scanf("%f", &q);

func2= a\* pow(q,e1)- b\* pow(q,e2)+ c;

/\* Output the function is <0 or >0 \*/

if(func2<0)

{ printf("For the value of %f, Value of the function is= %f, That is less than 0 \n", q, func2);

temp2=1;

x2=q;

}

else

{ printf("For the value of %f, Value of the function is= %f, That is greater than 0 \n", q, func2);

temp2=0;

x1=q;

}

/\* deciding that f(x1) \* f(x2)<0 \*/

if(temp1==temp2)

{ choice=1;

printf("\n\t\t Therefore f(p) \* f(q) > 0 \n");

printf("Are You sure the value of q is %f?\n if YES press y or For NO press anykey....:-", q);

scanf("%ch", &choice1);

if(choice1=='y')

{ printf("The function have no root between the interval of %f and %f", p, q);

choice=0;

}

else

{ choice=1;

}

}

else

{ choice=0;

printf("\n\t\t Therefore f(p) \* f(q) <0 \nPress Enter to see the root:-\n");

getch();

for(j=1;j<9;j++)

{ /\* Find the mid point of p and q \*/

x0= (x1 + x2)/2;

/\*printf("%f", x0);\*/

/\* appliying the value of x0 to the equation and check the value of the function is greater or less than 0 \*/

func0= a\* pow(x0,e1)- b\* pow(x0,e2)+ c;

/\* printf("%f", func0);\*/

if(func0<0)

{ x2=x0;

}

if(func0>0)

{ x1=x0;

}

if(func0==0)

{ j=9; /\*If f(x0)=0 then the root is x0\*/

}

}

printf("\n One real root of the equation is %f ", x0);

}

/\* printf("%f", x1);

printf("%f", x2); \*/

}while(choice!=0);

getch();

}

/\* Creating a Function about Us \*/

void aboutus()

{ printf("\n---------------------------------About Us----------------------------------------");

printf("\nName= Anuraj Anand Singh & Adeetha Mitra\nClass :- 12 \nPhone Number :- 9007712266///7980708605\nSchool:- Ballygunge GOVT. High School\nThank YOU");

getch();

}

/\* Creating the main function \*/

int main()

{ int choice;

/\* Repeating the process while user choice not equal to 3 or exit \*/

do

{

printf("\n---------------------------------Computer Science Class 12 Project------------------------------------\n");

printf("\n------------------------------------- Year 2017 -- 2018 -----------------------------------\n");

/\* Creating a menu \*/

printf("1.Bisection Method \n2.About Us \n3.Exit\n:-");

scanf("%d", &choice);

switch(choice)

{ case 1: bisection();/\*Calling function bisection() \*/

break;

case 2: aboutus();/\*Calling function aboutus() \*/

break;

case 3: printf("\n\n!!!!!Thank You!!!!!!\n");

break;

default : printf("\n\n!!!!Wrong Input Please try again!!!");

}

}while(choice!=3);

getch();

return 0;

}