Quadratic Equation

/\* Name- Your\_Name\_Here

Section-I;

Roll No- XYZ

University Roll No-UnivROll\_NO

Program-B.Tech(CSE)\*/

#include <math.h>

#include <stdio.h>

int main() {

double a, b, c, discriminant, root1, root2, realPart, imagPart;

printf("Name: Your\_Name\_Here \n Sec: I\n Roll no: 7\n University Roll no: UnivROll\_NO \n Program:B.Tech(CSE)\n");

printf("Enter coefficients a, b and c: ");

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

discriminant = b \* b - 4 \* a \* c;

if (discriminant > 0) {

root1 = (-b + sqrt(discriminant)) / (2 \* a);

root2 = (-b - sqrt(discriminant)) / (2 \* a);

printf("root1 = %.2lf and root2 = %.2lf", root1, root2);

}

else if (discriminant == 0) {

root1 = root2 = -b / (2 \* a);

printf("root1 = root2 = %.2lf;", root1);

}

else {

realPart = -b / (2 \* a);

imagPart = sqrt(-discriminant) / (2 \* a);

printf("root1 = %.2lf+%.2lfi and root2 = %.2f-%.2fi", realPart, imagPart, realPart, imagPart);

}

return 0;

}

OUTPUT-

Bisection Method

/\* Name- Your\_Name\_Here

Section-I;

Roll No- XYZ

University Roll No-UnivROll\_NO

Program-B.Tech(CSE)\*/

#include<stdio.h>

#include<conio.h>

#include<math.h>

#define f(x) cos(x) - x \* exp(x)

int main()

{

float x0, x1, x2, f0, f1, f2, e;

int step = 1;

up:

printf("Name: Your\_Name\_Here\n Sec: I\n Roll no: 7\n University Roll no: UnivROll\_NO \n Program:B.Tech(CSE)\n");

printf("\nEnter two intervals:\n");

scanf("%f%f", &x0, &x1);

printf("Enter error:\n");

scanf("%f", &e);

f0 = f(x0);

f1 = f(x1);

if( f0 \* f1 > 0.0)

{

printf("Incorrect Initial Guesses.\n");

goto up;

}

printf("\nStep\t\tx0\t\tx1\t\tx2\t\tf(x2)\n");

do

{

x2 = (x0 + x1)/2;

f2 = f(x2);

printf("%d\t\t%f\t%f\t%f\t%f\n",step, x0, x1, x2, f2);

if( f0 \* f2 < 0)

{

x1 = x2;

f1 = f2;

}

else

{

x0 = x2;

f0 = f2;

}

step = step + 1;

}while(fabs(f2)>e);

printf("\nRoot is: %f", x2);

return 0;

}

OUTPUT-

Regula Falsi Method

/\* Name- Your\_Name\_Here

Section-I;

Roll No- XYZ

University Roll No-UnivROll\_NO

Program-B.Tech(CSE)\*/

#include<stdio.h>

#include<math.h>

#define f(x) x\*x\*x-2\*x-5

int main()

{

float x0,x1,x2,f0,f1,f2,e;

int step=1;

up:

printf("Name: Your\_Name\_Here\n Sec: I\n Roll no: 7\n University Roll no: UnivROll\_NO \n Program:B.Tech(CSE)\n");

printf("enter intervals");

scanf("%f %f",&x0,&x1);

printf("enter error");

scanf("%f",&e);

f0=f(x0);

f1=f(x1);

if(f0\*f1>0.0)

{

printf("incorrect guess\n");

goto up;

}

printf("\n step\t\tx0\t\tx1\t\tx2\t\tf(x2)\n");

do

{

x2=x0-(x0-x1)\*f0/(f0-f1);

f2=f(x2);

printf("%d\t\t%f\t%f\t%f\t%f\n",step,x0,x1,x2,f2);

if(f0\*f2<0)

{

x1=x2;

f1=f2;

}

else

{

x0=x2;

f0=f2;

}

step=step+1;

}while(fabs(f2)>e);

printf("\n root:%f",x2);

return 0;

}

OUTPUT-

Newton Raphson Method

/\* Name- Your\_Name\_Here

Section-I;

Roll No- XYZ

University Roll No-UnivROll\_NO

Program-B.Tech(CSE)\*/

#include<stdio.h>

#include<conio.h>

#include<math.h>

#include<stdlib.h>

#define f(x) 3\*x - cos(x) -1

#define g(x) 3 + sin(x)

int main()

{

float x0, x1, f0, f1, g0, e;

int step = 1, N;

printf("Name: Your\_Name\_Here\n Sec: I\n Roll no: 7\n University Roll no: UnivROll\_NO \n Program:B.Tech(CSE)\n");

printf("\nEnter intervals:\n");

scanf("%f", &x0);

printf("Enter error:\n");

scanf("%f", &e);

printf("Enter maximum iteration:\n");

scanf("%d", &N);

printf("\nStep\t\tx0\t\tf(x0)\t\tx1\t\tf(x1)\n");

do

{

g0 = g(x0);

f0 = f(x0);

if(g0 == 0.0)

{

printf("Mathematical Error.");

exit(0);

}

x1 = x0 - f0/g0;

printf("%d\t\t%f\t%f\t%f\t%f\n",step,x0,f0,x1,f1);

x0 = x1;

step = step+1;

if(step > N)

{

printf("Not Convergent.");

exit(0);

}

f1 = f(x1);

}while(fabs(f1)>e);

printf("\nRoot is: %f", x1);

return 0;

}

OUTPUT-

Gauss Elimination Method

/\*Name -Your\_Name\_Here

Sec-I

University roll no- UnivROll\_NO

Class Roll No- XYZ

Program-B.Tech(CSE)\*/

#include<stdio.h>

#include<stdlib.h>

#include<math.h>

intmain()

{

inti,j,k,n;

float a[20][20],x[20];

double s,p;

printf("Name -Your\_Name\_Here\n");

printf("Sec-I\n");

printf("University roll no- UnivROll\_NO \n");

printf("Class Roll No- XYZ\n");

printf("Program-B.Tech(CSE)");

printf("Enter the number of equations : ");

scanf("%d",&n);

printf("\nEnter the co-efficients of the equations :\n\n");

for(i=0; i<n; i++)

{

for(j=0; j<n; j++)

{

printf("a[%d][%d] = ",i,j);

scanf("%f",&a[i][j]);

}

printf("b[%d] = ",i + 1);

scanf("%f",&a[i][n]) ;

}

printf(" equation1: x+y+z=9\n");

printf(" equation2: 2x-3y+4z=13\n");

printf(" equation3: 3x+4y+5z=40\n");

for(k=0; k<=n-1; k++)

{

for(i=k+1; i<n; i++)

{

p = a[i][k]/a[k][k];

for(j=k; j<=n; j++)

{

a[i][j] = a[i][j] - (p \* a[k][j]);

printf("\n a[%d][%d] = %f",i,j,a[i][j]);

}

}

}

x[n-1] = a[n-1][n] / a[n-1][n-1];

for(i=n-2; i>=0; i--)

{

s=0;

for(j=i+1; j<n; j++)

{

s += (a[i][j]\*x[j]);

x[i] = (a[i][n]-s)/a[i][i];

}

}

printf("\nThe result is :\n");

for(i=0; i<n ; i++)

{

printf("\nx[%d] = %.2f",i+1,x[i]);

}

return 0;

}

OUTPUT-

Gauss Jordan Method

/\*Name –Your\_Name\_Here

Sec-I

Class roll no – XYZ

University roll no- UnivROll\_NO

Program –Btechcse\*/

#include<stdio.h>

#include<stdlib.h>

void main()

{

float a[3][4],t; inti,j,k;

printf("Name-Your\_Name\_Here\n");

printf("Sec-I\n");

printf("University roll no- UnivROll\_NO \n");

printf("Class Roll No- XYZ\n");

printf("Program-B.Tech(CSE)\n");

printf("Enter the elements in row-wise : \n");

for(i=0;i<3;i++)

{

for(j=0;j<4;j++)

{

printf("a[%d][%d] : ",i,j);

scanf("%f",&a[i][j]);

}

}

for(i=0;i<3;i++)

{ for(j=0;j<4;j++)

{

printf("%.0f ",a[i][j]);

}

printf("\n");

}

printf("\n\n");

for(i=0;i<3;i++)

{

for(j=0;j<3;j++)

{

if(i!=j)

{

t=a[j][i]/a[i][i];

for(k=0;k<4;k++)

a[j][k]=a[j][k]-(a[i][k]\*t);

}

}

}

printf("Final Matrix form : \n");

for(i=0;i<3;i++)

{

for(j=0;j<4;j++)

{

printf("\t %.0f",a[i][j]);

}

printf("\n");

}printf("\n\nSolution is = ");

for(i=0;i<3;i++)

{printf("%f ",a[i][3]/a[i][i]);

}

}

OUTPUT-