**ASSIGNMENT NO: - 1**

**PROGRAM NO: - a**

%Program: BISECTION METHOD

%Name: Vedant Patil

%Roll No.: 2196099

%I/P: Function, upper limit, lower limit, accuracy

function []=VAP\_BS(fun,x1,x2,acc)

y1=feval(fun,x1);

y2=feval(fun,x2);

while (y1\*y2)>0

x1=input('Enter value of x1\n');

x2=input('Enter value of x2\n');

y1=feval(fun,x1);

y2=feval(fun,x2);

end

while abs(x1-x2)>acc

x0=(x1+x2)/2;

y0=feval(fun,x0);

if y1\*y0<0

x2=x0;

y2=feval(fun,x0);

else x1=x0;

y1=feval(fun,x0);

end

end

x0=(x1+x2)/2;

fprintf('The root of eqn is %f\n',x0);

% VAP\_BS(@(x) x^3-2\*x-5,2,3,0.01)

% The root of eqn is 2.097656

% fzero(@(x) x^3-2\*x-5,2)

%

% ans =

%

% 2.0946

**ASSIGNMENT NO:-1**

**PROGRAM NO:-b**

%Program: NEWTON RAPHSON METHOD

%Name: Vedant Patil

%Roll No.: 2196099

%I/P: Function, f'x, f''x, initial guess, accuracy, max iterations

function[]= VAP\_NRM(fun,dfun,ddfun,x0,acc,maxitr)

g=(feval(fun,x0)\*feval(ddfun,x0))/(feval(dfun,x0)^2);

while abs(g)>1

x0=input('Enter new value of x0\n');

g=(feval(fun,x0)\*feval(ddfun,x0))/(feval(dfun,x0)^2);

end

itr=1;

while itr<=maxitr

x1=x0-(feval(fun,x0)/feval(dfun,x0));

acc\_cal=abs(x1-x0);

if acc\_cal<acc

break

else x0=x1;

itr=itr+1;

end

end

fprintf('Root of eqn is %f\n',x1);

% VAP\_NRM(@(x) x^3+x-1,@(x) 3\*x^2+1,@(x) 6\*x,0,10^-15,5)

%Root of eqn is 0.682328

%fzero(@(x) x^3+x-1,0)

%ans =

%0.6823

**ASSIGNMENT NO:-1**

**PROGRAM NO:-c**

%Program: GUASS ELIMINATION

%Name: Vedant Patil

%Roll No.: 2196099

%I/P: Matrix A & B

a=input('Enter matrix A ');

d=input('Enter matrix D ');

n=length(d);

%Creating upper triangular matrix

for i=1:n

for k=i+1:1:n

f=a(k,i)/a(i,i);

for j=1:n

a(k,j)=a(k,j)-f\*a(i,j);

end

d(k)=d(k)-f\*d(i);

end

end

% Backward Substitution

for i=n:-1:1

temp=d(i);

for j=i+1:n

temp=temp-a(i,j)\*x(j);

end

x(i)=temp/a(i,i);

end

fprintf('x=%f\n',x)

% Enter matrix A [1,3,5;3,2,4;2,1,1]

% Enter matrix D [2;7;4]

% x=2.250000

% x=-1.125000

% x=0.625000

% a\d

% ans =

% 2.2500

% -1.1250

% 0.6250

**ASSIGNMENT NO:-1**

**PROGRAM NO:-d**

%Program. GAUSS SEIDEL

%Name: Vedant Patil

%Roll No.: 2196099

%I/P: Mac iterations, Equations of x,y,z.

fx=inline('(28-2\*x2-6\*x3)/20');

fy=inline('(-23-x1-9\*x3)/20');

fz=inline('(-57-2\*x1+7\*x2)/20');

n=input('\n Enter the required number of iterations ');

x1=0;

x2=0;

x3=0;

for i=1:1:n

x1=fx(x2,x3);

x2=fy(x1,x3);

x3=fz(x1,x2);

fprintf('\n%f %f %f',x1,x2,x3);

end

fprintf('\nx1=%f',x1);

fprintf('\nx2=%f',x2);

fprintf('\nx3=%f',x3);

%Enter the required number of iterations 6

%1.400000 -1.220000 -3.417000

%2.547100 0.260295 -3.013607

%2.278053 0.092220 -3.045528

%2.304436 0.105266 -3.043601

%2.302554 0.104493 -3.043683

%2.302656 0.104525 -3.043682

%x1=2.302656

%x2=0.104525

%x3=-3.043682>>

**ASSIGNMENT NO:-1**

**PROGRAM NO:-e**

%Program: TDMA

%Name: Vedant Patil

%Roll No.: 2196099

%I/P: Coefficient matrix, constant matrix

a=input('Enter matrix a');

d=input('Enter matrix d');

n=length(d);

for i=2:1:n

a(i,i)=a(i,i)-a(i,i-1)/a(i-1,i-1)\*a(i-1,i);

d(i)=d(i)-a(i,i-1)/a(i-1,i-1)\*d(i-1);

end

x(n)=d(n)/a(n,n);

for i=(n-1):(-1):1

x(i)=(d(i)-a(i,i+1)\*x(i+1))/a(i,i);

end

x

%Enter matrix a[10 2 0 0;2 9 3 0;0 1 10 4;0 0 3 11]

%Enter matrix d[12;14;15;14]

%x =

% 1 1 1 1

%a=[10 2 0 0;2 9 3 0;0 1 10 4;0 0 3 11]

%a =

% 10 2 0 0

% 2 9 3 0

% 0 1 10 4

% 0 0 3 11

% d=[12;14;15;14]

% d =

% 12

% 14

% 15

% 14

% a\d

% ans =

% 1

% 1

% 1

% 1