**ASSIGNMENT NO:-2**

**PROGRAM NO:-a**

%Program:- Langrange’s Interpolation

%Name: Vedant Patil

%Roll No.: 2196099

clc

clear all

x=input('enter x vector');

y=input('enter y vector');

xn=input('Enter value of xn: ');

n=length(x);

sum=0;

pr=1;

i=1;

j=1;

while i<=n

while j<=n

if i~=j

pr=pr\*((xn-x(j))/(x(i)-x(j)));

end

j=j+1;

end

sum=sum+y(i)\*pr;

i=i+1;

j=1;

pr=1;

end

sum

% enter x vector[0 1 2 5]

% enter y vector[2 3 12 147]

% Enter value of xn: 1.5

%

% sum =

%

% 6.1250

**ASSIGNMENT NO:-2**

**PROGRAM NO:-b**

%Program: Newton’s Forward Interpolation

%Name: Vedant Patil

%Roll No.: 2196099

clc

clear all

x=input('enter x vector');

y=input('enter y vector');

xn=input('Enter value of xn: ');

n=length(x);

for j=1:n-1

for i=1:n-j

if j==1

del(i,j)=y(i+1)-y(i); % for del 1

else del(i,j)=del(i+1,j-1)-del(i,j-1); % Remaining del

end

end

end

del

h=x(2)-x(1);

u=(xn-x(1))/h;

term=0;

for j=1:n-1

mult=1;

for k=1:j

mult=mult\*(u-(k-1));

end

term=term+del(1,j)\*mult/factorial(j);

end

yn=y(1)+term

% enter x vector[2 3 4 5 6 7 8 9];

% enter y vector[19 48 99 178 291 444 643 894]

% Enter value of xn: 3.5

%

% del =

%

% 29 22 6 0 0 0 0

% 51 28 6 0 0 0 0

% 79 34 6 0 0 0 0

% 113 40 6 0 0 0 0

% 153 46 6 0 0 0 0

% 199 52 0 0 0 0 0

% 251 0 0 0 0 0 0

%

%

% yn =

%

% 70.3750

%

% >> interp1(x,y,xn)

%

% ans =

%

% 73.5000

**ASSIGNMENT NO:-2**

**PROGRAM NO:- c 1**

%Program: TRAPEZODIAL RULE

%Name: Vedant Patil

%Roll No.: 2196099

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

function[]=VAP\_TRAP(fun,x0,xn,n)

h=(xn-x0)/n;

y0=feval(fun,x0);

yn=feval(fun,xn);

yr=0;

for i=1:1:n-1

yr=yr+feval(fun,x0+i\*h);

end

I=(h/2)\*(y0+yn+2\*yr);

h

I

%VAP\_TRAP(@(x) exp(x)/x,1,2,8)

%h =

% 0.1250

%I =

% 3.0615

%quad(@(x) exp(x)/x,1,2,8)

%ans=

% 3.0591

**ASSIGNMENT NO:-2**

**PROGRAM NO:- c 2**

%Program: SIMPSON’S 1/3RD RULE

%Name: Vedant Patil

%Roll No.: 2196099

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

function[]=VAP\_SIMP(fun,x0,xn,n)

h=(xn-x0)/n;

y0=feval(fun,x0);

yn=feval(fun,xn);

yodd=0;

for i=1:2:n-1

yodd=yodd+feval(fun,x0+i\*h);

end

yeven=0;

for j=2:2:n-1

yeven=yeven+feval(fun,x0+j\*h);

end

I=(h/3)\*(y0+yn+2\*yeven+4\*yodd);

h

I

%VAP\_SIMP(@(x) exp(x)/x,1,2,8)

%h =

% 0.1250

%I =

% 3.0591

**ASSIGNMENT NO:-2**

**PROGRAM NO:- c 3**

%Program: SIMPSON’S 3/8TH RULE

%Name: Vedant Patil

%Roll No.: 2196099

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

function[]=VAP\_SIMP3(fun,x0,xn,n)

h=(xn-x0)/n;

y0=feval(fun,x0);

yn=feval(fun,xn);

yr=0;

ys=0;

for i=1:1:n-1

yr=yr+feval(fun,x0+i\*h);

end

for j=3:3:n-1

ys=ys+feval(fun,x0+j\*h);

end

yt=yr-ys;

I=(3\*h/8)\*(y0+yn+2\*ys+3\*yt);

h

I

%VAP\_SIMP3(@(x) exp(x)/x,1,2,8)

%h =0.1250

%I =3.0049

**ASSIGMENT NO:-2**

**PROGRAM NO:-d1**

%Name of program: Gauss 2 point method

%Name: Vedant Patil

%Roll No.: 2196099

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

function[]=VAP\_GAUSS2P(fun,x0,xn)

a=(xn-x0)/2;

b=(xn+x0)/2;

x1=-a/sqrt(3)+b;

x2=a/sqrt(3)+b;

f1=feval(fun,x1);

f2=feval(fun,x2);

I=(f1+f2)\*a;

I

% VAP\_GAUSS2P(@(x) x^3+x-1,1,4)

% I =

% 68.2500

% quad(@(x) x.^3+x-1,1,4)

% ans =

% 68.2500

**ASSIGNMENT NO:-2**

**PROGRAM NO:-d2**

%Name of program: Gauss 3 point Method

%Name: Vedant Patil

%Roll No.: 2196099

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

function[]=VAP\_GAUSSL3P(fun,x0,xn)

a=(xn-x0)/2;

b=(xn+x0)/2;

x1=-a\*sqrt(3/5)+b;

x2=a\*sqrt(3/5)+b;

x3=b;

f1=feval(fun,x1);

f2=feval(fun,x2);

f3=feval(fun,x3);

I=(8/9\*f3+(f1+f2)\*5/9)\*a;

I

% VAP\_GAUSSL3P(@(x) x^2-5\*x+2,3,5)

% I =

% -3.3333

% quad(@(x) x.^2-5.\*x+2,3,5)

% ans =

% -3.3333