NEWTON FORWARD

Q1)Find the value of sin 54 from the given Dataset.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q | 45 | 50 | 55 | 60 |
| Sin Q | 0.707 | 0.766 | 0.8192 | 0.866 |

INPUT:

clc

clear all

close all

X =input('Enter the Value of X:');

x=[45,50,55,60];

y=[0.707,0.766,0.8192,0.866];

n=length(x);

%use to create blank table

D=zeros(n,n);

p=0;

D(:,1)=y';

for j=2:n

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

D(i,j) =D(i+1 , j-1)-D(i,j-1);

end

end

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

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

A=y(1);

G=u;

for k=1:n-1

A=A+G\*D(1,k+1);

G=((u-k)/(k+1))\*G;

end

fprintf('value of Y(%f)=%f',X,A);

OUTPUT:

Enter the Value of X:54

X =

54

x =

45 50 55 60

y =

0.7070 0.7660 0.8192 0.8660

n =

4

D =

0.7070 0 0 0

0.7660 0 0 0

0.8192 0 0 0

0.8660 0 0 0

D =

0.7070 0 0 0

0.7660 0.0532 0 0

0.8192 0 0 0

0.8660 0 0 0

D =

0.7070 0 0 0

0.7660 0.0532 0 0

0.8192 0.0468 0 0

0.8660 0 0 0

h =

5

u =

1.8000

A =

0.7070

A =

0.7070

G =

0.7200

A =

0.7070

G =

-0.0480

A =

0.7070

G =

0.0144

value of Y(54.000000)=0.707000>>

Q2)Find the value of sin 54 from the given datasets.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 | 4 |
| Y | 1 | 7 | 23 | 54 | 109 |

OUTPUT:

X =

0.5000

A =

1

A =

1

G =

-0.1250

A =

1

G =

0.0625

A =

1

G =

-0.0391

A =

1

G =

0.0273

value of Y(0.500000)=1.000000

NEWTON BACKWORD:

Q3) Consider Following Tabular Values Determine y(210).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | 50 | 100 | 150 | 200 | 250 |
| Y | 618 | 724 | 805 | 906 | 1032 |

**INPUT:**

clc

clear all

close all

X =input('Enter the Value of X:');

x=[50,100,150,200,250];

y=[618,724,805,906,1032];

n=length(x);

%use to create blank table

D=zeros(n,n);

D(:,1)=y';

for j=2:n

for i=j:n

D(i,j) =D(i ,j-1)-D(i-1,j-1);

end

end

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

u=(X-x(n))/h;

A=y(n)

G=u;

for k=1:n-1

A=A+G\*D(n-k,k+1)

G=((u+k)/(k+1))\*G

end

fprintf('value of Y(%f)=%f\n',X,A);

**OUTPUT:**

Enter the Value of X:210

A =

1032

A =

951.2000

G =

0.7200

A =

933.2000

G =

-0.6720

A =

933.2000

G =

0.6384

A =

933.2000

G =

-0.6129

value of Y(210.000000)=933.200000

Q4) X= [0 ,1,2,3,4]

Y = [1,2,4,8,16]

X=2.5

OUTPUT:

Enter the Value of X:2.5

A =

16

A =

10

G =

0.3750

A =

10.3750

G =

0.0625

A =

10.3750

G =

0.0234

A =

10.3750

G =

0.0117

value of Y(2.500000)=10.375000