**PROBLEM:**

**4.1: A program of find the integral of the following function using Simpson’s 1/3 rule**

**f(x) = 0.2+25x-200x2+675x3-900x4+400x5 where a=0 and b=0.8**

**4.2: A program of find the integral of the following function using Simpson’s 3/8 rule**

**f(x) = 0.2+25x-200x2+675x3-900x4+400x5 where a=0 and b=0.8**

**OBJECTIVE:**

To study about application of Simpson’s 1/3 rule and Simpson’s 3/8 rule.

**CODE(4.1)**

|  |  |
| --- | --- |
| clear all;  close all;  clc;  b=0.8;  a=0;  c=a+(a+b)/2;  n=input('Enter maximum order of the function: ');  fprintf('Enter the coefficient like a0 to an\n\n');  for i=1:1:n+1;  x(i)=input('Coefficient: ');  end  fa=0;  fb=0;  fc=0; | facb=0;  faca=0;  for i=1:1:n+1  fa=fa+x(i)\*power(a,i-1);  fb=fb+x(i)\*power(b,i-1);  fc=fc+x(i)\*power(c,i-1);  facb=facb+x(i)\*(power(b,i)/i);  faca=faca+x(i)\*(power(a,i)/i);  end  fa;  fb;  fc;  fac=facb-faca;  I=(b-a)\*((fa+4\*fc+fb)/6)  err=((fac-I)/fac)\*100;  fprintf('Error=%f%%\n',err); |

**OUTPUT:**

Enter maximum order of the function: 5

Enter the coefficient like a0 to an

Coefficient: 0.2

Coefficient: 25

Coefficient: -200

Coefficient: 675

Coefficient: -900

Coefficient: 400

I =

1.3675

Error=16.644993%

**CODE(4.2):**

|  |  |
| --- | --- |
| clear all;  close all;  clc;  b=0.8;  a=0;  h=(b-a)/3;  c=a+h;  d=c+h;  n=input('Enter maximum order of the function: ');  fprintf('Enter the coefficient like a0 to an\n\n');  for i=1:1:n+1;  x(i)=input('Coefficient: ');  end  fa=0;  fb=0;  fc=0;  fd=0; | facb=0;  faca=0;  for i=1:1:n+1  fa=fa+x(i)\*power(a,i-1);  fb=fb+x(i)\*power(b,i-1);  fc=fc+x(i)\*power(c,i-1);  fd=fd+x(i)\*power(d,i-1);  facb=facb+x(i)\*(power(b,i)/i);  faca=faca+x(i)\*(power(a,i)/i);  end  fa;  fb;  fc;  fd;  fac=facb-faca;  I=h\*(3/8)\*((fa+3\*fc+3\*fd+fb))  err=((fac-I)/fac)\*100;  fprintf('Error=%f%%\n',err); |

**OUTPUT:**

Enter maximum order of the function: 5

Enter the coefficient like a0 to an

Coefficient: 0.2

Coefficient: 25

Coefficient: -200

Coefficient: 675

Coefficient: -900

Coefficient: 400

I =

1.5192

Error=7.397775%

**DISCUSSION:**

In this problem, we found out the integral of the given functions using Simpson’s 1/3 rule and Simpson’s 3/8 rule.Using Simpson 3/8 Rule,we can decrease error rate sufficiently low.