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%Lab:-6
%Title:- To Integrate given function using Newton Cote's Quadrature Formula.
%Developed by:- Munna Pajiyar
%Roll No:- 221452
%Date:- 2025/01/03
%------Three Critical statements-----

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close all;
clear variables;
clc;

%-----User Input Section-----
func=input('enter the function f(x)=');
f=inline(func);
disp(f);
a=input('enter the lower limit a= ');
b=input('enter the lower limit b= ');

%-------Calculation Section-----------
n=6;
h=(b-a)/n;
x(1)=a;
y(1)=f(a);
for i=1:n
    x(i+1)=x(i)+h;
    y(i+1)=f(x(i+1));
end
out=[x;y];
disp (out);

%---------Traezoidal Rule-------------
N=length(y);
 temp=0;
for i=2:N-1

       temp=temp+2*y(i);

end
I=(h/2)*(y(1)+y(N)+temp);
 result = Strcat('By trapezoidal rule, I= ',num2Str(I));
 disp(result);


 %-------Simpson's 1/3 th rule-------------
 temp=0;
 for i=2:N-1
     if(mod(i,2)==0)
         temp=temp+4*y(i);
     else
         temp=temp+2*y(i);
     end
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 end
 I=(h/3)*(y(1)+y(N)+temp);
  result = Strcat('By Simpsons 1/3 rd rule, I= ',num2Str(I));
 disp(result);



%---------Simpson's 3/8 th rule-------------
temp=0;
for i=2:N-1
 if(mod(i+2,3)==0)
     temp=temp+2*y(i);
 else

     temp=temp+3*y(i);
 end
end
I=((3*h)/8)*(y(1)+y(N)+temp);
result = Strcat('By Simpsons 3/8 th rule, I= ',num2Str(I));
 disp(result);
```