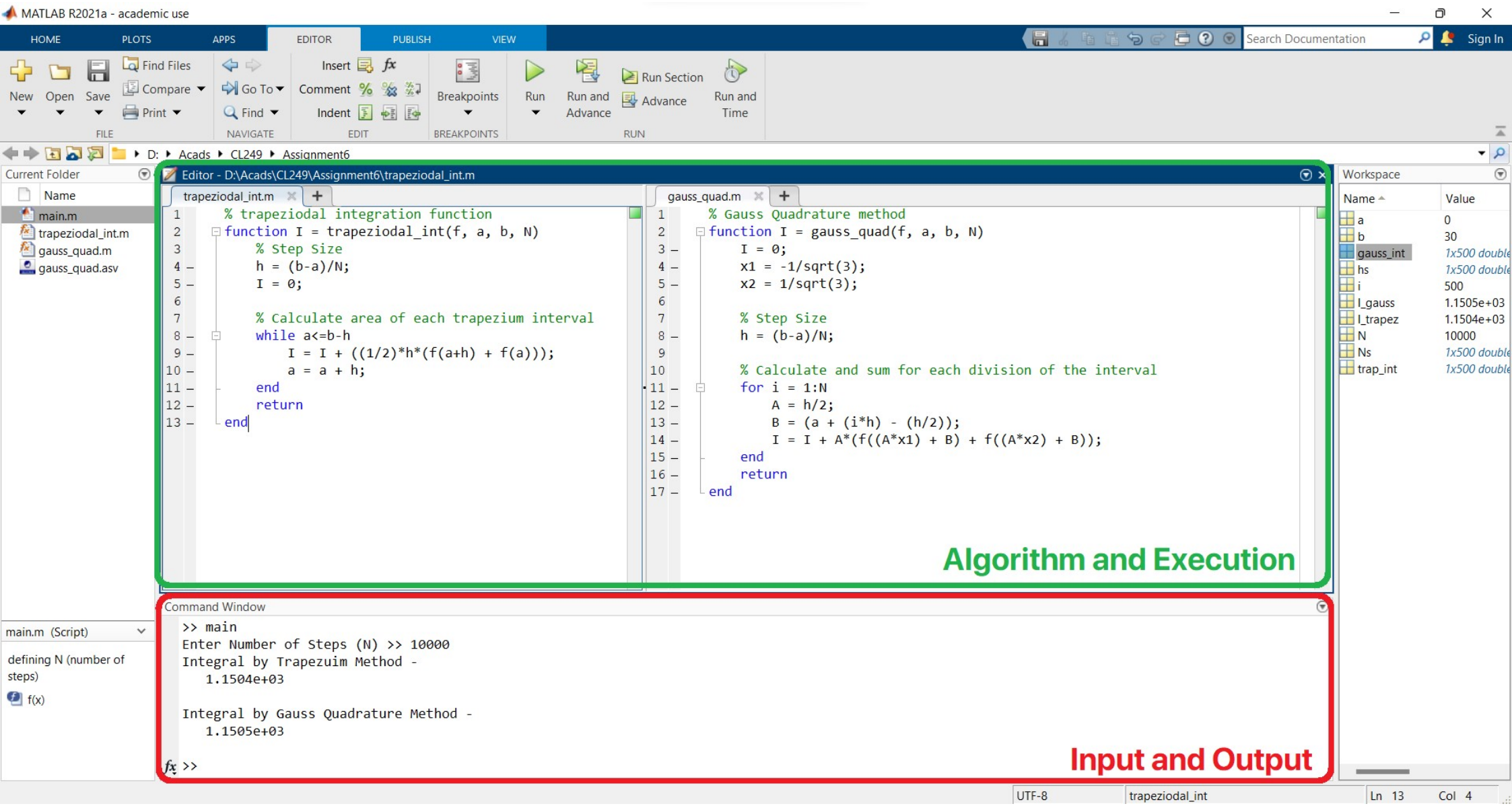
MATLAB R2021a - academic use
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D: ▸ Acads ▸ CL249 ▸ Assignment6
Current Folder
Name
main.m
trapeziodal_int.m
gauss_quad.m
gauss_quad.asv
Editor - D:\Acads\CL249\Assignment6\trapeziodal_int.m
trapeziodal_int.m
% trapeziodal integration function
function I = trapeziodal_int(f, a, b, N)
% Step Size
h = (b-a)/N;
I = 0;
% Calculate area of each trapezium interval
while a<=b-h
I = I + ((1/2)*h*(f(a+h) + f(a)));
a = a + h;
end
return
end
gauss_quad.m
% Gauss Quadrature method
function I = gauss_quad(f, a, b, N)
I = 0;
x1 = -1/sqrt(3);
x2 = 1/sqrt(3);
% Step Size
h = (b-a)/N;
% Calculate and sum for each division of the interval
for i = 1:N
A = h/2;
B = (a + (i*h) - (h/2));
I = I + A*(f((A*x1) + B) + f((A*x2) + B));
end
return
end
Algorithm and Execution
Workspace
Name
Value
a 0
b 30
gauss_int 1x500 double
hs 1x500 double
i 500
I_gauss 1.1505e+03
I_trapez 1.1504e+03
N 10000
Ns 1x500 double
trap_int 1x500 double
Command Window
>> main
Enter Number of Steps (N) >> 10000
Integral by Trapezuim Method -
1.1504e+03
Integral by Gauss Quadrature Method -
1.1505e+03
>>
Input and Output
main.m (Script)
defining N (number of steps)
f(x)
UTF-8
trapeziodal_int
Ln 13
Col 4