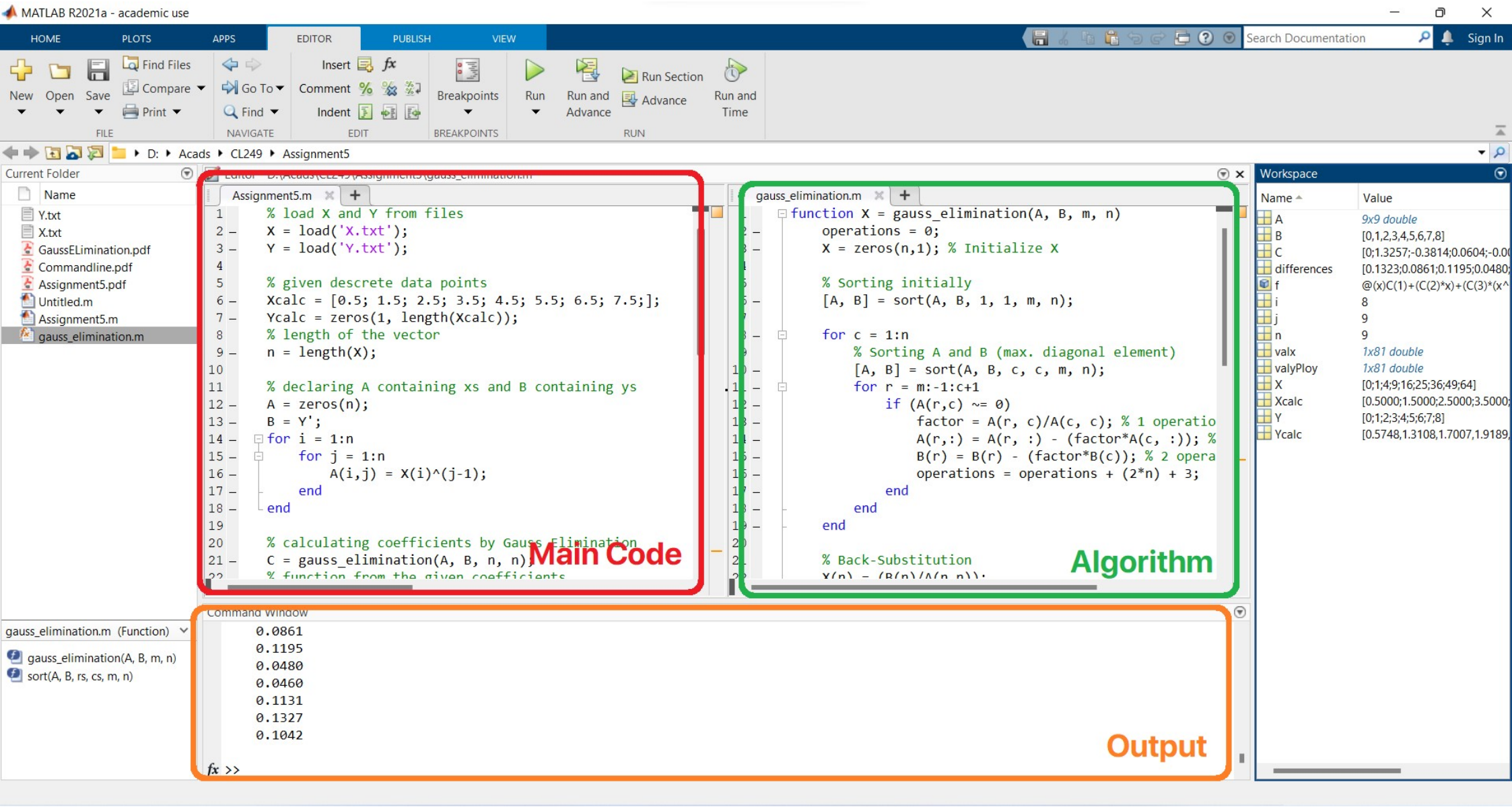
MATLAB R2021a - academic use
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RUN
D: ▸ Acads ▸ CL249 ▸ Assignment5
Current Folder
Name
Y.txt
X.txt
GaussELimination.pdf
Commandline.pdf
Assignment5.pdf
Untitled.m
Assignment5.m
gauss_elimination.m
Assignment5.m
% load X and Y from files
X = load('X.txt');
Y = load('Y.txt');
% given descrete data points
Xcalc = [0.5; 1.5; 2.5; 3.5; 4.5; 5.5; 6.5; 7.5;];
Ycalc = zeros(1, length(Xcalc));
% length of the vector
n = length(X);
% declaring A containing xs and B containing ys
A = zeros(n);
B = Y';
for i = 1:n
for j = 1:n
A(i,j) = X(i)^(j-1);
end
end
% calculating coefficients by Gauss Elimination
C = gauss_elimination(A, B, n, n);
Main Code
gauss_elimination.m
function X = gauss_elimination(A, B, m, n)
operations = 0;
X = zeros(n,1); % Initialize X
% Sorting initially
[A, B] = sort(A, B, 1, 1, m, n);
for c = 1:n
% Sorting A and B (max. diagonal element)
[A, B] = sort(A, B, c, c, m, n);
for r = m:-1:c+1
if (A(r,c) ~= 0)
factor = A(r, c)/A(c, c); % 1 operatio
A(r,:) = A(r, :) - (factor*A(c, :)); %
B(r) = B(r) - (factor*B(c)); % 2 opera
operations = operations + (2*n) + 3;
end
end
end
% Back-Substitution
Algorithm
Workspace
Name
Value
A
9x9 double
B
[0,1,2,3,4,5,6,7,8]
C
[0;1.3257;-0.3814;0.0604;-0.0
differences
[0.1323;0.0861;0.1195;0.0480;
f
@(x)C(1)+(C(2)*x)+(C(3)*(x^
i
8
j
9
n
9
valx
1x81 double
valyPloy
1x81 double
X
[0;1;4;9;16;25;36;49;64]
Xcalc
[0.5000;1.5000;2.5000;3.5000;
Y
[0;1;2;3;4;5;6;7;8]
Ycalc
[0.5748,1.3108,1.7007,1.9189,
Command Window
0.0861
0.1195
0.0480
0.0460
0.1131
0.1327
0.1042
fx >>
Output
gauss_elimination.m (Function)
gauss_elimination(A, B, m, n)
sort(A, B, rs, cs, m, n)