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%% EE2013 - Fall 2014
% Recitation 5 - 09/30/2014
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clear; close all; clc;
%% Problem 4.9
disp('-----Problem 4.9-----')
% Method 1 - using matrix algebra
%A*V = C
A = [5 -3;
     -1 3]; % A matrix
C = [-18;
     4]; % C matrix
B = A^-1*C; % solve for voltages
disp(' '); % display a space
for n = 1:length(B) % run a loop for the number of voltage results
    if abs(B(n)) < 1
        str = sprintf('The voltage of V%i is: %0.1f mV',n,B(n)*1000);
% string to display for Volts
        disp(str); % display result
    else
        str = sprintf('The voltage of V%i is: %0.1f V',n,B(n)); %
string to display for milli-Volts
        disp(str); % display result
    end
end
% Method 2 - using the solve command
eqn1 = '5*v1-3*v2 = -18';
eqn2 = '-1*v1+3*v2 = 4';
a = solve(eqn1,eqn2,'v1','v2');
a.v1
a.v2

% Method 3 - using Cramer's rule.
D = det(A);
Dv1 = det([C, A(:,2)]);
Dv2 = det([A(:,1), C]);
v1 = Dv1/D
v2 = Dv2/D
%% Problem 4.10
disp('-----Problem 4.10-----')
% Method 1 - using matrix algebra
%A*V = C
A = [10 -9;
     -2 3]; % A matrix
C = [18;
     30]; % C matrix
B = A^-1*C; % solve for voltages
disp(' '); % display a space
for n = 1:length(B) % run a loop for the number of voltage results
    if abs(B(n)) < 1
        str = sprintf('The voltage of V%i is: %0.1f mV',n,B(n)*1000);
% string to display for Volts
        disp(str); % display result
    else
        str = sprintf('The voltage of V%i is: %0.1f V',n,B(n)); %
string to display for milli-Volts
        disp(str); % display result
    end
end

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        end
    end

%% Problem 4.31
disp('-----Problem 4.31-----')
% Method 1 - using matrix algebra
% A*V = C
A = [6 -1 -5;
     -1 16 -9
     -5 -9 21]; % A matrix
C = [5; % C matrix
     0
     -3];
B = A^-1*C; % solve for voltages
disp(' '); % display a space
for n = 1:length(B) % run a loop for the number of voltage results
    if abs(B(n)) < 1
        str = sprintf('The current of i%i is: %0.1f mA',n,B(n)*1000); %
string to display for Amps
        disp(str); % display result
    else
        str = sprintf('The current of i%i is: %0.1f A',n,B(n)); % string
to display for milli-Amps
        disp(str); % display result
    end
end
end

%% Problem 4.42
disp('-----Problem 4.42-----')
% Method 1 - using matrix algebra
% A*V = C
A = [7 -10 5;
     -7 11 -3;
     -1 0 1]; % A matrix
C = [1; % C matrix
     0
     2];
B = A^-1*C; % solve for voltages
disp(' '); % display a space
for n = 1:length(B) % run a loop for the number of voltage results
    if abs(B(n)) < 1
        str = sprintf('The current of i%i is: %0.1f mA',n,B(n)*1000); %
string to display for Amps
        disp(str); % display result
    else
        str = sprintf('The current of i%i is: %0.1f A',n,B(n)); % string
to display for milli-Amps
        disp(str); % display result
    end
end
end

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