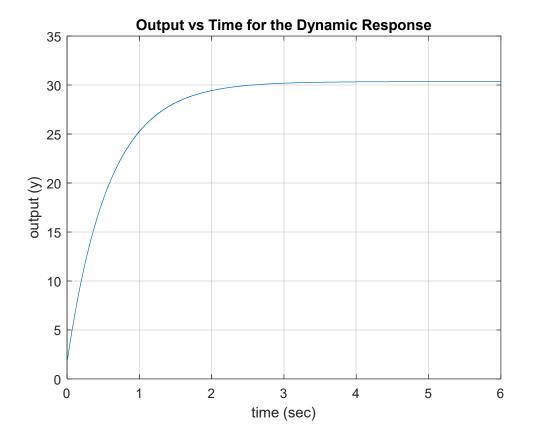
## MECH-3221 Control Theory Homework 3

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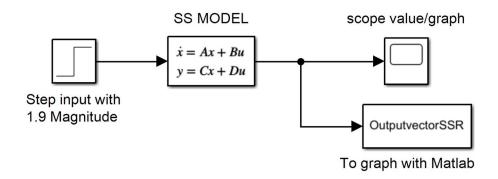
July 11, 2022

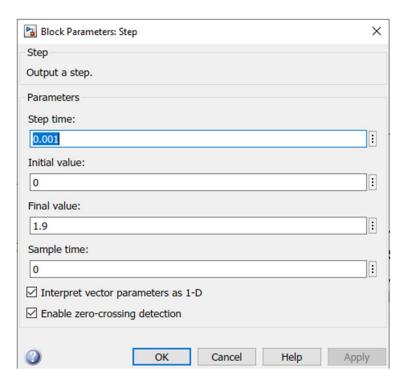
## PART A:

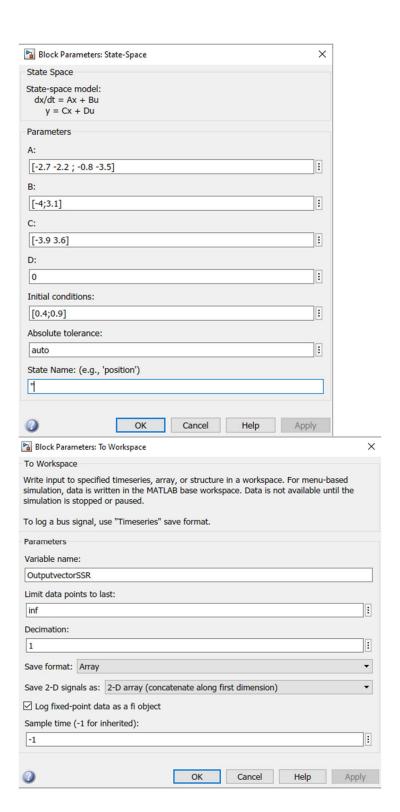
```
%%%Homework 3 Control Theory
%%Arjun Posarajah 104980541
%Part A
%%%SSR Model
%%Values A that are multiplied by X in the input eqn
A = [-2.7 -2.2 ; -0.8 -3.5];
%%Values B that are multiplied by U in the input eqn
B=[-4;3.1];
%%Values C that are multiplied by X in the output eqn
C=[-3.9 \ 3.6];
%%Values D that multiplied by U in the output eqn
D=0;
%Time range of 0s to 6s with a step of 0.001s
t= 0:0.001:6;
%%%Vector with equal row/columns with a magnitude of 1.9
u=1.9*(ones(size(t)));
%%%Initial States of x1 & x2 with a matrix form of both
x1=0.4;
x2=0.9;
x = [x1, x2];
%%Creation of the Continuous time space model
sys=ss(A,B,C,D);
%%function of the simulated time response
[y,t]=lsim(sys,u,t,x);
%graphing of the function above from the variable of t,y with aesthetics
%like a grid, title and axis names
plot(t,y);
grid;
title('Output vs Time for the Dynamic Response')
xlabel('time (sec)');
ylabel('output (y)');
```



## PART B:







```
%%%Homework 3 Control Theory
%%Arjun Posarajah 104980541
%Part B

%%Plot the vector from Simulink
plot(tout,OutputvectorSSR);

%Graph Aesthetics with title, grid, and axis labels
title('Simulink SSR Output for the Dynamic Response');
grid on;
xlabel('Time (sec)');
ylabel('Output (y)');
```

