1. Use Simulink to plot the solution of the following equation:
\[15 \ddot{x} + 5x = 4u_s(t) - 4u_s(t - 2)\] where \(u_s\) is the unit step function.
For \(0 \leq t \leq 10\). Take \(x(0) = 2\).

Turn in a screen shot of your Simulink model along with plots of your results.

2. Find the state space model for the following system (by hand):
\[2 + 3s \frac{Y(s)}{s^3} = \frac{F(s)}{s^2} + \frac{s + 1}{3s + 2}\]

Use MATLAB and your state space model to find the impulse response, the step response, and the response to a \(f(t) = 2\sin(2\pi ft) + \cos(3\pi ft)\) where \(f = 2\) Hz. Plot all three responses in subplots on a single figure. Turn in the commented MATLAB® code and your results.