MATLAB R2022b - academic use

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Live Editor - C:\Users\sethr\OneDrive\Desktop\ECEN380\Homework\Homework 6\state_variable_description_problem294...

problem_2_point_86.mlx | lab2_matlab.mlx | state_variable_description_problem294.mlx *

```
21  xlabel('n');
22  ylabel('s[n]');
23  grid on;
24
25  sgtitle('\underline{System Impulse/Step Responses}', 'Interpreter', 'latex'); % Overall Title
```

Part (b)

```
26  clf; % Clear current figure (so can run multiple subplots at once)
27  A = [1/2, -1/2; 1/3, 0];
28  b = [1; 2];
29  c = [1, -1];
30  D = 0;
31  T = [1 1; 2 -1]; % Transformation matrix
32  n = 0:29;
33  u = ones(1,30);
34
35  subplot(2, 1, 1);
36  sys = ss(A,b,c,D,-1);
37  sysT = ss2ss(sys, T);
38
39  h = impulse(sysT,30);
40  stem(n, h(1:30),'filled','Color','b') % First 30 of impulse response
41  title('Impulse Response');
42  xlabel('n');
43  ylabel('h[n]');
44  grid on;
45
46  subplot(2, 1, 2);
47  s = lsim(sysT, u); % Step response
48  stem(n, s(1:30),'filled','Color','b') % First 30 of step response
49  title('Step Response');
50  xlabel('n');
51  ylabel('s[n]');
52  grid on;
53
54  sgtitle('\underline{Transformed System Impulse/Step Responses}', 'Interpreter', 'latex'); % Ove
```

Name: a, A, b, c, D, h, n, s, sys, sysT, T, u

Zoom: 80% | UTF-8 | LF | script | Ln 28 | Col 12

Figure

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