Q4

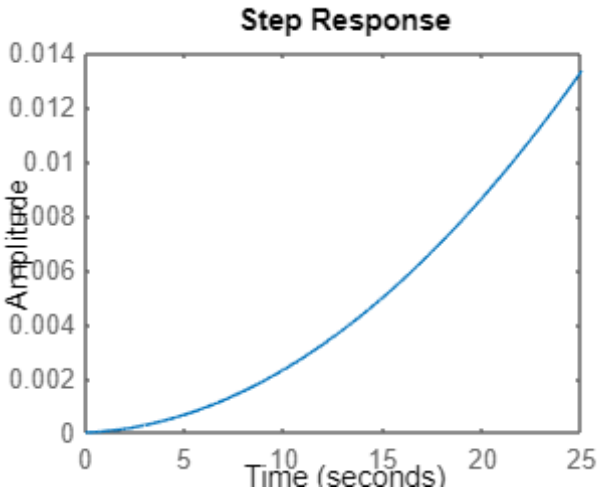
```
clc
clear
close

% Variable definitions and system creation
m = 5; % Slider mass
M = 25000; % Container mass
l = 8; % Rope length
g = 9.81; % Acceleration due to gravity

% System Transfer Function is given by the numerator and denominator
% coefficients
num = [0,0,0.2,0.2453];
den = [1,0,6.1325e+03,0,0];

[A,B,C,D] = tf2ss(num,den);

sys = ss(A,B,C,D);
step(sys);
```




Differences

I have observed that this system is marginally stable unlike the system in question 2.2 which is a closed loop system that has feedback control. The poles of this system are on the imaginary axis.

```
eig(A)
```

```
ans = 4×1 complex
   0.0000 + 0.0000i
   0.0000 + 0.0000i
   0.0000 +78.3103i
   0.0000 -78.3103i
```