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);

A
```

```
A = 4×4
10^3 ×
         0   -6.1325         0         0
    0.0010         0         0         0
         0    0.0010         0         0
         0         0    0.0010         0
```

```
B
```

```
B = 4×1
     1
     0
     0
     0
```

```
C
```

```
C = 1×4
         0         0    0.2000    0.2453
```

```
D
```

```
D = 0
```

Difference

The system matrices are different