Contents

Defining variables

```
syms m1 g m2 M L1 L2
```

Observability Check

```
A = [0 1 0 0 0 0; 0 0 -m1*g/M 0 -m2*g/M 0; 0 0 0 1 0 0; 0 0 -((M*g)+(m1*g))/(M*L1) 0 -g*m2/(M
*L1) 0; 0 0 0 0 0 1; 0 0 -m1*g/(M*L2) 0 -((M*g)+(m2*g))/(M*L2) 0];
B = [0; 1/M; 0; 1/(L1*M); 0; 1/(L2*M)];
c1 = [1 0 0 0 0 0; 0 0 0 0 0 0; 0 0 0 0 0 0];
c2 = [0 0 0 0 0 0; 0 0 1 0 0 0; 0 0 0 0 1 0];
c3 = [1 0 0 0 0 0; 0 0 0 0 0 0; 0 0 0 0 1 0];
c4 = [1 0 0 0 0 0; 0 0 1 0 0 0; 0 0 0 0 1 0];
Obs1 = rank([c1' A'*c1' ((A')^2)*c1' ((A')^3)*c1' ((A')^4)*c1' ((A')^5)*c1'])
Obs2 = rank([c2' A'*c2' ((A')^2)*c2' ((A')^3)*c2' ((A')^4)*c2' ((A')^5)*c2'])
Obs3 = rank([c3' A'*c3' ((A')^2)*c3' ((A')^3)*c3' ((A')^4)*c3' ((A')^5)*c3'])
Obs4 = rank([c4' A'*c4' ((A')^2)*c4' ((A')^3)*c4' ((A')^4)*c4' ((A')^5)*c4'])
```

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