
```
% MECH 6300 - HW 6
```

```
A = blkdiag([2,1;0,2],2,2,[1,1;0,1],1)
```

```
B = [2 1 0
      2 1 1
      1 1 1
      3 2 1
      -1 0 1
      1 0 1
      1 0 0]
```

```
C = [2 2 1 3 -1 1 1
      1 1 1 2 0 0 0
      0 1 1 1 1 1 0]
```

```
U = ctrb(A,B)
```

```
ctrlRank = rank(U)
```

```
V = obsv(A,C)
```

```
obsvRank = rank(V)
```

```
A =
```

2	1	0	0	0	0	0
0	2	0	0	0	0	0
0	0	2	0	0	0	0
0	0	0	2	0	0	0
0	0	0	0	1	1	0
0	0	0	0	0	1	0
0	0	0	0	0	0	1

```
B =
```

2	1	0
2	1	1
1	1	1
3	2	1
-1	0	1
1	0	1
1	0	0

```
C =
```

2	2	1	3	-1	1	1
1	1	1	2	0	0	0
0	1	1	1	1	1	0

$U =$

Columns 1 through 13

	2	1	0	6	3	1	16	8	4	40	20
12	96										
	2	1	1	4	2	2	8	4	4	16	8
8	32										
	1	1	1	2	2	2	4	4	4	8	8
8	16										
	3	2	1	6	4	2	12	8	4	24	16
8	48										
	-1	0	1	0	0	2	1	0	3	2	0
4	3										
	1	0	1	1	0	1	1	0	1	1	0
1	1										
	1	0	0	1	0	0	1	0	0	1	0
0	1										

Columns 14 through 21

48	32	224	112	80	512	256	192
16	16	64	32	32	128	64	64
16	16	32	32	32	64	64	64
32	16	96	64	32	192	128	64
0	5	4	0	6	5	0	7
0	1	1	0	1	1	0	1
0	0	1	0	0	1	0	0

$ctrlRank =$

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$V =$

2	2	1	3	-1	1	1
1	1	1	2	0	0	0
0	1	1	1	1	1	0
4	6	2	6	-1	0	1
2	3	2	4	0	0	0
0	2	2	2	1	2	0
8	16	4	12	-1	-1	1
4	8	4	8	0	0	0
0	4	4	4	1	3	0
16	40	8	24	-1	-2	1
8	20	8	16	0	0	0
0	8	8	8	1	4	0
32	96	16	48	-1	-3	1
16	48	16	32	0	0	0
0	16	16	16	1	5	0
64	224	32	96	-1	-4	1
32	112	32	64	0	0	0

0	32	32	32	1	6	0
128	512	64	192	-1	-5	1
64	256	64	128	0	0	0
0	64	64	64	1	7	0

obsvRank =

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