

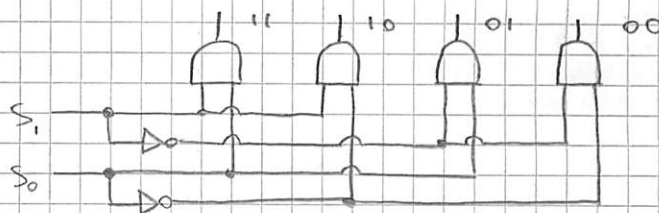
Class #3

Multiplexing (many inputs $\Rightarrow$ 1 output)

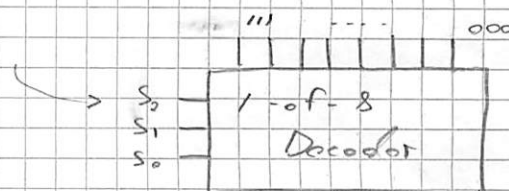
- ① Decoder circuitry (to chose between inputs)
- ② Pass/block circuitry (to open/close connections)

① Decoder

- 1-of-4
(2 bits)

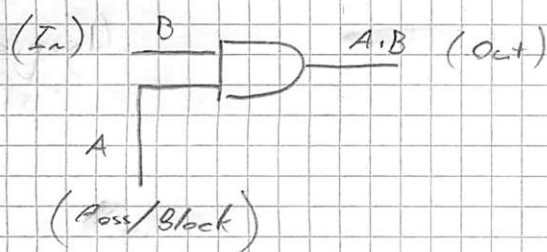


- 1-of-8 (3 bits)
- 1-of-16 (4 bits)
- etc...



② Pass/block circuitry

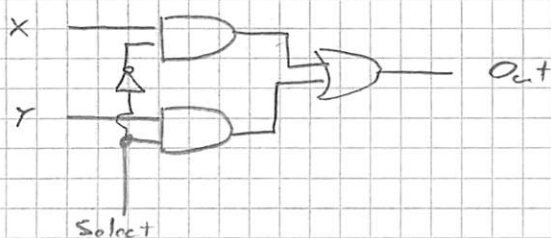
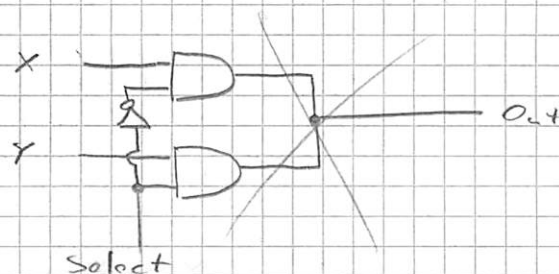
Cats



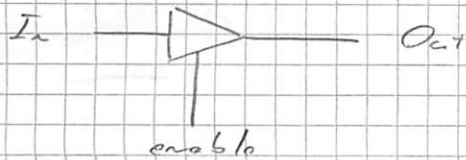
	A	B	A.B	
Block	0	0	0	Out = 0
	0	1	0	
Pass	1	0	0	Out = In
	1	1	1	

Unidirectional, disabled state is always low, output may not be tied together w/ other output

For example:



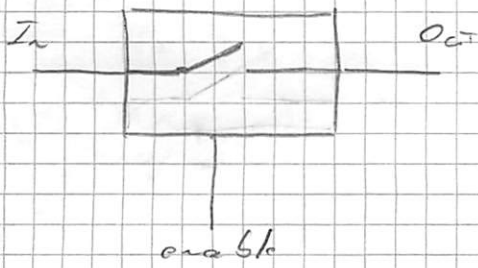
Thru-state



enable	In	Out
0	0	Open
0	1	Open
1	0	0
1	1	1

Unidirectional, output may be tied together w/ other outputs, 3 possible output states

Transmission Gates



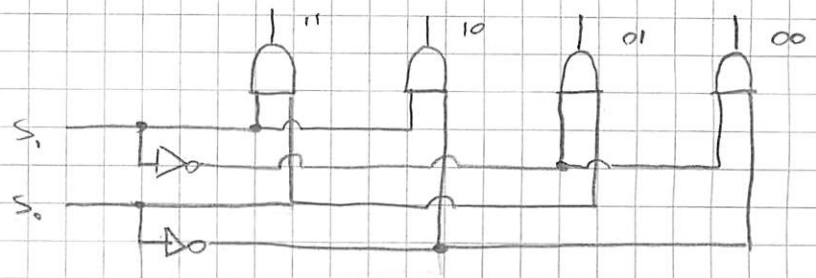
enable	In	Out
0	Open	Open
1	$In = Out$	$In = Out$

Bi-directional, output may be tied together w/ other outputs, all states possible $\rightarrow$ can switch analog signals

Digital Electronics II

Decoder

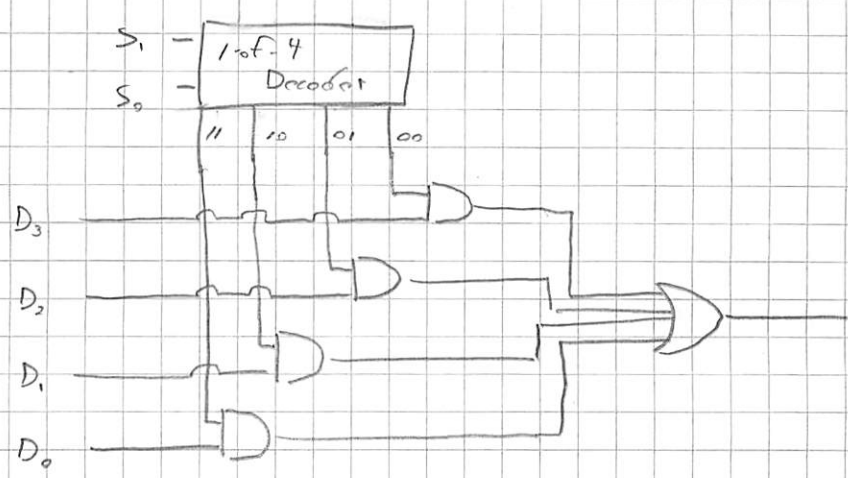
• 1-of-4



Multiplexer

• 4-1

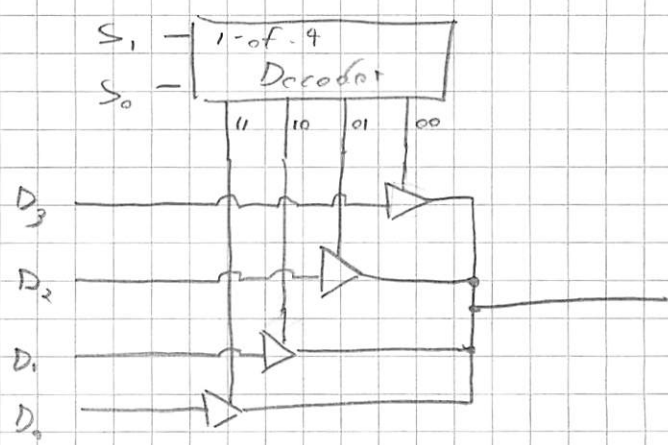
(ordinary)



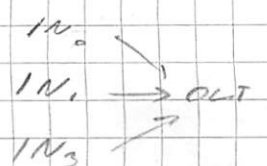
or

• 4-1

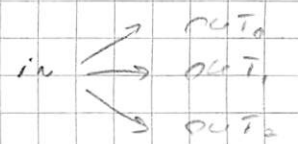
(free-state)



Multiplexer

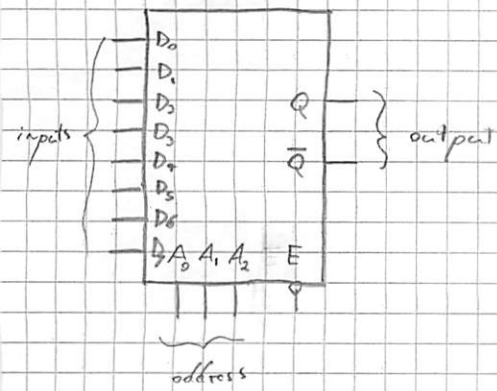


De-multiplexer

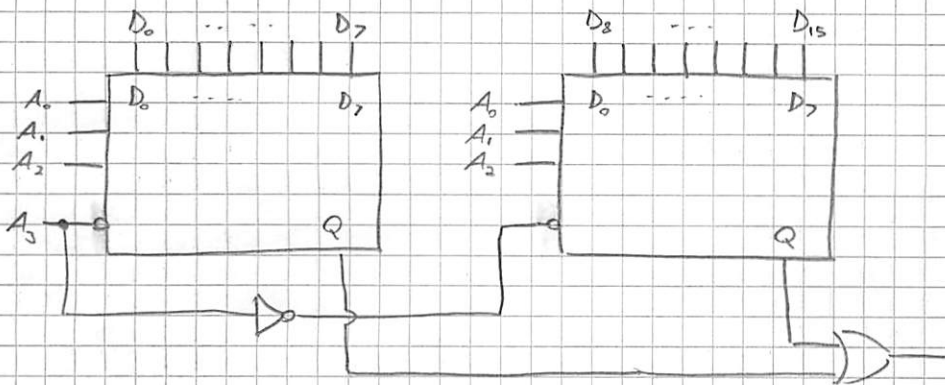


8-input multiplexer

4



16-input multiplexer

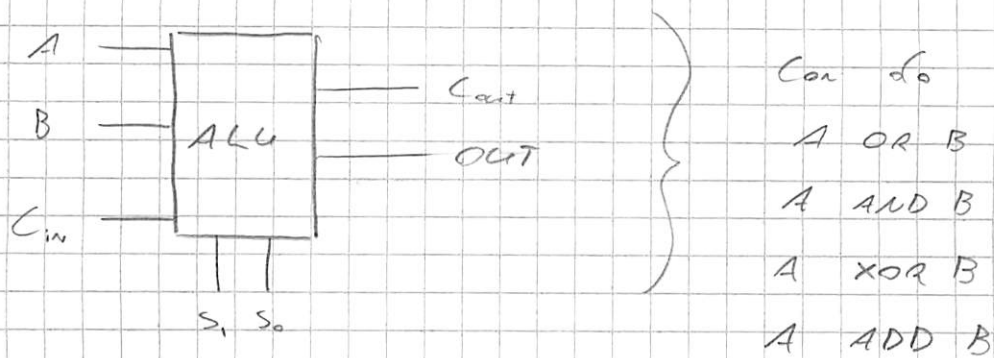


(slides) ..

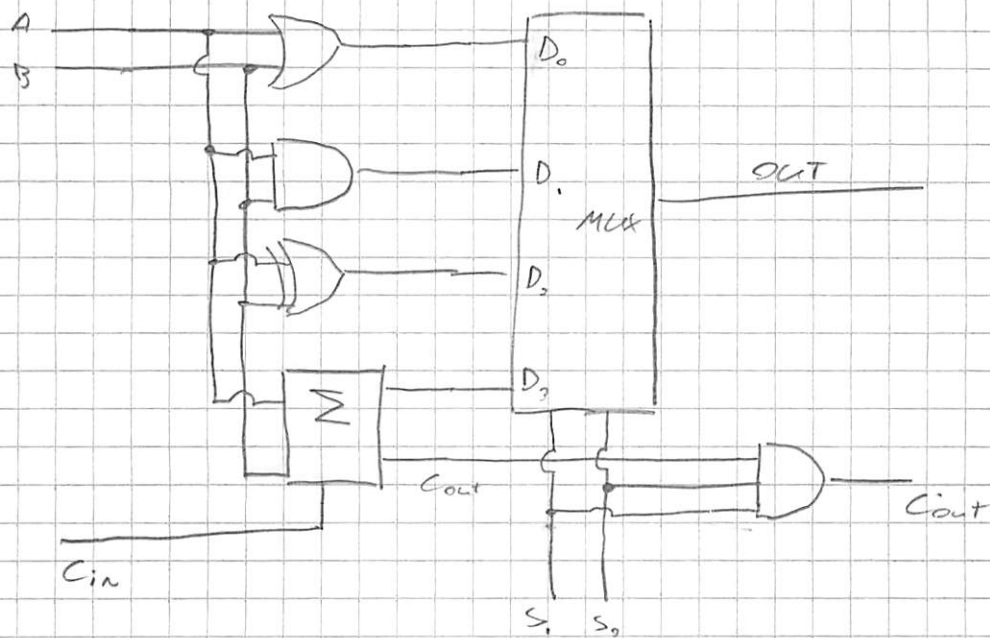
3 - 7

Aritmetic Logic Unit (ALU)

5



How ?



A few words (& slides) on programmable logic & ROM.