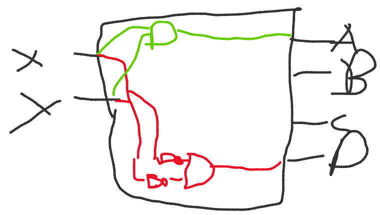
Day 3 (Jan 27th)

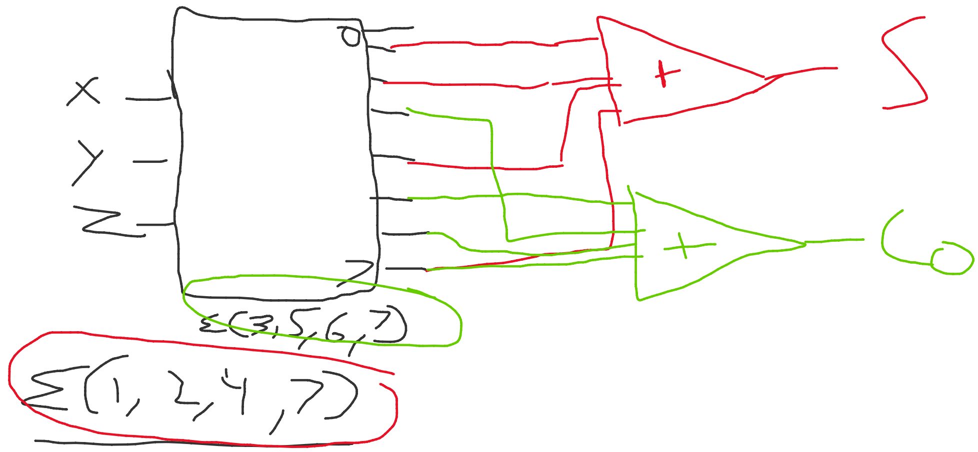
Monday, January 27, 2020 1:24 PM

2-to-4 Decoder:



X	Y	A	B	C	D
0	0	0	0	0	1
0	1	0	0	1	0
1	0	0	1	0	0
1	1	1	0	0	0

3 to 8 Decoder:



X	Y	Z	S	C_o	
			0	0	
			1	0	
			1	0	
			0	1	
			1	0	
			0	1	
			0	1	
			1	1	

Priority Encoder:

For all zeros we don't care about the current output (because we shouldn't ever get all zeros)
If C is 1 we don't care what D is so we can simplify the truth table
If B is 1 we don't care about C or D
If A is 1 we don't care about B, C or D

A	B	C	D	X	Y
0	0	0	0	X	X
0	0	0	1	0	0
0	0	1	X	0	1
0	1	X	X	1	0
1	X	X	X	1	1

X Karnaugh Map:

			C	C	
	X	0	0	0	
	1	1	1	1	B
A	1	1	1	1	B
A	1	1	1	1	
		D	D		

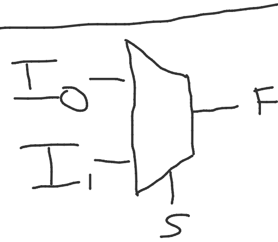
X: A + B (the don't cares would be 0)

Y Karnaugh Map:

			C	C	
	X	0	1	1	
	0	0	0	0	B
A	1	1	1	1	B
A	1	1	1	1	
		D	D		

Y: A'B'C + A (the don't cares would be 0)

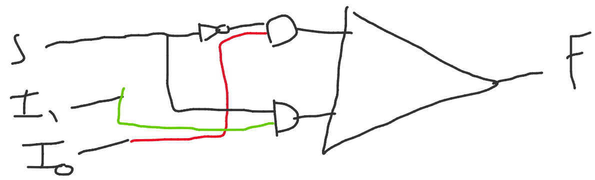
Multiplexer



S	I_1	I_o	F	
0	0	0	0	
0	0	1	1	
0	1	0	0	
0	1	1	1	

0	1	1	1	
1	0	0	0	
1	0	1	0	
1	1	0	1	
1	1	1	1	

Basically Either copy over I_0's column to F or I_1's Column to F

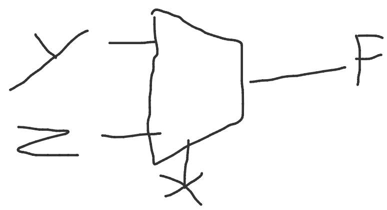


			I_1	I_1	
	0	1	1	0	
S	0	0	1	1	
		I_0	I_0		

F: $S'I_0+SI_1$

F=(1,2,6,7)

X	Y	Z	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1



Selector bits are always the most significant bits (X in this single selector bit case)
Amount of Inputs are equal to 2^(Amount of Selector Bits)

The Way to help visualize the multiplexor in the tables, you divide th Exclusive Or e selector bit

X	Y	Z	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
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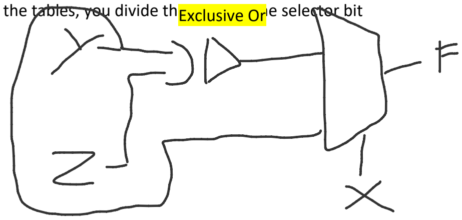
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1



Two Selector Bits:

X	Y	Z	F
0	0	0	0
0	0	1	1
----------	----------	----------	----------
0	1	0	1
0	1	1	0
----------	----------	----------	----------
1	0	0	0
1	0	1	0
----------	----------	----------	----------
1	1	0	1
1	1	1	1