−8

positive 01000 → 1's comp 10111

$$\begin{array}{r} 10111 \\ +\quad\ \ 1 \\ \hline \boxed{11000} \end{array}$$

$\boxed{11000}$

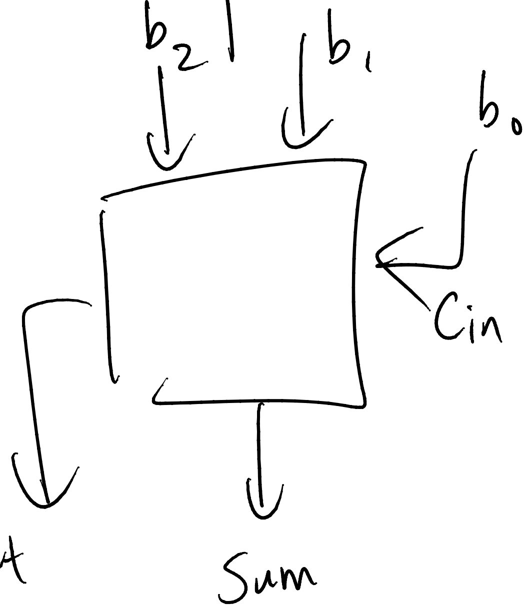
−14 → 01110 → 1's 10001

$$\begin{array}{r} 10001 \\ +\quad\ \ 1 \\ \hline \boxed{10010} \end{array}$$

$\boxed{10010}$

8-to-1 mux using 4-to-1

$b_2 b_1 b_0$



Cin	x	y	
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

2

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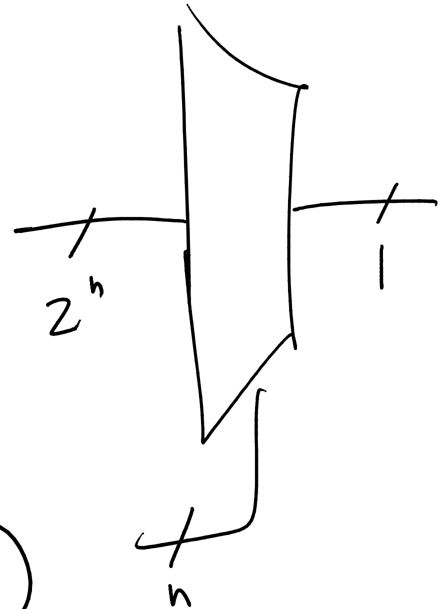
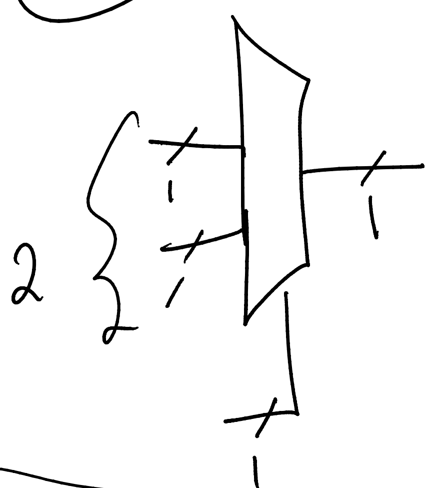


$n = 1, \ldots, ?$

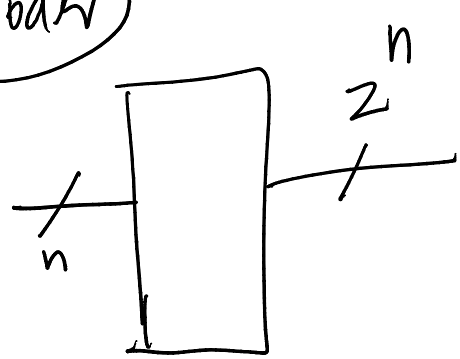
mux



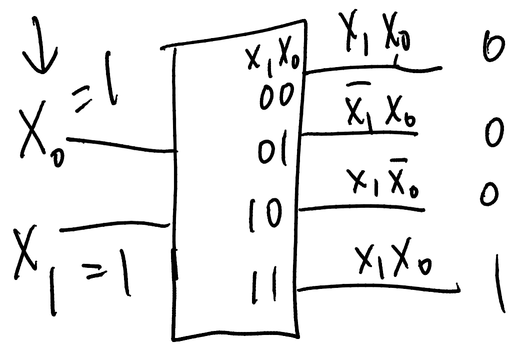
$n=1$

$2^1 = 2$

decoder



LSB $n=2$



$x_1 = 1, \; x_0 = 0$

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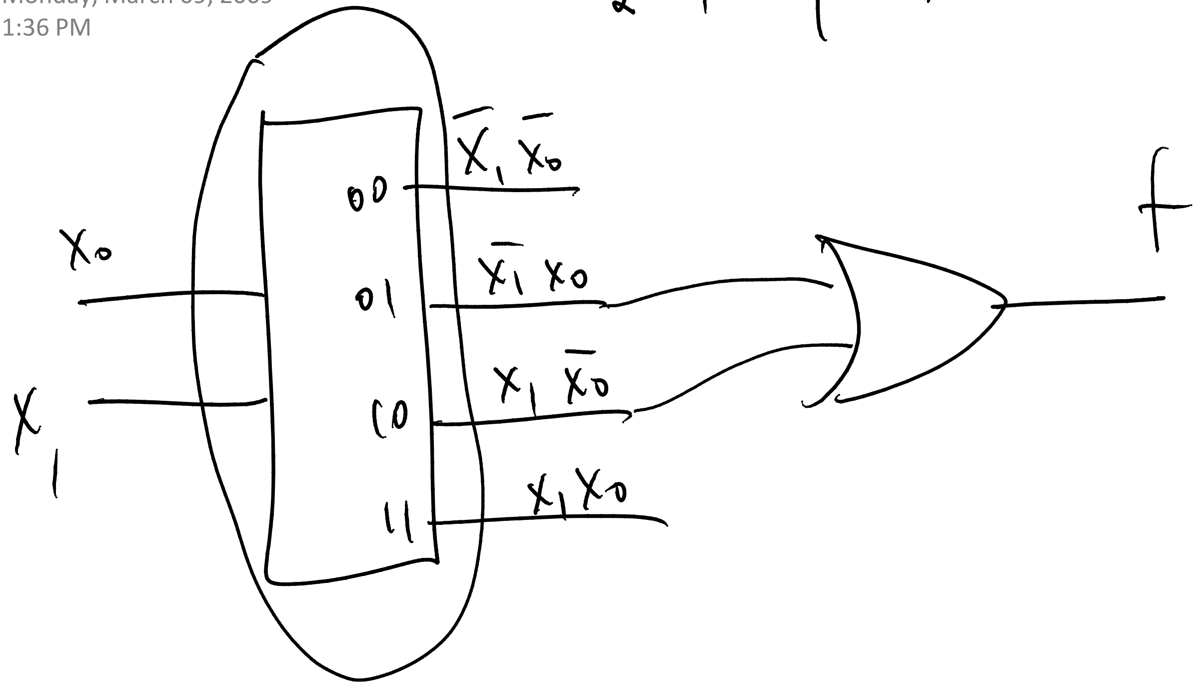
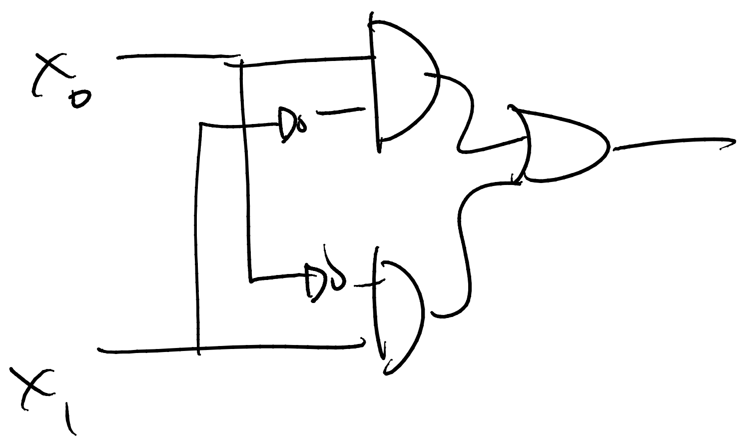
2-to-4 decoder



$$f = \bar{x}_1 x_0 + x_1 \bar{x}_0$$



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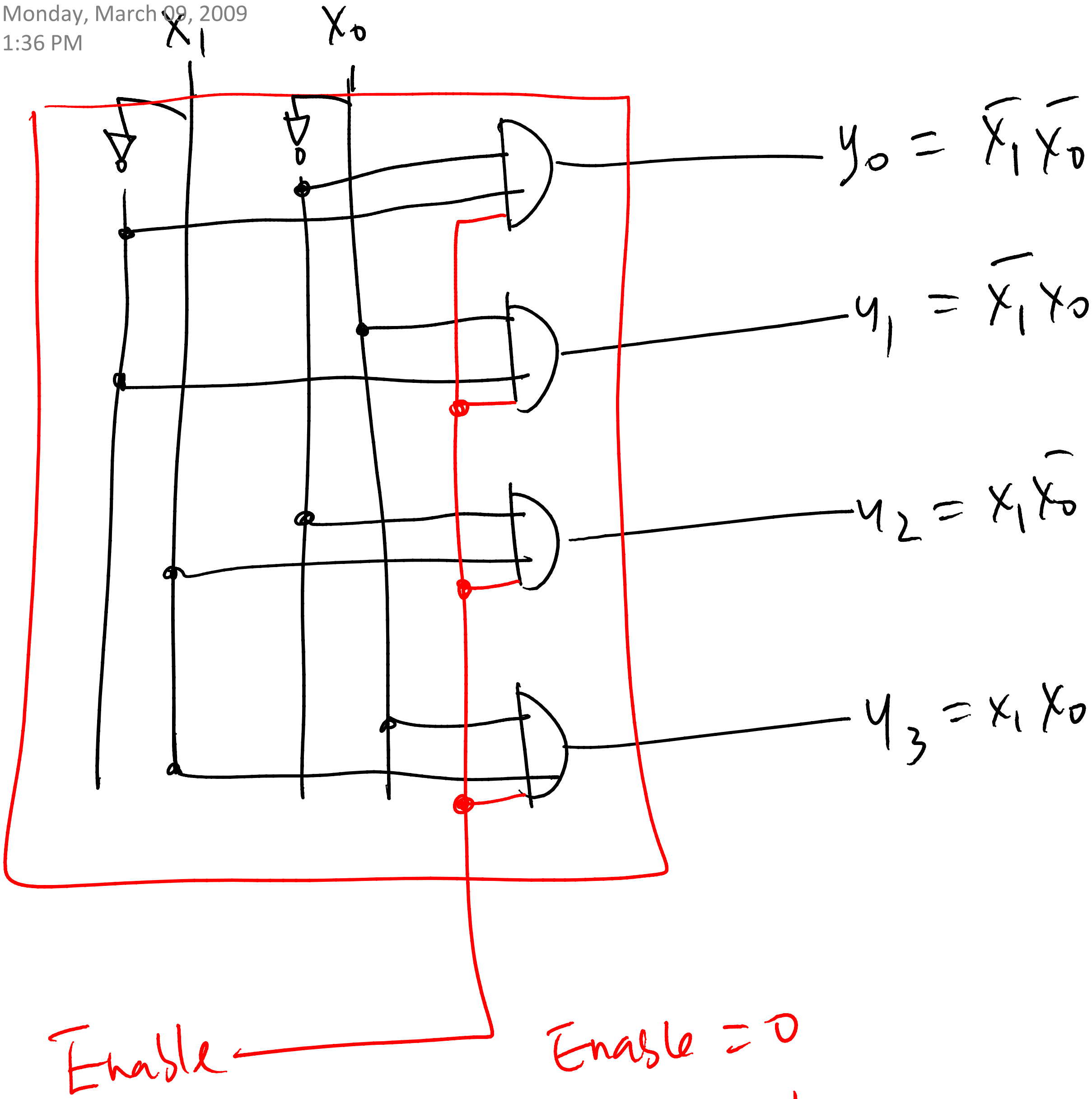

Enable = 0

Enable = 1

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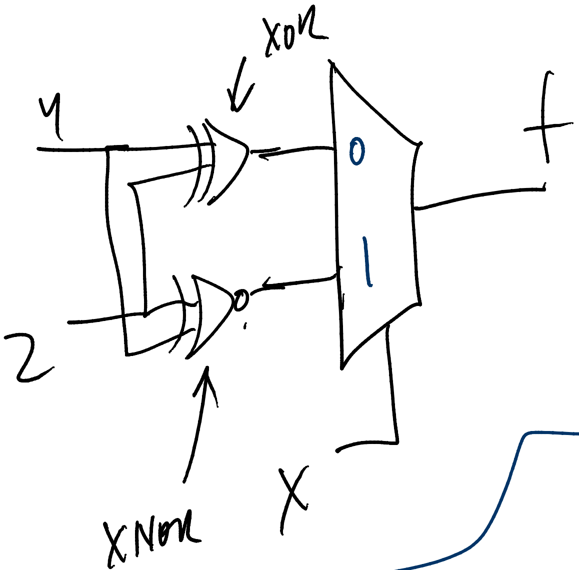
x	y	z	f
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

$$f = \bar{x}\bar{y}z + \bar{x}y\bar{z} + x\bar{y}\bar{z} +$$

$$xyz$$

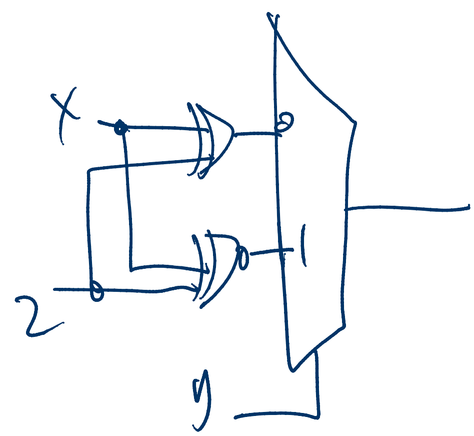
use 2-to-1 mux and (only) necessary logic gates.



$$f = \bar{x}\left[\bar{y}z + y\bar{z}\right] + x\left[\bar{y}\bar{z} + yz\right]$$

Select/control

$$f = \bar{y}\left[\bar{x}z + x\bar{z}\right] + y\left[\bar{x}\bar{z} + xz\right]$$



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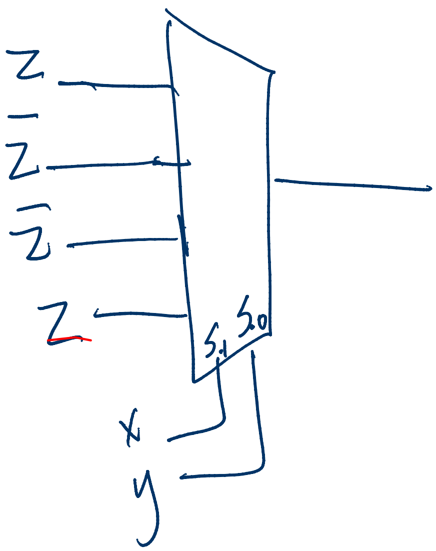
$$f = \bar{x}\bar{y}z + \bar{x}y\bar{z} + x\bar{y}\bar{z} + xyz$$

$$f = \bar{x}[\bar{y}z + y\bar{z}] + x[\bar{y}\bar{z} + yz]$$

$$= \bar{x}[\bar{y}(z) + y(\bar{z})] + x[\bar{y}(\bar{z}) + y(z)]$$

0 0   0 1   1 0   1 1



$f(x, y, z) = \sum m(0, 4, 5, 6, 7)$

using 4-to-1 mux

using 2-to-1 mux