

0. HA, FA

Sept 27, 2017

I MSI decoder 3x8 decoder
4x16 decoder

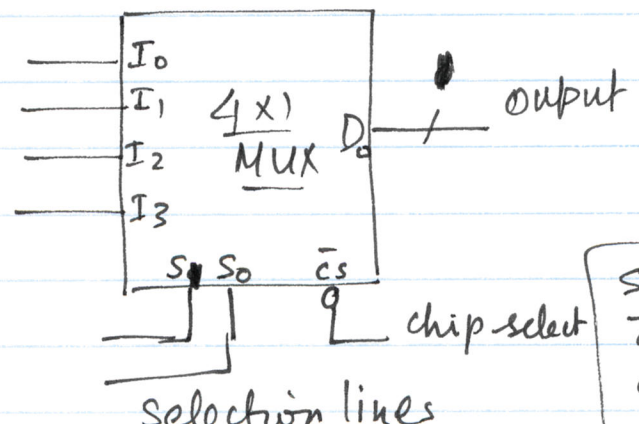
Combinational circuit implementation.

"encoder"

II MUX multiplexer
MSI

"decoder"

4x1 MUX



S ₁	S ₀	D ₀
0	0	I ₀
0	1	I ₁
1	0	I ₂
1	1	I ₃

N x 1 Multiplex function: It routes one of N inputs to the only output, based on the values in the selection lines.

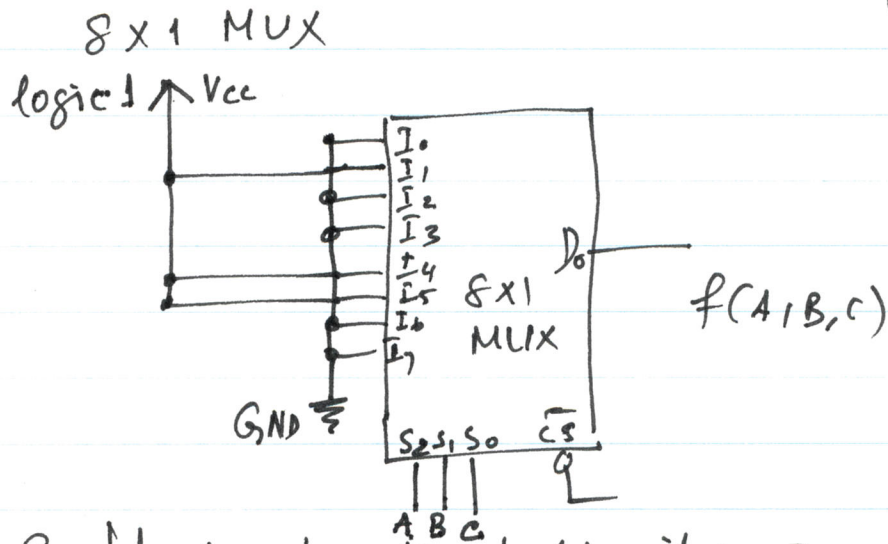
uses: routing sensors
data acquisition

N sources - 1 target

1. Build a combinational circuit using MUX
2. Build a larger MUX using smaller sized MUXs.

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Build combinational circuit: Implement using 8x1.

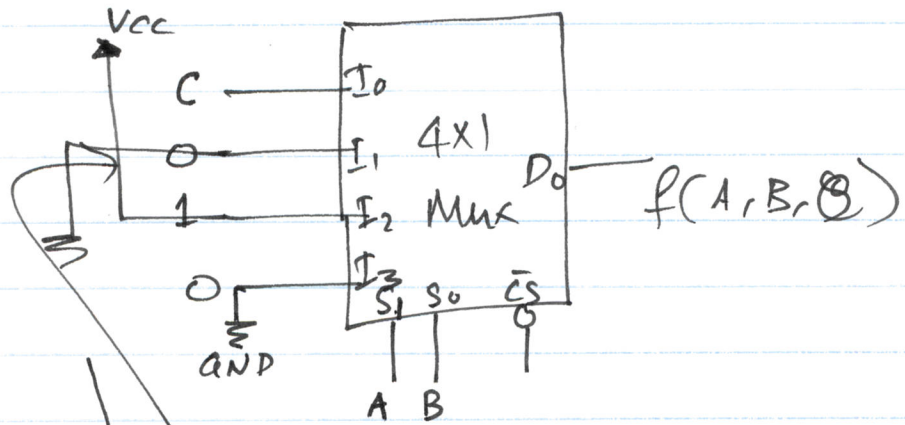
$f(A, B, C) = \sum_{m_1, m_4, m_5} (1, 4, 5)$

$f(A, B, C) = \underline{\underline{\quad}}$

A	B	C	$f(A, B, C)$
0	0	0	0
0	0	1	1 ✓
0	1	0	0
0	1	1	0
1	0	0	1 ✓
1	0	1	1 ✓
1	1	0	0
1	1	1	0

Implement using 4x1 mux?

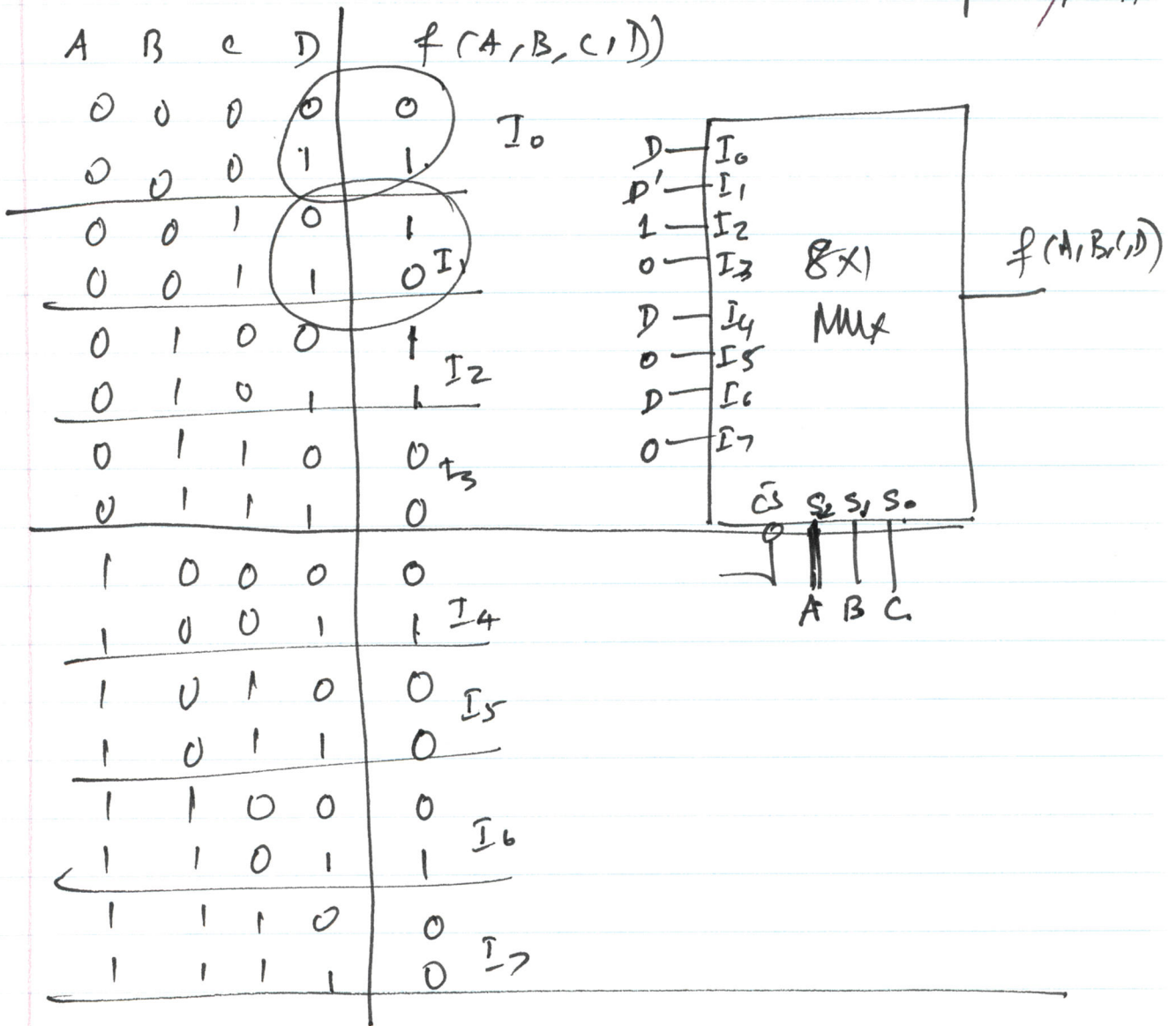
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	A	B	C	$f(A, B, C)$	
$S_1 S_0$ 0 0	0	0	0	0	I_0
$S_1 S_0$ 0 1	0	1	0	0	I_1
$S_1 S_0$ 1 0	1	0	0	1	I_2
$S_1 S_0$ 1 1	1	1	0	0	I_3

(4)

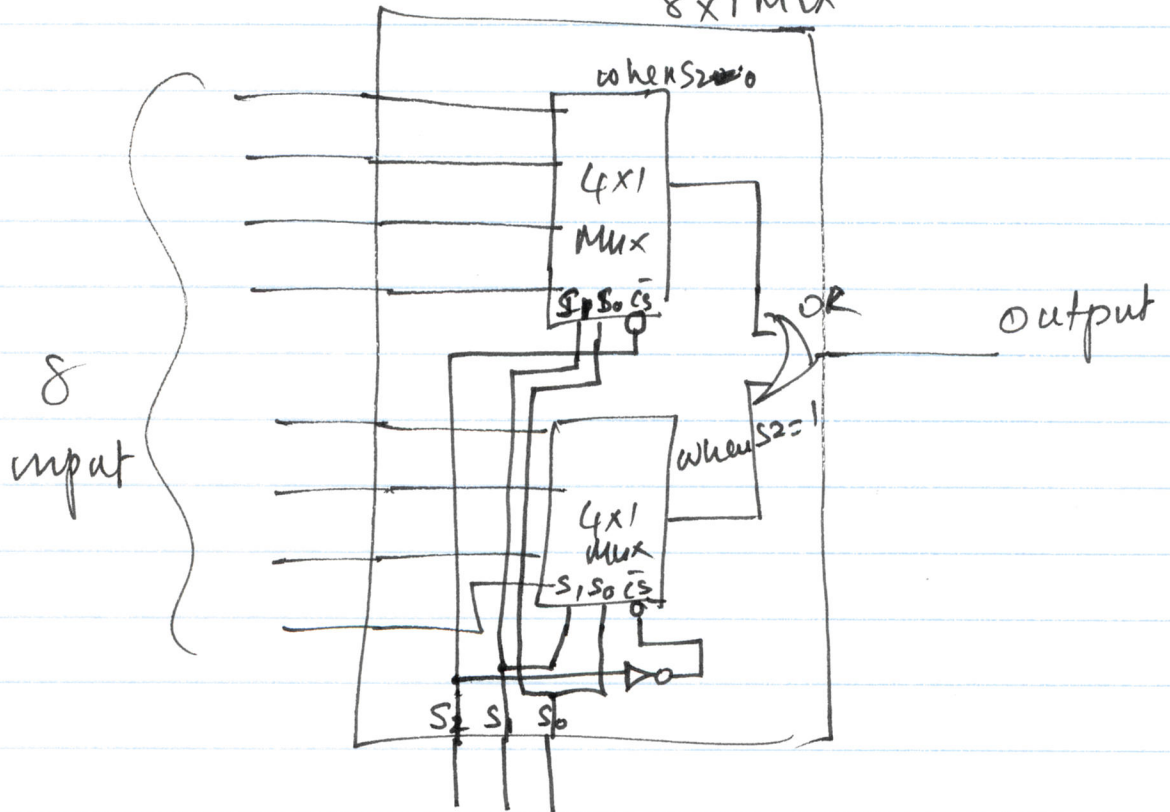
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Build 8x1 Mux using 2 4x1 Mux



Design $f(A, B, C, D) = \sum(4, 5, 11, 15)$

using 4x1 MUX