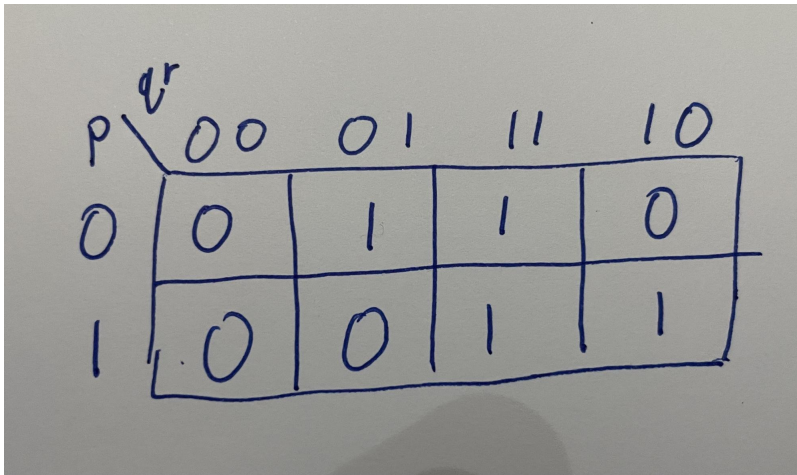


# ECE M16 Homework 2

Lawrence Liu

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## HW1 Problem 4 part b



A handwritten truth table for a 2-input function. The inputs are labeled  $p$  and  $q$ . The outputs are labeled 0 and 1. The table is a 2x4 grid with columns for  $00$ ,  $01$ ,  $11$ , and  $10$ . The rows are for  $0$  and  $1$ .

$p \backslash q$	$00$	$01$	$11$	$10$
$0$	$0$	$1$	$1$	$0$
$1$	$0$	$0$	$1$	$1$

# HW1

## Problem 7

(a)

Month	m3	m2	m1	m0	output
1	0	0	0	1	1
2	0	0	1	0	0
3	0	0	1	1	1
4	0	1	0	0	0
5	0	1	0	1	1
6	0	1	1	0	0
7	0	1	1	1	1
8	1	0	0	0	1
9	1	0	0	1	0
10	1	0	1	0	1
11	1	0	1	1	0
12	1	1	0	0	1

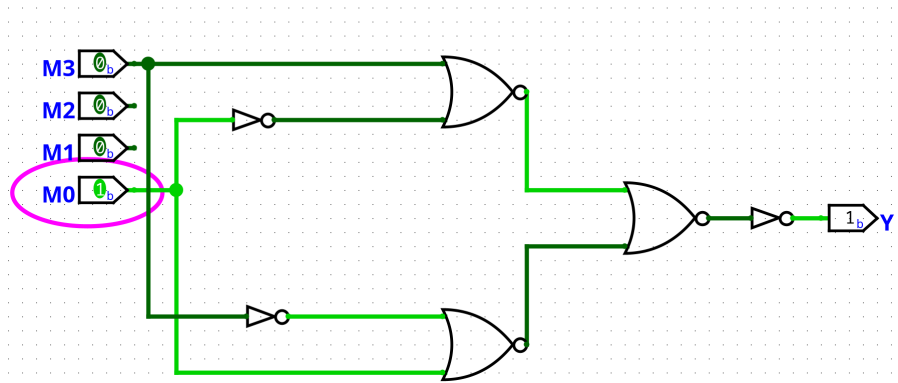
(b)

m1 \ m0	00	01	10	11
m3 \ m2	1	0	1	1
01	0	1	1	0
11	0	0	0	1
10	0	0	0	0

Therefore the equation is:

$$m_0 \cdot \overline{m_3} + \overline{m_0} \cdot m_3$$

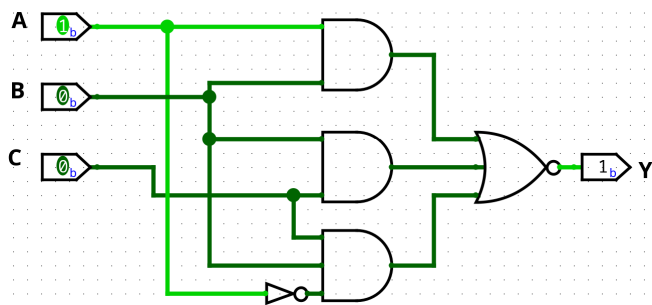
(c)



## HW 2

### Problem 1

There would be a static 0 hazard between  $b = 1, c = 1, a = 0$  and  $b = 1, c = 1, a = 1$ . We can fix it with the following circuit. We can fix this by adding an And gate between  $b$  and  $c$  before the nor, so the resulting function would look like this



### Problem 2

Let the inputs be  $M[0 : 3]$  then we have the following truth table

decimal	M3	M2	M1	M0	q2	q5
0	0	0	0	0	1	1
1	0	0	0	1	0	1
2	0	0	1	0	1	1
3	0	0	1	1	0	1
4	0	1	0	0	0	1
5	0	1	0	1	0	0
6	0	1	1	0	1	0
7	0	1	1	1	0	1
8	1	0	0	0	1	1
9	1	0	0	1	0	1

Therefore we will have the following Kmap for q2

		$q2$ $M1, M0$			
		00	01	11	10
$M3, M2$	00	1	0	0	1
	01	0	0	0	1
	11	-	-	-	-
	10	1	0	-	-

Therefore the equation for q2 is:

$$q2 = \overline{M2} \cdot \overline{M0} + M1 \cdot \overline{M0}$$

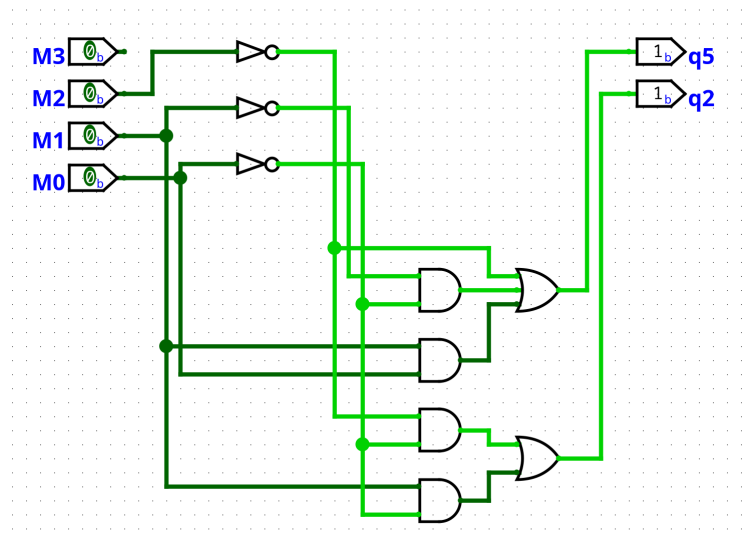
Likewise, the Kmap for q5 is

		$q5$ $M1, M0$			
		00	01	11	10
$M3, M2$	00	1	1	1	1
	01	1	0	1	0
	11	-	-	-	-
	10	1	1	-	-

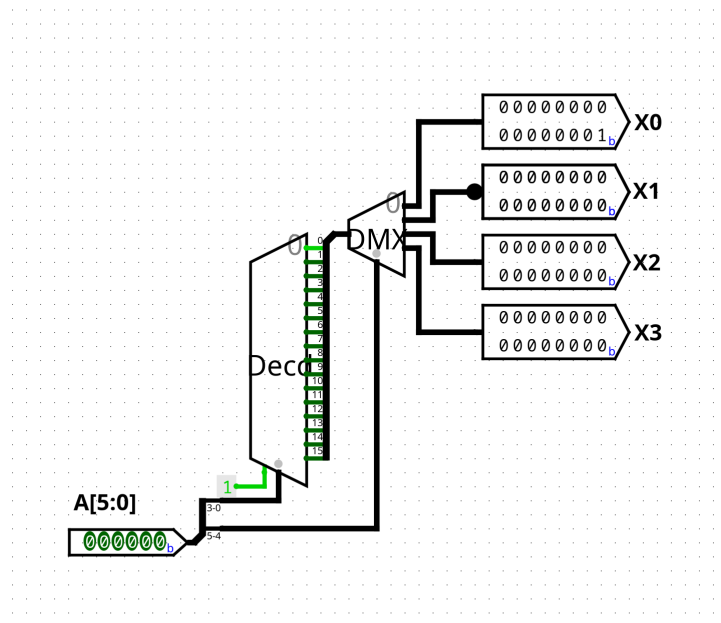
Therefore the equation for q5 is:

$$q5 = \overline{M2} + \overline{M1} \cdot \overline{M0} + M1 \cdot M0$$

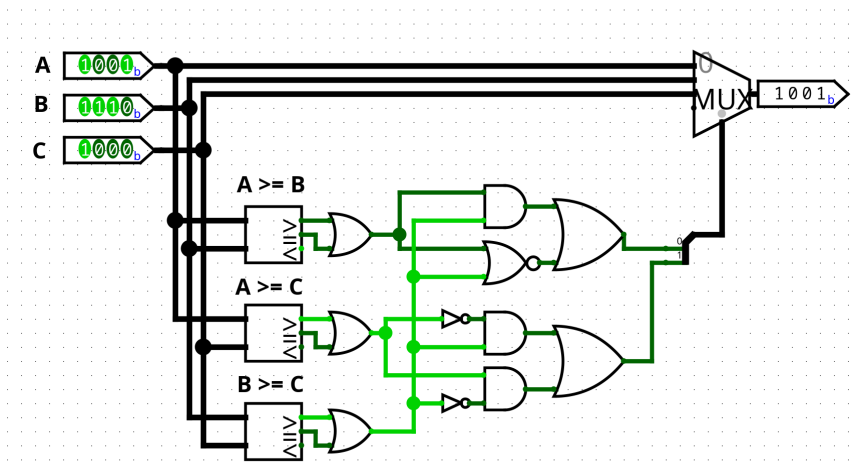
Therefore the resulting circuit is



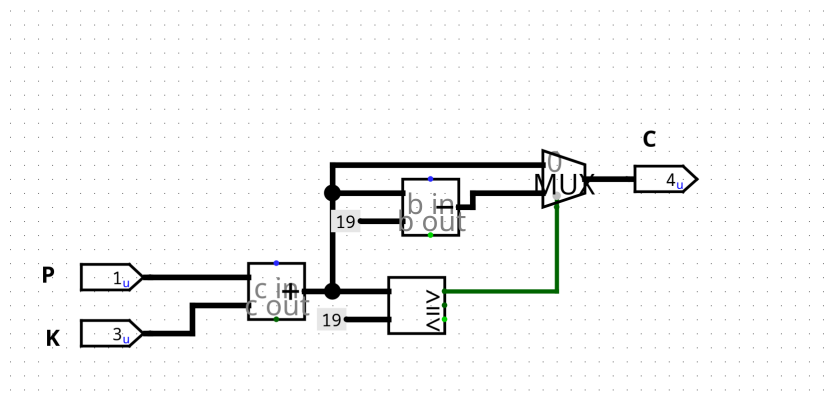
### Problem 3



## Problem 4



## Problem 5



## Problem 6

