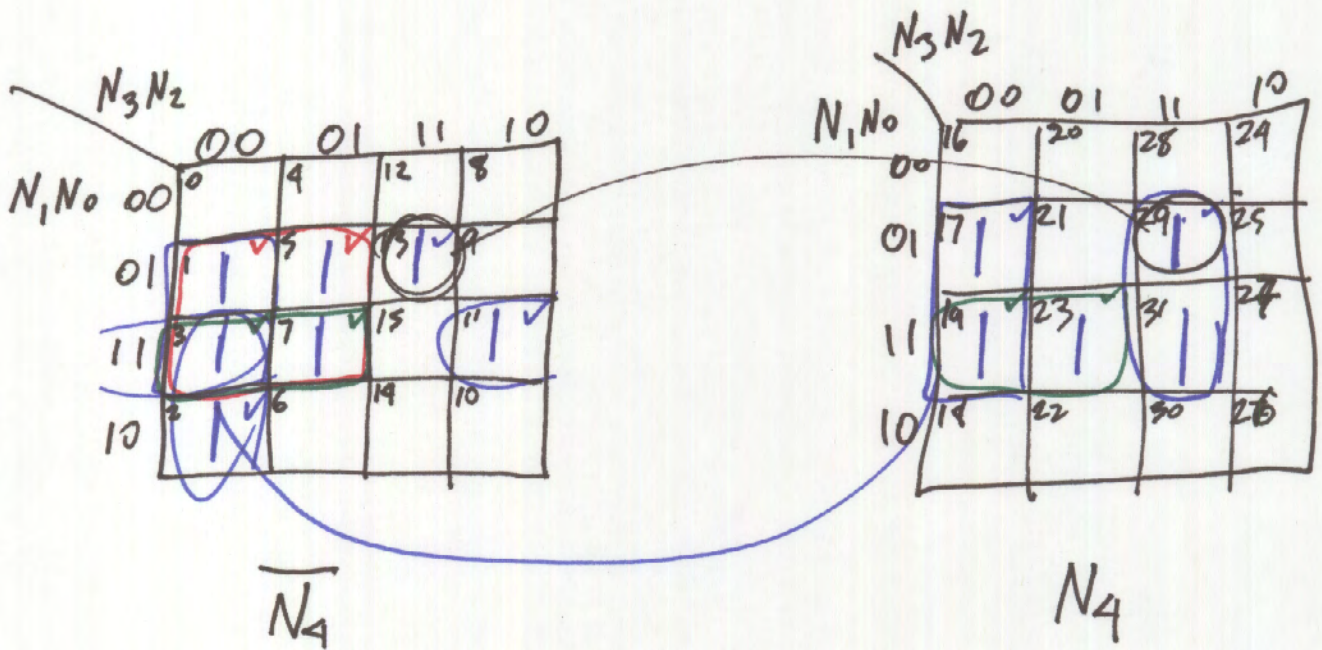


ECGR 2181 - 9/28/09 - Extra Notes (1)

Problem \rightarrow Output a "1" when the inputted hexadecimal # is prime, from 0 to 31

$$F(N_4 N_3 N_2 N_1 N_0) = \sum_M(1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31)$$



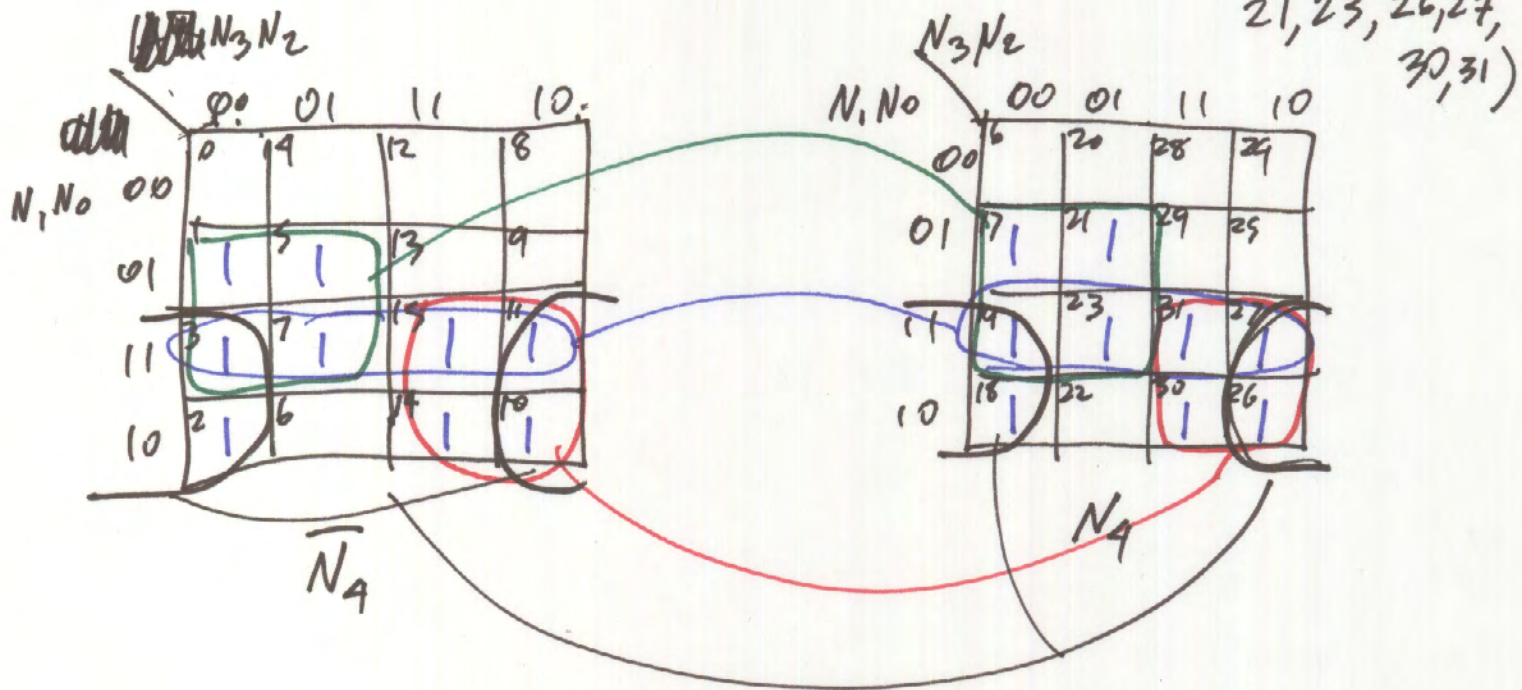
1 OR, 7 ANDs, 4 NOTs

$$\overline{N_4} \overline{N_3} N_0 + \overline{N_3} N_1 N_0 + \overline{N_3} \overline{N_2} N_0 +$$

$$\overline{N_4} \overline{N_2} N_1 N_0 + \overline{N_4} \overline{N_3} \overline{N_2} N_1 + N_3 N_2 \overline{N_1} N_0 +$$

$$N_4 N_3 N_2 N_0$$

$$F(N_4 N_3 N_2 N_1 N_0) = \sum m(1, 2, 3, 5, 7, 10, 11, 14, 15, 17, 18, 19, 21, 23, 26, 27, 30, 31)$$



$$F = \boxed{N_3 N_1} + \boxed{\bar{N}_3 N_0} + \boxed{\bar{N}_2 N_1}$$

Red Green Black

Blue is redundant

	N_4	N_3	N_2	N_1	N_0	F
0	0	0	0	0	0	0
1	0	0	0	0	1	1
2	0	0	0	1	0	1
3	0	0	0	1	1	1
4	0	0	1	0	0	0
5	0	0	1	0	1	1
6	0	0	1	1	0	0
7	0	0	1	1	1	1
8	0	1	0	0	0	0
9	0	1	0	0	1	0
10	0	1	0	1	0	1
11	0	1	0	1	1	1
12	0	1	0	0	0	0
...						

$$F = a \text{ OR } b$$

$$F = a + b$$

$$F' = (a)' * (b)'$$

$$F = (a'b')'$$

$$(a+b)' = (a'b')$$

$$S = a' + b' + c'$$

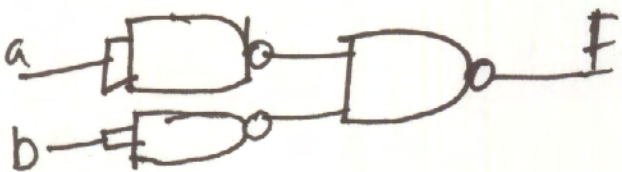
$$S' = (a' + b' + c')'$$

$$S' = (a)' * (b)'' * (c)''$$

$$S' = a * b * c$$

$$S = (a * b * c)'$$

NAND



$$F(a,b,c) = \sum m(0,1,2,3,7)$$

		cb			
		00	01	11	10
c	0	0	2	6	4
	1	1	3	7	5

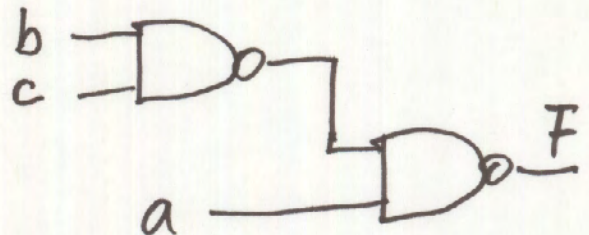
$$F = a' + bc$$

$$F' = (a' + bc)'$$

$$F' = (a)'' * (bc)'$$

$$F' = a * (bc)'$$

$$F = (a * (bc)')'$$



ECG R 2181 - Extra Notes - 9/28/09 (4)

e	i ₁	i ₀	d ₃	d ₂	d ₁	d ₀	decoder
0	0	0	0	0	0	0	w/ enable
0	0	1	0	0	0	0	
0	1	0	0	0	0	0	
0	1	1	0	0	0	0	
1	0	0	0	0	0	1	
1	0	1	0	0	1	0	
1	1	0	0	1	0	0	
1	1	1	1	0	0	0	