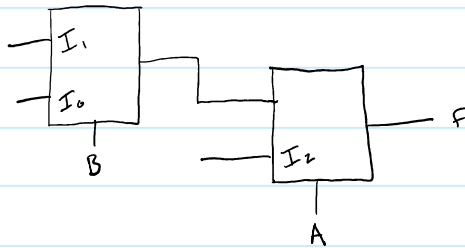


EGN3342 - Homework 4 - Justin VanWinkle - j3338546

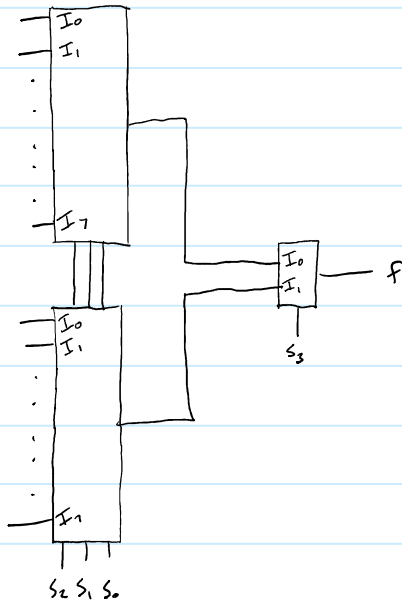
Thursday, July 2, 2015

10:38 AM

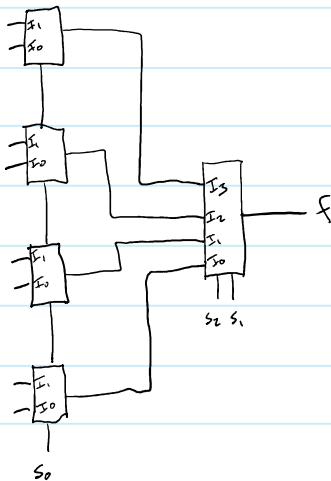
1) a)



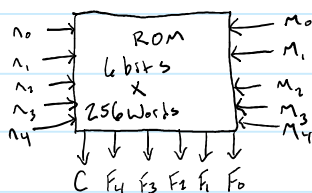
b)



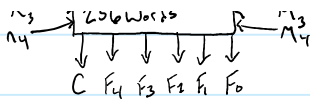
c)



2)



n_4	m_4	n_3	m_3	n_2	m_2	n_1	m_1	n_0	m_0	C	F_4	F_3	F_2	F_1	F_0
1	1	0	0	1	0	0	0	0	1	1	0	1	0	1	0
0	0	0	0	0	0	1	1	1	1	0	0	0	1	0	1

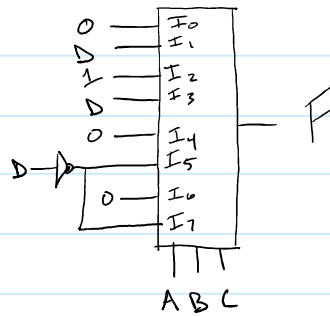


1	1	0	0	1	0	0	0	0	1	1	0	1	0
0	0	0	0	0	0	1	1	1	1	0	0	0	1
0	0	1	0	1	1	0	0	0	1	0	1	0	0
1	1	0	0	0	0	0	0	1	1	1	0	0	1
1	1	1	1	0	0	0	0	0	0	1	1	0	0

$$\begin{aligned}
 3) \quad F &= ab'cde' + bc'd'e + a'cd'e + ac'de' \\
 &= b'(acde' + a'cd'e + ac'de) + b(c'd'e + a'cd'e + ac'de') \\
 &= b'(acde' + a'cd'e + ac'de) + b(c'd'e + a'd'e + ac'de') \\
 &= b'f_0(a, 0, c, d, e) + b f_1(a, 1, c, d, e)
 \end{aligned}$$

4)

A	B	C	D	F	
0	0	0	0	0] f ₀ = 0
0	0	0	1	0	
0	0	1	0	0] f ₁ = 0
0	0	1	1	1	
0	1	0	0	1] f ₂ = 1
0	1	0	1	0	
0	1	1	0	1] f ₃ = D
0	1	1	1	1	
1	0	0	0	0] f ₄ = 0
1	0	0	1	0	
1	0	1	0	1] f ₅ = D'
1	0	1	1	0	
1	1	0	0	0] f ₆ = 0
1	1	0	1	0	
1	1	1	0	1] f ₇ = D'
1	1	1	1	0	



5)

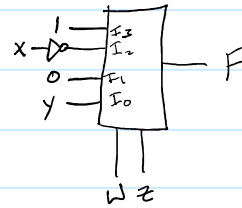
W	x	y	z	F	W	z	x	y	F
0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	1	1
0	0	1	0	1	0	0	1	0	0
0	0	1	1	0	0	0	1	1	1
0	1	0	0	0	0	1	0	0	0
0	1	0	1	X	0	1	0	1	0
0	1	1	0	1	0	1	1	0	X
0	1	1	1	0	0	1	1	1	0
1	0	0	0	1	1	0	0	0	1
1	0	0	1	1	1	0	0	1	X
1	0	1	0	X	1	0	1	0	0
1	0	1	1	1	1	0	1	1	0
1	1	0	0	0	1	1	0	0	1
1	1	0	1	X	1	1	0	1	1
1	1	1	0	0	1	1	1	0	X
1	1	1	1	1	1	1	1	1	1

$$f_0 = y$$

$$f_1 = 0$$

$$f_2 = x'$$

$$f_3 = 1$$



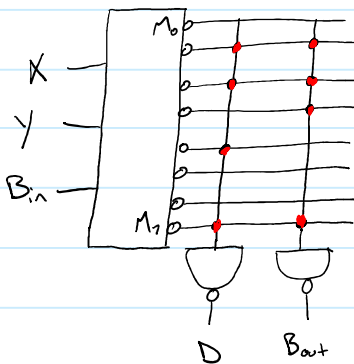
6)

X	0	0	0	0	1	1	1	1
Y	0	0	1	1	0	0	1	1
B _{in}	0	1	0	1	0	1	0	1
D	0	1	1	0	1	0	0	1
B _{out}	0	1	1	1	0	0	0	1

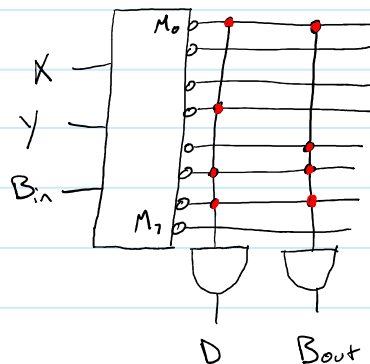
$$D = \sum m(1, 2, 4, 7)$$

$$B_{out} = \sum m(1, 2, 3, 7)$$

a)



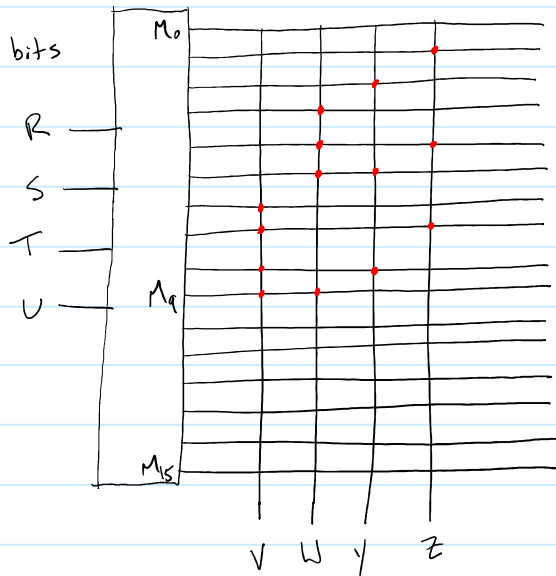
b)



7)

D	BCD	VW	YZ
0	0000	00	00
1	0001	00	01
2	0010	00	10
3	0011	01	00
4	0100	01	01
5	0101	01	10
6	0110	10	00
7	0111	10	01
8	1000	10	10
9	1001	11	00

a) ROM: 16 words x 4 bits



b)

	R _S	00	01	11	10
T _U	00	0	0	X	1
	01	0	0	X	1
	11	0	1	X	X
	10	0	1	X	X

	R _S	00	01	11	10
T _U	00	0	1	X	0
	01	0	1	X	1
	11	1	0	X	X
	10	0	0	X	X

$$V = RU' + RU + ST \quad W = ST' + RU + ST'U' + ST'U$$

	R _S	00	01	11	10
T _U	00	0	0	X	1
	01	0	1	X	0
	11	0	0	X	X
	10	1	0	X	X

	R _S	00	01	11	10
T _U	00	0	1	X	0
	01	1	0	X	0
	11	0	1	X	X
	10	0	0	X	X

$$Y = RU' + ST'U + ST'U' \quad Z = R'S'T'U + STU + ST'U'$$

$$Y = RU' + ST'U + S'TU' \quad Z = R'S'T'U + STU + ST'U'$$

