Pre-Lab Worksheet #2 **NAME:** Alexander Williams **Lab B** 08

1. Karnaugh maps for functions A, M_1, and M_0

$C_1\backslash C_0R$

	00	01	11	10
0	0	1	0	0
1	0	0	0	0

A

$C_1\backslash C_0R$

	00	01	11	10
0	0	1	0	0
1	1	0	1	1

M_1

$C_1\backslash C_0R$

	00	01	11	10
0	0	1	0	1
1	0	1	0	1

M_0

2. Simplified SOP expressions for M_1, M_0 and A.

$A = \bar{C}_1\bar{C}_2R$

$M_1 = C_1C_2 + C_1\bar{R} + \bar{C}_1\bar{C}_2R$

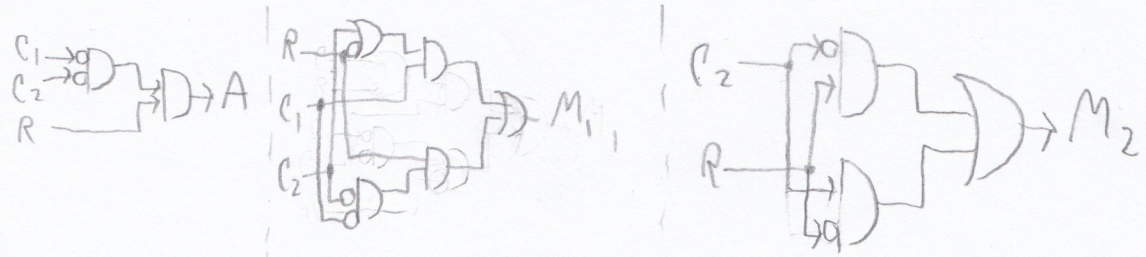
$M_2 = \bar{C}_2R + C_2\bar{R}$

3. Use Boolean Algebra to ensure that gates with only 2-inputs are needed for M_1, M_0 and A:

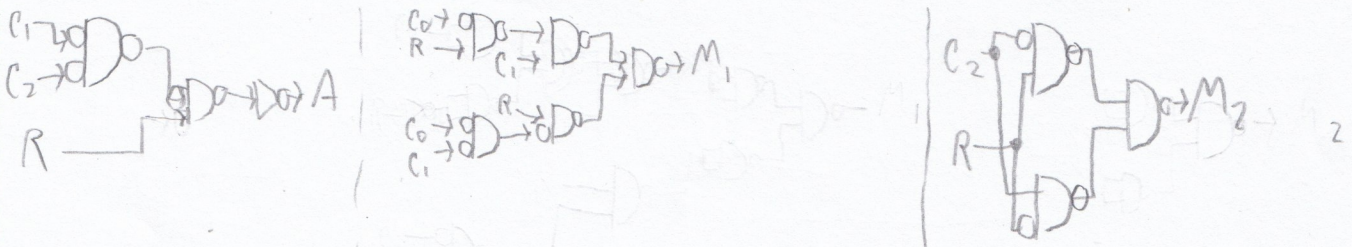
$A = (\bar{C}_1\bar{C}_2)R$

$M_1 = C_1((C_2 + \bar{R}) + (\bar{C}_1\bar{C}_2)R$

Draw M_1, M_0 and A using 2-input AND and OR gates and inverters (on the inputs)



Draw M_1, M_0 and A using 2-input NAND gates and inverters



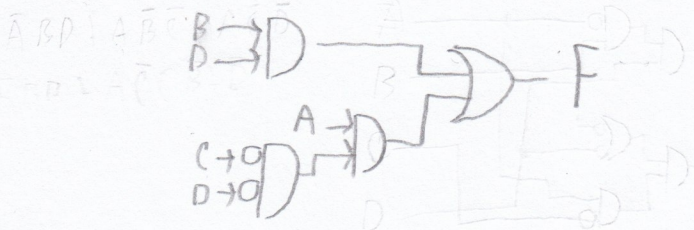
4. The SOP of : F(A,B,C,D) = F(A,B,C,D) = Σm(5, 8,12,13)+ Σd(7,15)

$F(A,B,C,D) = BD + A\bar{C}\bar{D}$

AB\CD

	00	01	11	10
00				
01		1	X	
11	1	1	X	
10	1			

5. The circuit that represents the SOP of F(A,B,C,D) using OR gates, AND gates and inverters (on main inputs).



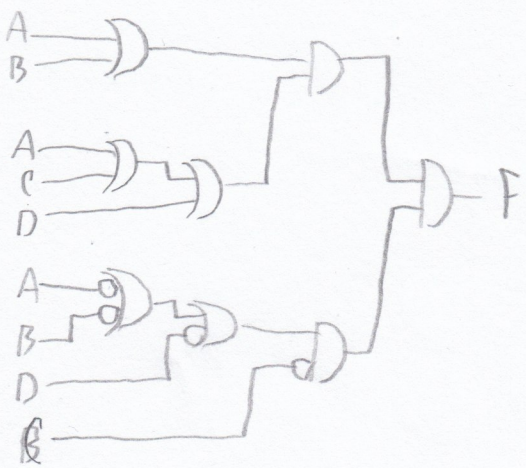
6. The POS of : F(A,B,C,D) =Σm(5, 8,12, 13) + Σd(7,15)

$F = (C)(A+B)(A+C+D)(\bar{A}+B+\bar{D})$

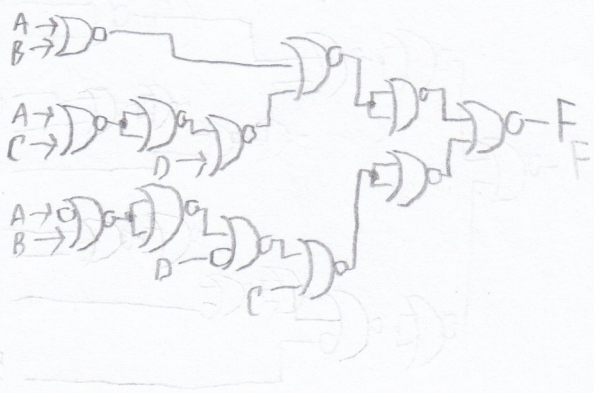
AB\CD

	00	01	11	10
00	0	0	0	0
01	0	1	X	0
11	1	1	X	0
10	1	0	0	0

7. Draw the POS form of the circuit using 2-input OR and AND gates (plus inverters on the main inputs.)



8. Re-draw the circuit using only 2-input NOR gates (plus inverters on the main inputs.) Include pin numbers of chips.



Finally, write a list of things that you learned in doing this pre-lab: