①

A_0	00	01	11	10
0	0	0	0	0
1	1	0	0	0

M_1	00	01	11	10
0	0	0	1	1
1	1	0	1	0

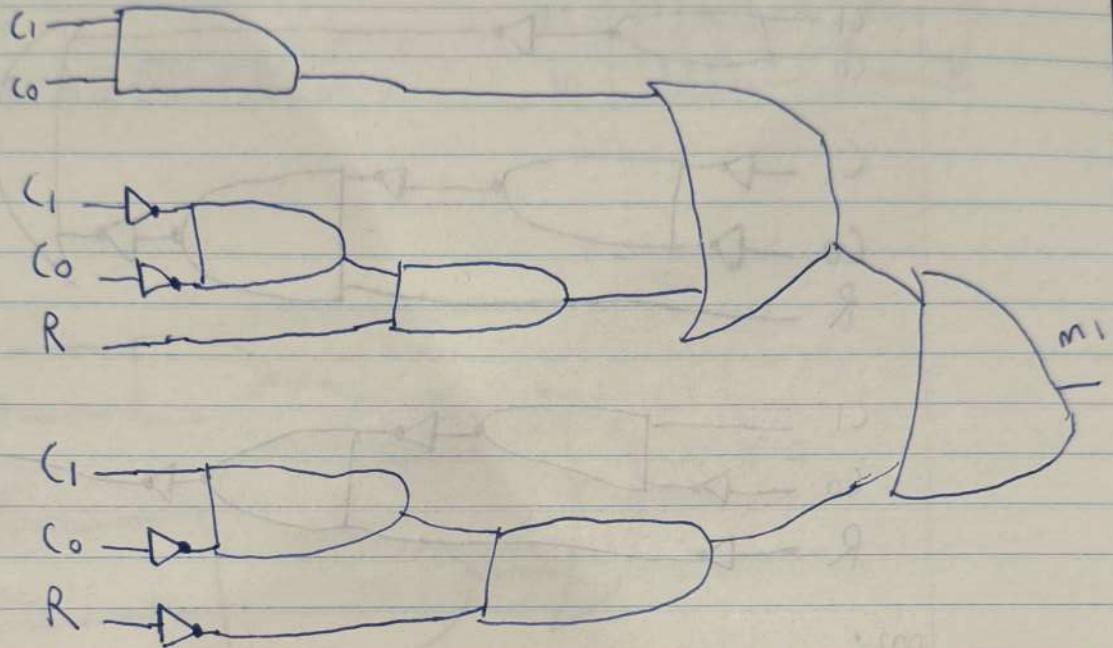| M_0	00	01	11	10
0	0	1	1	0
1	1	0	0	1

② $M_1 = C_1 C_0 + C_1' C_0' R + C_1 C_0' R'$
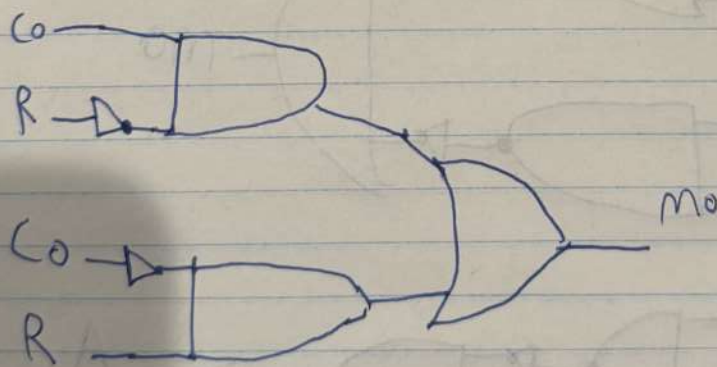
$M_0 = C_0 \oplus R \Rightarrow C_0 R' + C_0' R$

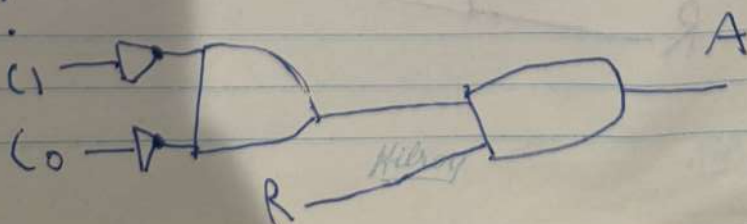$A = C_1' C_0' R$

And

③ using 2 input and or gates and Invertes:

m1:

m2:

A:

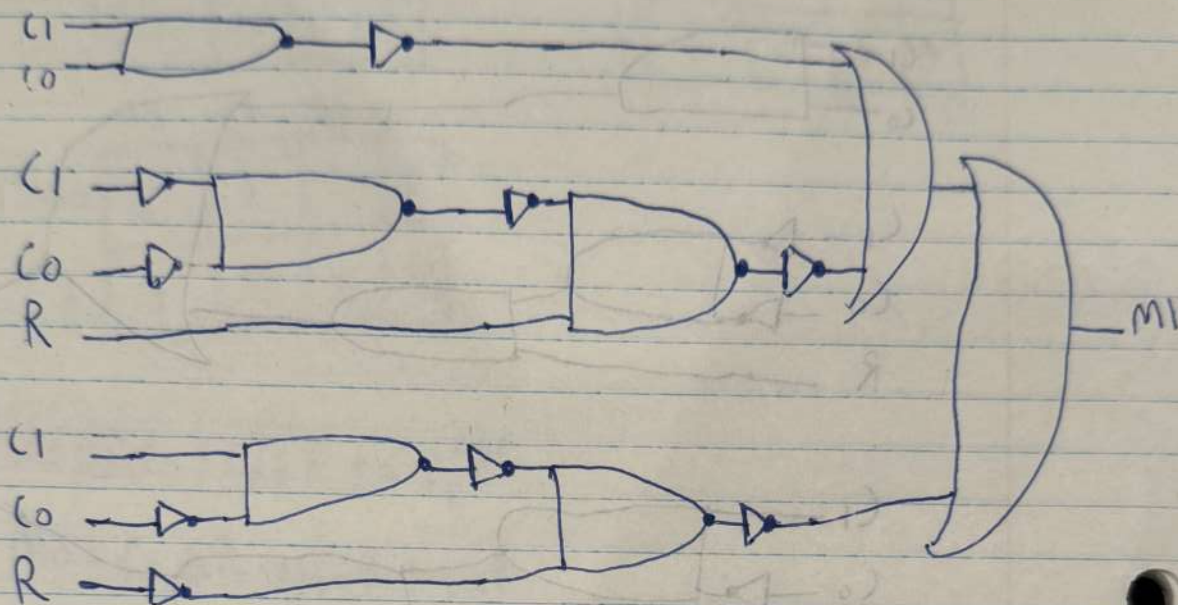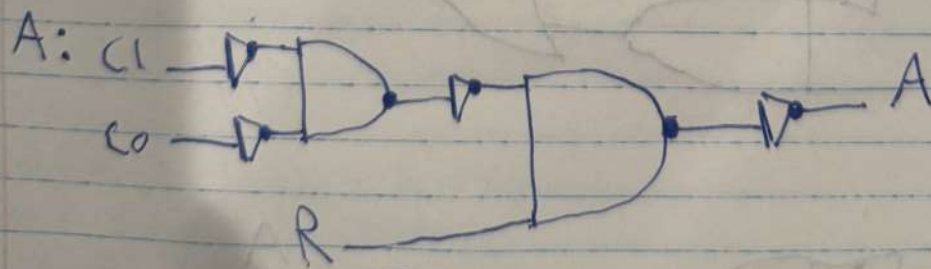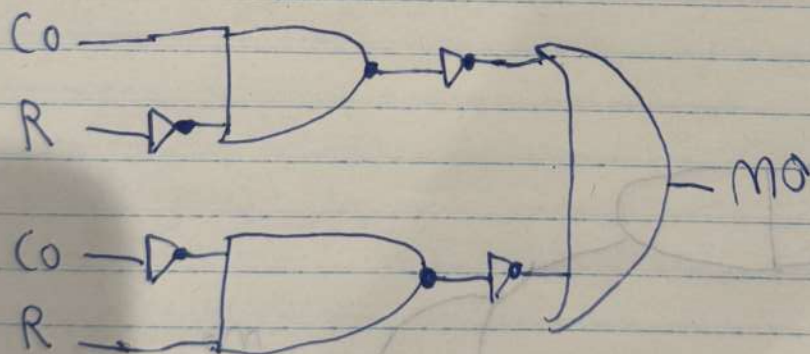using 2 input nand gates:

M1:

Ci
Co

Ci
Co
R

Ci
Co
R

— M1

m2:

Co
R

Co
R

— m0

A: Ci
Co

R

A

4) $F(A,B,C,D) = \sum_M(5,8,12,13)$

$+ \sum d(7,15)$

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

AB\CD	00	01	11	10
00	0 _0_	0 _1_	0 _3_	0 _2_
01	0 _4_	1 _5_	X _7_	0 _6_
11	1 _12_	1 _13_	X _15_	0 _14_
10	1 _8_	0 _9_	0 _11_	0 _10_

5)

⑥ $F(A,B,C,D) = \sum_m(5,8,12,13)$
$+ \sum_d(7,15)$
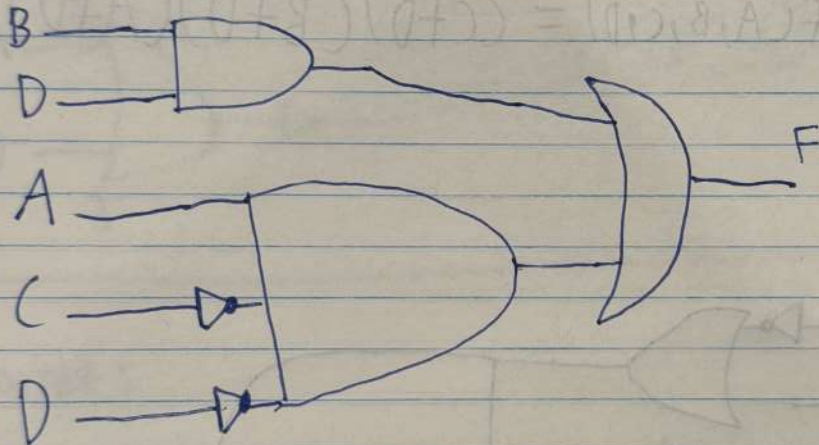
AB \ CD	00	01	11	10
00	0 ₁	0 ₂	0 ₃	0 ₃
01	0 ₄	1 ₅	X ₇	0 ₆
11	1 ₁₂	1 ₁₃	X ₁₅	0 ₁₄
10	1 ₈	0 ₉	0 ₁₁	0 ₁₀

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

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

⑦
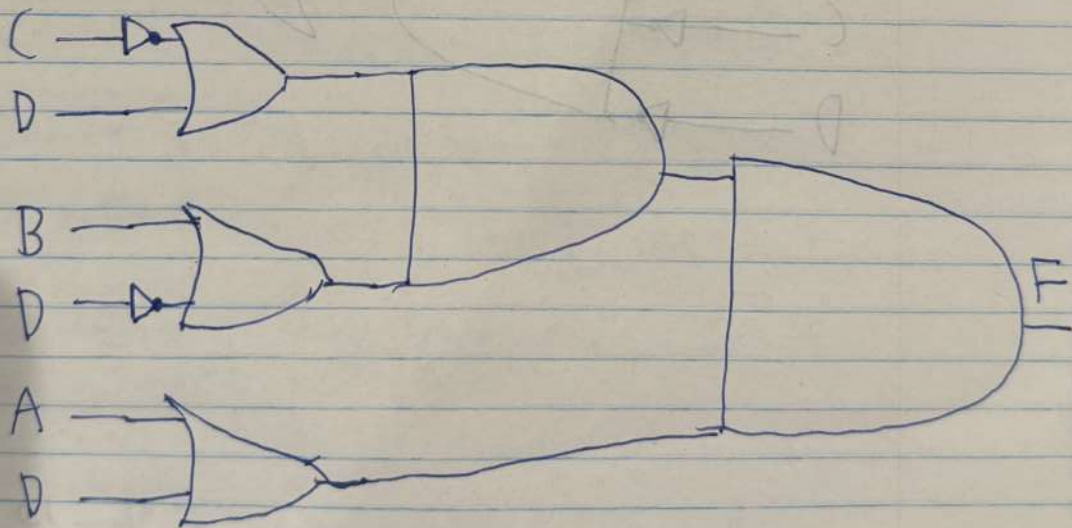
(8)
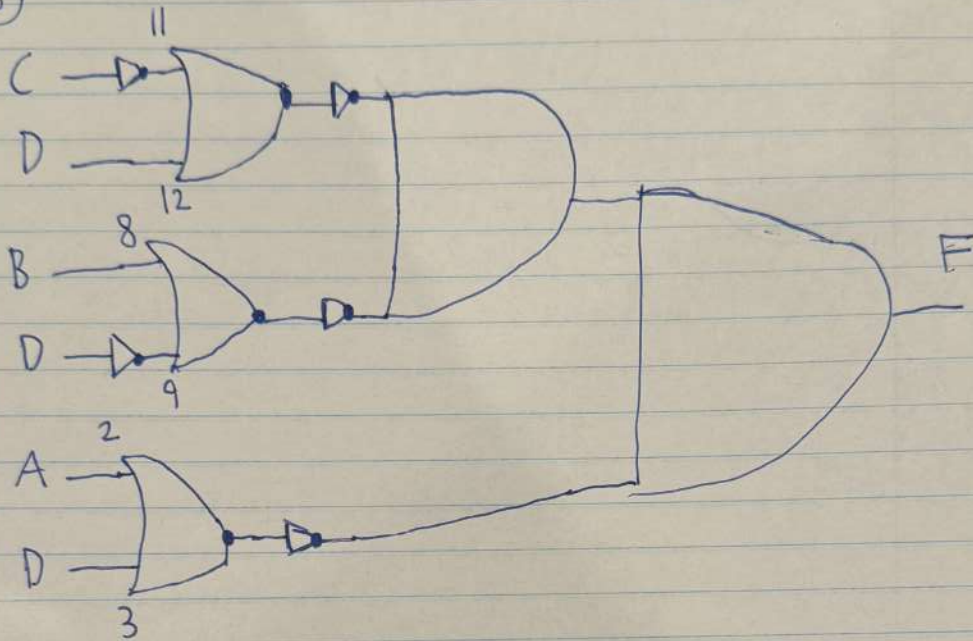
I learned:

the difference between nor and or, nand and And, Pos and Sop, and using chips for my gates.