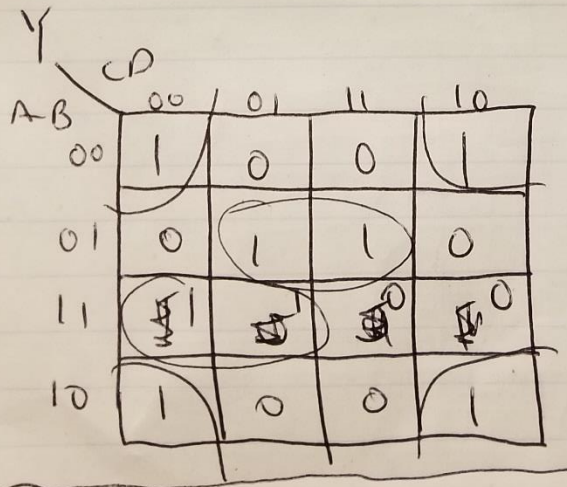
Raymond You

EECE 2160 – Kimani 8 am

Homework 4

1a. a

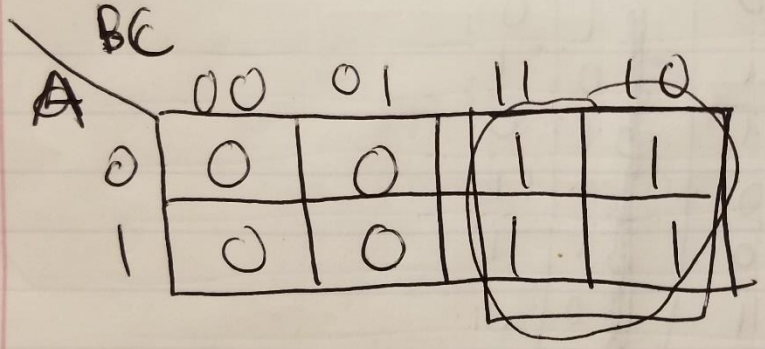
A	B	C	D	Y
0	0	0	0	1
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0



$Y = B'D' + ABC' + A'BD$

16.

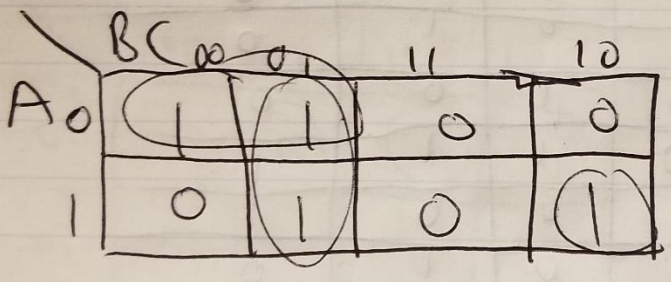
A	B	C	Y
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1



$Y = B$

1c.

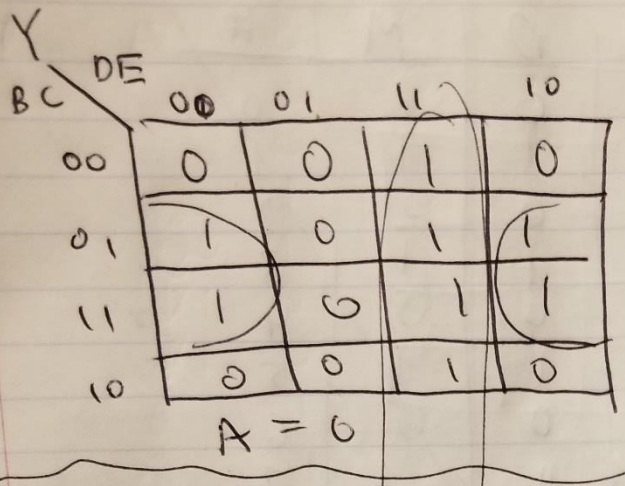
A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

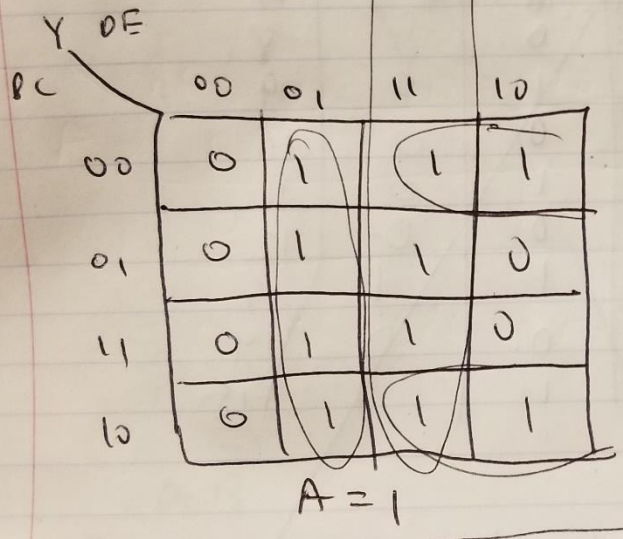


$Y = A'B' + B'C + ABC'$

1d.

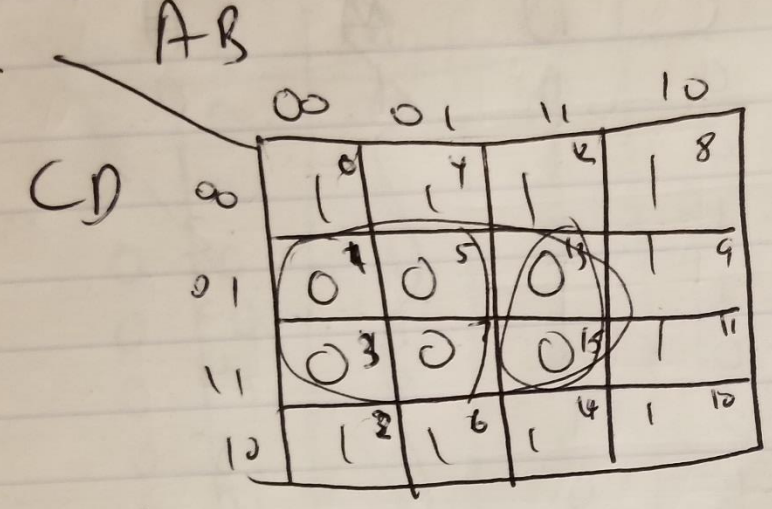
A	B	C	D	E	Y
0	0	0	0	0	0
0	0	0	0	1	0
0	0	0	1	0	0
0	0	0	1	1	1
0	0	1	0	0	1
0	0	1	0	1	0
0	0	1	1	0	1
0	0	1	1	1	1
0	1	0	0	0	0
0	1	0	0	1	0
0	1	0	1	0	0
0	1	0	1	1	1
0	1	1	0	0	1
0	1	1	0	1	0
0	1	1	1	0	1
0	1	1	1	1	1
1	0	0	0	0	0
1	0	0	0	1	1
1	0	0	1	0	1
1	0	0	1	1	1
1	0	1	0	0	0
1	0	1	0	1	1
1	0	1	1	0	0
1	0	1	1	1	1
1	1	0	0	0	0
1	1	0	0	1	1
1	1	0	1	0	1
1	1	0	1	1	1
1	1	1	0	0	0
1	1	1	0	1	1
1	1	1	1	0	0
1	1	1	1	1	1





$Y = DE + AE + A'CE' + AC'D$

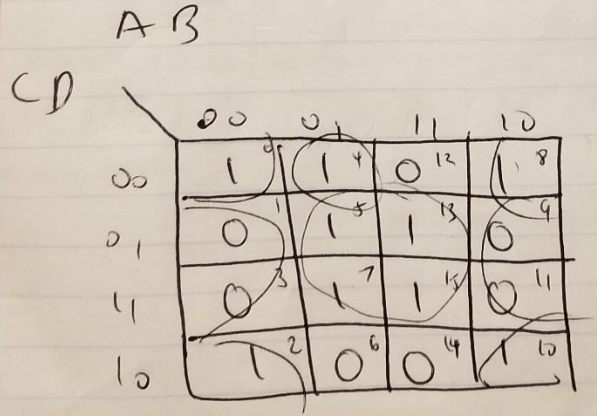
2a.



$F = (A + D')(B' + D')$

2b.

A	B	C	D	M	H
0	0	0	0		0
0	0	0	1		1
0	0	1	0		2
0	0	1	1		3
0	1	0	0		4
0	1	0	1		5
0	1	1	0		6
0	1	1	1		7
1	0	0	0		8
1	0	0	1		9
1	0	1	0		10
1	0	1	1		11
1	1	0	0		12
1	1	0	1		13
1	1	1	0		14
1	1	1	1		15

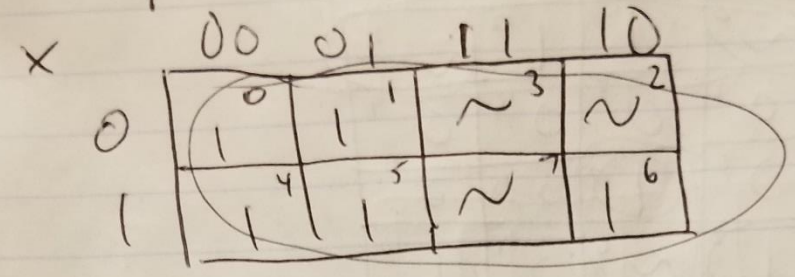


Circle groups of zero here

~~(A+B+D')(B+D')(D+B')(A+B'+C+D)(B+D)~~

$$F=(B+D')(B'+C'+D)(A'+B'+D)$$

3a.



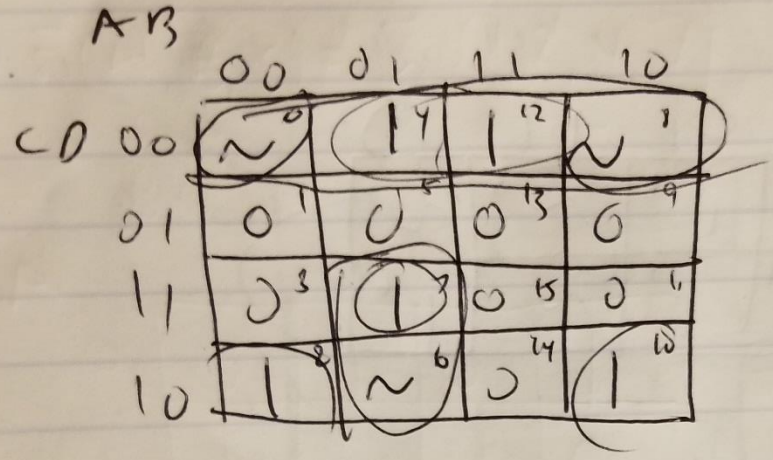
x	y	z	
0	0	0	0
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4
1	0	1	5
1	1	0	6
1	1	1	7

~~f = x + y + z~~

$F(x,y,z) = 1$

$$F(x,y,z) = \sum(0,1,2,3,4,5,6,7)$$

3b.

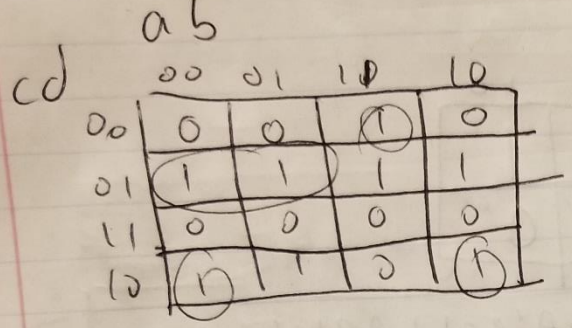


~~$F_{xy} = B'D' + BC'D' + A'BCD$~~

~~$F(A,B,C,D) = C'D' + B'D' + A'B($~~

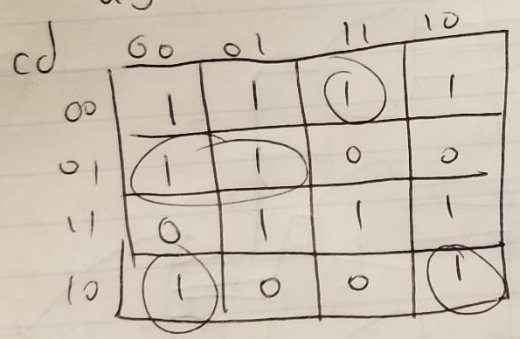
$F(A,B,C,D) = \sum(0,2,4,6,7,8,10,12)$

4. $f = ab c' + c'd + a'cd' + b'cd' = \sum(1,2,5,6,9,10,12,13)$

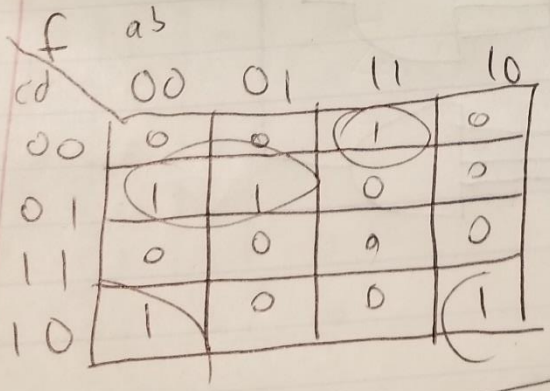


$g = (a+b+c'+d')(b'+c'+d)(a'+c+d')$

$= \Pi(3,6,9,13,14)$



Overlapping 1s

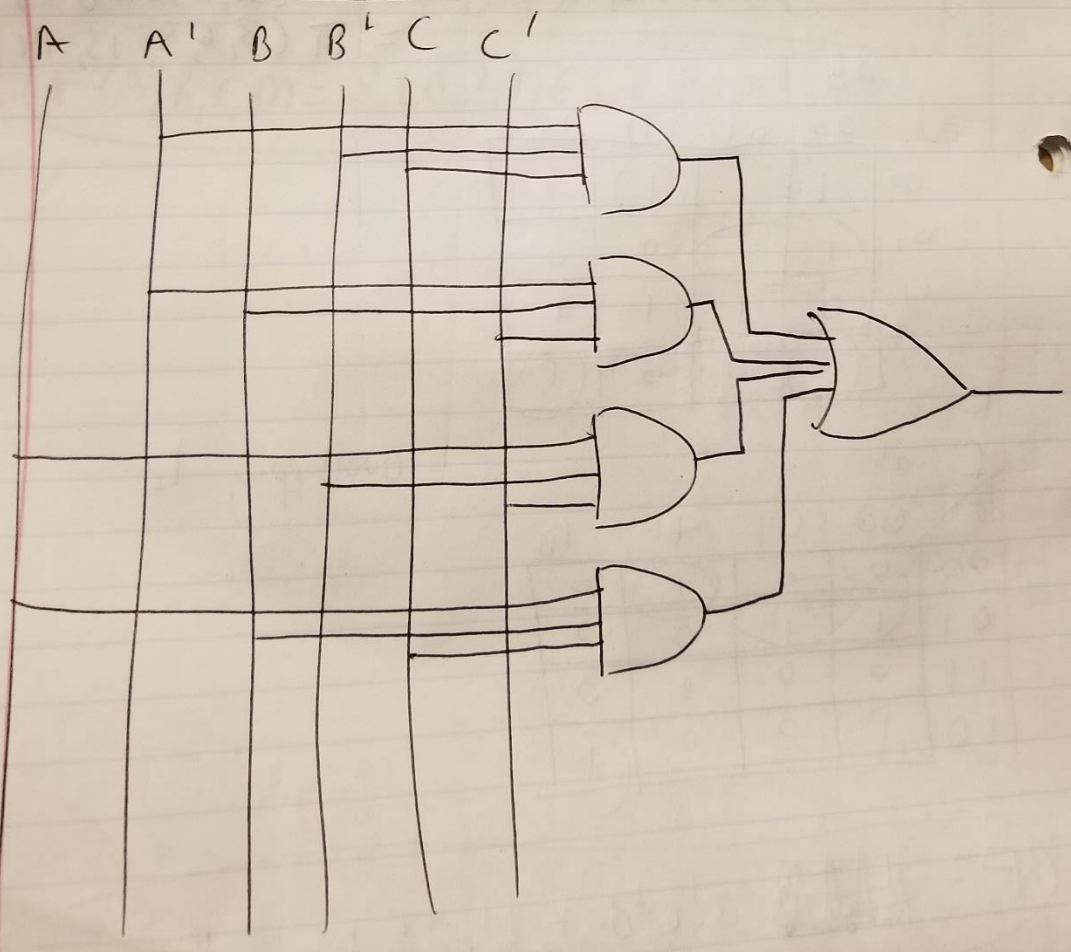


$F = a'c'd + b'cd' + abc'd'$

5. $F(A, B, C) = \sum (1, 2, 4, 7)$

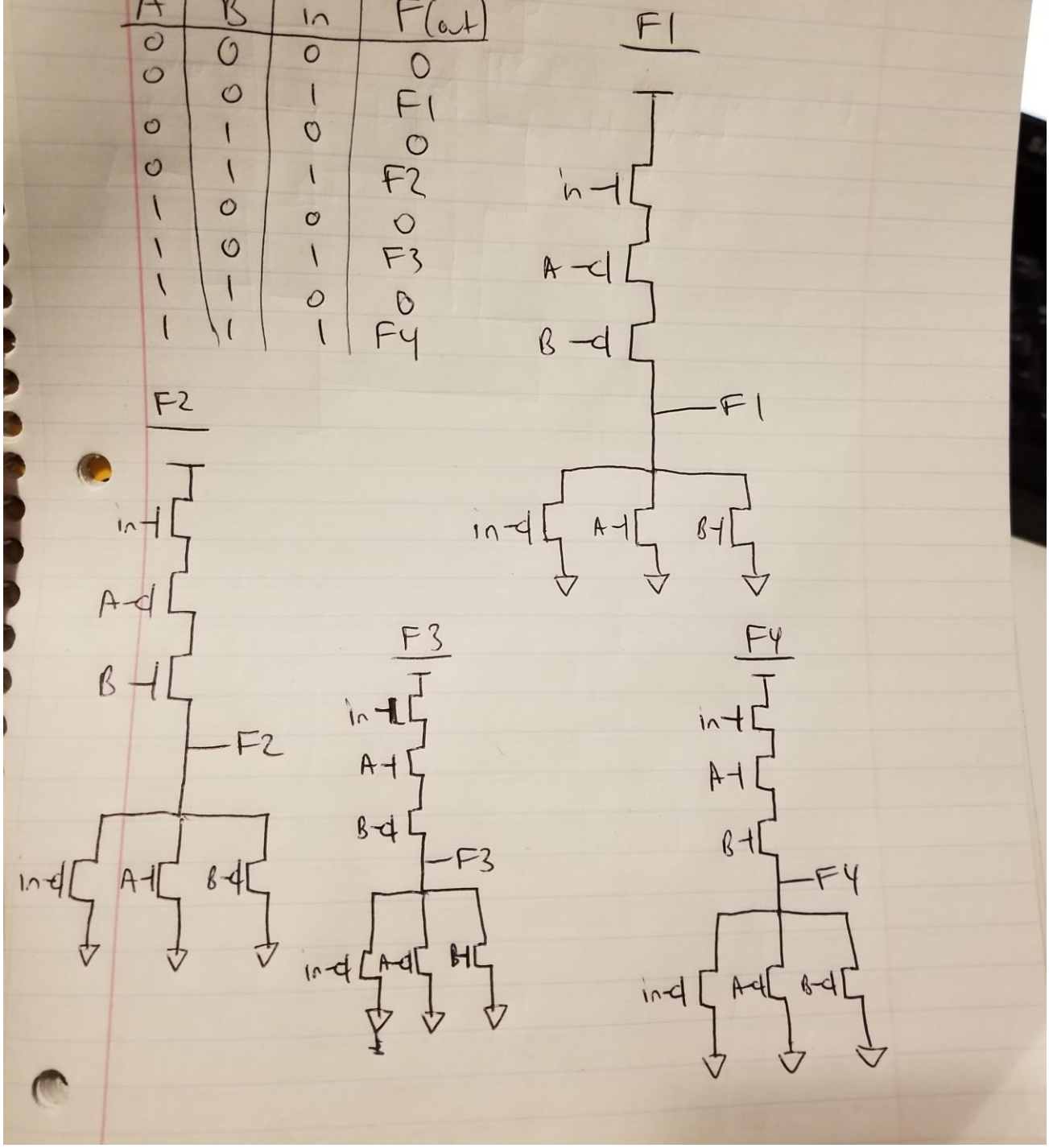
A \ BC	00	01	11	10
0	0 ^{0}	1 ^{1}	0 ^{3}	1 ^{2}
1	1 ^{4}	0 ^{5}	1 ^{7}	0 ^{6}

$F(A, B, C) = A'B'C + A'BC' + AB'C' + ABC$



6a. 2-to-4 decoder

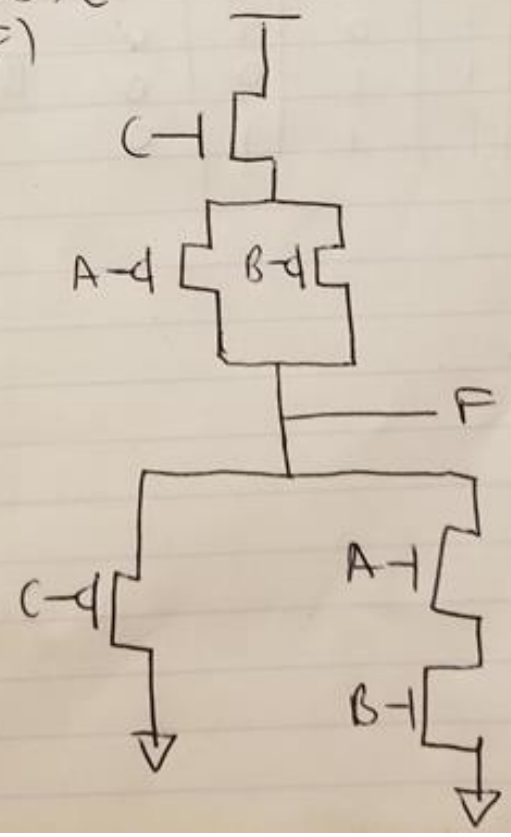
A	B	in	F(out)
0	0	0	0
0	0	1	F1
0	1	0	0
0	1	1	F2
1	0	0	0
1	0	1	F3
1	1	0	0
1	1	1	F4



6. $F(A,B,C) = (A'+B')(C$

A	B	C	Out (F)
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

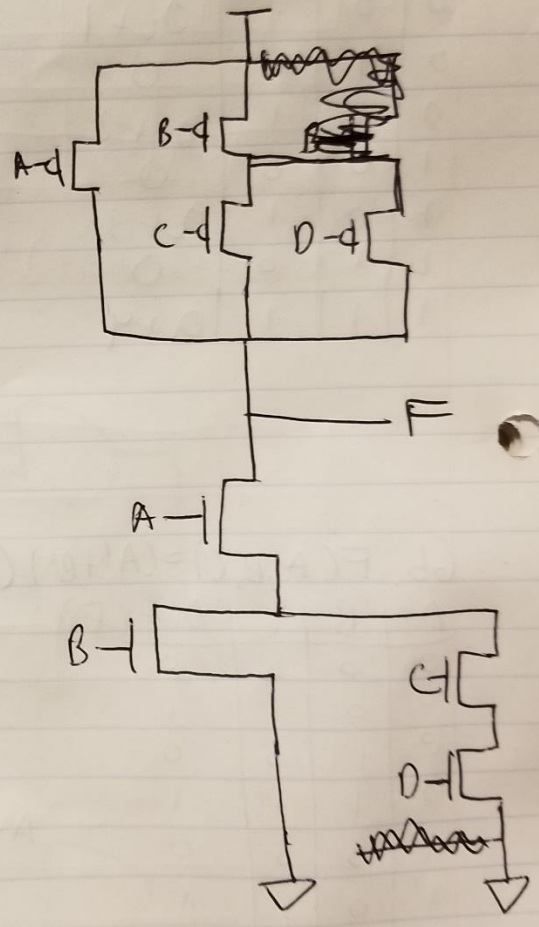
$F' = AB + C'$



6c. $F=(A\cdot(B+CD))'$

$= A' + (B'C') + (B'D')$

A	B	C	D	out
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0



Buffer gate

7.