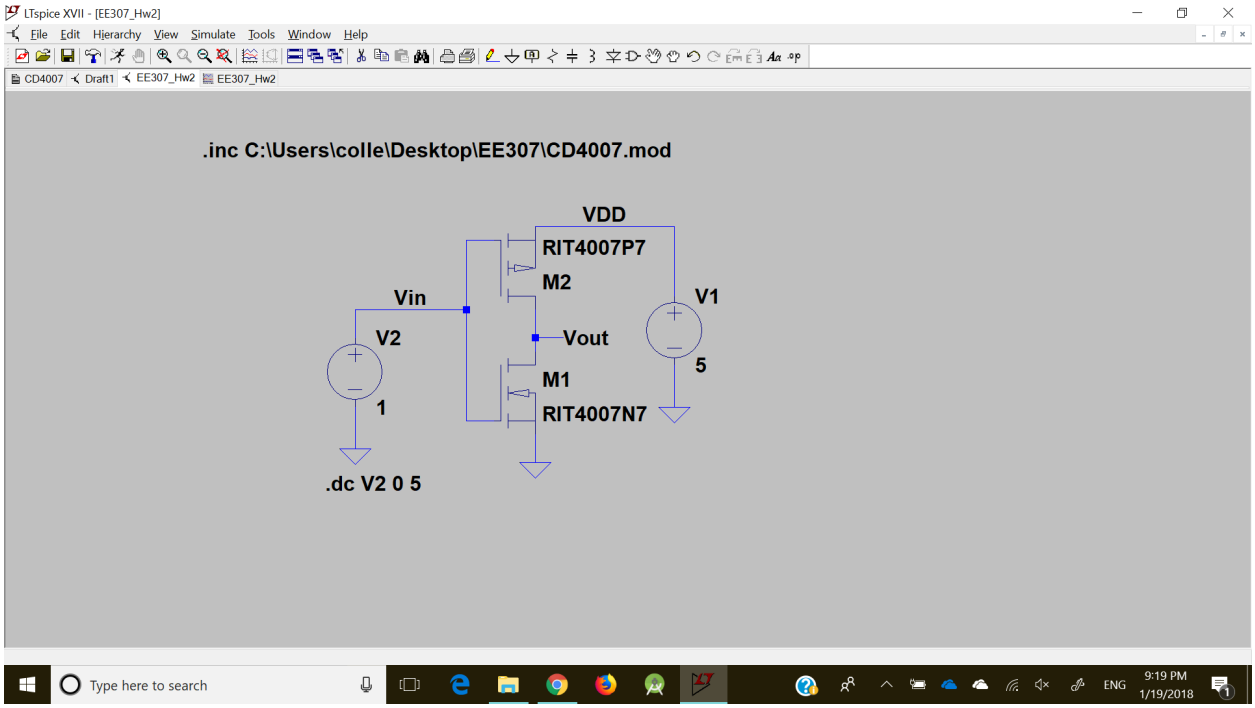
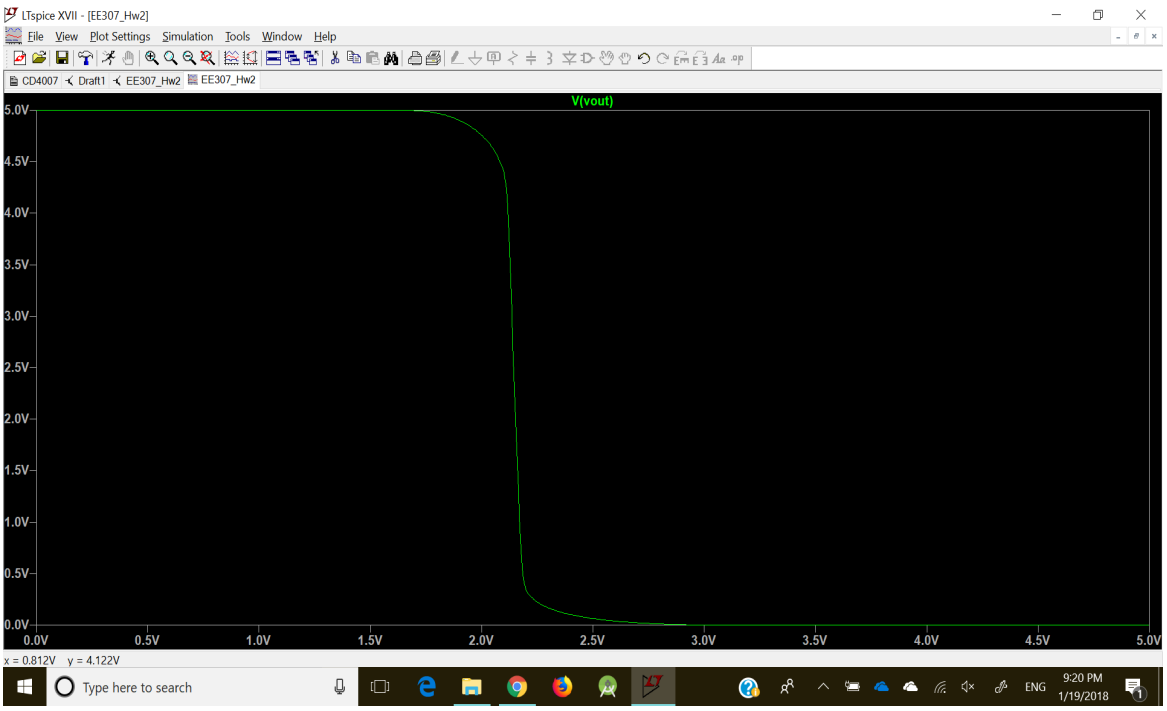
Colleen Lau
Jan 19, 2018

1. HW2
    a. I did it
    b. Digikey sells 7,072,345 parts
    c. 6999 FET arrays
    d. I read it and understand
2. 

    a. 

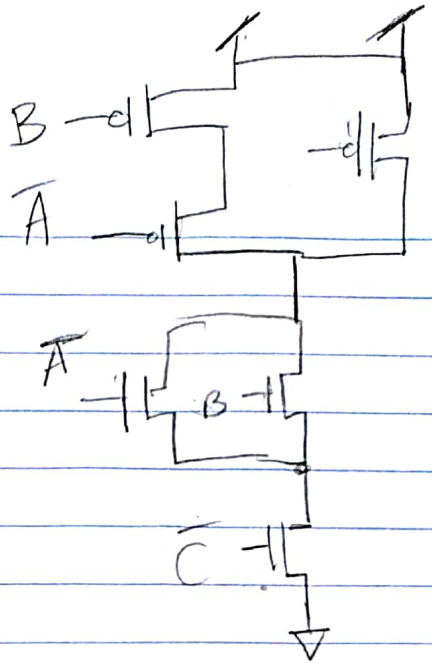
3. See paper

Colleen Law
EE 307-06
HW2

3. a) $Out = A \cdot \overline{B} + C$

$= \overline{\overline{(A \cdot \overline{B}) + C}}$

$Out = \overline{(\overline{A} + B) \cdot \overline{C}}$



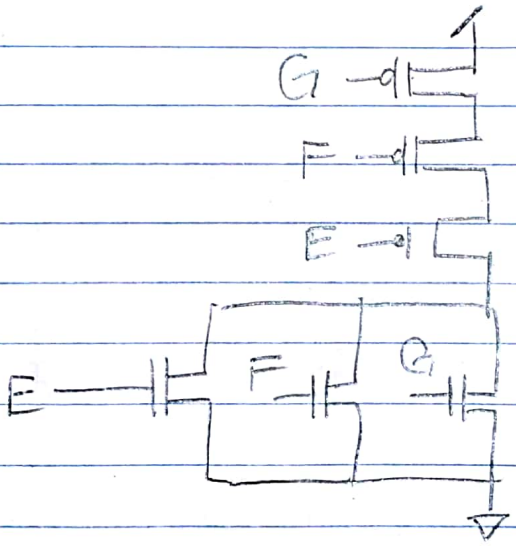
b) $D_X = \overline{\overline{(E + \overline{F}) \cdot G}}$

$= \overline{(E + \overline{F}) + \overline{G}}$

$= \overline{\overline{(A + B) \cdot C}}$

$\overline{\overline{(A+B)} + C}$ → demorgan

$\overline{(\overline{A} \cdot \overline{B}) + C}$

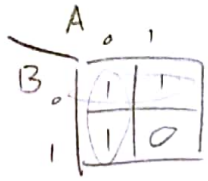


Colleen Lau EE 307-06 HW2

4. a)

NAND

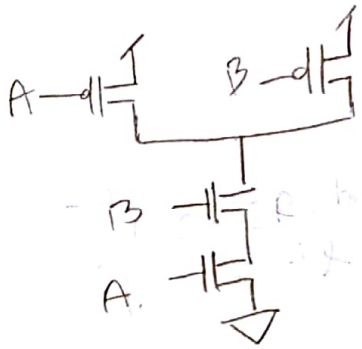
A	B	Vout
0	0	1
0	1	1
1	0	1
1	1	0



$\overline{A}+\overline{B}$

$\overline{\overline{A}+\overline{B}}$

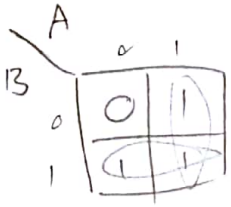
$A \cdot B$



b)

OR

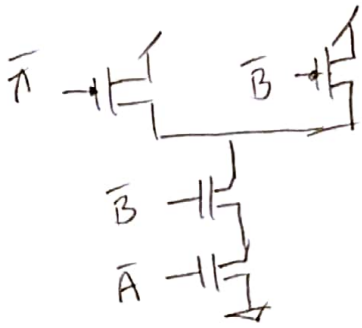
A	B	Vout
0	0	0
0	1	1
1	0	1
1	1	1



$A + B$

$\overline{A+B}$

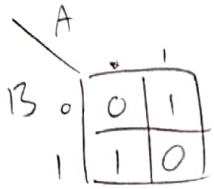
$\overline{\overline{A} \cdot \overline{B}}$



d)

XOR

A	B	Vout
0	0	0
0	1	1
1	0	1
1	1	0

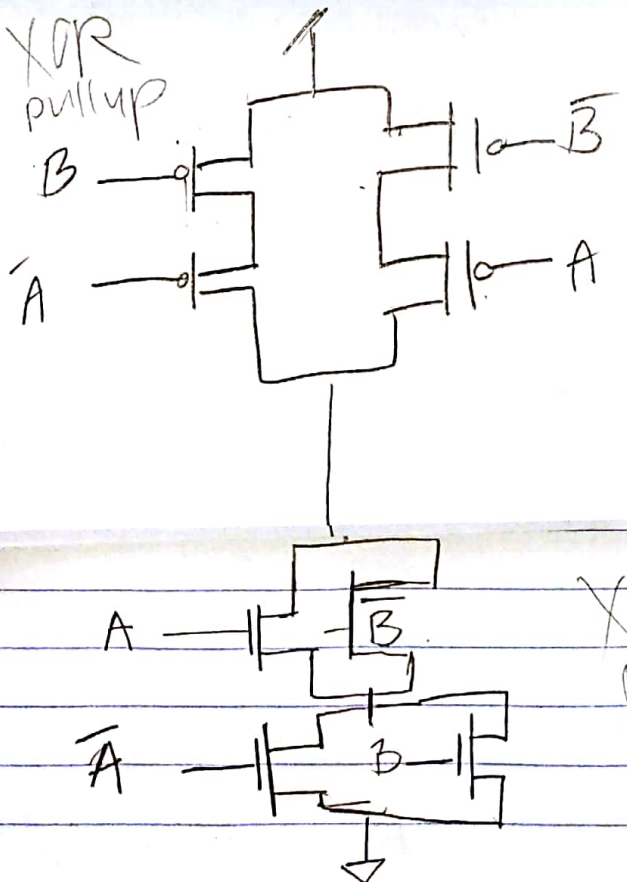


$(A \cdot \overline{B}) + (\overline{A} \cdot B)$

$\overline{(A \cdot \overline{B}) + (\overline{A} \cdot B)}$

$\overline{(A \cdot \overline{B})} \cdot \overline{(\overline{A} \cdot B)}$

$(\overline{A}+B) \cdot (A+\overline{B})$



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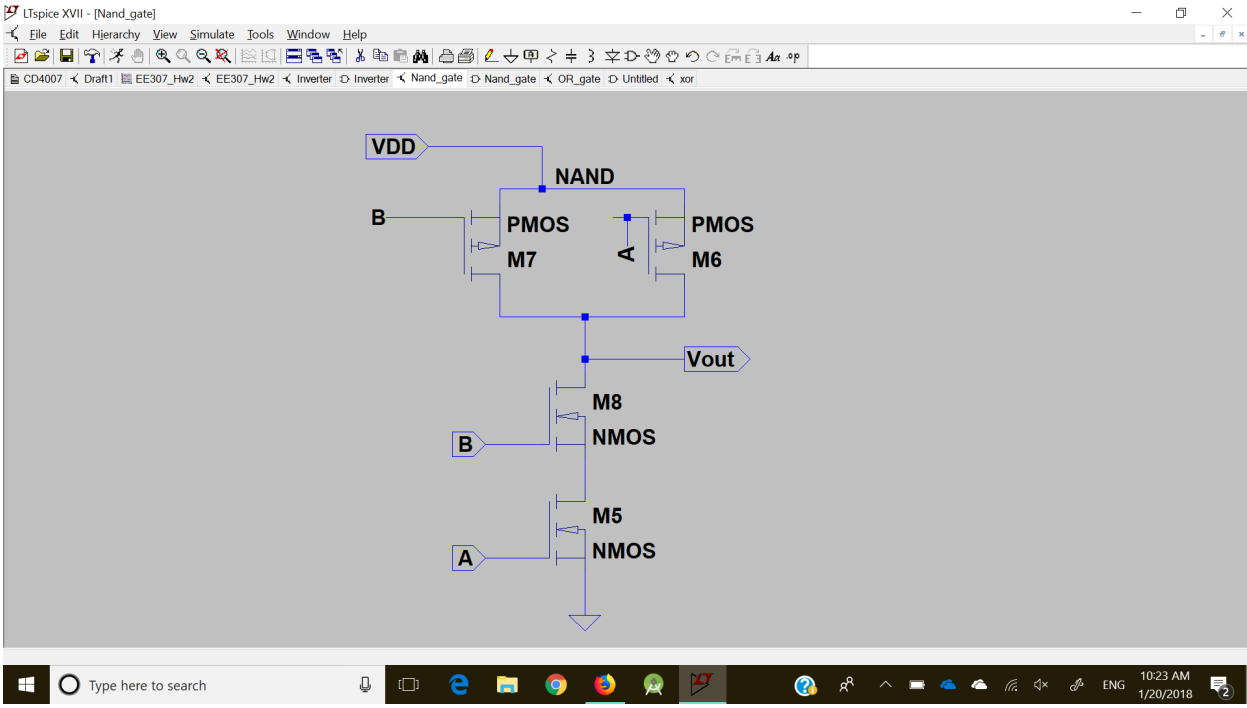
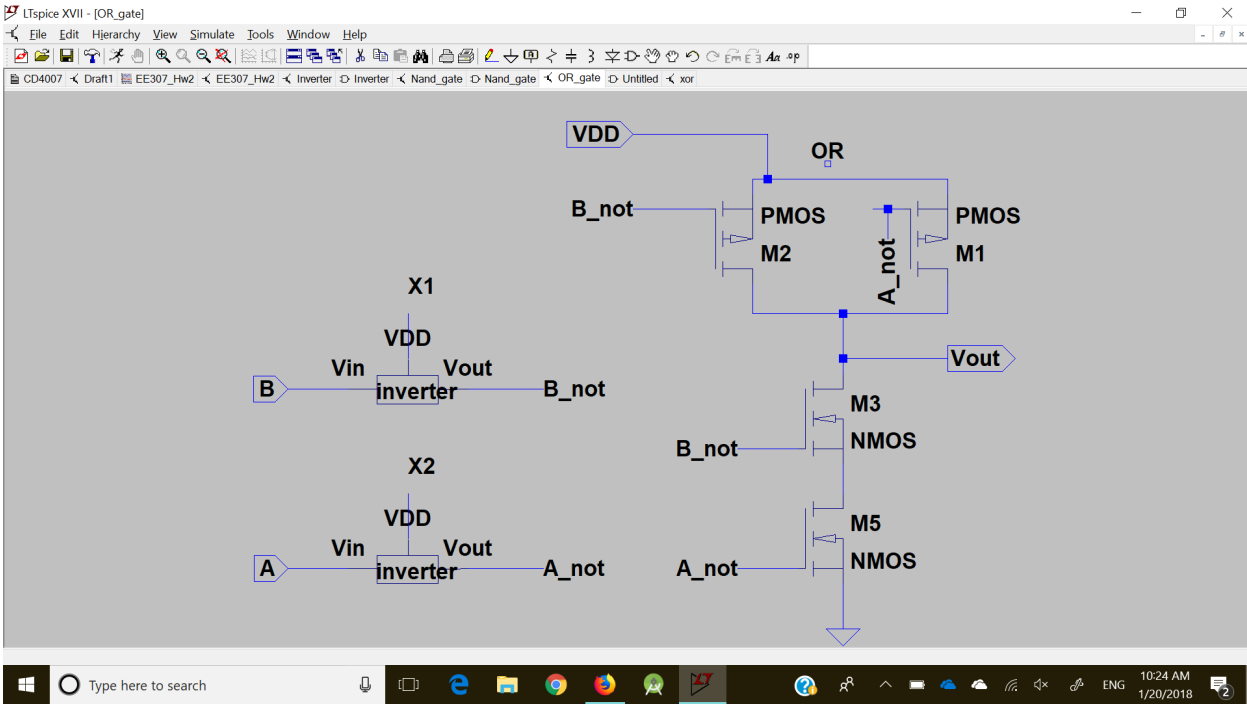
4. See page 3

a.



b.



c.

Inputs			Output Pull up network	Pull down network
A	B	Output		
0	0	0	OFF	ON
0	1	1	ON	OFF
1	0	1	ON	OFF
1	1	1	ON	OFF

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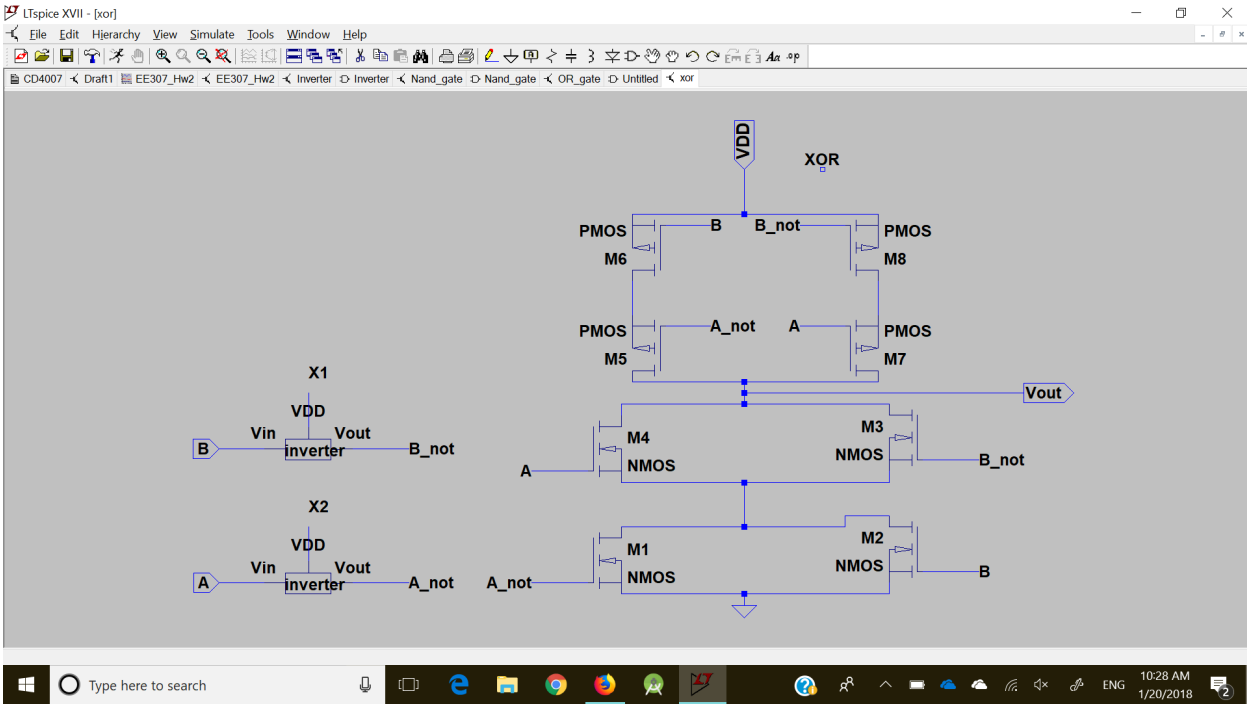
d.



5b. Half adder summing circuit

b) i) Truth Table

Input		Output	
A	B	S	C
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

i)

A	B	sum
0	0	0
0	1	1
1	0	1
1	1	0

ii)

A \ B	0	1
0	0	1
1	1	0

Like XOR

c) Half adder carry circuit

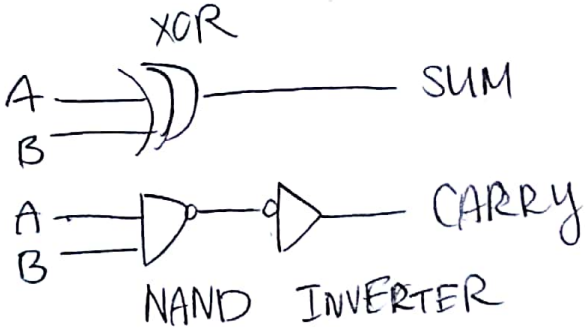
i)

A	B	Carry
0	0	0
0	1	0
1	0	0
1	1	1

ii)

A \ B	0	1
0	0	0
1	0	1

Like AND



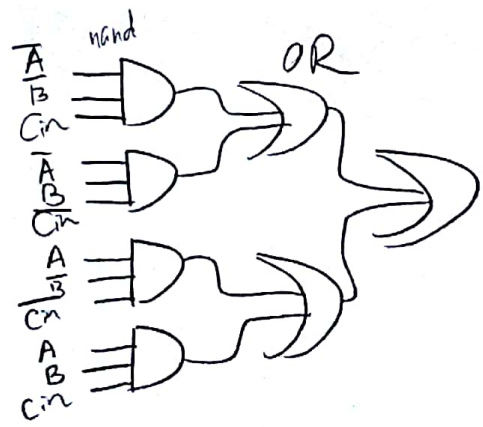
Full adder sum

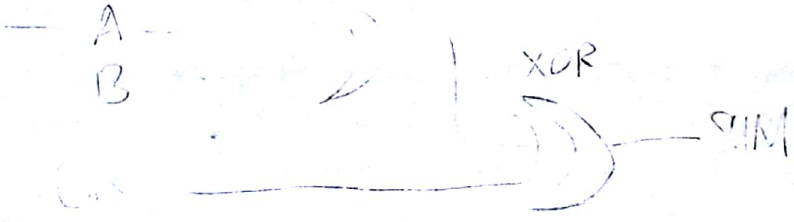
d)

Input			Output
A	B	Cin	Sum
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

A \ BCin	00	01	11	10
0	0	1	0	1
1	1	0	1	0

$S = \bar{A}\bar{B}Cin + \bar{A}B\bar{C}in + ABCin + A\bar{B}\bar{C}in$





Colleen Lau EE 307
hw 2
#5

5.e) Fuller adder carry circuit

I

Input			Output	
A	B	Cin	sum	Carry
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

II Carry kmap

A \ BCin	00	01	11	10
0	0	0	1	0
1	0	1	1	1

Carry = AB + ACin + BCin