

(5 pts) Exercise B-1

- Show the truth table for NAND and NOR gates



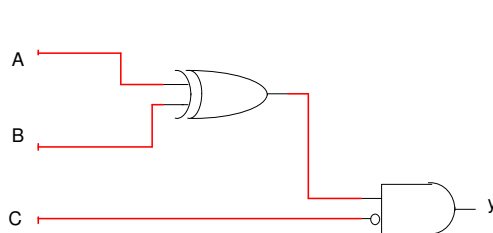
A	B	x
0	0	
0	1	
1	0	
1	1	



A	B	x
0	0	
0	1	
1	0	
1	1	

(5 pts) Exercise B-2

- A.) Show the truth table for the following logic circuit



A	B	C	y

- B.) Write the Boolean equation for this circuit.

(5 pts) Exercise B-3

- Draw a circuit for the following formula:
$$F = \overline{(A + B) \cdot C} + D$$

(2 pts EXTRA CREDIT) Exercise B-4

- Recall – how many entries are in a truth table for a function with n inputs?
- Consider – how many different truth tables are possible for a function with n inputs?

(5 pts) Exercise B-11

- Show the sum of products for the following truth table.

A	B	C	f
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

(5 pts) Exercise B-12

- Simplify the following equations (use Boolean laws discussed earlier)

$$B(A+0) =$$

$$B(A\bar{A}) =$$

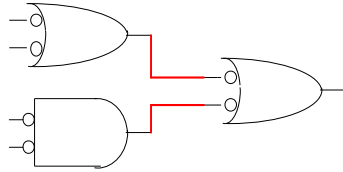
$$(A+\bar{B})(\bar{A}+B) =$$

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

Is $\overline{\bar{A}\bar{B}}$ the same as \overline{AB} ?

(5 pts) Exercise B-13

- Use bubble pushing to simplify this circuit



(10 pts) Exercise B-14

- A) Show the sum of products for the following truth table.

A	B	C	f
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

- B) Simplify this equation

(5 pts) Exercise B-21

- 1. Fill in the following K-Map based on the truth table at right
- 2. Minimize the function using the K-map

A	B	C	f
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

(5 pts) Exercise B-22

- Draw the two-level circuit for the function from Exercise B-21

(5 pts) Exercise B-23

- Suppose we already have this k-Map. Minimize the function.

	\overline{CD}	\overline{CD}	CD	CD
$\overline{A}\overline{B}$	1	0	0	1
$\overline{A}B$	1	1	1	1
AB	1	1	0	0
$A\overline{B}$	0	0	0	1

(3 pts) Exercise B-24

- Consider your answer to Exercise B-23. Using a K-map, you found some particular two-level, minimal circuit. However, is it unique? (e.g. is there only one possible two-level circuit for that K-Map that is minimal?) Will this always be the case, or could a different K-map change your answer?