**Experiment 3 – XOR**

**CSCI 220 – Section 1**

**Due 2/17/2016**

Report By:

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On my honor I have neither received nor given aid on this report.

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**Part I  
Objective of the Experiment**

The objective of this experiment was to wire a circuit using the XOR gate and then to use boolean algebra to eliminate the XOR from the equation. We then wired the simplified equation.

**Part II  
Equipment/components necessary for the Experiment**

1 7404 NOT chip

1 7432 2-input OR chip

1 7408 2-input AND chip

1 7486 2-input XOR chip

**Part III  
Description of the followed procedure**

**(Truth table, Circuit design, etc.)**

For both equations we wired and tested them against the truth table. The function F(A,B,C) = B'(A⊕C') + BC + A'C is the original function we wired using the xor chip. After that we simplified this function to F(A,B,C) = (C + B') (C + A') and wired it a second time.

Simplification Process:

F(A,B,C) = BC + A'C + B'(A⊕C')

= (BC + A'C + B')(BC + A'C + (A⊕C')) Distributive

= (B' + C + A'C)(BC + A'C + (AC + A'C'))

= (B' + C)(BC + A'C + AC + A'C')

= (B' + C)(BC + (A'C + AC + A')(A'C + AC + C')) Distributive

= (B' + C)(BC + (A' + C)((A' + A)C + C')

= (B' + C)(BC + A' + C)

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

Truth Table:



Gate diagram for function F(A,B,C) = BC + A'C + B'(A⊕C'):



Gate diagram for function F(A,B,C) = (B' + C)(A' + C):



**Part IV  
Conclusion**

In conclusion a cicuit can be made more efficiently if the expression used is simplified. The two circuits we built worked fine and when tested against the truth table all cases were correct.