

PRE-LAB

Develop truth tables for the function listed below. Also, develop a logic implementation (circuit) for the design problem.

$$F(A,B,C) = AB + A'BC' + BC \quad (1)$$

LAB

In this lab, you'll receive instruction on using the protoboard and logic probe, researching logic chips, and using data sheets. We'll use <http://www.digikey.com> as a resource for finding information on a variety of logic chips and components.

1. Find data sheets for the 74### series NOT, AND, and OR logic chips. Note, for the AND and OR chips, find devices that have four logic gates per package (quad) and find a NOT chip with six gates (hex).
2. Using the protoboard and logic probe, connect the NOT chip and verify each gate on the chip by varying the input and examining the output. Complete a truth table for one NOT gate on the chip.
3. Using the protoboard and logic probe, connect the AND chip and verify each gate on the chip by varying the inputs and examining the output. Complete a truth table for one AND gate on the chip.
4. Using the protoboard and logic probe, connect the OR chip and verify each gate on the chip by varying the inputs and examining the output. Complete a truth table for one OR gate on the chip.
5. Using the 7400 series logic gates, implement the logic function F above. Verify operation by comparing the circuit performance to your truth table. Demonstrate your design to your instructor.