

UNIVERSITY OF NEVADA LAS VEGAS: DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING LABORATORIES.

Class:	CPE 100L – 1002		Semester:	SPRING 2020
Points		Document author:	Kristy Nguyen	
		Author's email:	<a href="mailto:nguyek20@unlv.nevada.edu">nguyek20@unlv.nevada.edu</a>	
		Document topic:	Postlab 2	
Instructor's comments:				

## 1. Introduction / Theory of Operation

Lab 2 was an introduction to hardware, which would allow us to get familiar with breadboards, circuits testing, debugging, and multimeter continuity test. We built simple circuits and learned about the setup of the IC chip and the operation of the IC chip tester.

## 2. Prelab report

UNIVERSITY OF NEVADA LAS VEGAS, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING LABORATORIES				
Class:		CPE 100 1002		Semester: SPRING 2020
Points		Document author:	Kristy Nguyen	
		Author's email:	<a href="mailto:nguyek20@unlv.nevada.edu">nguyek20@unlv.nevada.edu</a>	
		Document topic:	Prelab 2	
Instructor's comments:				

## Introduction / Theory of operation

Lab 2 is an introduction to hardware, specifically getting familiar with breadboards, circuits testing, and debugging and multimeter continuity test. This would allow us to build simple circuits and learn about the setup of IC chip and reading the result.

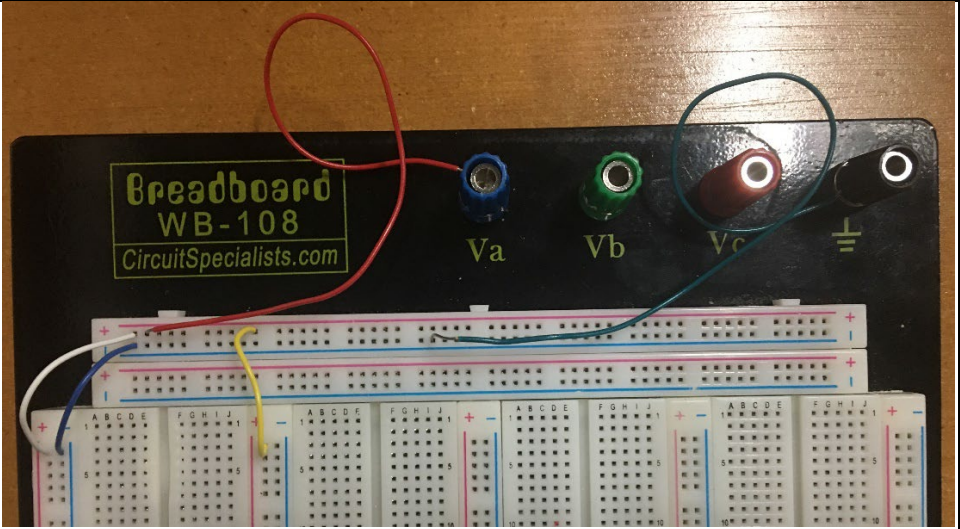
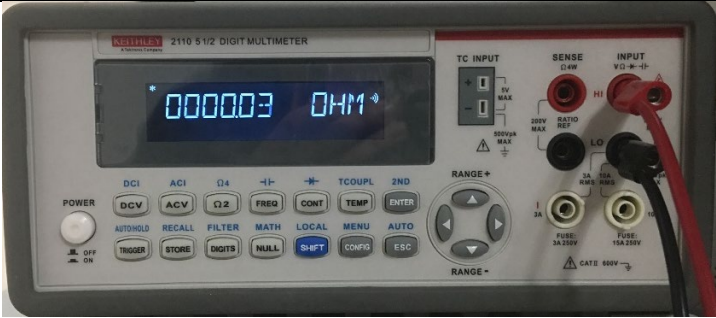
## Prelab main content

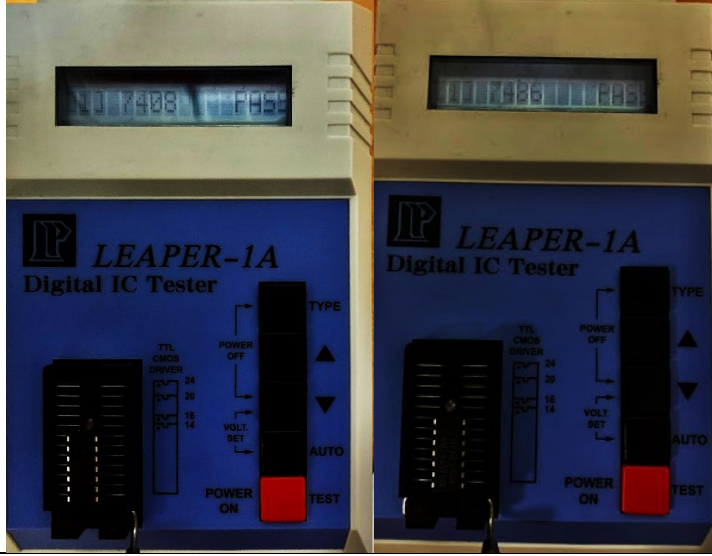
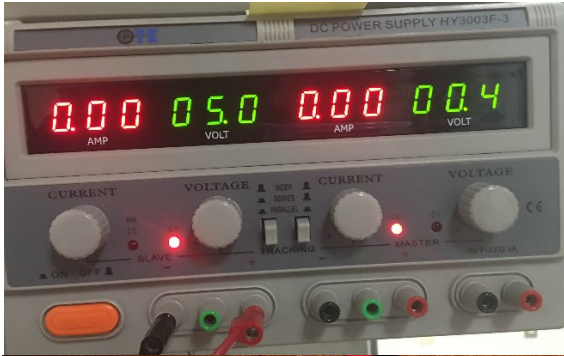
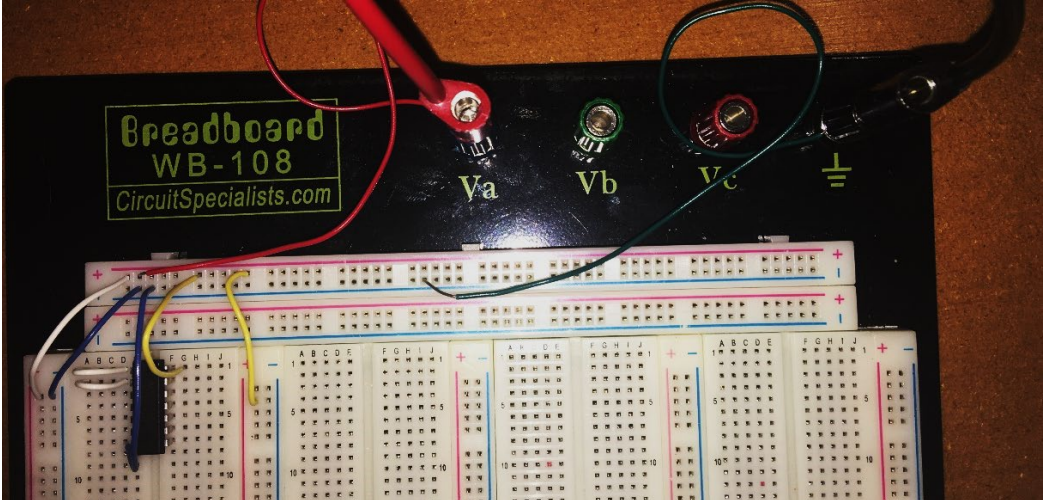
- 1) An electronic breadboard is used for those new to electronics and is the best way to start building simple or complex circuits. The anatomy of a breadboard involves binding posts, DIP support, terminal strips, and power rails. The terminal strips are located at the bottom of the breadboard underneath the adhesive. The metal rows have little clips hiding underneath the holes that allow you to stick a wire into the holes on a breadboard. The power rails run vertically along the sides of the breadboard and provides a way to access power in your circuit.

The DIP support is a ravine that isolates the two sides of a breadboard so that we can connect components of the integrated circuit without interfering with the functionality on either side of the breadboard. Lastly, the binding posts allow you to connect power sources to the breadboard.

- 2) A power supply is a hardware component that supplies power. The power supply receives power from an outlet and converts the power from one form to another. Its function is to deliver a constant supply of voltage to an electronic device.
- 3) A multimeter is used to measure electrical voltage, current, resistance, and other values. It is an instrument that is widely used for testing equipment. It can also be used to test continuity between two points in a circuit.

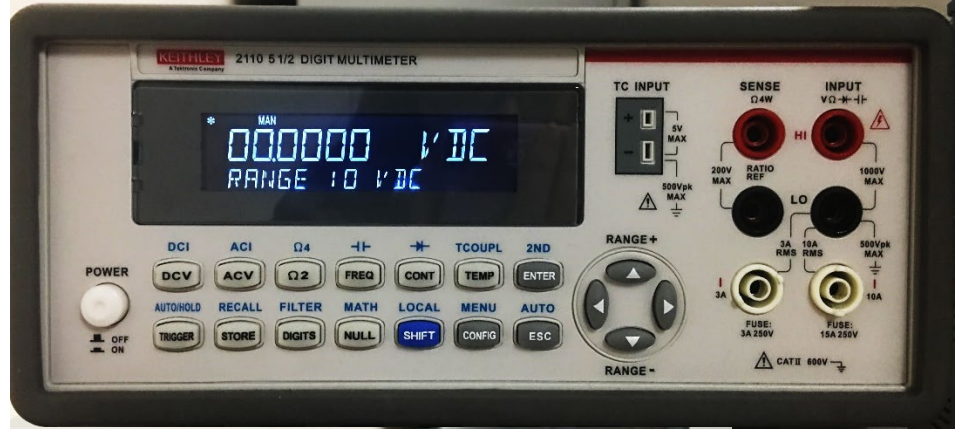
3. Results of the experiments

Experiment	Experiment Results
1	<div>a. </div>
2	<div>a. </div> <div>b. Answers to f.a (1) through f.g (7) questions<ul style="list-style-type: none"><li>1) Point Va of the breadboard is connected to positive end of the horizontal power rail.</li><li>2) Point GND of the breadboard is connected to the negative end of the horizontal power rail.</li><li>3) Point Vb of the breadboard is not connected to the power.</li><li>4) The red row of the top strip is connected to the postive end of the vertical power rail.</li></ul></div>

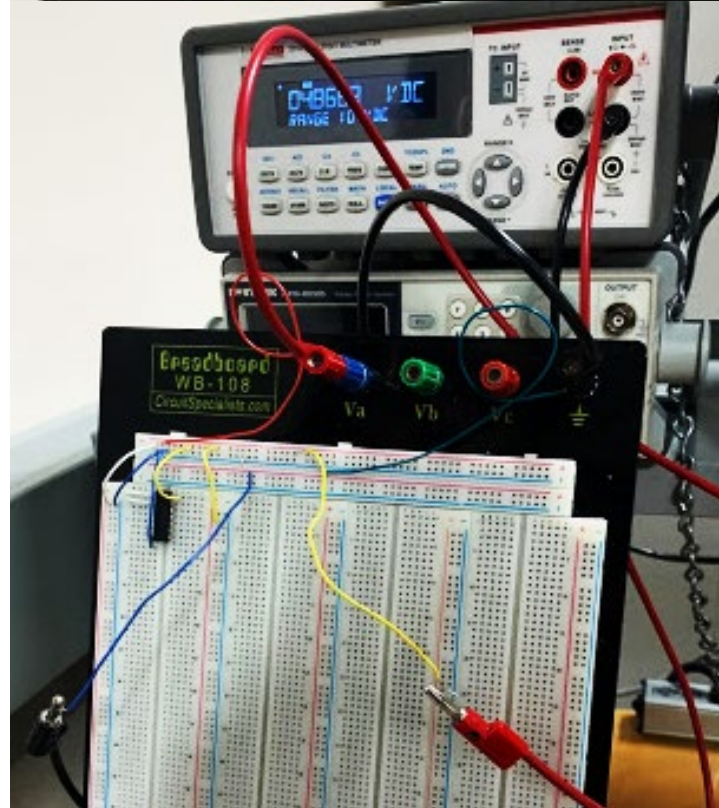
	<p>5) The points labeled as a b c d e f g h i j are connected by a – e and f-j.</p> <p>6) The rows labeled 1...5 are connected only within the same row.</p> <p>7) All of the points in the column of the vertical strip are connected together because the power is distributed throughout the breadboard, horizontally and vertically.</p>
3	<p>a. The IC chips are 7408 Quad AND 2 and 7486 Quad XOR 2.</p>  <p>b.</p>
4	  <p>a. See pictures above.</p>



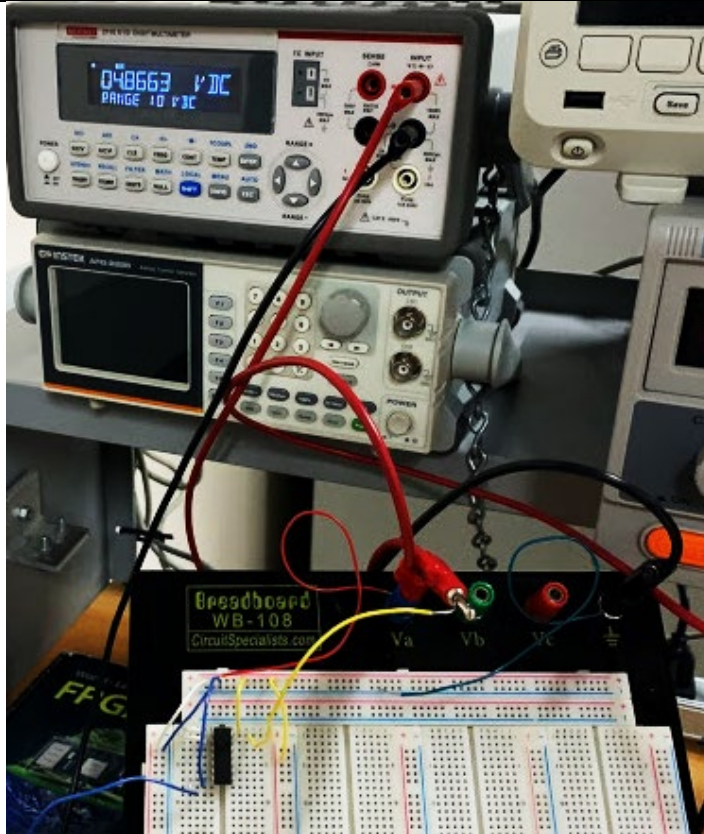
5



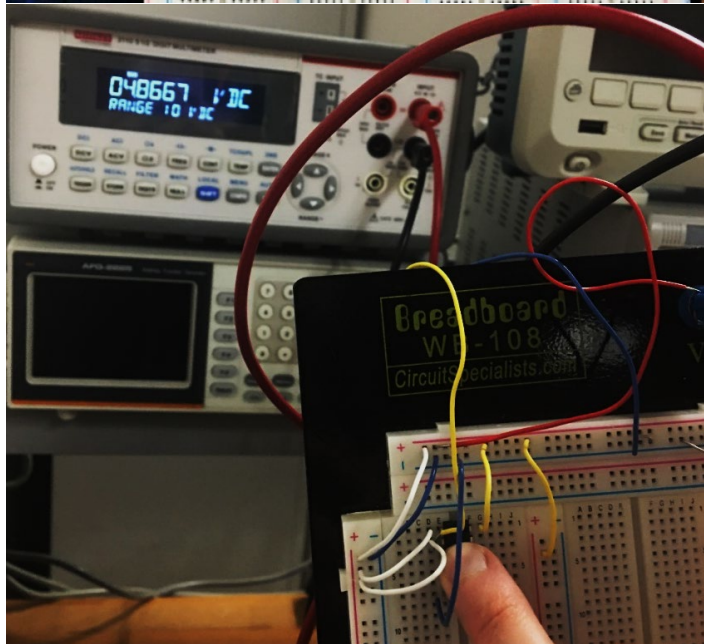
a.



b.



c.



d.

e. Truth table

A	B	$Y = AB$
0	0	0
0	1	0
1	0	0
1	1	1

#### **4. Answer the questions**

- 1) TTL standard is transistor-transistor logic that indicates the transistor performing logic and amplifying functions and became the foundation of digital electronics. Acceptable input signals range from 0V - 0.8V for TTL low or logical 0 and 2V - 5V for TTL high or logical 1.
- 2) The purpose of the breadboard is to start building simple or complex circuits.
- 3) The multimeter continuity test is used to check if there's an electrical connection between two points of the circuit.

#### **5. Conclusions**

As a student who is still a beginner in CPE 100, this lab was fairly straightforward due to the prelab work on TinkerCad. I learned how to properly cut and strip wires as well as connecting them to the power. The main problem during the lab was the difficulty of stripping the wire. In order to solve this issue, my partner and I kept on experimenting and did not give up in trying to strip the wire. The conclusion that we came to was that the IC chip that contained the AND gates only evaluated to true when the A and B inputs were powered.