Group8
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Lab #1: Introduction to Logic Gates

I. Introduction

II. Procedures

Part 1: Working with the breadboard

1. Testing the eight LED pairs:

(i) On the monitor, the LED light for number 1 is on HIGH, aka red.
(ii) With GND, the LED light for number 1 is on LOW, aka green. After repeating for the other pairs, they function in the same way.
Observation:
The red LED refers to 1, and the green LED refers to 0.
the red LED (+5V) is connected to ground somewhere in the breadboard to complete the circuit.
And the green LED (GND) is connected to +5V(some positive voltage) to complete the circuit.

2. Eight Logic Switches:

When the switch moves UP, the red light is on. When the switch moves DOWN, the green light is on.
After testing the remaining S2-S8, all of them function correctly.

3. Clock:

(i) The light switches from green to red to green and then to red, and stays in both green and red for about a second. The red LED turns on 34 times in a 30 second interval.
(ii) The switch between red and green goes faster.
(iii) Both red and green stay on. The output looks like that they are always on, but it actually is switching on and off so fast that we can't see.
(iv) The third and the fifth in addition to the fourth LED are turned on on red, which the green for the fourth remains on.
The frequency of the output is so high that it turns the LED beside the target LED on.

Part 2: Working with digital chips/ICs (integrated Circuits)

Part 3: Building a Logic circuit

1. General guidelines
2. Constructing the circuit
3. Testing the circuit

First, we put the alarm as the output of the or gate, so when we run the circuit, the alarm doesn't work correctly. Then we put the alarm as the output of the and gate, and it functions.
The first alarm that we get doesn't work, so we get a new alarm which works.
We need to re-calibrate the motion detector several times and then in order to get the right truth table, we re-calibrate again.

M	S	L	A
0	0	0	0
0	1	1	0
1	0	1	0
1	1	1	1

Answer the following:

1. The alarm will always be activated because there's always motion that is detected by the motion detector.
2. The assumption assumes that no matter what state of the switch and the motion detector are at, the alarm will go on continuously.