

Name: ..... Student ID: .....

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## Laboratory 1

### Pre-Lab

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#### 1. Supply voltage and Ground

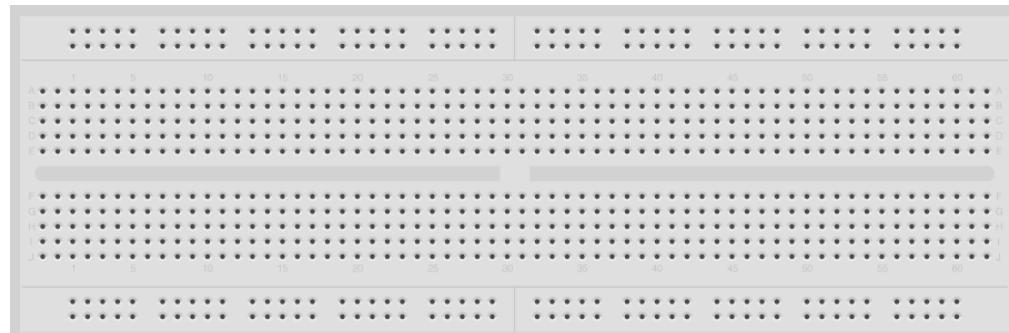
- 1.1 Connect +5V to input 0 of logic monitor. Observe and record the status of LED D0 of logic monitor.

- 1.2 Connect GND to input 1 of logic monitor. Observe and record the status of LED D1 of logic monitor.

Instructor's signature

**2. Circuit of Proto-board (breadboard)**

- 2.1 Connect +5V to the upper leftmost hole of the board.
- 2.2 Connect a wire to input 0 of logic monitor
- 2.3 Use the wire to find out the circuit of the Proto-board. (Hint: If the holes are connected, LED0 will be lit up.)
- 2.4 Sketch the connection of each hole of proto-board as found by using the aforementioned method.



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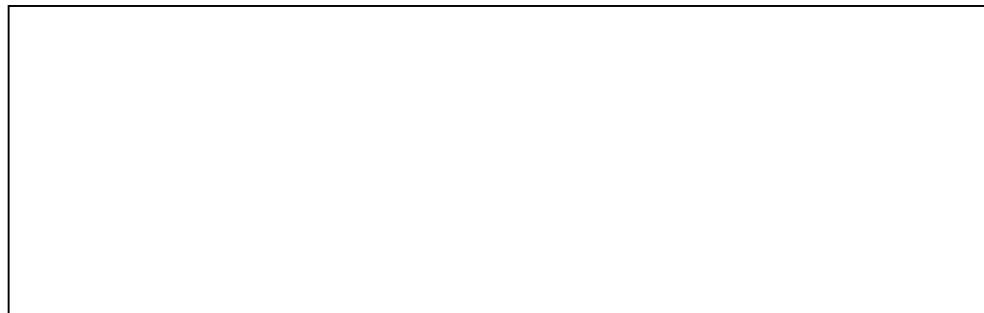
**3. Logic Switch**

- 3.1 Connect logic switch D7 to input 7 of logic monitor.
- 3.2 Change the status of the logic switch D7. Observe and record the status of LED D7

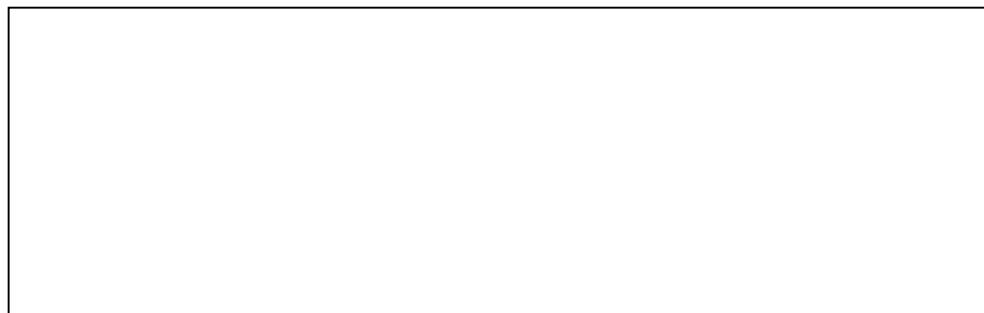
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**4. Debounce Switch**

4.1 Connect the falling edge output of the switch 2 (SW-2) to the input 0 of the logic monitor. Observe and record the status of LED D0.



4.2 Press switch 2 (SW-2). Observe and record the status of LED D0.



4.3 Press and hold switch 2 (SW-2). Observe and record the status of LED D0.



4.4 Connect the rising edge output of switch 2 (SW-2) to input 1 of logic monitor. Redo the experiment as in the falling edge case



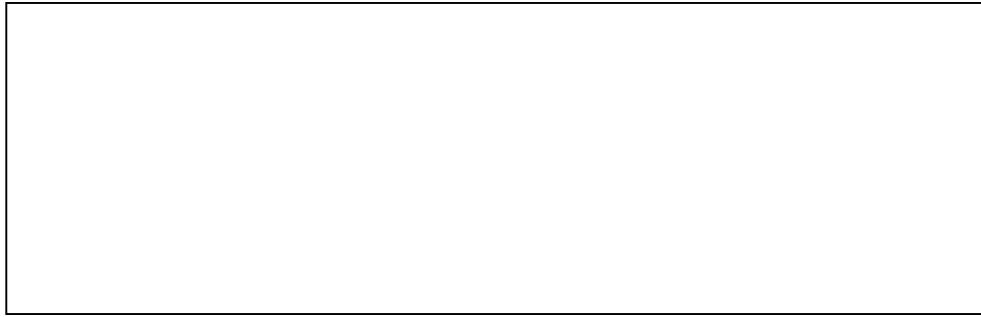
Instructor's signature

**5. Debounce Switch and Logic Probe**

5.1 Connect the falling edge of switch 1 (SW-1) to the input terminal of logic probe. Observe and record the status of all three LEDs.



5.2 Press switch 1 (SW-1). Observe and record the status of all three LEDs of the logic probe.



5.3 Press and hold switch 1 (SW-1). Observe and record the status of all three LEDs of the logic probe.

5.4 Remove the wire that connected to the falling edge output of switch 1 (SW-1).

5.5 Connect the rising edge output of switch 1 (SW-1) to the input of logic probe. Redo the experiment as in the falling edge case.

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**6. Pulse Generator and Logic Probe**

6.1 Connect the output terminal of pulse generator to the input of logic probe. Observe and record the status of all three LEDs of the logic probe.

6.2 Change the frequency of the pulse generator by pressing the switch one time. Observe and record the status of all three LEDs of the logic probe.

6.3 Set the frequency of pulse generator to be 1 KHz. Observe and record the status of all three LEDs of the logic probe. Explain your observation result.

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**7. Adjustable Power Supply**

7.1 Turn the knob to the leftmost position.

7.2 Connect the output of the adjustable power supply to the input terminal of the logic probe. Observe and record the status of all three LEDs of the logic probe.

7.3 Gradually turn the knob to the right. Observe and record the status of all three LEDs of the logic probe. What is the position of the knob such that the pulse LED (yellow LED) is on?

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**8. Seven Segment Display**

8.1 Connect the output of logic switch D0 to the input A of the left seven segment display.

8.2 Connect the output of logic switch D1 to the input B of the left seven segment display.

8.3 Connect the output of logic switch D2 to the input C of the left seven segment display.

8.4 Connect the output of logic switch D3 to the input D of the left seven segment display.

8.5 Connect the output of logic switch D4 to the input DP of the left seven segment display.

8.6 Find the status of logic switches D0-D4 that displays the following number.

- 0

- 5

- 8

- A

- F.

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