Laboratory Worksheet #03
Hardware: Digital Input and Output Exercise

When developing hardware circuits, it is recommended to build and test small circuits that will later be expanded upon. This first project involves the use of a couple key components (74365 chips, LEDs, BILEDs, Buzzers, Resistors) that play an important role in both digital input and output.

Construct the circuit shown below. Debugging the hardware circuit is performed using the Logic Probe available in the Toolbox. Directions on using the logic probe can be found not only in the LITEC Multimedia Tutorials, but also in Chapter 2 of your lab manual. Also, please refer to Appendix B, Figure B.1 in the lab manual concerning the connections of **+5V** and **Ground** on the Smart Car connection board.

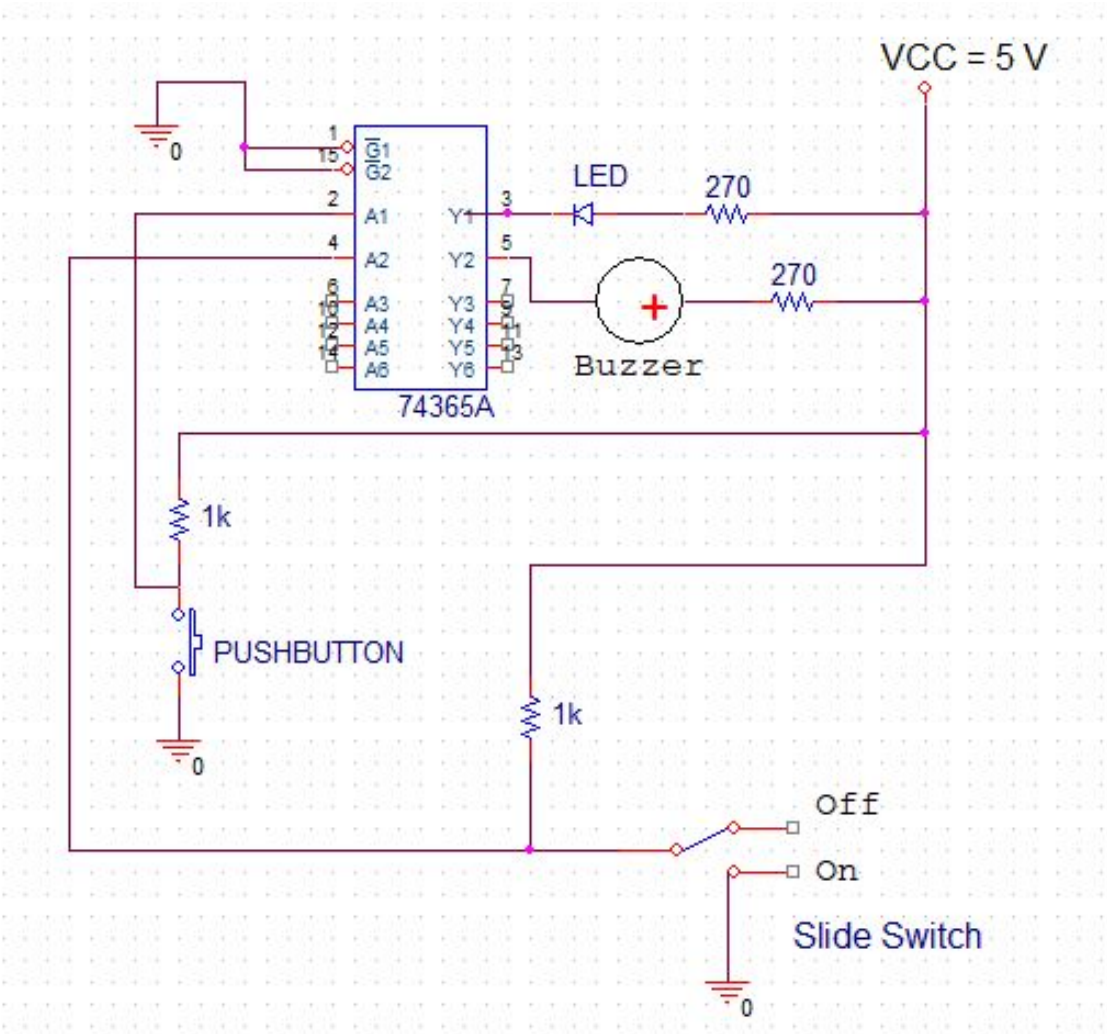

Figure 1: Worksheet 3 Schematic

Note: In the above circuit schematic, the power connections for the 74365 chip are not shown. This format is common to circuit schematics, where the implementer is expected to know the connections for power and ground.

1) Using the on-line data sheets, determine all pins of the 74F365 that need to be connected toa high voltage (VCCor +5V) and those that need to be connected to a low voltage (GND or 0V).

1& 8
15
16

2) Using the Logic Probe, what value (high/low) do you get when you test pin #16 on the 74F365 buffer? What color is Logic Probe LED?

high

3) What about when you test pin#1 on the same chip?

low

4) What voltage values are the buffer gate outputs connected to the LED and Buzzer (pin 3 and pin 5 of the Hex buffer, respectively) when the slide switch is ON and the button is pushed? Are the LED and Buzzer on (lit/noisy) or off (unlit/no sound)?

0v, 0v
LED is lit, buzzer is noisy

5) Connect pins 1 and 15 to power (5V) instead of ground. What happens when you push the button or move the slide switch?

No matter push the button or not, LED and buzzer always unlit and nosound.

6) Disconnect pins 1 and 15 completely (so they are not connected to anything). The pins are now considered 'floating', which means their voltage level is uncertain. What happens when you push the button or move the slide switch?

LED and buzzer works as normal

When complete, include Worksheet 3 with your Laboratory 1-1 Pre-lab submission.