CS 3651: Current Buffer (Transistor Switch) Lab

Name(s): _____

Learning Objectives:
1.   Identifying a component via markings
2.   Looking up specification sheet using the Internet
3.   Identifying the Emitter, Collector, and Base on a transistor
4.   Using a transistor as a current buffer (switch)

Step 1: You have been given a transistor with unknown (to you) specifications. A transistor can be used to switch current based upon a digital signal (or amplify a low current analog signal). Using the Internet, look up the transistor you have been given and find a specifications sheet for it.

Is your transistor an NPN or PNP transistor? _____
What is the maximum current your transistor can switch? _____
What is the ordering of the E,C,B pins on your transistor? Draw a diagram:

Step2: You will now make a current buffer using your provided transistor that will switch a small load such as an electric motor. (See the TA for a load. You may want to substitute a LED and resistor for your load until you have the circuit correctly wired.) **Connect an output pin on your UBW to the Base of your transistor using a current limiting resistor.**

What ohm rating did you use for your current limiting resistor? _____
Why?

Step 3: Wire up your power supply and load (motor, LED/Resistor, etc) to the other two pins of the transistor so that it will work. (Refer to the assigned readings for ideas of how to do this.) Note: If your power supply for the load is different from that of the UBW, you will need to tie their grounds together. To keep things simple, when testing with a LED/Resistor you can use the UBW's +5V power supply to power the load as long as the LED takes less than 100mA. When driving a motor or other higher current load, you will need a separate power supply for the load. Be sure to not OVERPOWER the load with a power supply that provides too many volts (or current) for a current limited load).

Step 4: Connect your UBW to your computer. Use a terminal to set your chosen pin to work as an output. Toggle the pin, and verify that your load turns on and off.

Step 5: Draw a schematic of your circuit:

Step 6: Demonstrate your circuit to the Lecturer or TA.