UCI STUDY GROUP LESSON 8
LOGIC GATES: AND LOGIC USING TRANSISTORS AND 7408 IC

The circuit on the left is made with 2N3904 transistors, 2 10KΩ resistors, 220Ω resistor for LED and the LED. The circuit on the right uses the 7408 integrated circuit chip with 2 10KΩ resistors and the same 220Ω for the LED.I am using the breadboard 5VDC power supply. The bottom supply is not used. I am using a common ground to make hook-up cleaner.
From this view the transistor pins are left-to-right: E-B-C.

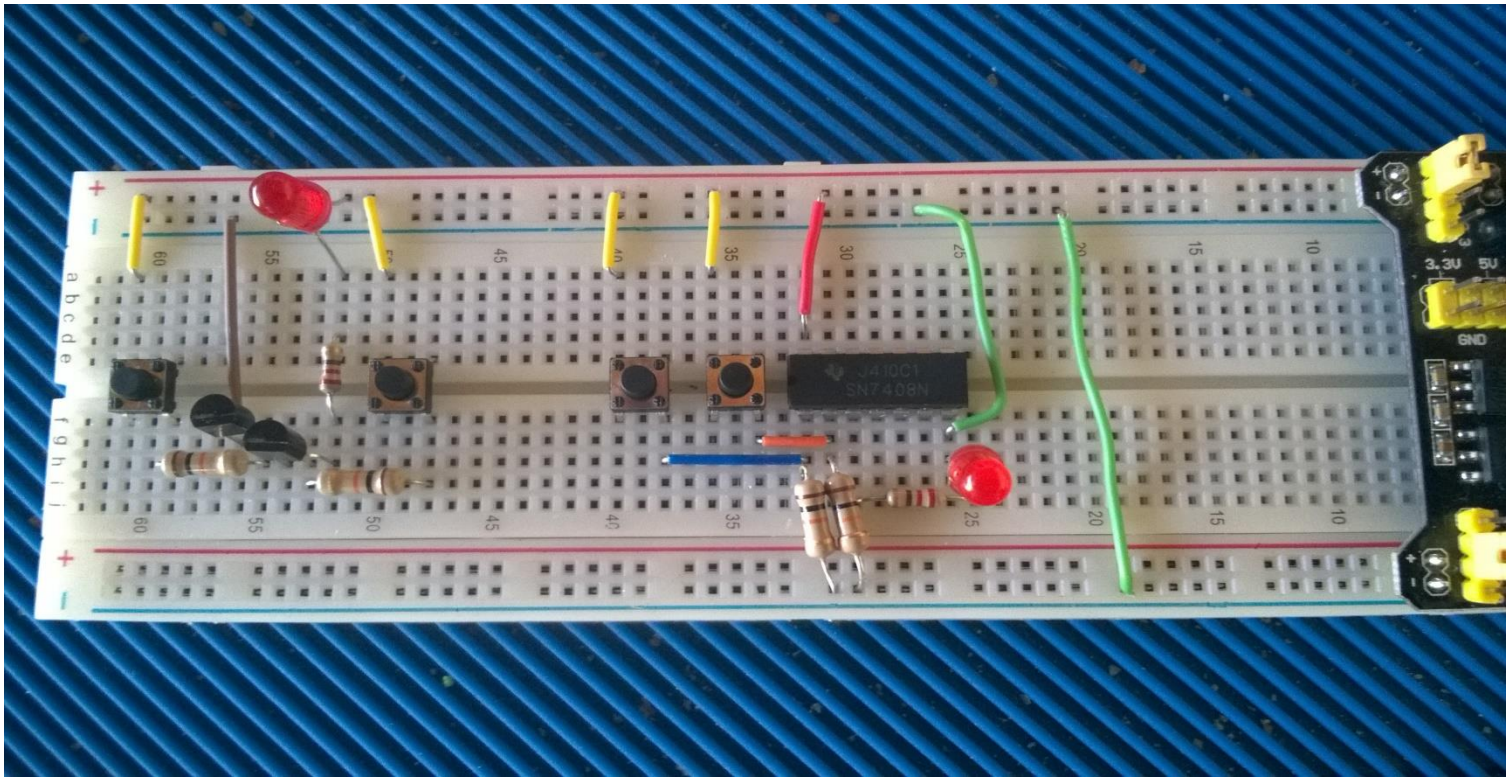

Figure 1:Top View

Left circuit:
The 10K resistors on the left circuit limit base current to the transistors when the switches are pressed.

Right circuit:
The 10K resistors on the right circuit are “pull-down” resistors to keep the inputs pins at a logical 0 when not active. Vcc is supplied to the switches and the resistors feed current to the base of each transistor. The IC can handle direct 5V on the input pins (#1 & #2) but they need to be pulled low. The output of the IC on pin 3 connects to the LED 220Ω resistor. **The notch of the IC is on the left. Vcc is pin #14 and Gnd is pin #7.**

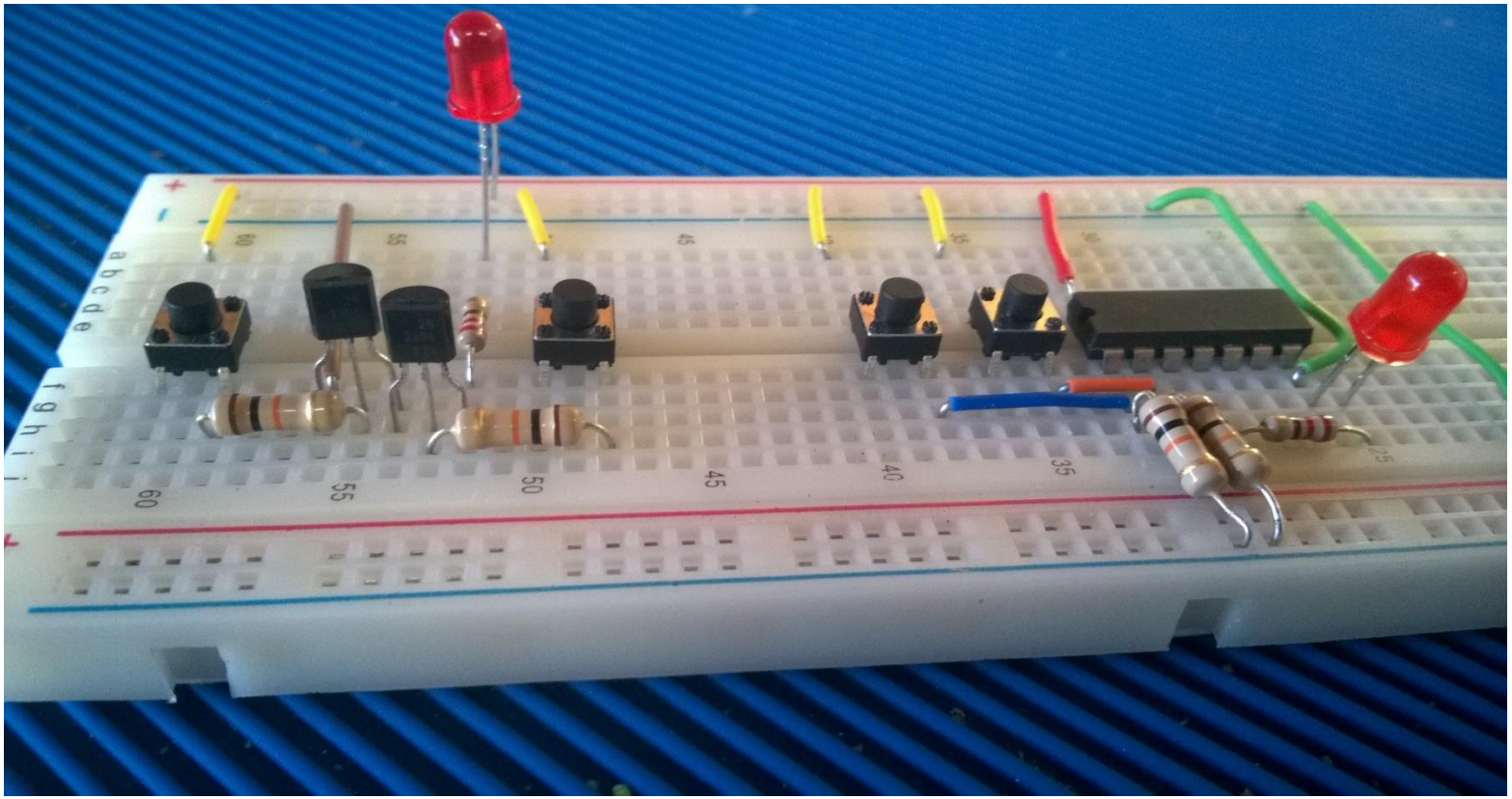

Figure 2: Front Edge View

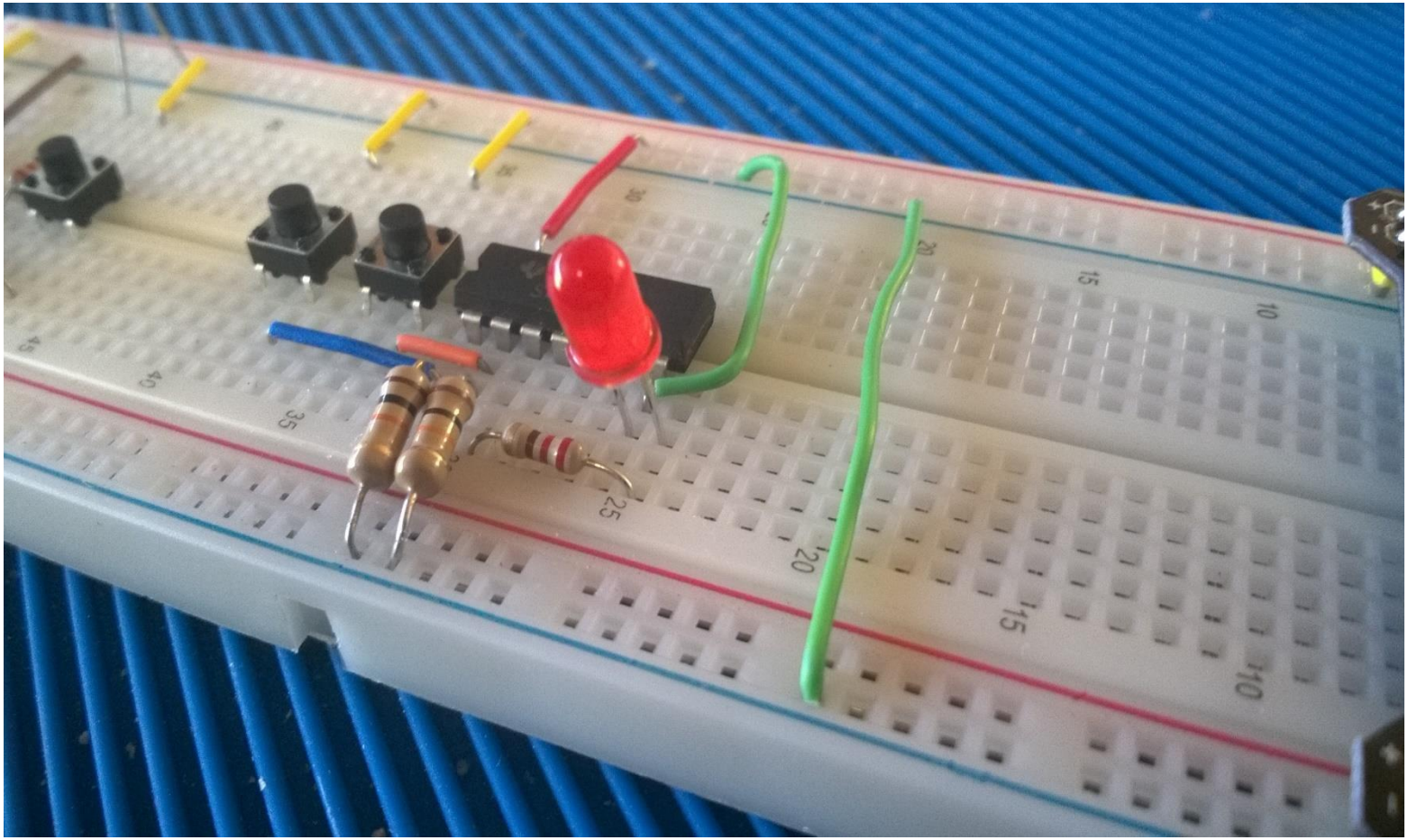

Figure 3: Close-up of the IC Circuit. Pins 1&2 are the inputs and pin 3 is the output.

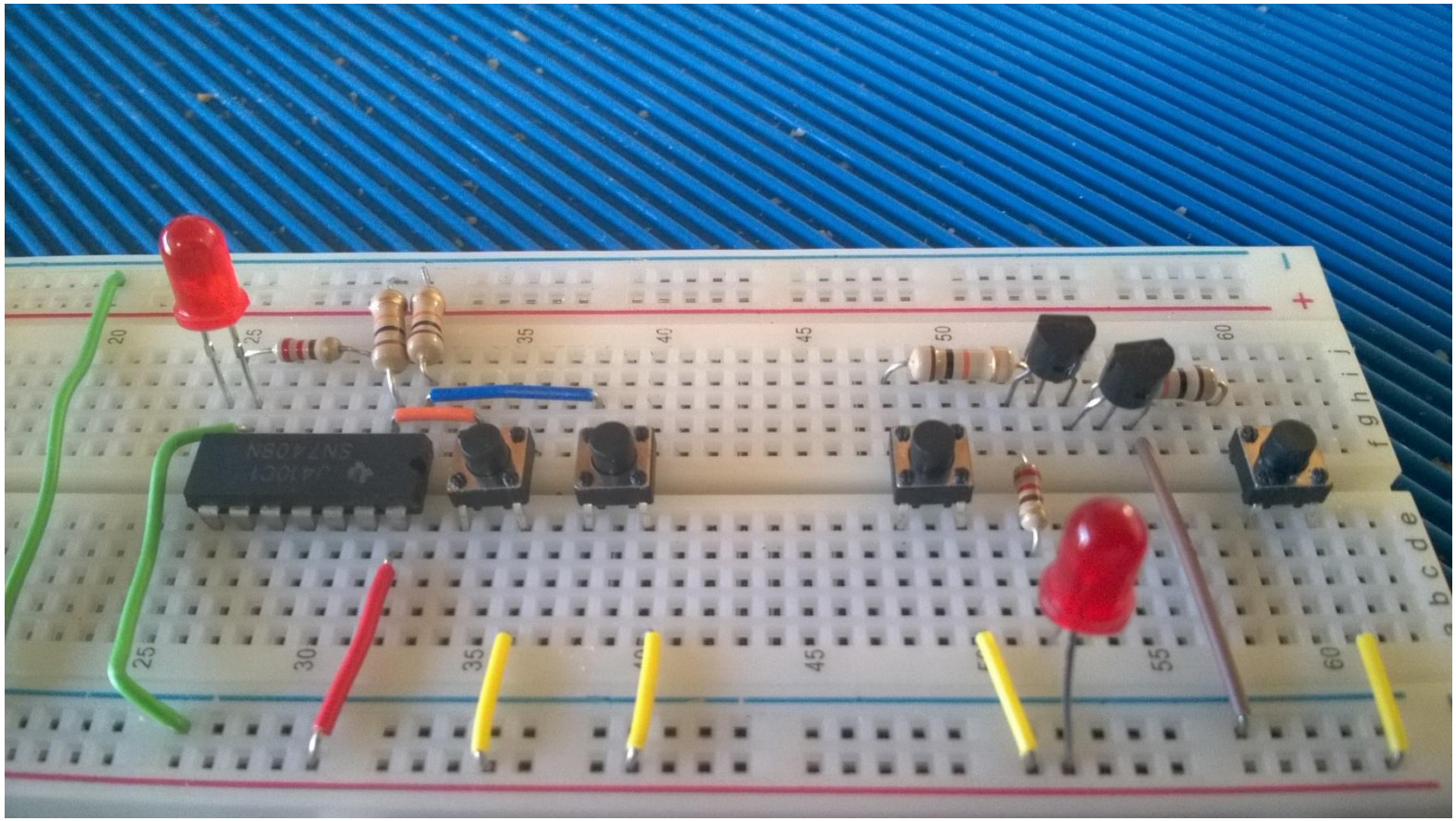

Figure 4: Rear View of the Breadboard. Notice how the Emitter and Collectors are Connected.