ELC 2137 Lab 2: Transistor Logic Gates

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Summary

In this lab, circuits were constructed to act as logic gates. To do this, several resistors and transistors were connected to switches and lights. Based on if the light was on or off, it was possible to determine the flow of current through the transistors and if the transistors were acting as "on" or "off". Transistors are "voltage-controlled switches", so they were on or off depending on whether or not there was current flowing through them. Diagrams were given as a guide on how to construct the three circuits in the lab. There were varying amounts of transistors and switches used in each circuit to create an inverter gate, a nor gate, and an and gate.

Questions

1. Logic/truth table for Final gate

Switch 1	Switch 2	Light
0	0	0
0	1	0
1	0	0
1	1	1

2. This circuit implements an And gate because the light does not come on unless both switches are on.

Circuit Demonstration Page

Student names: _Kyle Monk_　　　　　　_Jane Ross_

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Instructor Initials

Pushbutton "Or Gate"　_____　　　Transistor Not gate　_____
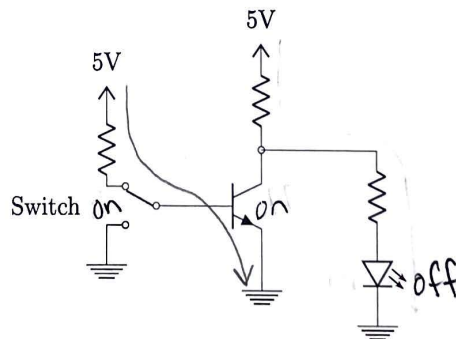
Transistor Nor gate　_____　　　Transistor unknown gate　_____

Diagrams
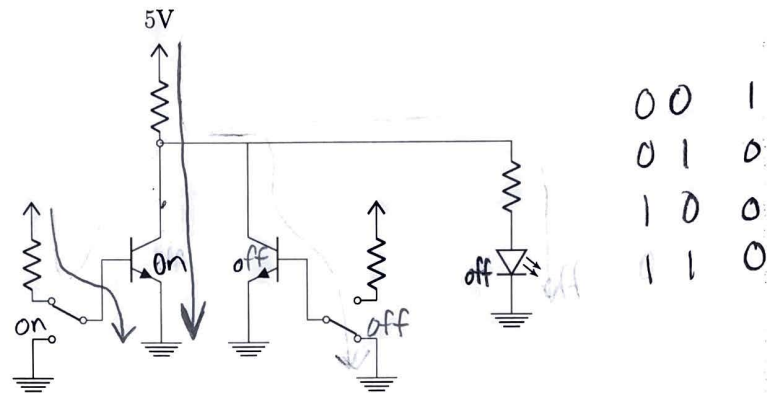
On each of the circuits below, draw the current paths and note whether each switch, transistor, and LED is ON or OFF.

Inverter:

5V

5V

Switch on

on

off

0 1
1 0

NOR:

5V

0	0	1
0	1	0
1	0	0
1	1	0

Final gate:

5V

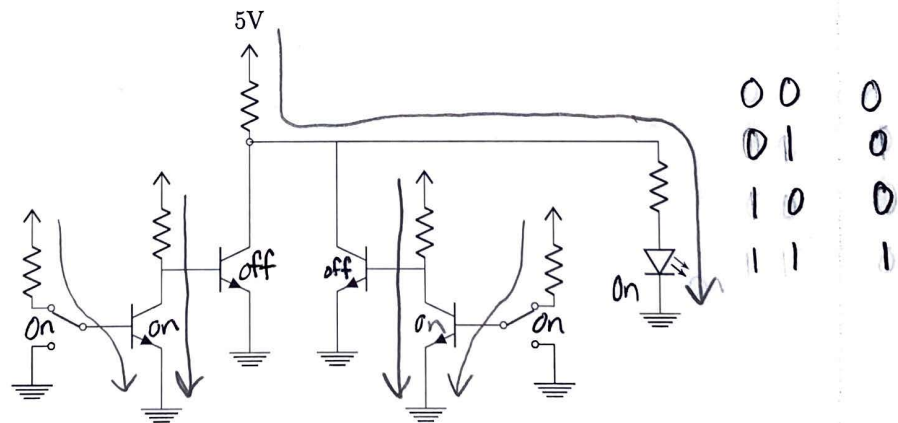|		
0	0	0
0	1	0
1	0	0
1	1	1

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Figure 1: Results: Circuit Demonstration Pages