Final Circuit Design

Our final circuit design consisted of an LM324 chip containing two Op amps and a NAND gate. The design was based off of the idea that we have three voltages to work with, 9V, 6V and 4.5V. We decided to use the LM324 Op amp's voltage output because it only depends on the hi and low inputs. We first designed the circuit to turn on two LEDs, red and yellow, separately depending on the voltage from A. We chose these because they where the two with the highest and lowest corresponding resistor configuration outputs. After we made this circuit we found a logic gate that would only output a 1 when two 0's where inputted. This happened to be the NAND gate. When this is connected to the LM324's outputs it turns on the green LED only when 6V is coming from node A.

Why Our Circuit…

Our circuit is the top design because we believe that it is the most efficient circuit. It only uses 2 op amps and a logic gate. This creates less room for error in its operation. When we completed our circuit it was humorous watching the stunned faces of every other student working on the assignment at that time, writhing with envy at the simplicity of our design. Physically, our circuit only took ¼ of the breadboard space as many of the groups and did the same thing.

In circuit design you always try to make a circuit that uses the least amount of components. Many groups had different combinations of the AND, OR and NOT gates used. We think that by using a NAND gate, the most fundamental of all TTL logic, in combination with our op-amp, we created a greater scope of what our circuit could do. In short, ours was the best because it was the simplest and most versatile.