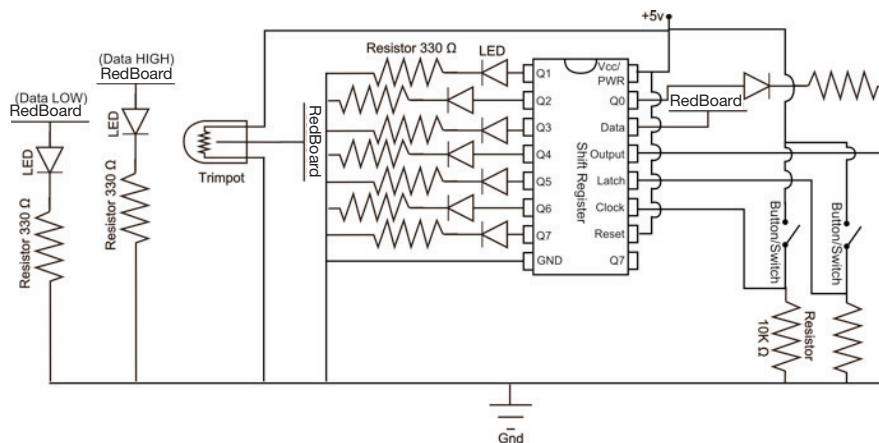**Name:**
**Date:**

**Circuit #14c Shift Register**

## Circuit:



### Got your shift register lighting up all the LEDs in a pattern?

Upload Circ05Expansion to your RedBoard and add two buttons, two LEDs and a trimpot to your circuit, use the schematic for reference.

Your two buttons now pulse the clock and latch the shift register. You will use the trimpot to set your data either HIGH or LOW. Play with the trimpot to figure out which setting is HIGH and which setting is LOW. One of the indicator LEDs will light up depending on the value. Then use the clock pulse button to send the data value to the shift register. To see the data that you have shifted into the register so far hit the latch button.

### Before answering the questions below set your data pins all back to LOW, or off (Remember, LOW == 0)
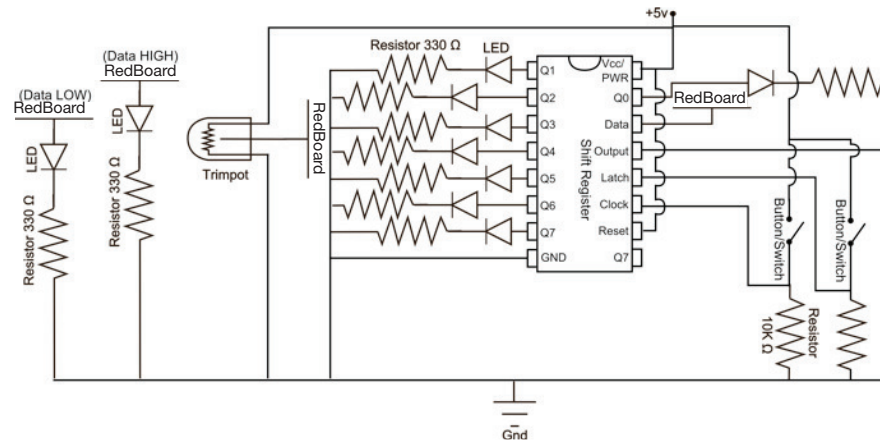
## 1.

**Which circuit, original or expanded makes more sense to you?**

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## 2.

**Using this interface you have more control over the shift register than the original code. Explain the difference between this circuit and the original. Use examples from the original code and explain what physical element has replaced it. Also explain what the various states of the components are.**

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## Circuit:



# 3.

**Because you decide when to "latch" your data in you can control all the pins in any order you like as long as you "clock" in the proper sequence. This lets you decide which pins are ON or OFF without having to cycle through them all. Decide on eight different circuits (or objects) you would like to turn on and off using a register and then explain at least two different patterns you would send the shift register to control these objects. Use binary to write the patterns. Example: servo, servo, egg beater motor, spray on butter object, servo, waffle iron, servo, hot plate. 1111100: first two servos pour ingredients, egg beater mixes, butter sprays on waffle iron which is heating up, servo and hot plate off. 00000111: first two servos reset, egg beater off, no butter, waffle iron stays on, servo tilts waffle off of iron onto hot plate which keeps waffle warm. Note: Zero does not always mean off, it can make the circuit (or object) do something else, like reset a servo position or squirt syrup instead of butter.**

Soft potentiometers come in a bunch of shapes and sizes. Explain how you could combine two soft potentiometers, two servos and a slingshot to create a machine that launches marshmallows (because they are soft) towards wherever the two soft potentiometers tell it to, include a schematic or logic flow chart in the blank section .... or just go build one instead of explaining how it might work. You've finished the SIK, what are you waiting for? In fact, forget these guiding questions, if you want just use this page to brainstorm what your next project will be.

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