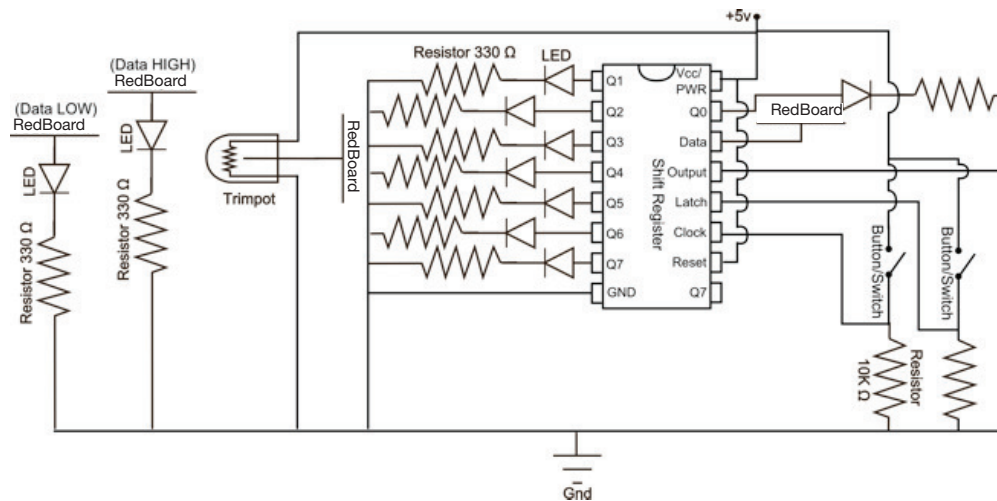


Circuit #14b Shift Register

Circuit:



1.

The byte in this circuit's shift register is used to turn LEDs on and off. It can also be used to represent many other types of data in binary. Explain how a number is written in binary, then write the number fifteen using ones and zeros.

Does your shift register light 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. Make sure you don't confuse the two! 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 is LOW. One of the indicator LEDs will light up depending on which value it represents. 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. To really get a feel for how shift registers work first set all the LEDs LOW, then start playing with different patterns of data values.

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

2.

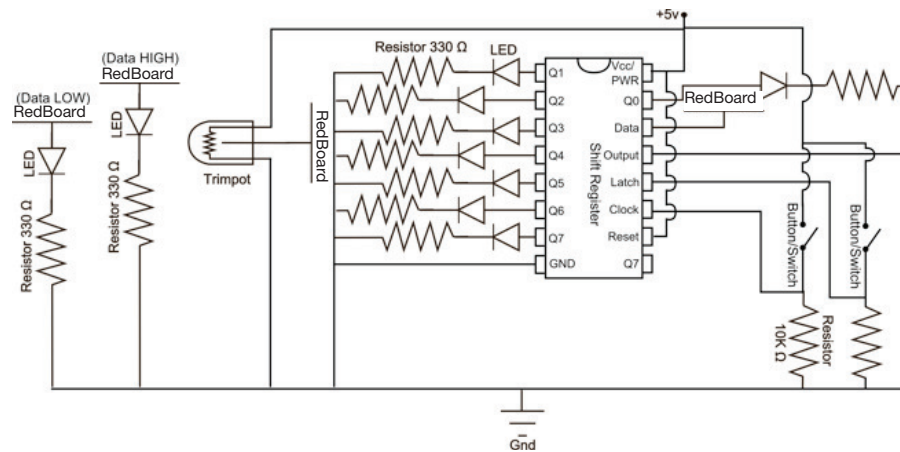
Try setting just one data pin before hitting the latch button. What happens?

3.

Try setting eight data pins before hitting the latch button. What happens?

Circuit #14b Shift Register

Circuit:



4.

Now set seven data pins before hitting the latch button. What happens this time?

5.

Now enter nine bits in the following order: 0,1,0,0,1,1,0,0,0. What does your LED pattern look like? Answer in binary.

6.

Explain how the LED pattern and shift register would act if you were shifting out the Most Significant Bit instead of the Least Significant Bit. Find the one command or word you would need to change in the code to make this happen and write it below.
