Ryan Young
CSE 2300w Lab Report
D-flipflop Lab

Shift Registers

Objectives:

The objective for this lab was to use four D-flipflop to build a register to show that serial and parallel input and output can be achieved through the D preset and clear inputs. We also built a circuit specifically for the clock input.

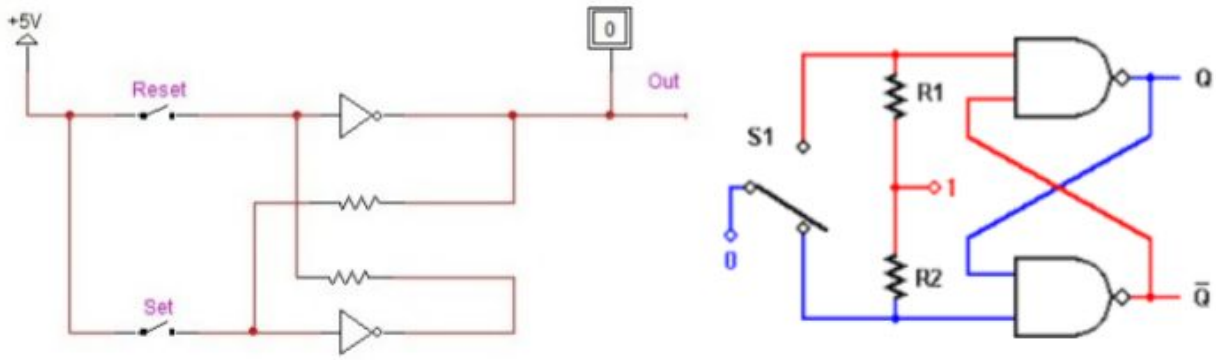
Introduction:

The theory behind this lab revolves around the concept of a shift register. A shift register is composed of two or more D-flipflops. These flipflops are connected by a common clock so that the when the clock pulses data moves bit by bit through one D-flipflop. The physical chips we are using on our breadboard allow data to move on the rising edge of the clock cycle. This essentially means that data will only move when the clock cycles from a 0 to a 1 and will remain there until the next 0 to 1 cycle.

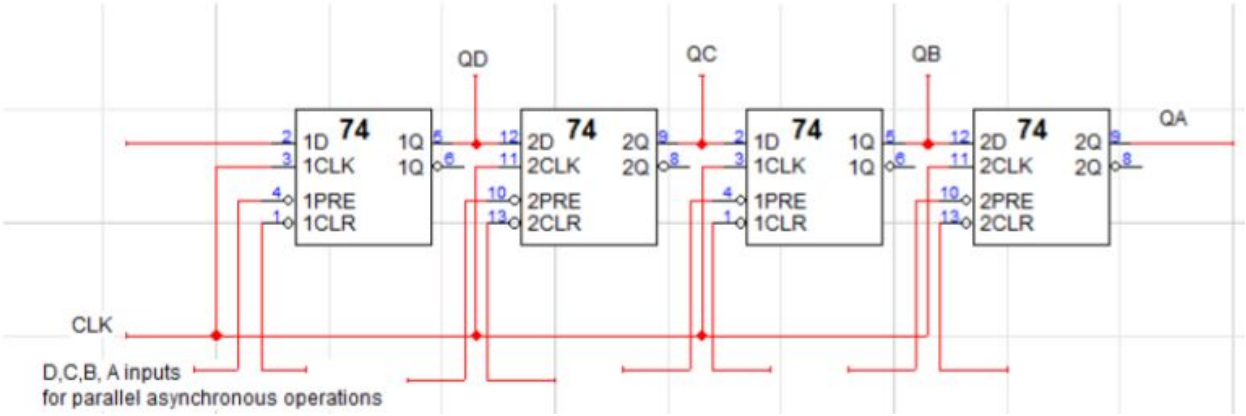
Procedure:

1.) Firstly we must read through the entire PDF and make sure we understand what the lab is asking.

2.) After that is completed then I created the debouncer circuit on the physical breadboard based off the schematic below. This allows us to maintain a solid 1 or 0 thus countering any noise produced by a switch.

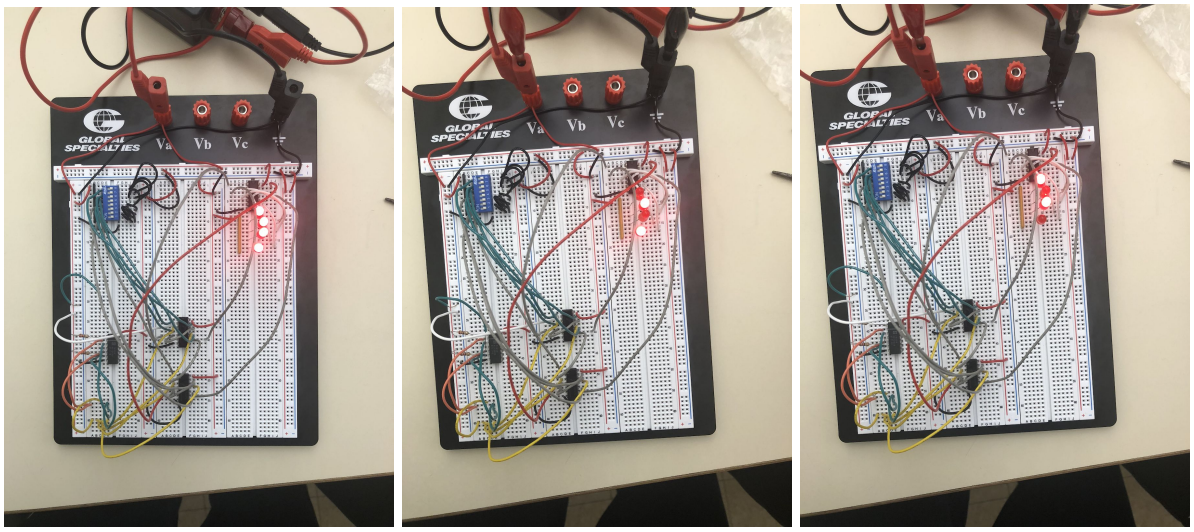


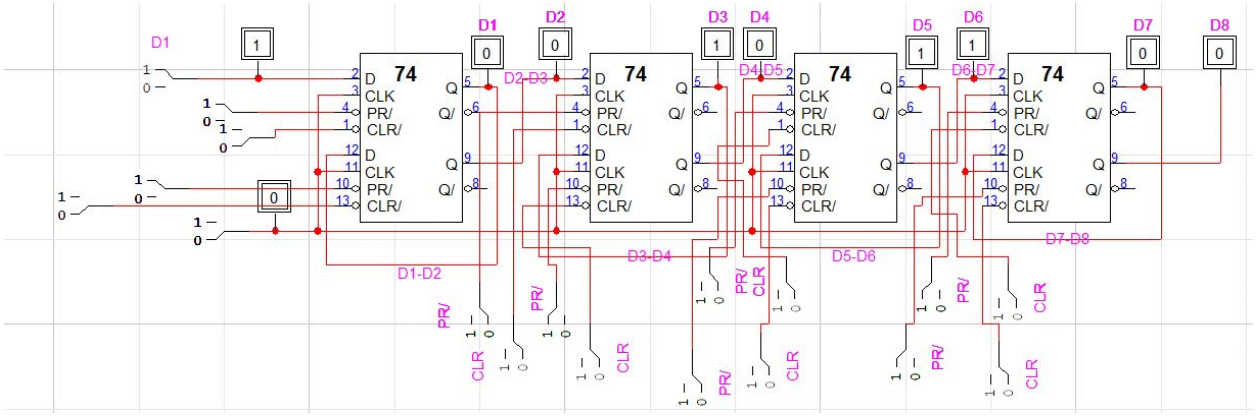
3.) Next following the completion of the debouncer circuit I used the diagram showing the four connected D-flipflops (as seen below) and finished the rest of the circuit using two SN7494 physical chips.



4.) Finally I completed the lab report and made sure all my testing was correct.

Results:





You can see above the serial input of a four bit number on my physical breadboard in the top pictures. The bottom picture shows the last two digits of my uconn id “44” in decimal being portrayed in binary across an 8bit register. The register shifted the values to the right resulting in the next value of the clock pulse being “22”.

Discussion:

This lab was one of the first labs were nothing went wrong. The building of the physical circuit actually went fairly smoothly, following the schematics was fairly straight forward and Haitham was awesome with help as always. The main technique I used in order to build the circuit was to modularly test each component and make sure it works before connecting the entire circuit together.

Conclusions:

The main points I concluded from this laboratory was that shift registers are very useful for storing bits of data. This was the first lab that actually went the way it was supposed to and im glad we were given a lab that could be done in the time allocated to us.

Questions:

1.) The main functional purpose of this register is to serially shift the values to the right by one each clock cycle. But in terms of use in a microprocessor they can be used for things such as I/O controls.
2.) Yes both are Dual D-flipflops that are positive edge driven that include an option to set and reset or clear each one.