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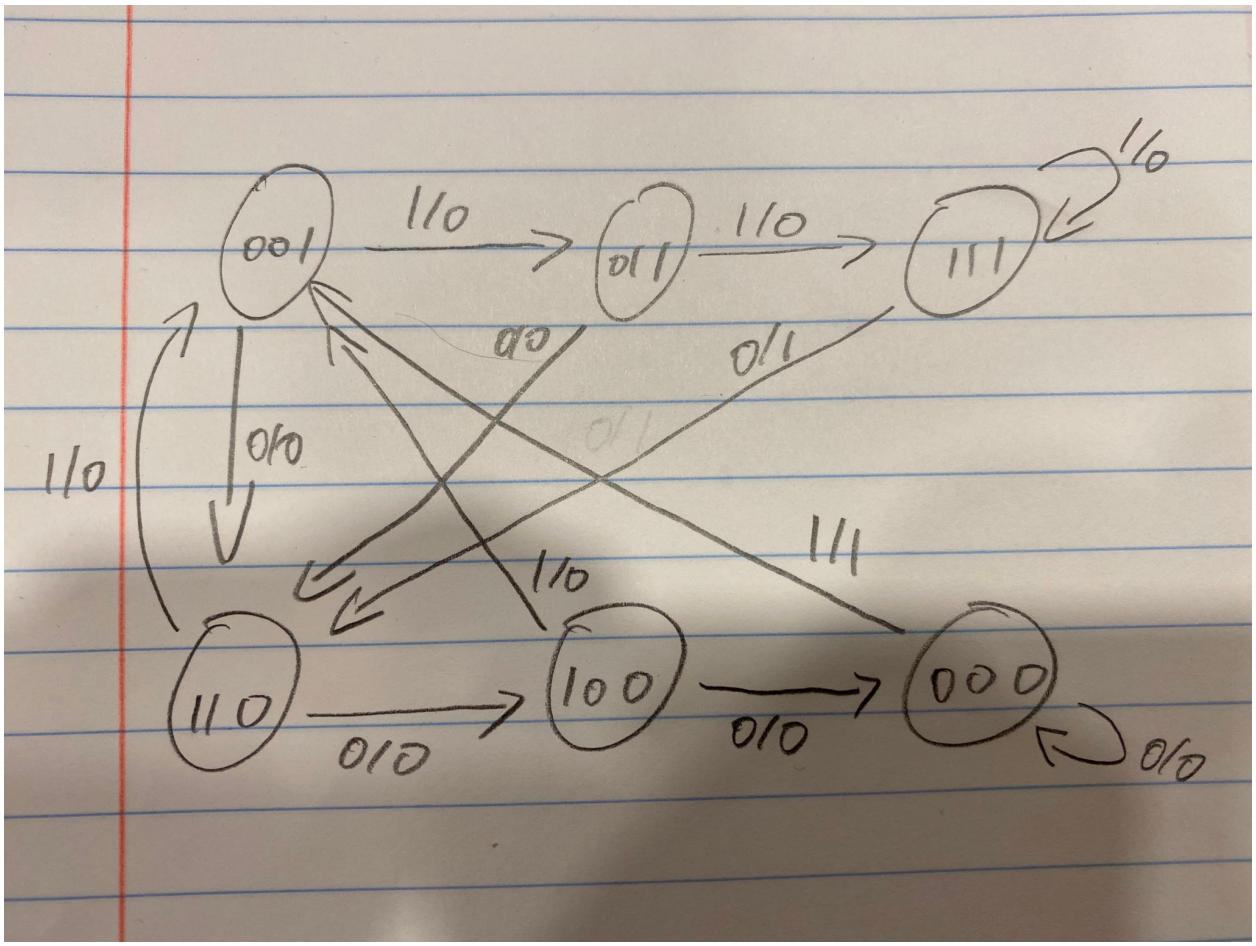
SEC 004L

CSE 2301 Lab 12

Theory/Question

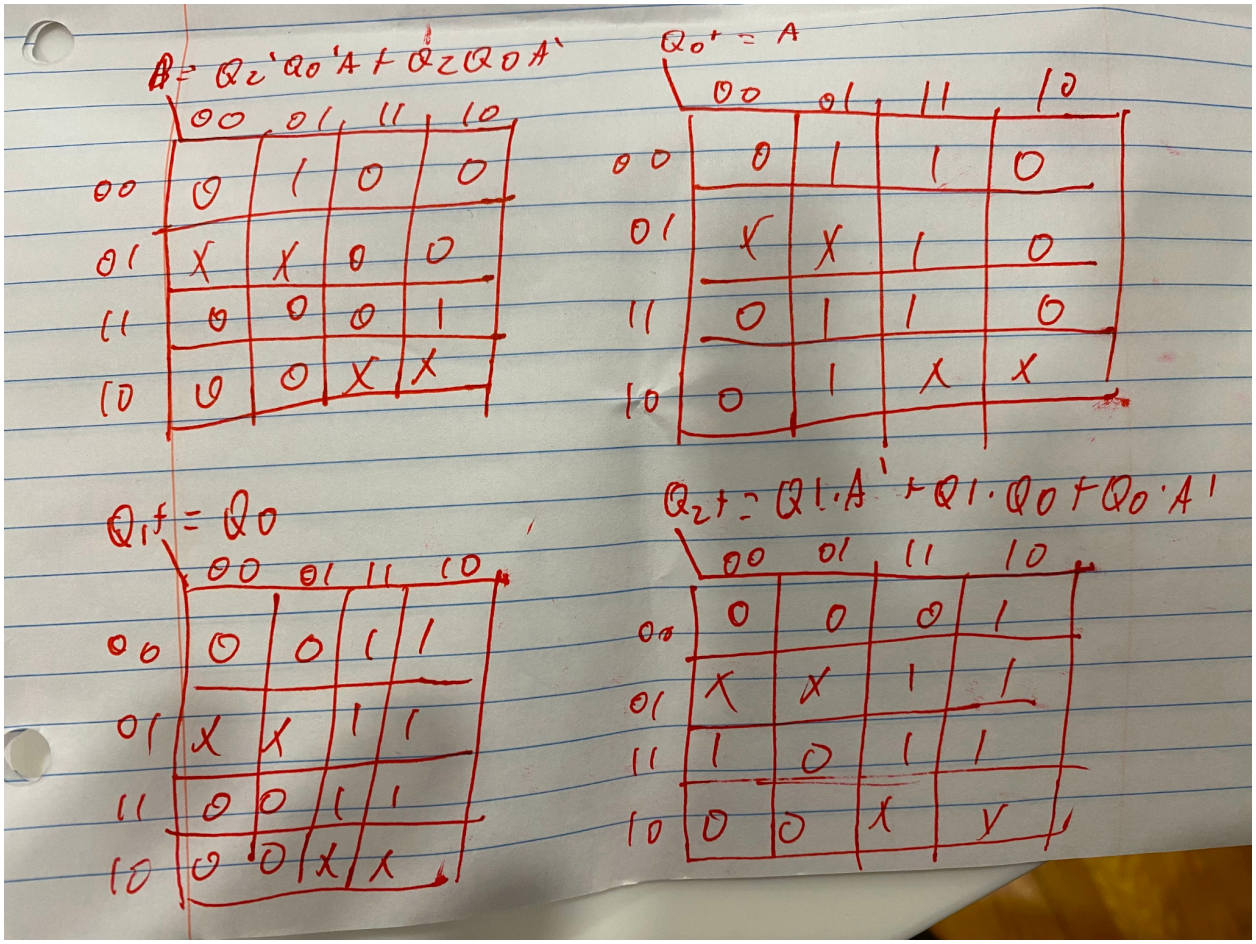
The main difference between Sequential logic and Combinational logic is one processes data through flip-flops to hold memory and logic gates while the other, combinational, uses only logic gates to output given present inputs. In this lab there is a synchronous counter as all the clock pulses are connected to all the D Flip-Flops. In this lab we also somewhat use a shift register as we have a series of D Flip-Flops that take in inputs from each other.

Deliverables



Transition Table

Q2	Q1	Q0	A (Input)	$Q2^+$	$Q1^+$	$Q0^+$	B (Buzzer)
0	0	0	0	0	0	0	0
0	0	0	1	0	0	1	1
0	0	1	0	1	1	0	0
0	0	1	1	0	1	1	0
0	1	0	0	X	X	X	X
0	1	0	1	X	X	X	X
0	1	1	0	1	1	0	0
0	1	1	1	1	1	1	0
1	0	0	0	0	0	0	0
1	0	0	1	0	0	1	0
1	0	1	0	X	X	X	X
1	0	1	1	X	X	X	X
1	1	0	0	1	0	0	0
1	1	0	1	0	0	1	0
1	1	1	0	1	1	0	1
1	1	1	1	1	1	1	0



Discussion

This lab was one of the more challenging labs, not for the design process, but more for constructing the actual hardware. The process of making the K-map and its equations was pretty straight forward. While building the circuit, some of my breadboard connections were not set, making it hard to determine what the problem was. Also at one point, the hex inverter for the LED's fell out and I placed it back in the wrong orientation. Overall the lab was somewhat enjoyable but very frustrating. I liked how this lab incorporated a lot of what we learned into this lab.