ECE-301-204

Lab11 Synchronous Finite State Machine Design and Implementation

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Objective:

Understand the design and operation of a simple synchronous finite state machine (FSM) to dispense a product when 15 cents have been entered in nickels and dimes.

Preparation:

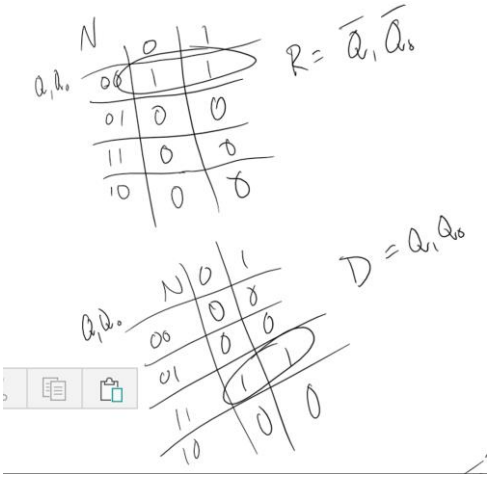
D-Type FF implementation

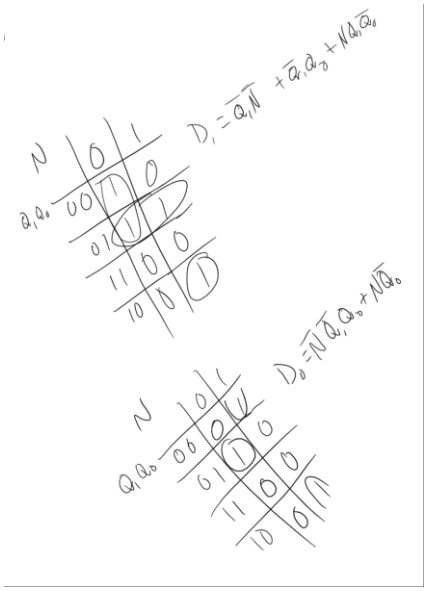
minterm	Coin input	Present State		Next State		Excitation Variables		Output Variables	
		MSB	LSB	MSB	LSB			Return coins	Dispense candy
	N/D-bar	Q_1	Q_0	Q_1^+	Q_0^+	D_1	D_0	Ret	Disp
0	0	0	0	1	0	1	0	1	0
1	0	0	1	1	1	1	1	0	0
2	0	1	0	0	0	0	0	0	0
3	0	1	1	0	0	0	0	0	1
4	1	0	0	0	1	0	1	1	0
5	1	0	1	1	0	1	0	0	0
6	1	1	0	1	1	1	1	0	0
7	1	1	1	0	0	0	0	0	1

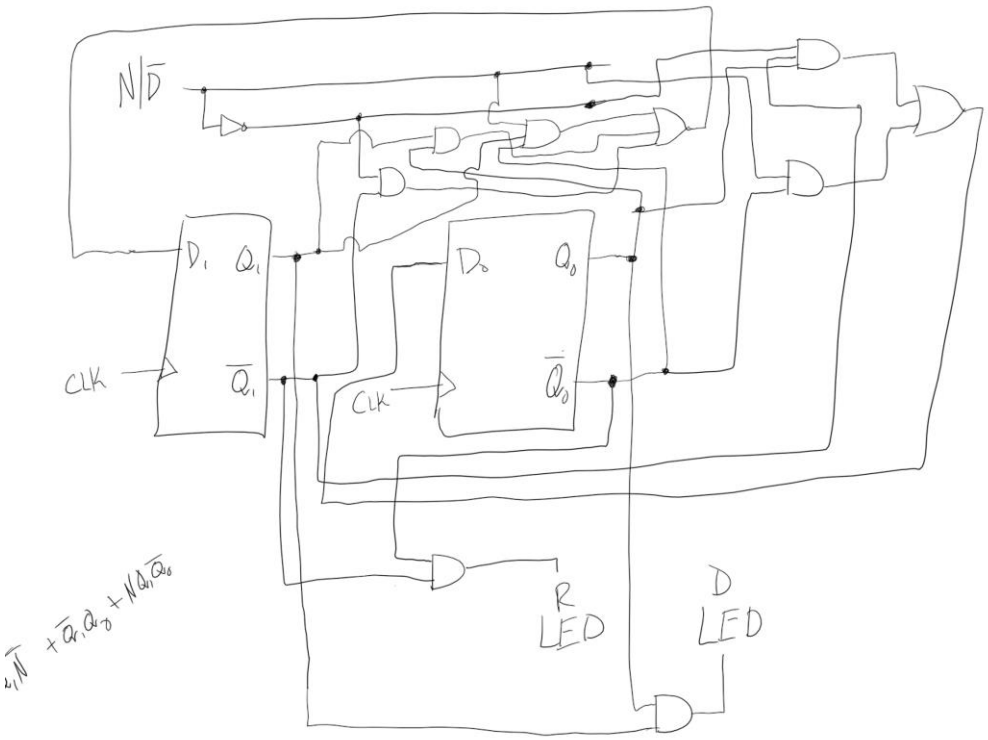
Materials and Equipment:

- ET-1000 Trainer
- Wires
- Breadboard
- AND gates, OR gates, D flip-flops

Laboratory Data







Above are the Karnaugh Maps, equations, and circuit implementation of the lab.

Comments and Conclusions:

This last lab we made a “vending machine” out of a couple of logic gates and 2 D flip-flops. This gives us insight into the many things that we can do in the real world with just a circuit. Definitely gives me a different perception when I look at things now.