Hardware Assignment - AI1110

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***Abstract*—In this assignment I made a Random number generator using decoder, flip flops, XOR gate, 555IC**

1 Components used

Component	Value	Quantity
Breadboard		1
Seven Segment Diplay	Common Anode	1
Decoder	7447	1
Flip Flop	7474	2
X-OR Gate	7486	1
555 IC		1
Resistor	1 KΩ	1
Capacitor	100 nF	1
Capacitor	10 nF	1
Jumper Wires		

TABLE 0
Components used

(1)

2 Procedure

1) I connected the 555 timer circuit according to the figure 1

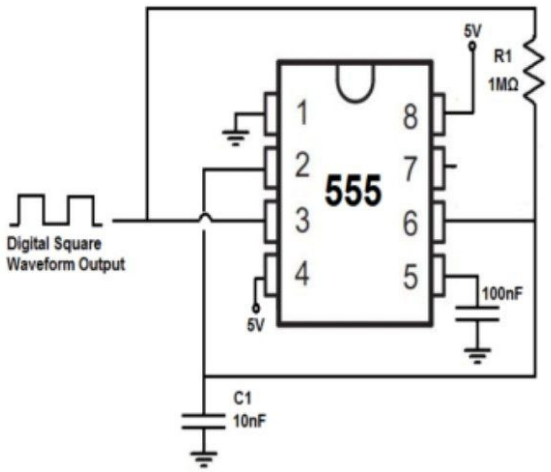

Fig. 1. Connection in 555 timer circuit

2) Then I connected Clock output of 555 timer circuit to the clock signal of D-Flip flops
3) Now I make the circuit for shift registers using a 4 D-Flip flops (using two 7474 IC's)

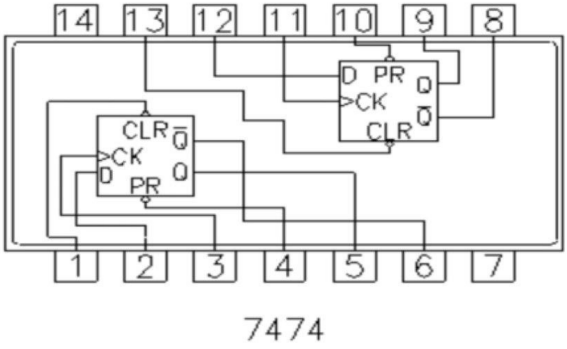

Fig. 3. Connection in 7474 IC

4) Then we connected XOR gate (7486 IC) according to the figure 4

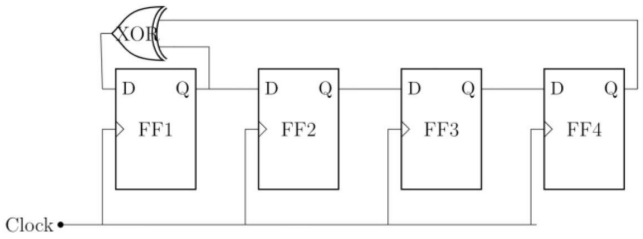

Fig. 4. Connection in XOR gate

5) Then I connected the decoder (7447 IC) and connected its A,B,C,D with Q_0,Q_1,Q_2,Q_3 respectively as per the figure 5
6) Then I connected The seven segmented display and then connected it with the dceoder (7447 IC) according to the table 6 and the figure 6
7) I connected all the independent parts with each other and then connected the power source

3 Output

The circuit generates random numbers on the seven segment display. The output is shown in figure 7

Fig. 5. Connection in Decoder gate

7447	$\bar{a}$	$\bar{b}$	$\bar{c}$	$\bar{d}$	$\bar{e}$	$\bar{f}$	$\bar{g}$
Display	a	b	c	d	e	f	g

Fig. 6. Connection of seven segmented display with decoder

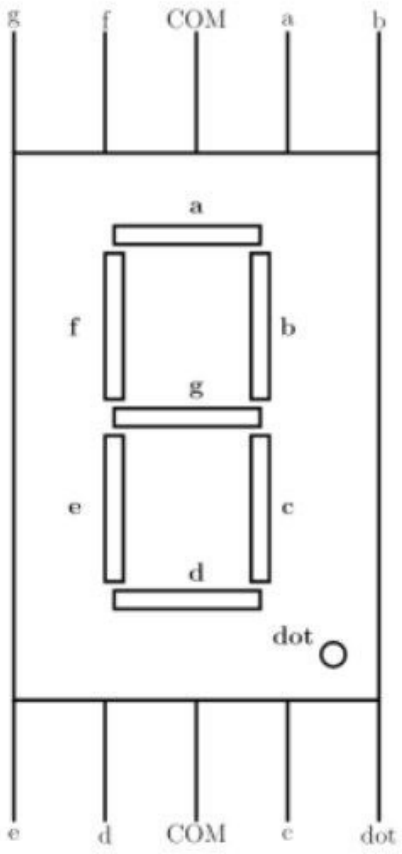

Fig. 6. Seven segmented display

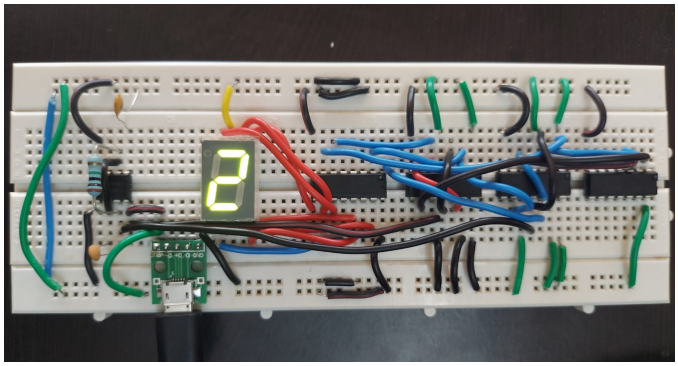

Fig. 7. output