AI-1110: Hardware Assignment
Random number generator

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***Abstract*—In this assignment we made a random number generator using flip flops,ic,XOR,decoder.**

COMPONENTS

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		

Procedure

1) I made the circuit for shift registers using a 4 D-Flip flops (using two 7474 IC's) and connected them respectively to ground and vcc.
2) Then I connected XOR gate (7486 IC) according to the figure given in the instruction .
3) I connected the 555 timer circuit according to the figure given in the instructions.
4) Then I connected Clock output of 555 timer circuit to the clock signal of D-Flip flops made previously.
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. I fixed the connections of the display. 1
6) The brightness of the seven segment display is determined by the resisitance we used to ground it.
7) Then I connected The seven segmented display and Then connected it with the dceoder (7447 IC) according to the table given in the instructions and the figure. 3
8) I connected all the independent parts with each other and then connected the power source which uses a USB jack.

Fig. 1: Connection in Decoder gate

Output

The seven segment display was displaying various digits continuously, along with them additional figures also occur cause the display can show ony a single integer.

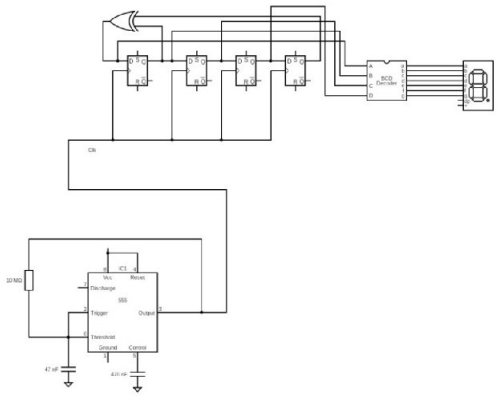

Fig. 2: BLOCK DIAGRAM

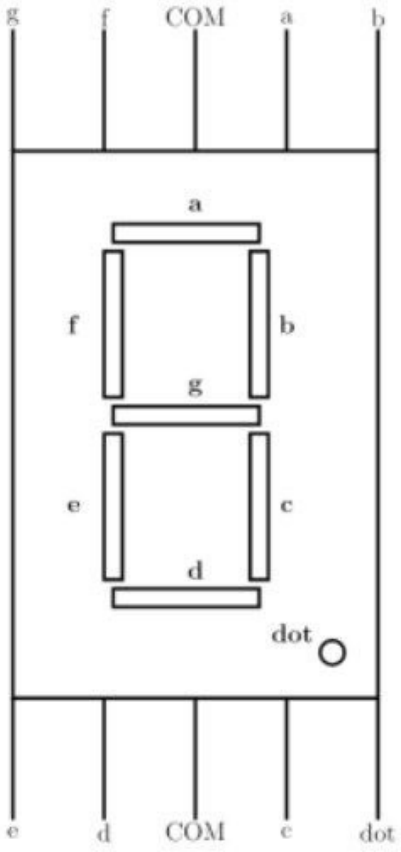

Fig. 3: Seven segmented display

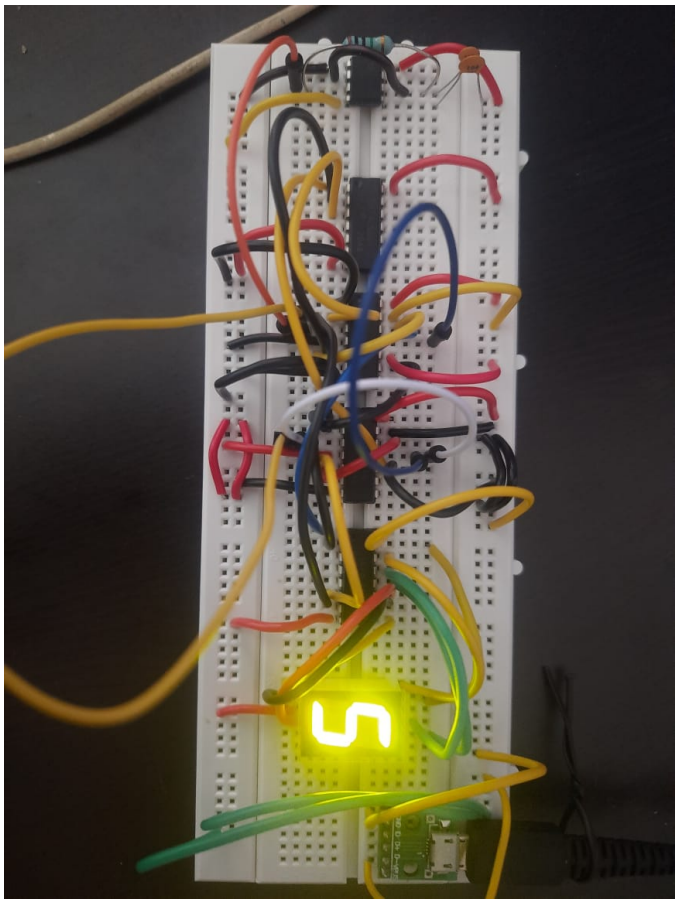

Fig. 4: Final circuit displaying 5.

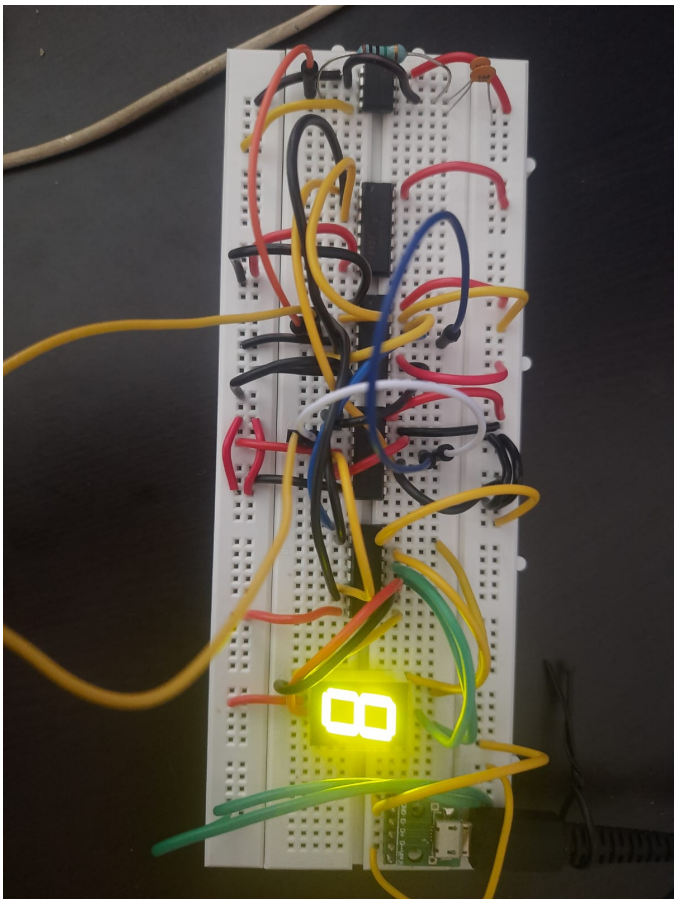

Fig. 5: Final circuit displaying 8.

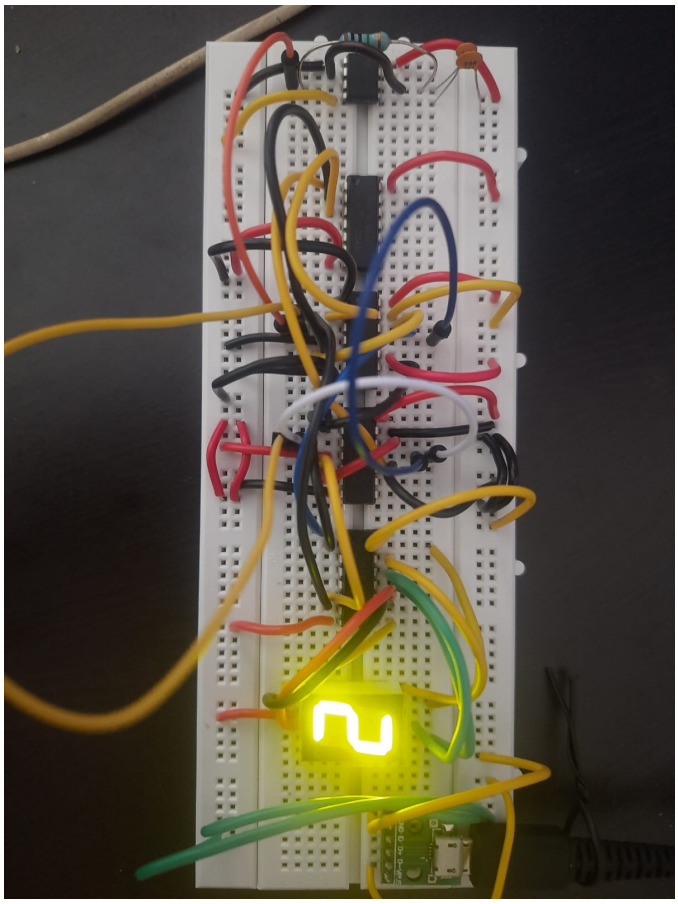

Fig. 6: Final circuit displaying 2.