Hardware Project

AI1110: Probability and Random Variables
Indian Institute of Techonology Hyderabad

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Abstract

Using shift registers to create a random number generator for this assignment.

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: Table Of Contents

Procedure

1) Connecting the 555 timer circuit like the figure (Connection in 555 timer circuit)
2) Then, coupling the 555 timer's clock output to the D-flip flops' clock signal.
3) Now, making the circuit for shift registers using a 4 D-Flip flops (using two 7474 IC's)
4) Then connecting XOR gate (7486 IC) according to the figure 7 (Connection in XOR gate)
5) Then connecting the decoder (7447 IC) and connecting its A,B,C,D with Q_0,Q_1,Q_2,Q_3 respectively as per the figure 7(Connection in Decoder Gate)
6) Then, in accordance with the table, connecting the seven segmented display and the dceoder (7447 IC) 7(Connection of seven segmented display with decoder) and the figure 7(Seven segmented display)
7) Linking all of the independent components, Before connecting the power supply.

Output

Random numbers are generated on the display.

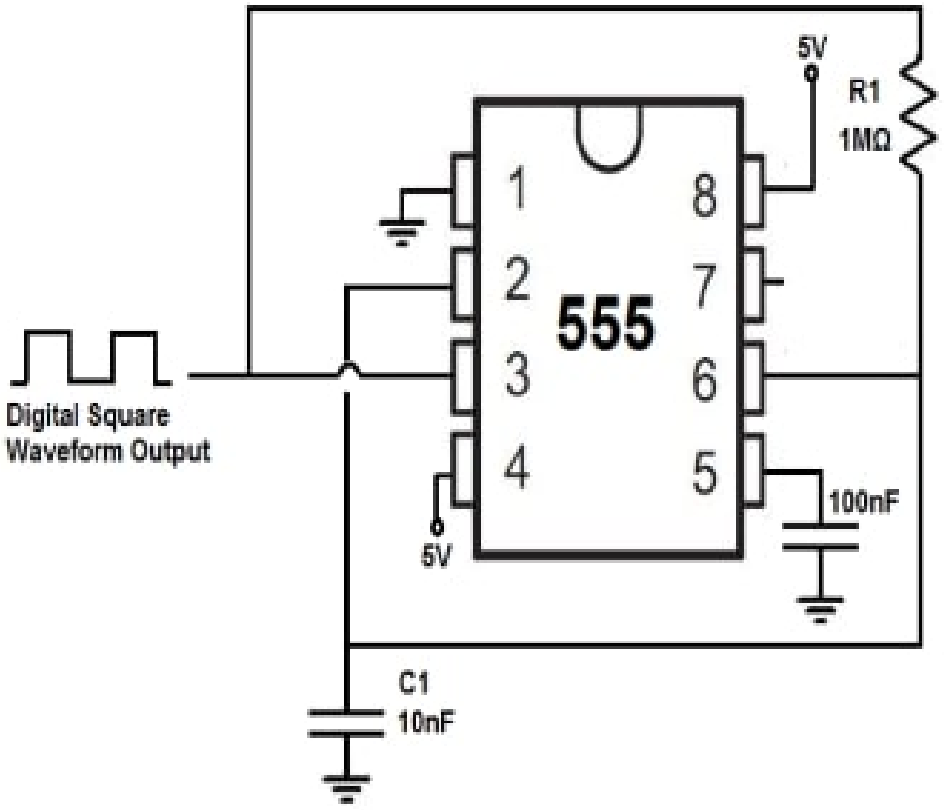

Fig. 7: Connection in 555 timer circuit

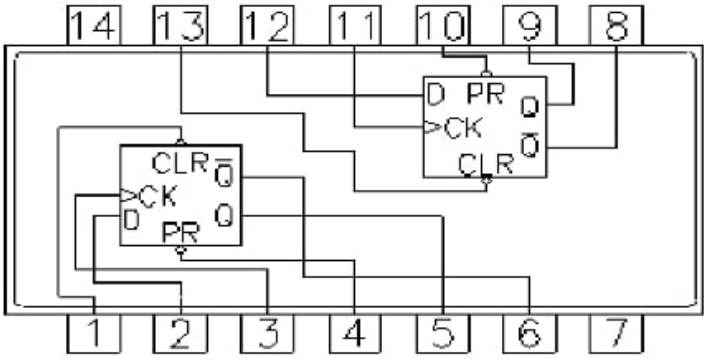

Fig. 7: Connection in 7474 IC

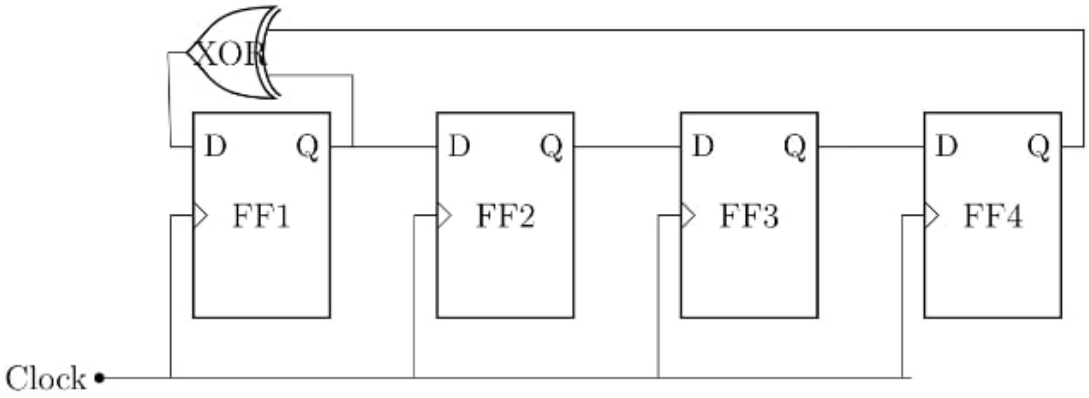

Fig. 7: Connection in XOR gate

Fig. 7: Connection in Decoder gate

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

Fig. 7: Connection of seven segmented display with decoder

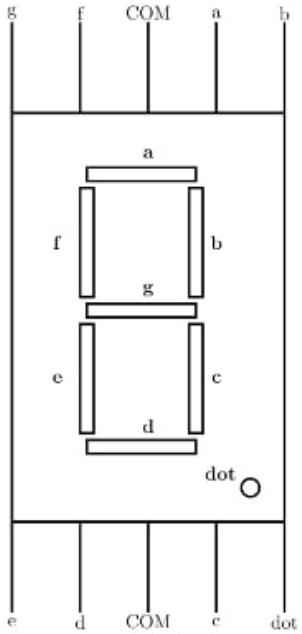

Fig. 7: Seven segmented display

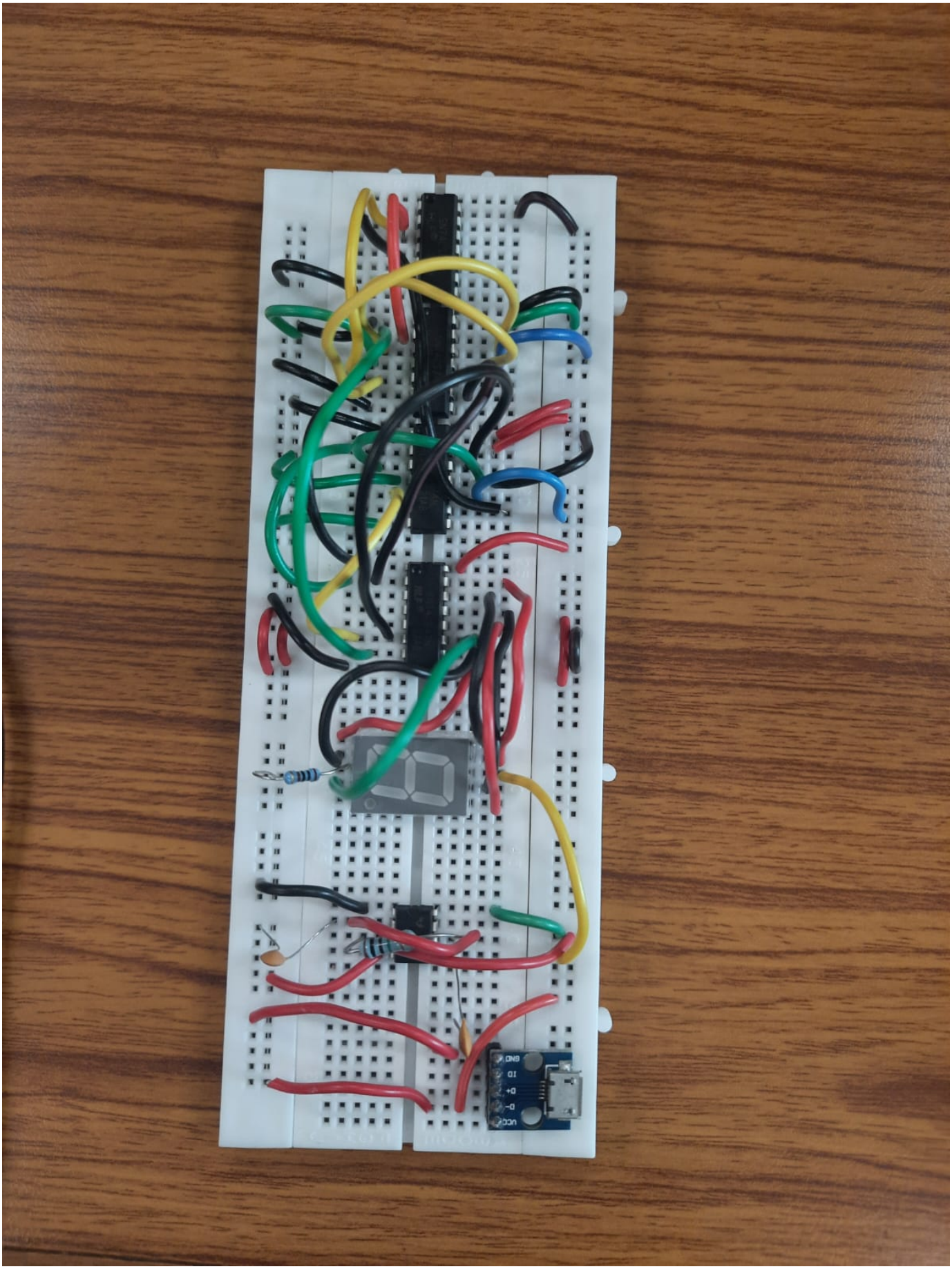

Fig. 7: output

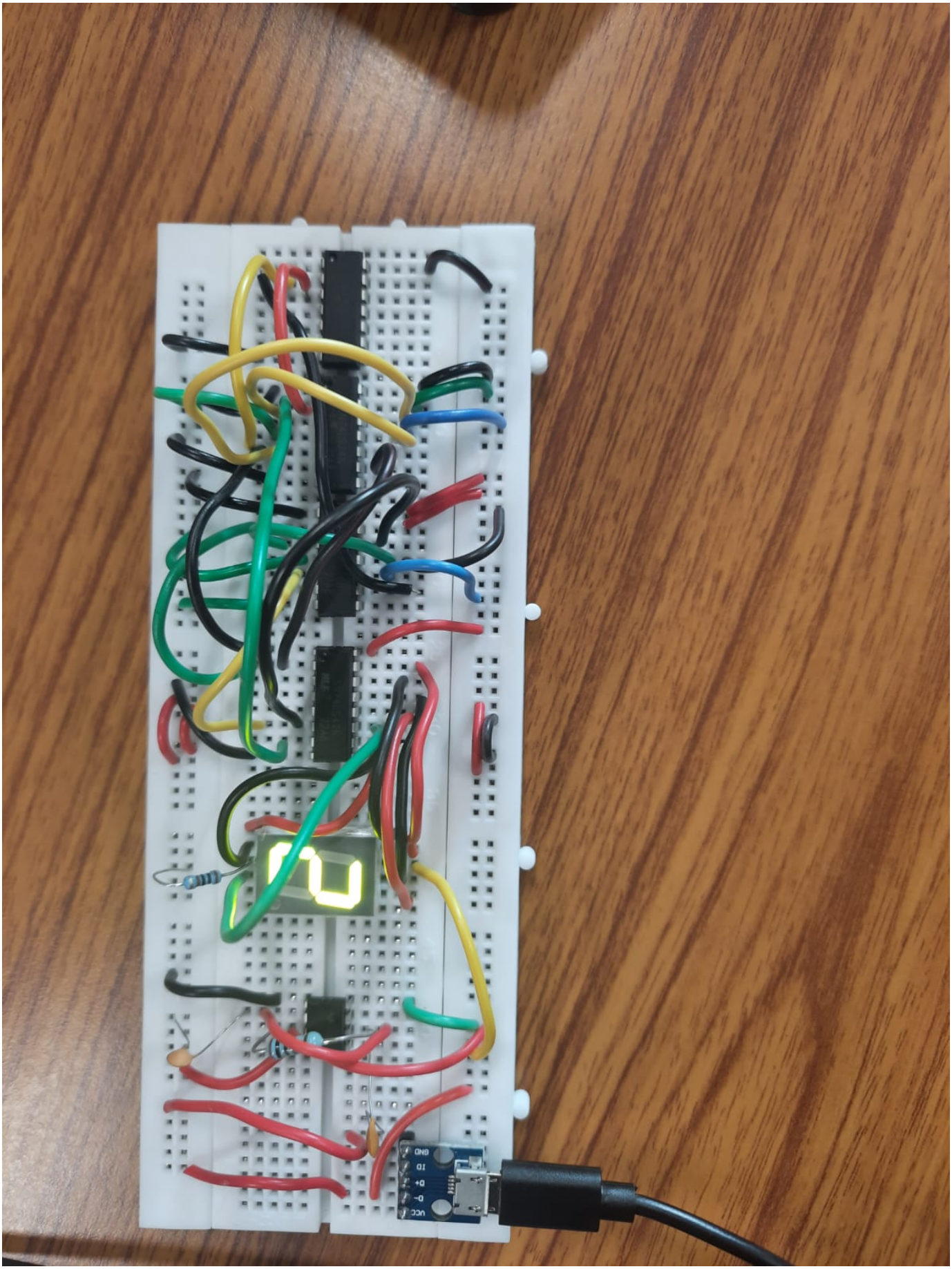

Fig. 7: output

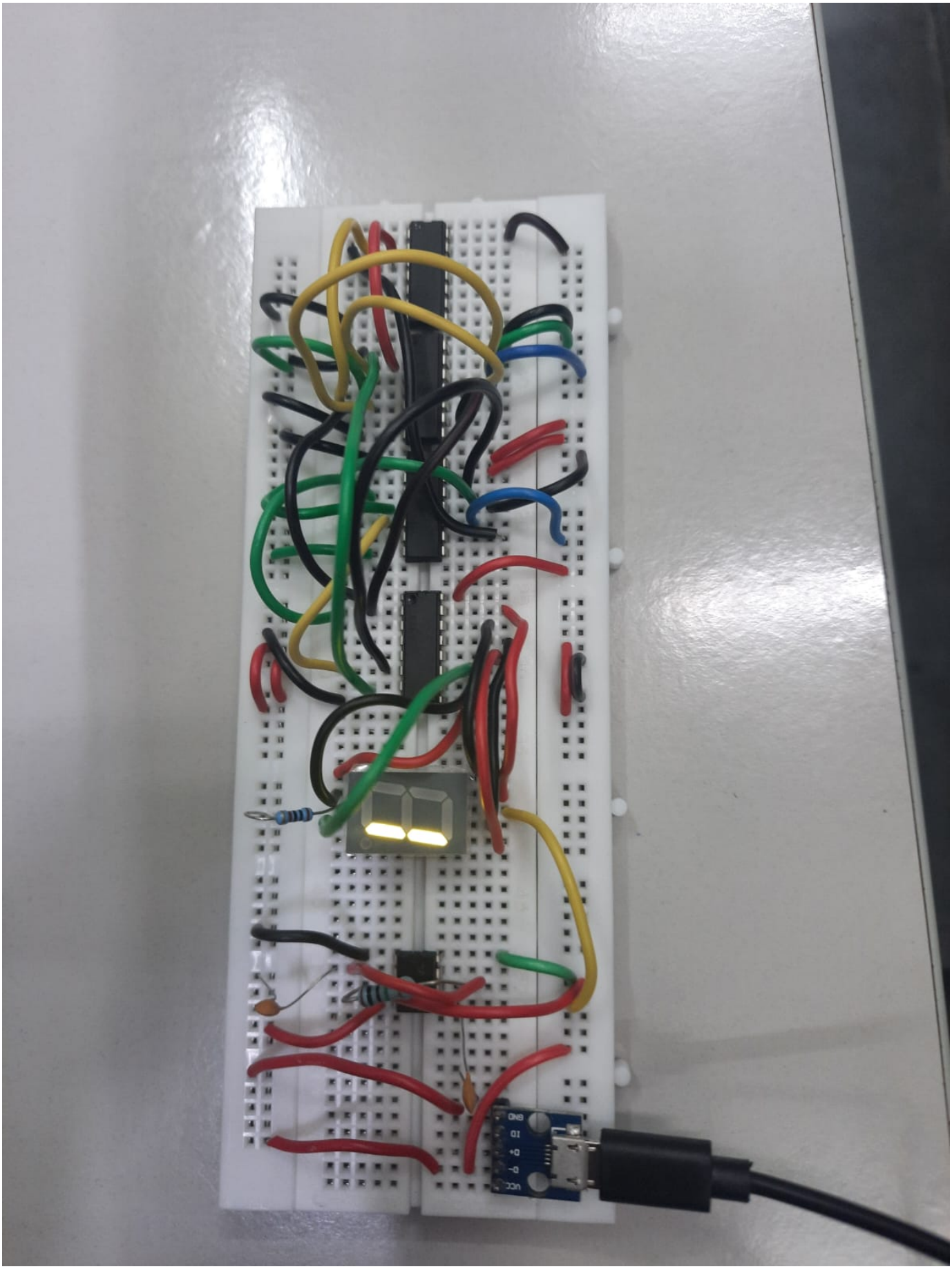

Fig. 7: output

Block Diagram

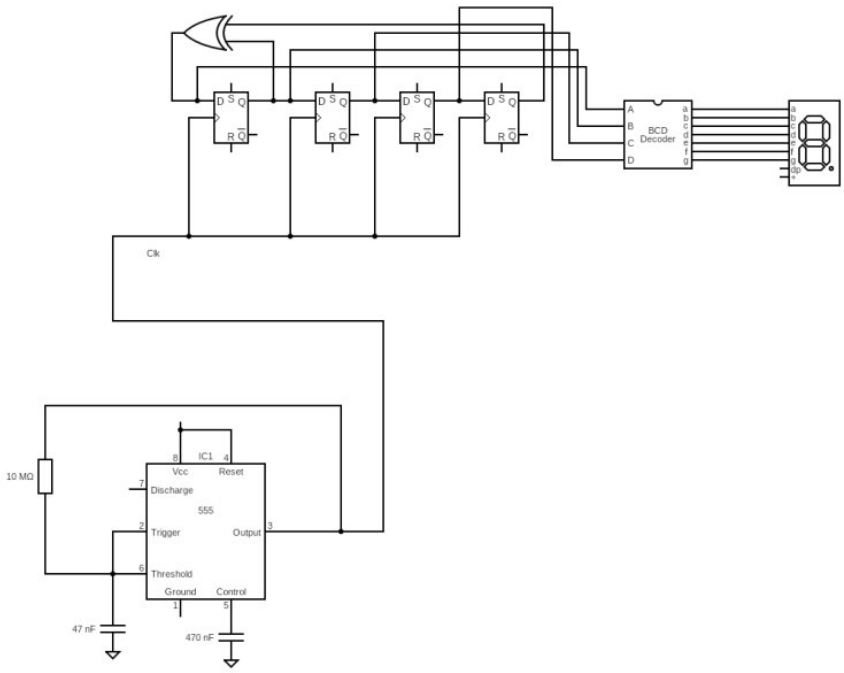

Figure 4: Block Diagram