Probability Hardware Report

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***Abstract*—Use 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: Components used

Procedure

1) We connected the 555 timer circuit like the figure 1
2) Then, we coupled the 555 timer's clock output to the D-flip flops' clock signal.
3) Now we make the circuit for shift registers using a 4 D-Flip flops (using two 7474 IC's)
4) Then we connected XOR gate (7486 IC) according to the figure 7
5) Then we 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 4
6) Make connections between the seven segment display in figure 5 and the 7447 IC in figure 6 as shown in Table
7) make conections like Vcc and GNG to every IC as per the respective IC pinout for IC's 7474,7447,7486.
8) Before connecting the power supply, we linked all of the independent components using figure 3.

Output

Random numbers are generated on the display.

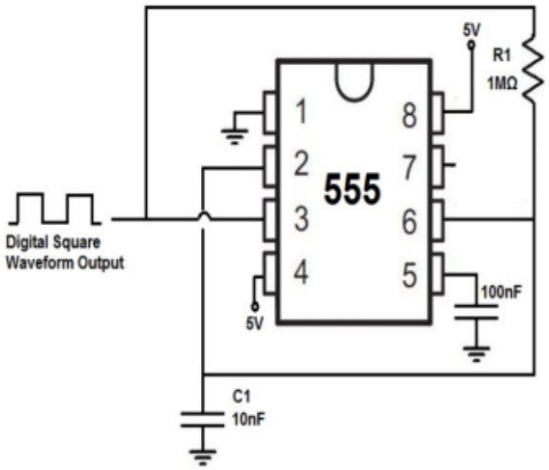

fig:2 Connection in 555 timer circuit

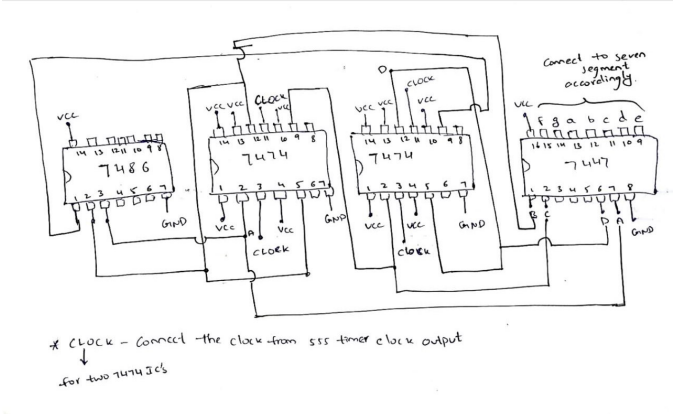

fig:3 circuit connections

fig:4 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:5 Connection of seven segmented display with decoder

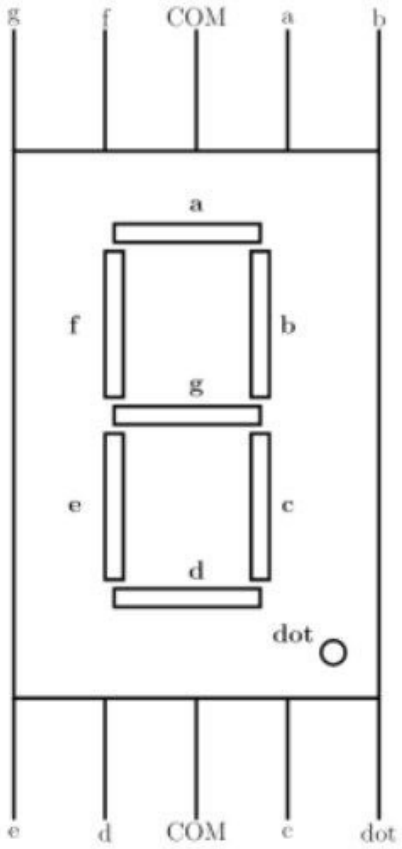

fig:6 Seven segmented display

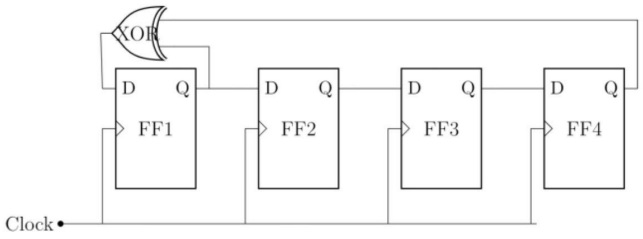

fig:7 Connection in XOR gate

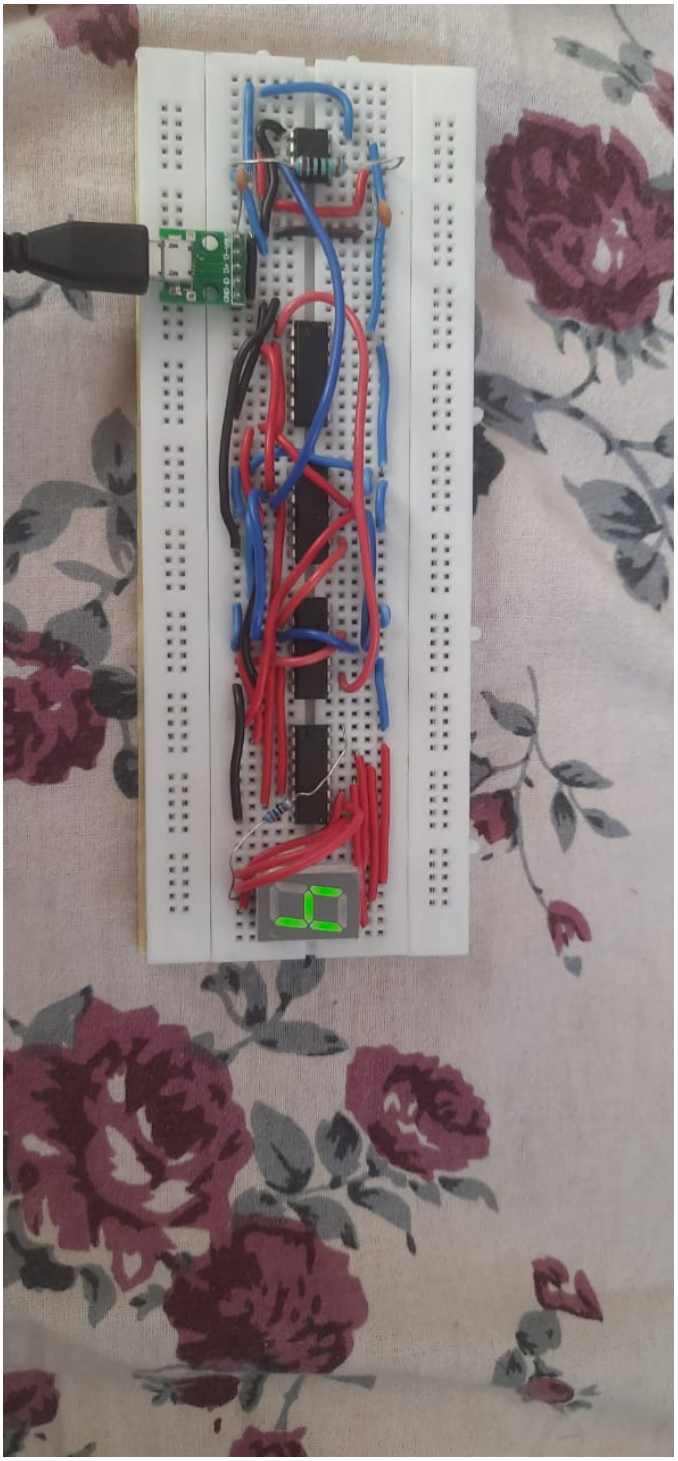

fig:8 output

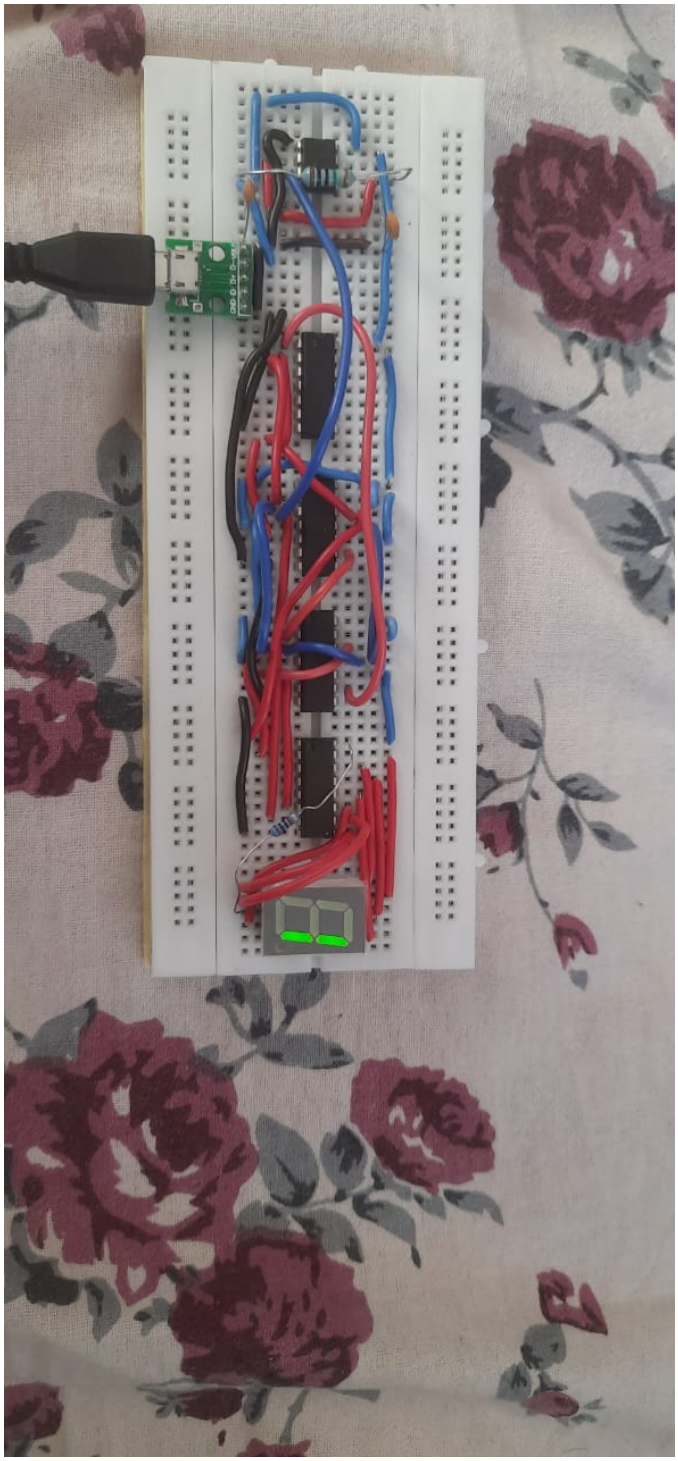

fig:9 output

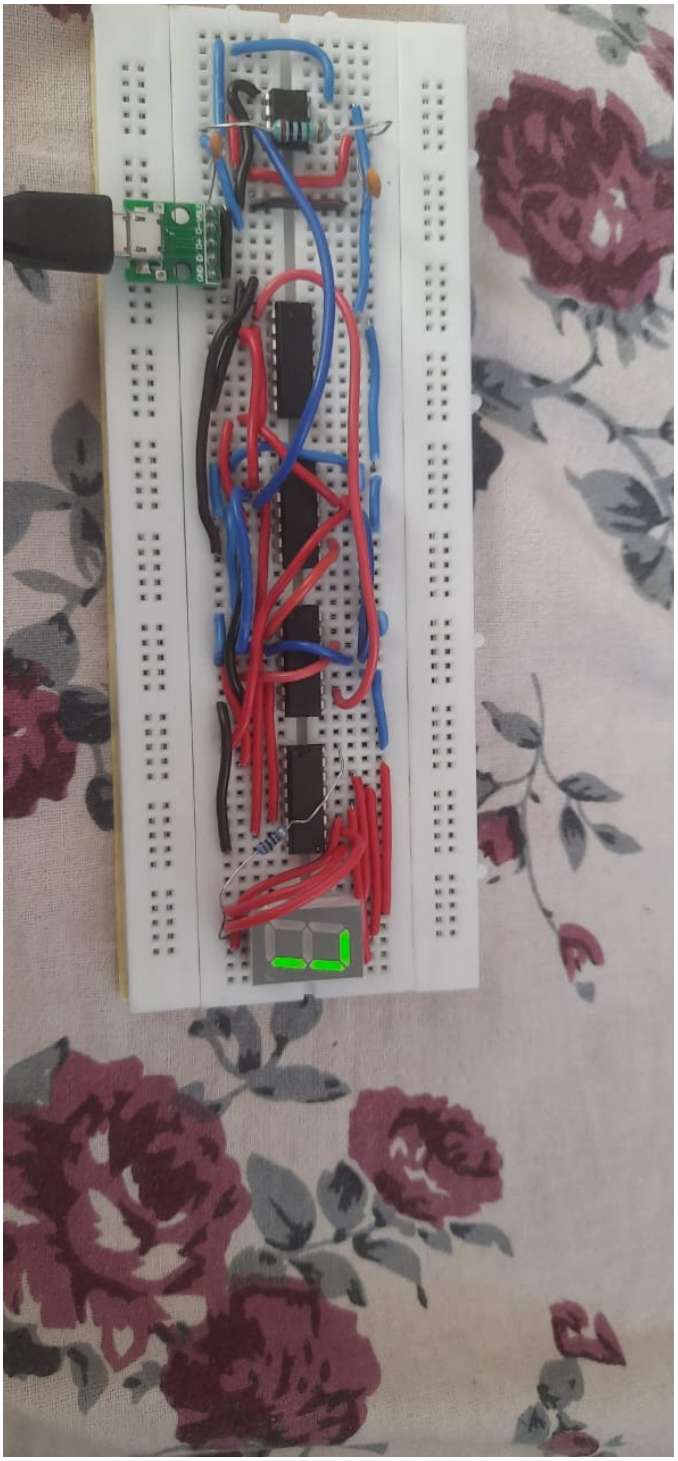

fig:10 output

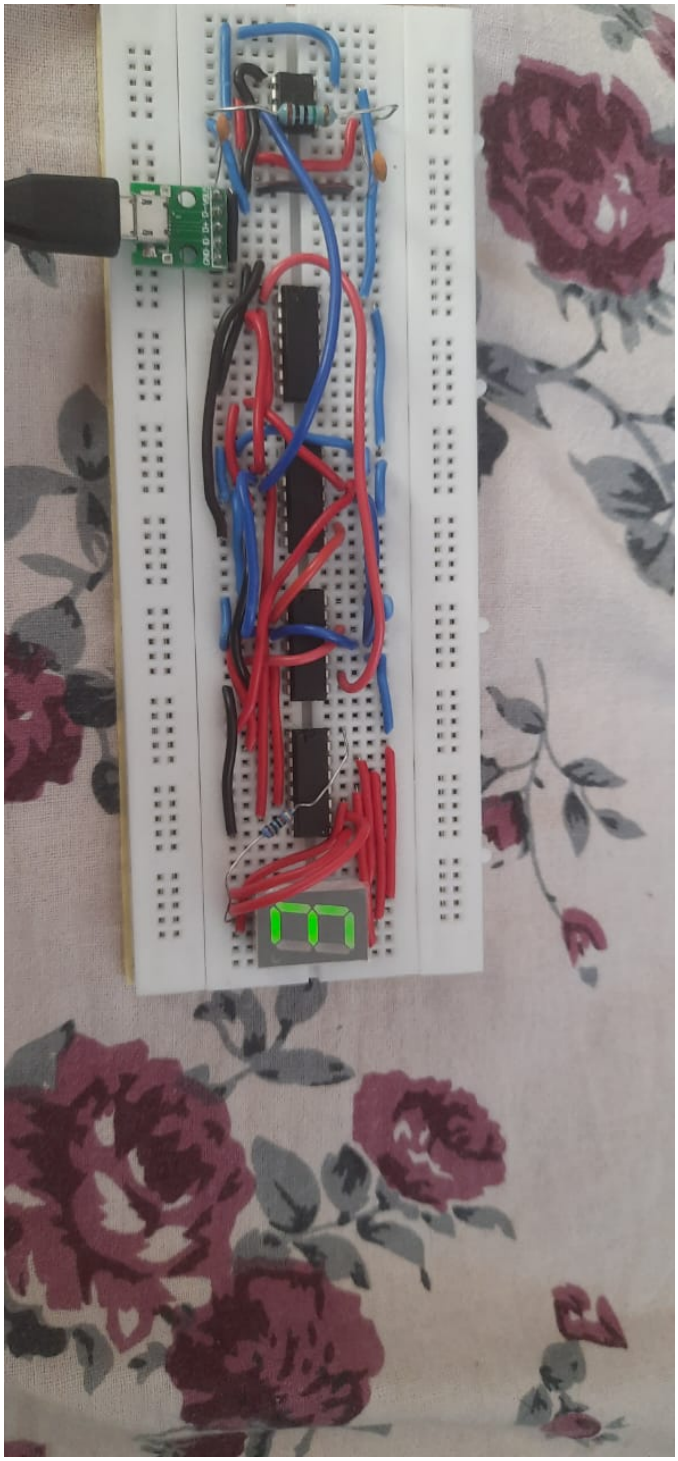

fig:11 output