Probability Hardware Assignment

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***Abstract*—Shift registers were used 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 7
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 7
6) Then, in accordance with the table, we connected the seven segmented display and the dceoder (7447 IC) 7 and the figure 7
7) Before connecting the power supply, we linked all of the independent components.

Output

Random numbers are generated on the display.

1.1.1. Generate the CLOCK signal using the 555 the figure ??

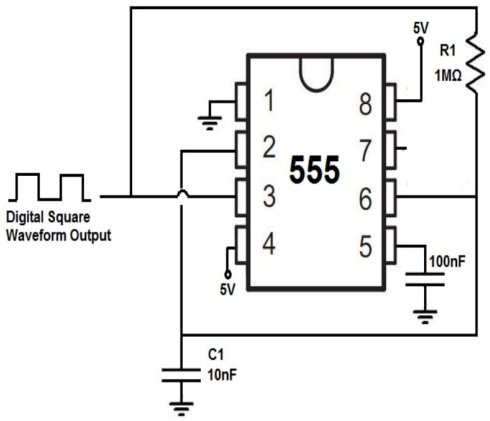

Fig. 7. Connection in 555 timer circuit

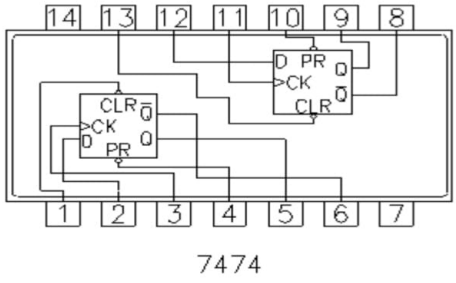

Fig. 7. Connection in 7474 IC

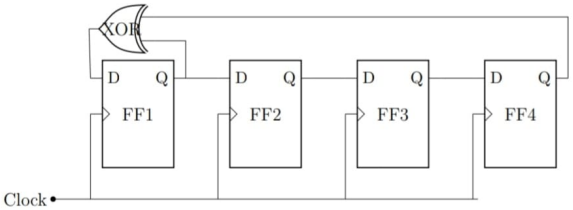

Fig. 7. Connection in XOR gate

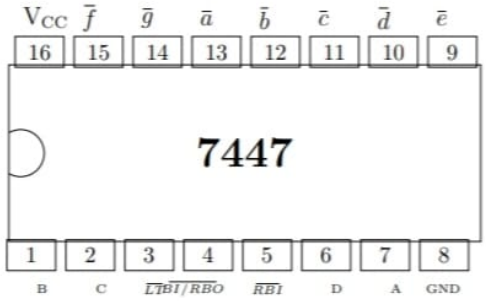

Fig. 7. Connection in Decoder gate

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

Table 1.1.6.1

Fig. 7. Connection of seven segmented display with decoder

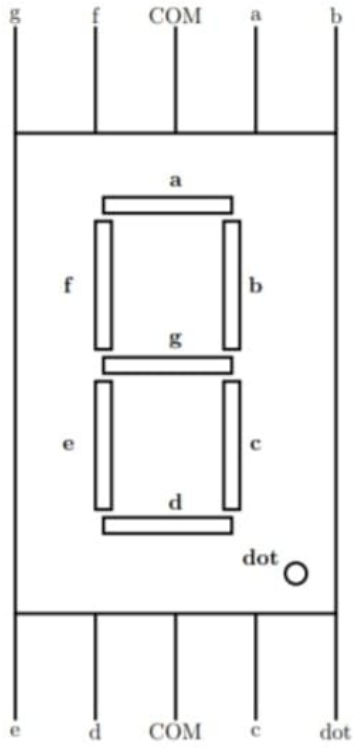

Fig. 7. Seven segmented display

Block Diagram

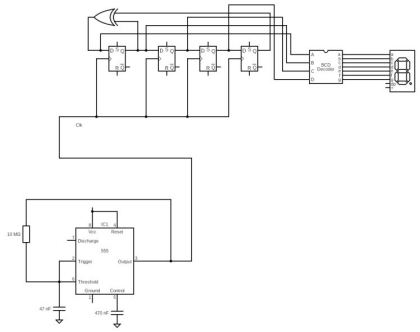

Figure 4: Block Diagram

Fig. 7. Block Diagram

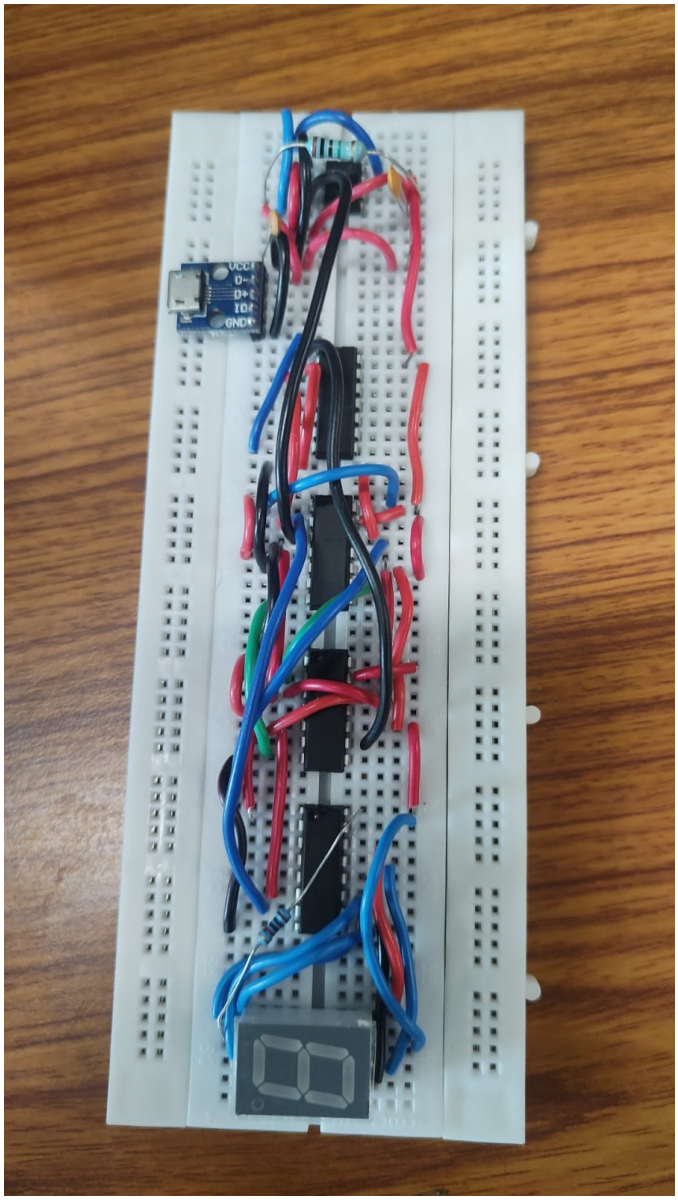

Fig. 7. output

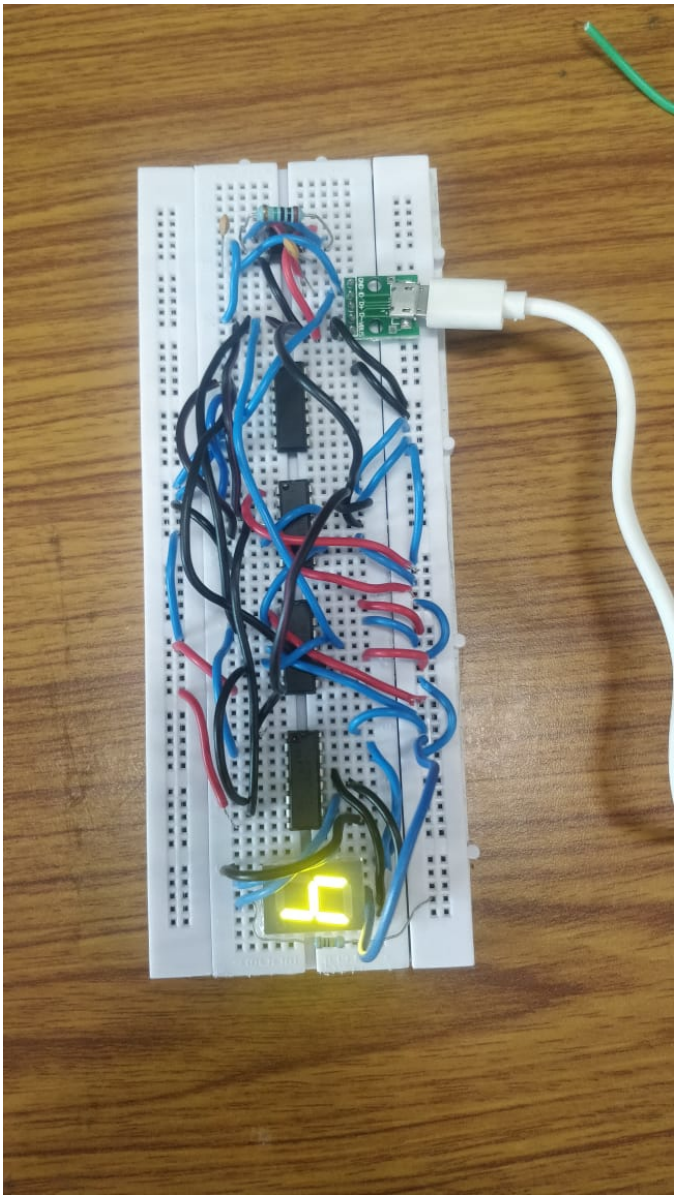

Fig. 7. output

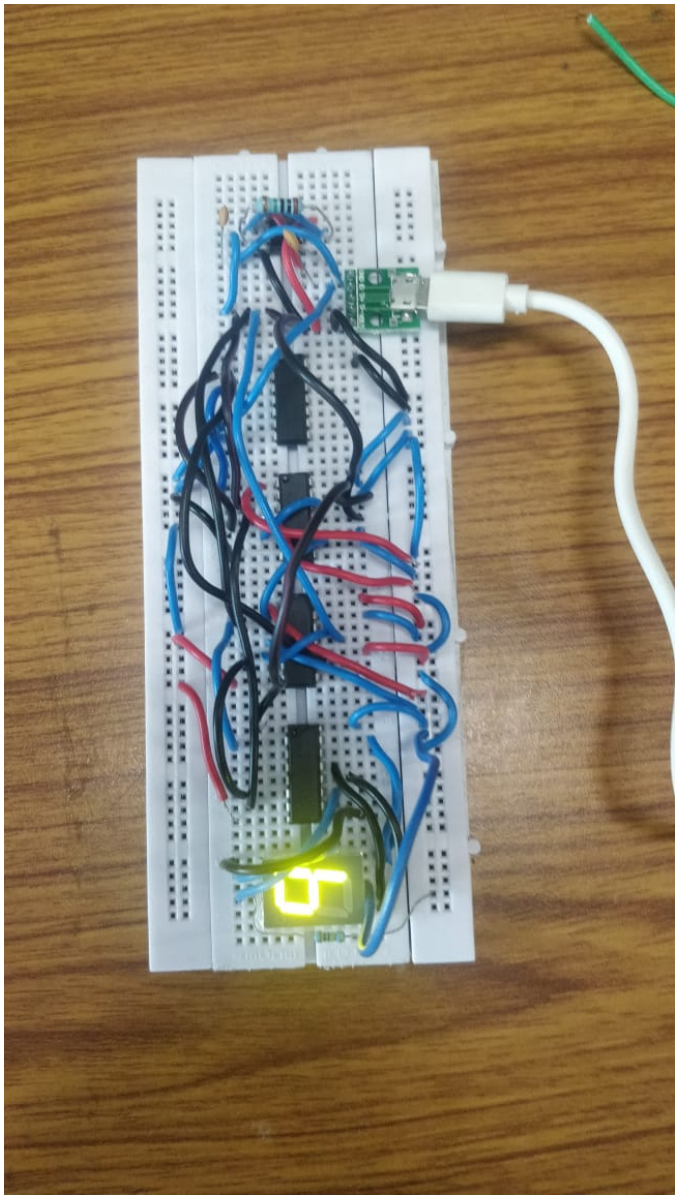

Fig. 7. output