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) The 555 timer circuit was connected as shown in Figure 7 6
2) Next, the clock output of the 555 timer was coupled to the clock signal of the D-flip flops. circuit for shift registers was constructed using four D-flip flops, utilizing two 7474 ICs.
3) The XOR gate (7486 IC) was connected according to the configuration depicted in Figure 7. 6
4) The decoder (7447 IC) was connected, with its A, B, C, and D inputs connected to Q0, Q1, Q2, and Q3, respectively, as indicated in Figure 7. 6
5) Following the table, the seven-segmented display and the decoder (7447 IC) were interconnected, as depicted in Figure 7. 6
6) Finally, all the independent components were linked together before connecting the power supply, ensuring proper functionality of the circuit.

Output

Random numbers are generated on the display.

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

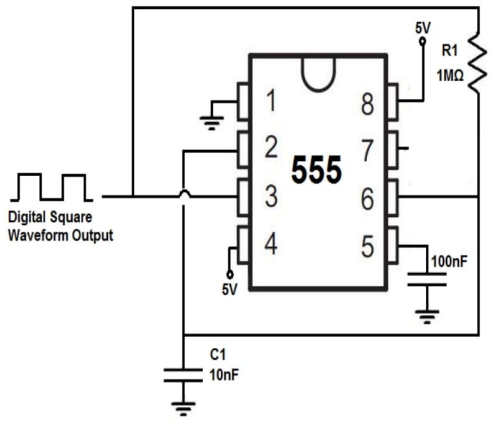

Fig. 6. Connection in 555 timer circuit

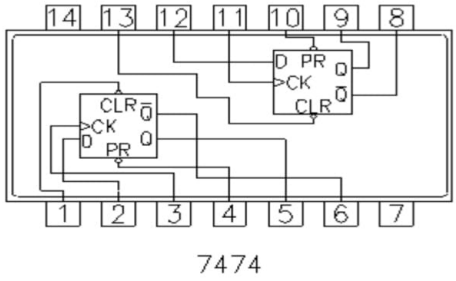

Fig. 6. Connection in 7474 IC

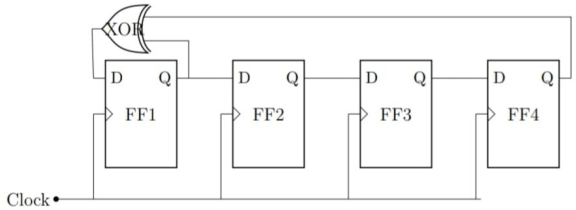

Fig. 6. Connection in XOR gate

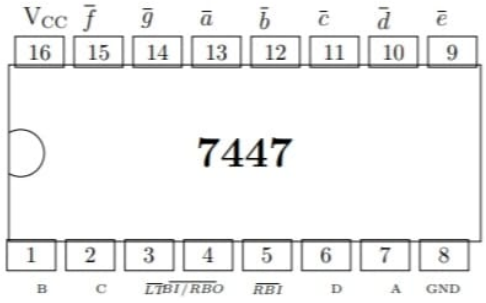

Fig. 6. Connection in Decoder gate

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. 6. Connection of seven segmented display with decoder

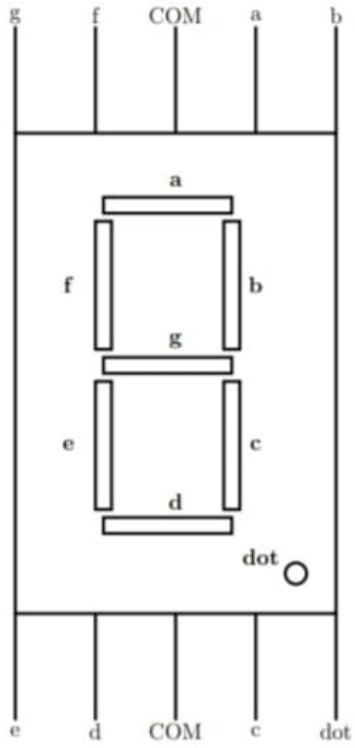

Fig. 6. Seven segmented display

Block Diagram

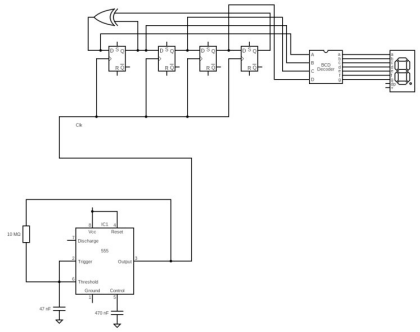

Figure 4: Block Diagram

Fig. 6. Block Diagram

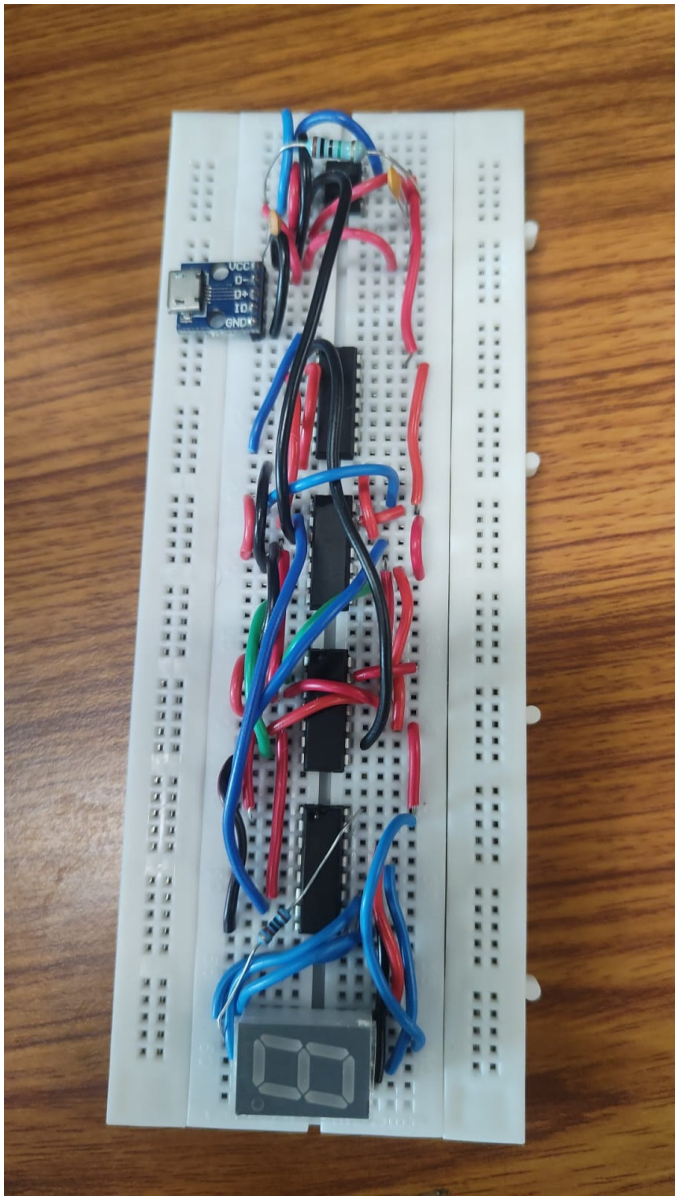

Fig. 6. output

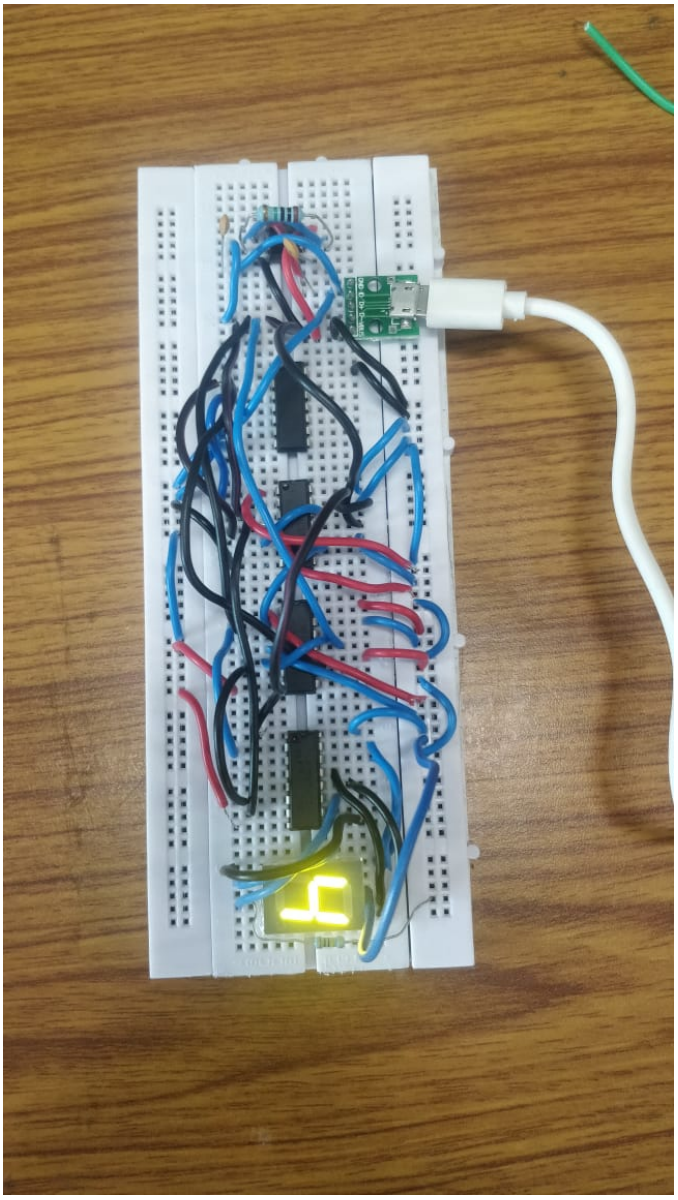

Fig. 6. output

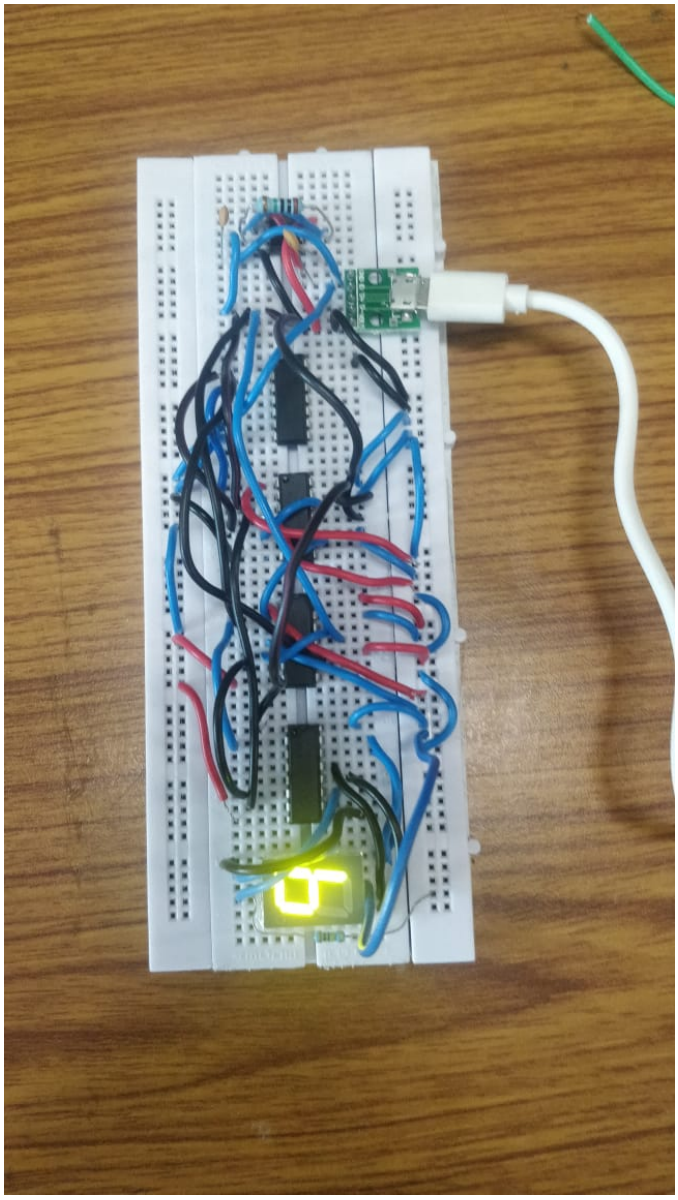

Fig. 6. output