

Random Number Generator (Hardware)

Gitanshu Arora
CS22BTECH11023

Abstract—This document contains the report about the random number generator that I made using flip-flops and XOR gate.

COMPONENTS USED:-

Component	Value	Quantity
Breadboard		1
Seven Segment Display	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 I

CONSTRUCTION:-

- 1) The circuit consists of a 555 timer circuit which is connected as illustrated in the following Fig. 1

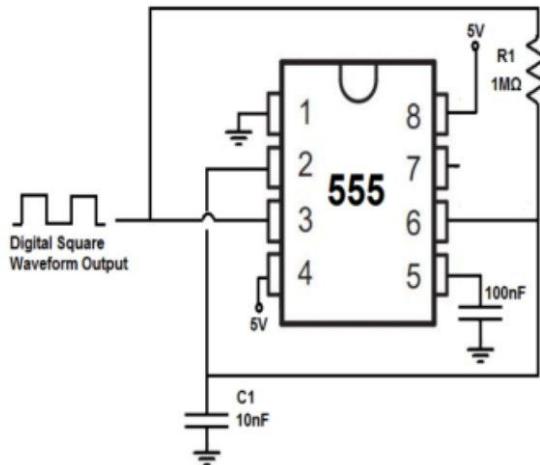


Fig. 1. 555 Timer Circuit

- 2) The CLOCK output of 555 timer circuit is connected to the CLOCK signal of D-Flip flops.
- 3) The circuit for shift registers consists of 4 D-Flip flops (using two 7474 IC's) and one X-OR gate (7486 IC) as shown in Fig. 2

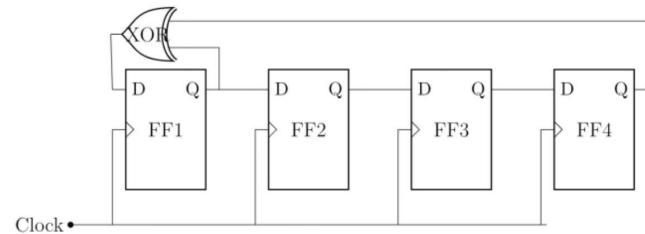


Fig. 2. Connection of 7474 IC's with XOR gate

- 4) The circuit connections of 7474 IC's are as shown in Fig. 4

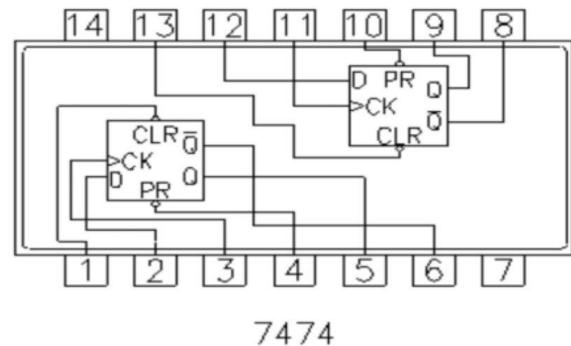


Fig. 3. Connections in 7474 IC

- 5) The output of each D-Flip flop is connected to Decoder IC (7447 IC) as shown in Fig. 4
- 6) The seven segmented display is connected with the decoder (7447 IC) according to the Table III and the Fig. 5
- 7) All the individual circuits are connected with each other and also connected to the power source.



Fig. 4. Connections of 7447 IC

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

TABLE III
CONNECTION OF SEVEN SEGMENTED DISPLAY WITH DECODER

OUTPUT:-

We get different numbers on the display randomly as shown in Fig. 6

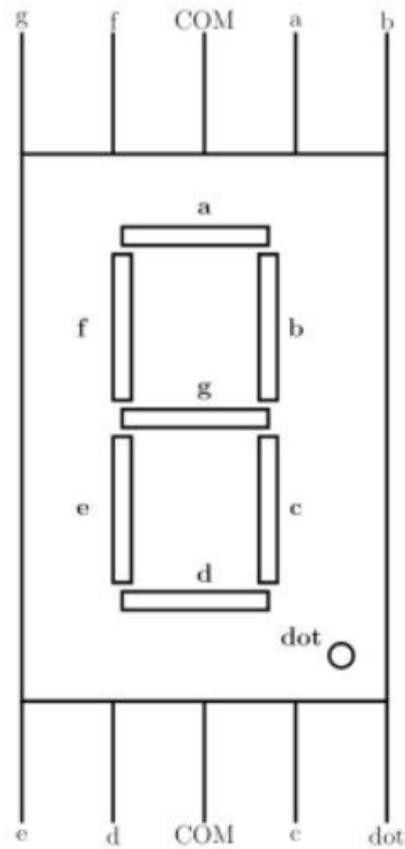


Fig. 5. Seven Segmented Display

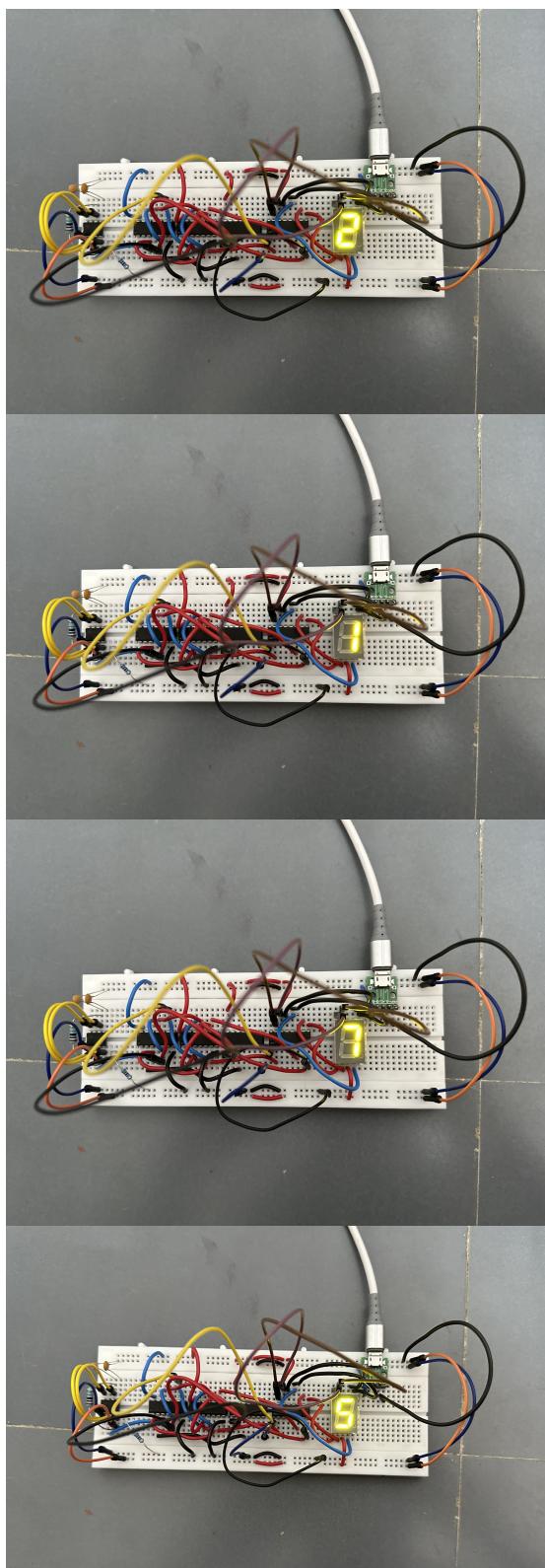


Fig. 6. Output