

Probability Hardware Assignment

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INTRODUCTION

In this project, we'll see how to make a random number generator using various circuit components. We'll be making clock connections, connection for power supply, and flip flops to build our circuit. When we run the circuit after connecting the display to the circuit the numbers on the 7 segment display change frequently. The given diagram represents the block diagram.

Block Diagram

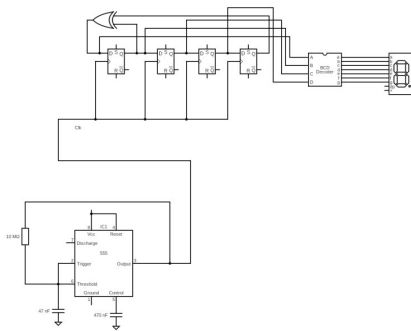


Figure 4: Block Diagram

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 K Ω	1
Capacitor	100 nF	1
Capacitor	10 nF	1
Jumper Wires		

TABLE 0

COMPONENTS USED

PROCEDURE

- 1) We have to connect the 555 timer the way it is connected below. The clock will be connected later to the main circuit.

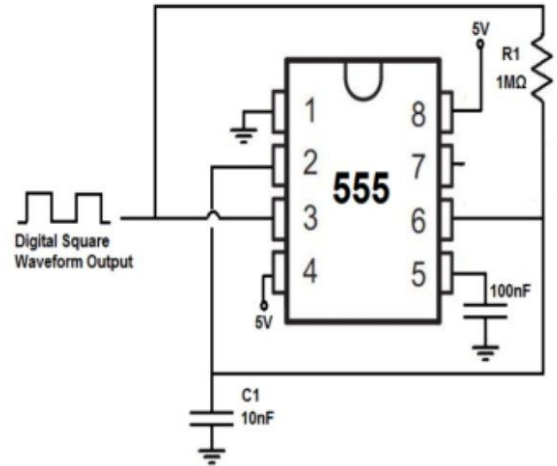


Fig. 1. Connection in 555 timer circuit

- 2) Then, we coupled the 555 timer's clock output to the D-flip flops' clock signal.
- 3) We need to connect the 4 flip flops (7686,7474,7474,7447) in line and we need to connect the wires as given in the figure.

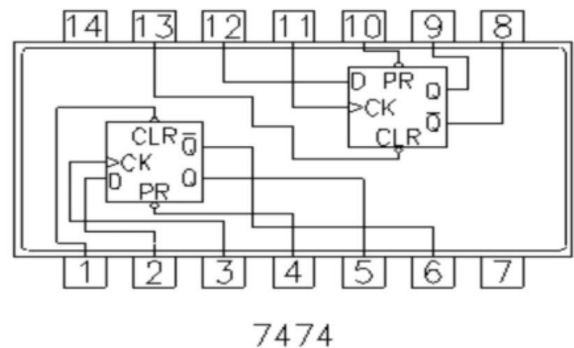


Fig. 3. Connection in 7474 IC

- 4) Then we connected XOR gate (7486 IC) according to the given figure .
- 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 given figure.

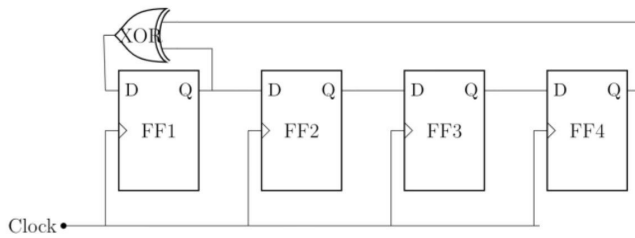


Fig. 4. Connection in XOR gate



Fig. 5. Connection in Decoder gate

- 6) Then, in accordance with the table, we connected the seven segmented display and the decoder (7447 IC) and the figure.

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

Fig. 6. Connection of seven segmented display with decoder

- 7) After doing all the connections we need to connect it to a power supply and we'll get random numbers getting generated.

OUTPUT

Random numbers are generated on the display.

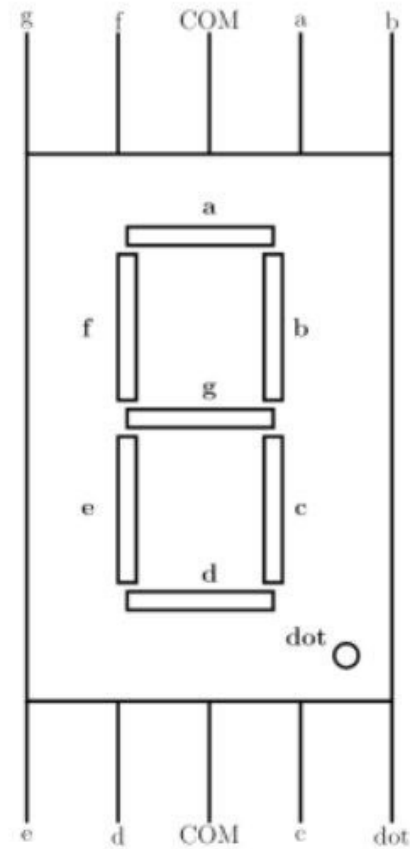


Fig. 6. Seven segmented display

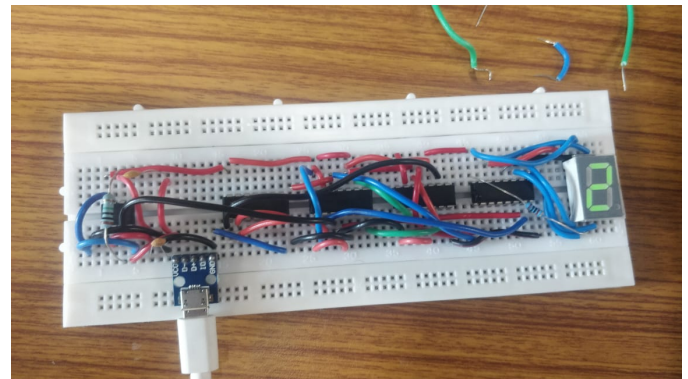


Fig. 7. output

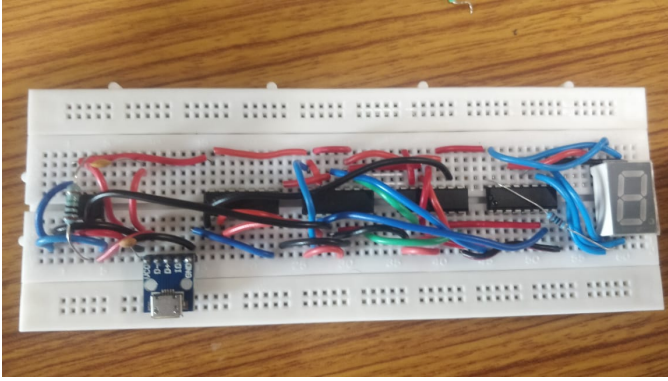


Fig. 7. output

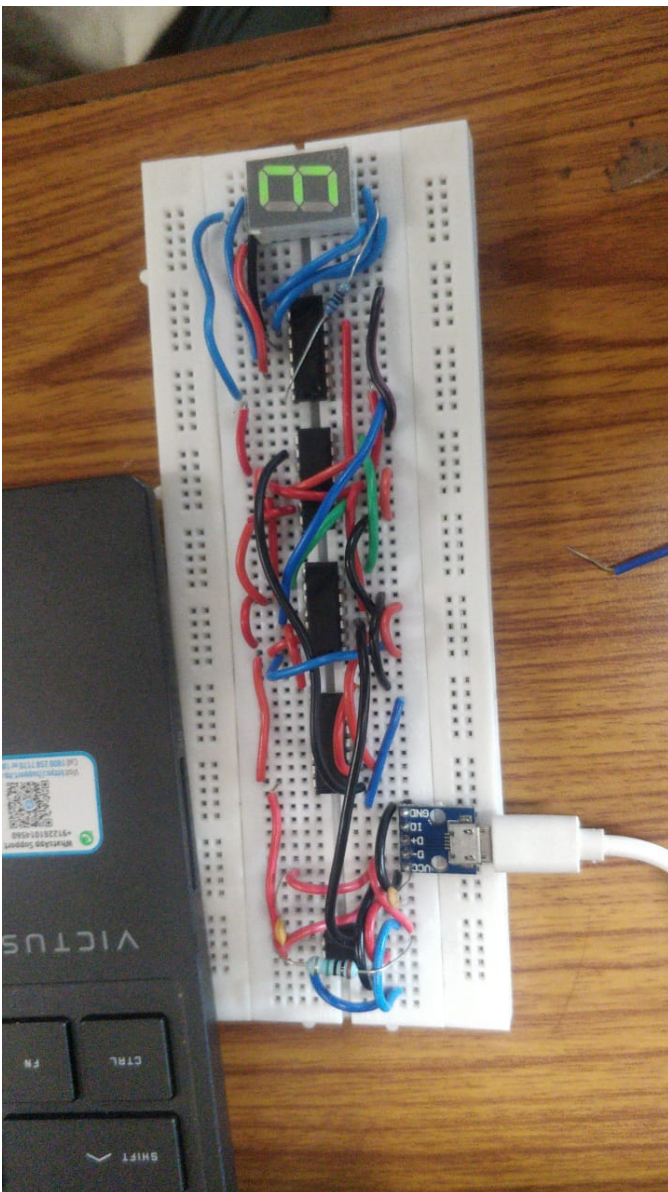


Fig. 7. output