

# Probability Hardware Assignment

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**Abstract**—In this assignment we have made a Random number generator using shift registers

## 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 $\Omega$	1
Capacitor	100 nF	1
Capacitor	10 nF	1
Jumper Wires		

TABLE 0  
COMPONENTS USED

## PROCEDURE

- 1) We connected the 555 timer circuit according to the figure 1

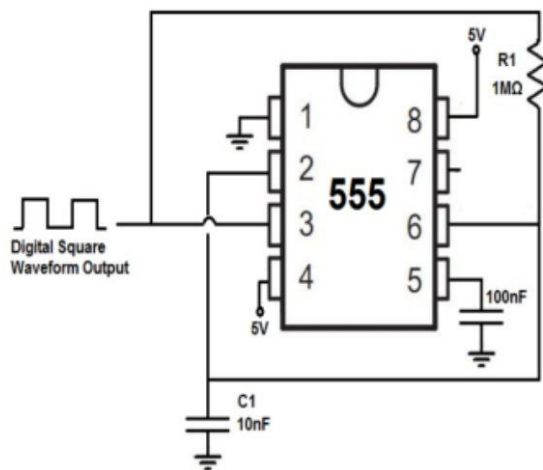


Fig. 1. Connection in 555 timer circuit

- 2) Then we connected Clock output of 555 timer circuit to the clock signal of D-Flip flops

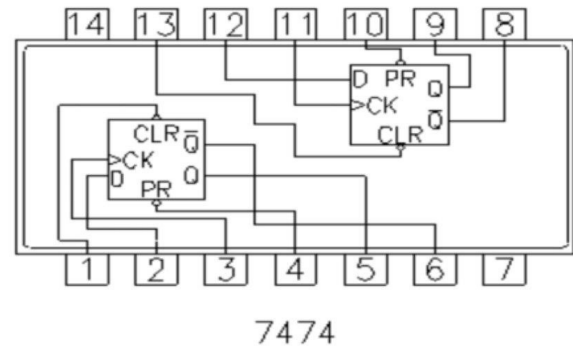


Fig. 3. Connection in 7474 IC

- 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 4

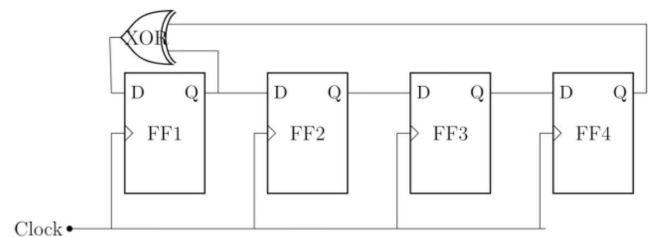


Fig. 4. Connection in XOR gate

- 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 5
- 6) Then we connected The seven segmented display and then connected it with the dceoder (7447 IC) according to the table 6 and the figure 6
- 7) We connected all the independent parts with each other and then connected the power source

## OUTPUT

Output was changing digits on the seven segment display the output is shown in figure 7



Fig. 5. 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. 6. Connection of seven segmented display with decoder

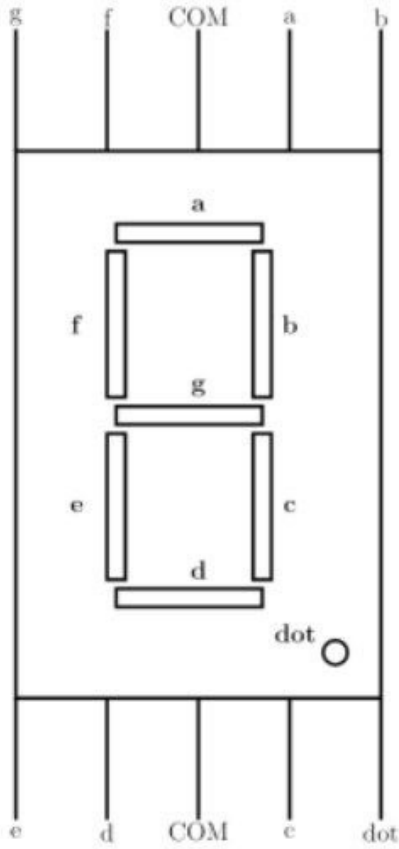


Fig. 6. Seven segmented display

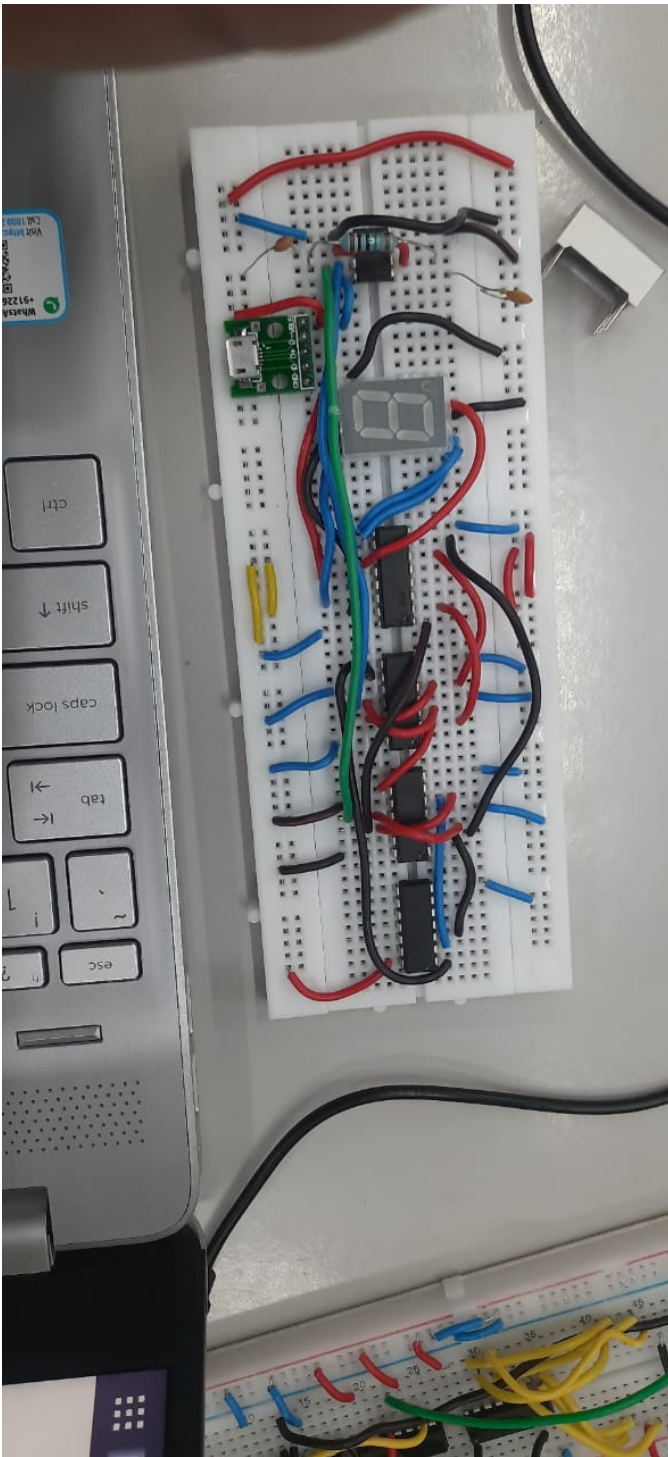


Fig. 7. output