

# AI-1110: Hardware Assignment

## Random number generator

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### DESCRIPTION

This Document contains the report about a random number generator made using flip flops, ic, XOR, decoder.

### COMPONENTS

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		

### PROCEDURE

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

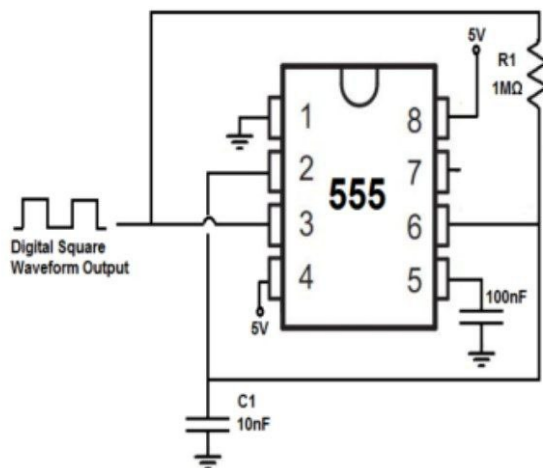


Fig. 1. 555 timer circuit

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

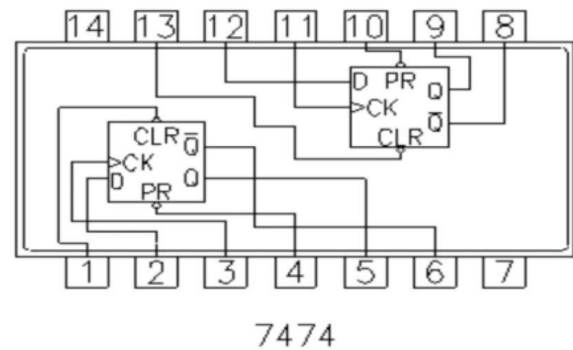


Fig. 2. Connection in 7474 IC

- 3) Now I made the circuit for shift registers using a 4 D-Flip flops (using two 7474 IC's)
- 4) Then I connected XOR gate (7486 IC) according to the figure 4

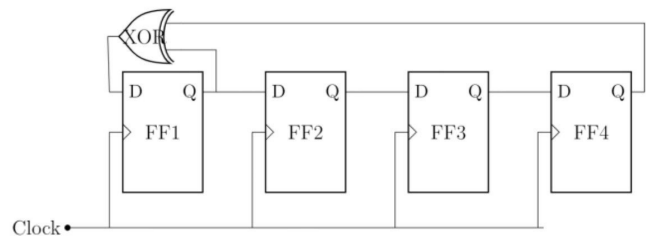


Fig. 4. Connection in XOR gate

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



Fig. 5. Connection in 7474 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 6

CONNECTION OF SEVEN SEGMENTED DISPLAY WITH DECODER

OUTPUT

The seven segment display shows various digits randomly.7

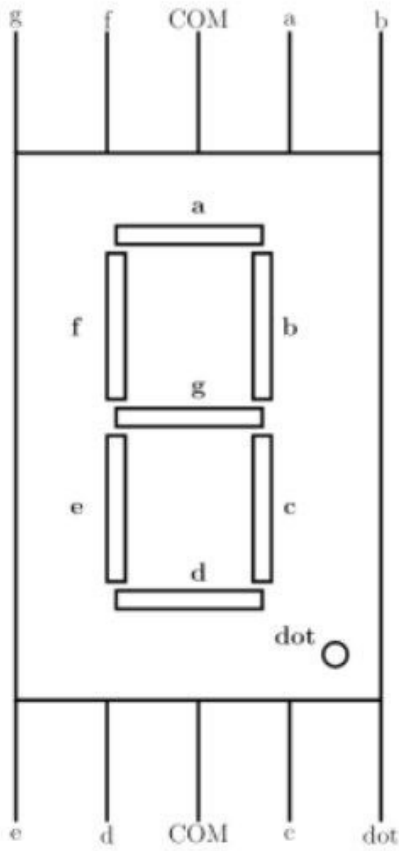


Fig. 7. Seven segmented display

Fig. 7. Final circuit

