

Probability Hardware Assignment

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BT22BTECH11010

Abstract

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

| 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 | $1K\Omega$ | 1 |
| Resistor | $1M\Omega$ | 1 |
| Capacitor | 100nF | 1 |
| Capacitor | 10nF | 1 |
| Jumper Wires | | 20 |

Table 1

Procedure

1. Connect 555 timer according to the figure 1

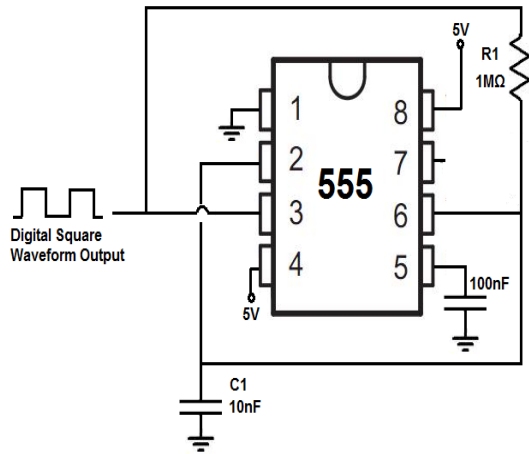


Figure 1: Connection in 555 timer circuit

2. Connect clock signal of D-Flip flops to the Clock output of 555 timer circuit.
3. The next step in the process would be to make the circuitary in such a way that shift registers for using a 4 D-Flip flops (using two 7474 IC's)

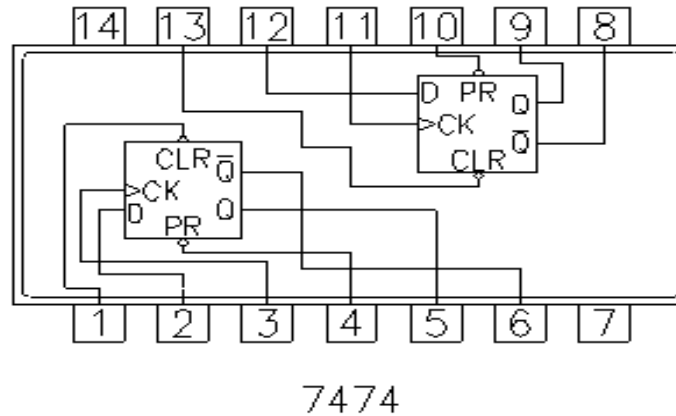


Figure 2: Connection in 7474 IC

4. The next connection is XOR gate (7486 IC) according to the figure 3
5. A,B,C,D of the decoder (7447 IC) is connected with Q_0, Q_1, Q_2, Q_3 respectively as per the figure 4

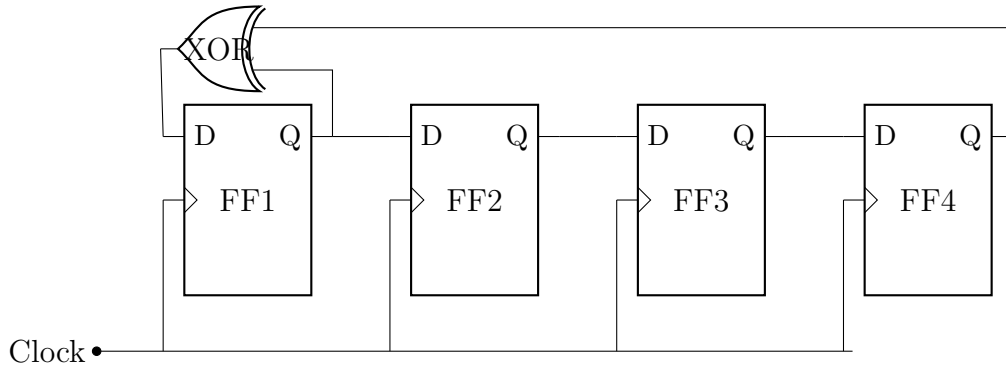


Figure 3: Connection in XOR gate

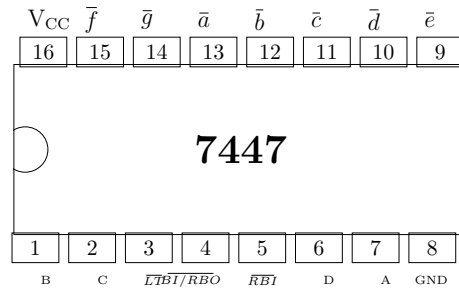


Figure 4: Connection in Decoder gate

6. Final step is to connect the seven segmented display and then connected it with the dceoder (7447 IC) according to the table 2 and the figure 5

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

Table 2: Connection of seven segmented display with decoder

Output

Output as expected is randomly changing numbers as per the figure 6

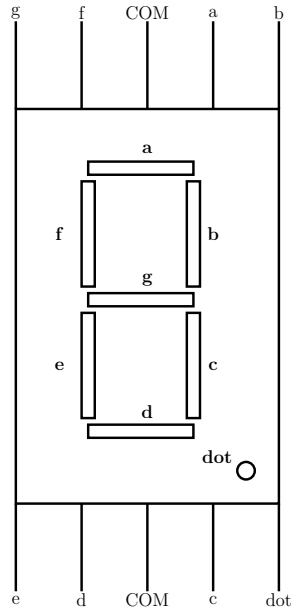


Figure 5: Seven segmented display

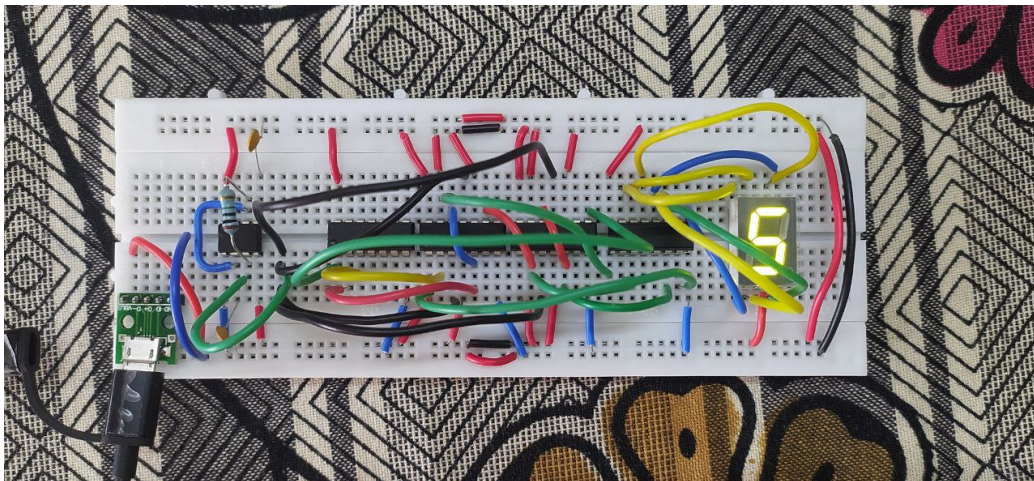


Figure 6: output