

AI1110: Probability and Random Variables Hardware Project

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1 ABSTRACT

In this project, we made a random number generator using shift registers.

2 COMPONENTS USED

- 1) Breadboard
- 2) Seven segment display
- 3) Decoder
- 4) 2 Flip Flop IC's
- 5) X-OR GATE
- 6) 555 IC
- 7) Resistors(1K, 1M)
- 8) Capacitors(100nF, 10nF)
- 9) jumper wires

3 PROCEDURE

- We generate the clock signal for the flip flops by using the 555 timer IC and making the respective connections as shown in the figure 1.

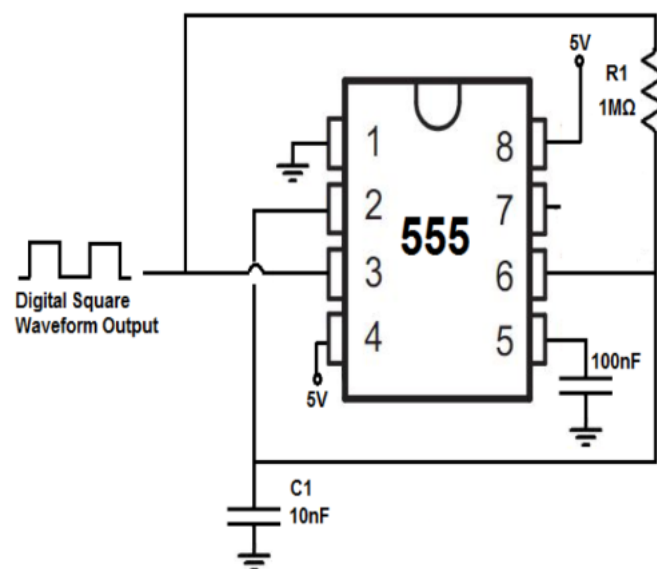


Fig. 1: 555 Timer IC

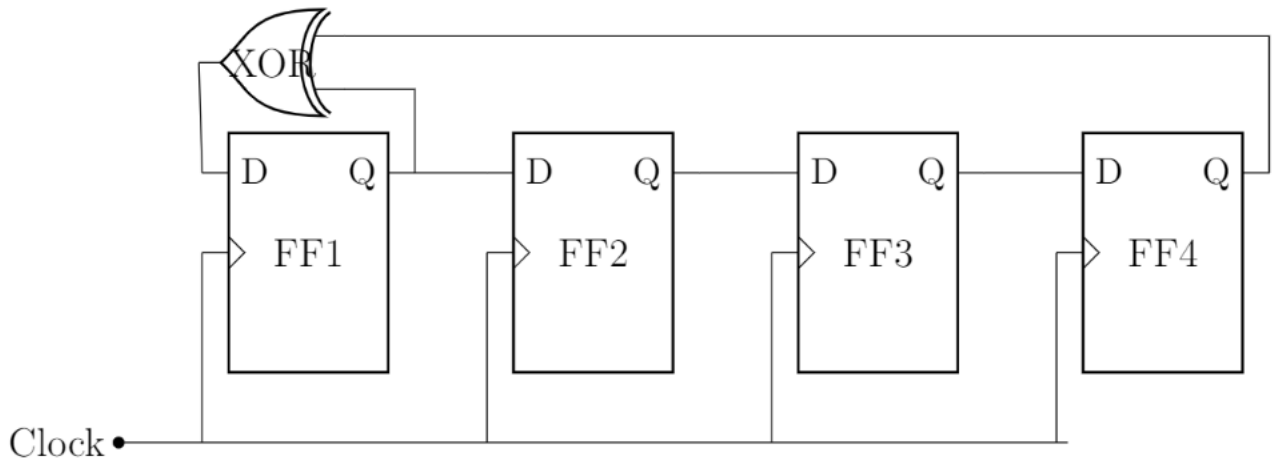


Fig. 2: Shift register

- Next, we used the flip flops to make a shift register with 4 bits, Q_0, Q_1, Q_2, Q_3 , and the inputs being D_0, D_1, D_2, D_3 . This is shown in figure 2
- Then the XOR gate is connected such that $D_0 = Q_0 \oplus Q_3$.
- Then, the four bits are connected to the decoder IC, which is connected to the 7-segment display.

4 OUTPUT IMAGE

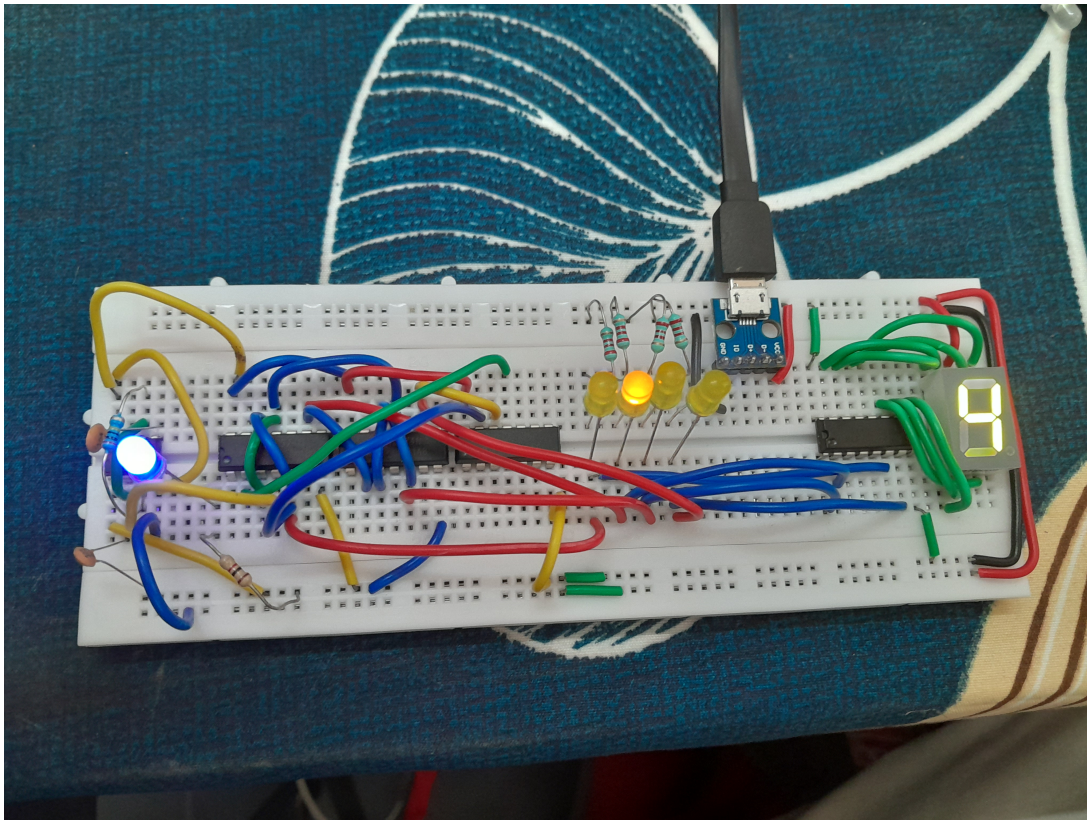


Fig. 3: circuit working