

# Hardware assignment

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**Aim:**

To make a circuit design which can display the random numbers on the seven segment display

### Components:

- 1) Breadboard
- 2) Seven Segment Display
- 3) 7447 Seven Segment Display Decoder
- 4) 7474 FlipFlop
- 5) 7486 X-OR gate
- 6) 555 IC
- 7) Resistor 10M $\Omega$
- 8) Resistor 1K $\Omega$
- 9) Capacitor 47nF
- 10) Capacitor 470nF
- 11) USB connector
- 12) wires

### Making the circuit:

- 1) Generate a clock using 555 IC by connecting as shown below

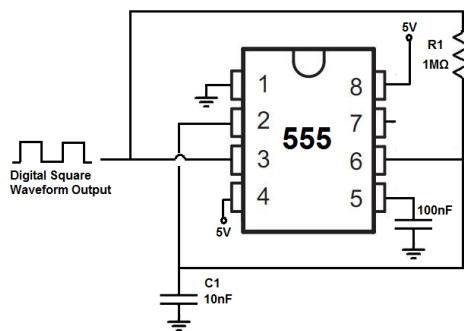


Fig. 1.

- 2) connect the clock output of 555 IC to the clock signal of Flip Flops

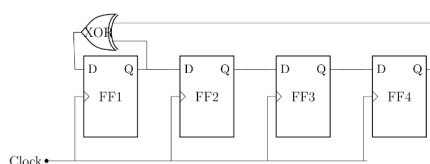


Fig. 2.

- 3) Now make the circuit for shift registers using 4 D-Flip flops (by using two 7474 IC's) and one XOR gate (7486 IC) as shown in figure 3,

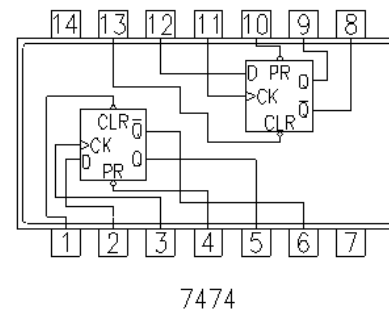


Fig. 3.

- 4) Connect the output of each D-flip flop to Decoder IC (7447 IC)

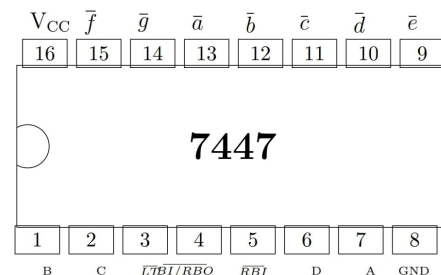


Fig. 4.

- 5) As per the pinout of IC 7474 [2,12] pins of both IC's need to be connected to the [7,1,2,6] of decoder IC respectively
  - 6) connect seven segment display to 7447 IC as per the letters *i.e* 'a' connected to 'ā'
  - 7) seven segment shown in fig 6
  - 8) connect to power supply using chip given
- output results are**

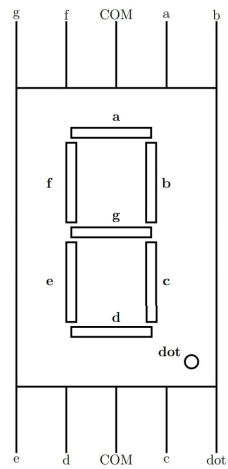


Fig. 7.

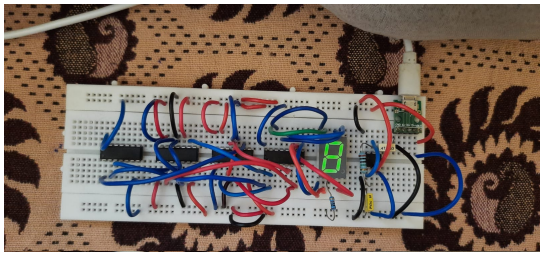


Fig. 8.

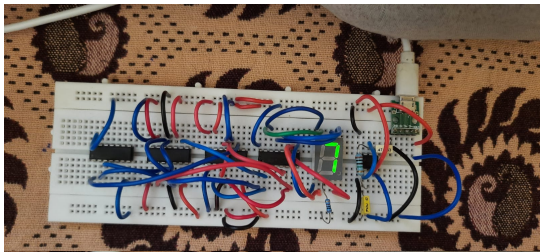


Fig. 8.

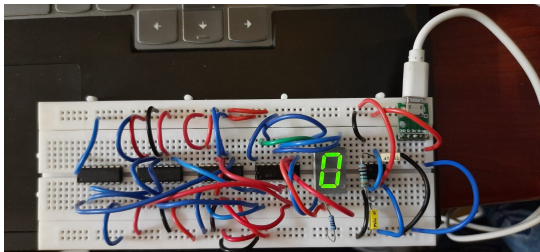


Fig. 8.