

Report on Hardware Assignment

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CS22BTECH11043

1. Components:

| Components | 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 Ohm | 1 |
| Resistor | 1M Ohm | 1 |
| Capacitor | 100nF | 1 |
| Capacitor | 10nF | 1 |
| Connecting wires | | 20 |

2. Description:

1. First, a micro USB is used to generate a VCC and GND bus.

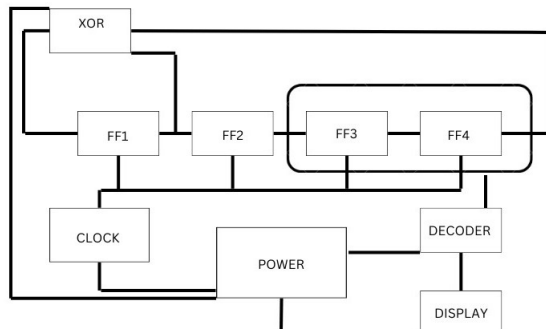
2. A clock signal is generated by forming a circuit using a 555 timer IC, a 10 Ω resistor, 100nF and 10nF capacitors with certain frequency which increases with the resistance to introduce a time delay for the random numbers to be generated.

3. The clock output of the 555 timer circuit is connected to the clock signal of D flip-flops.

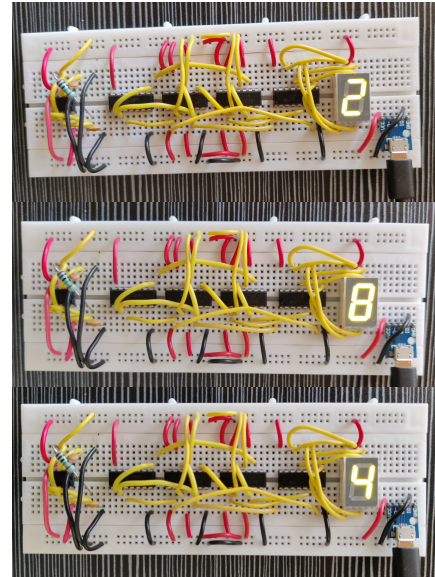
4. A circuit for shift registers is created using 4 D flip-flops (two 7474 ICs) and an XOR gate (7486 IC). Each output of the D flip-flop is connected to a decoder IC (7447 IC).

5. The connections are made for the seven-segment display to display the random numbers.

3. Block Diagram:



4. Observation:



I have observed that random numbers that are generated are displayed on the seven-segment display with a frequency that increases as we increase the resistance connected to the 555 timer IC.