Hardware Assignment Documentation

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Aim

Random Numbers Generation using shift registers.

Description

7-segment displays provide a convenient way of displaying numerical information from zero to nine as they basically consist of a load of light emitting diodes connected together within a single indicator package. The circuit uses 5V from Micro USB and this is Vcc for the circuit. The X-OR gate - a digital logic gate that gives a true output when the number of true inputs is odd, Flip flops and Decoder are to be connected to the clock - IC 555 to generate random numbers in the 7-segment displayer. The numbers follow a sequence of - 1, 3, 7, 14, 15, 13, 10, 5, 11, 6, 12, 9, 2, 4 ,8, 1, 3... This runs till the source is connected. Direct connection from 7-segment displayer to the source voltage should not be done as the display is very sensitive a resistor of 1kΩ should be added such that no short circuit occurs. The clock has a certain period depending on the values of capacitors and resistors. The random generator generates numbers from 1 to 15 random fashioned.

Components Used

1. Breadboard
2. Seven Segment Display - Common Anode
3. 7447 Decoder
4. 7474 Flip Flops
5. 7486 X-OR gate
6. 555 IC
7. Resistor 10MΩ
8. Resistor 1KΩ
9. Capacitor 100nF
10. Capacitor 100nF
11. Jumper wires
12. Micro USB

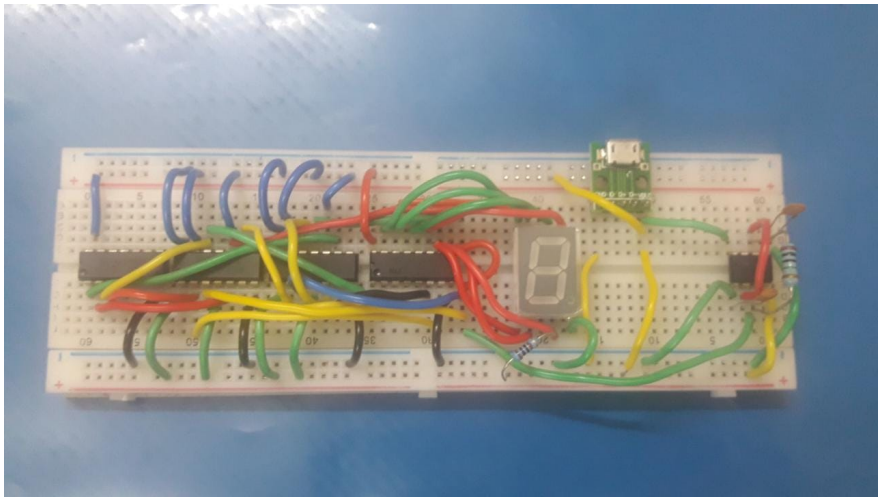

Figure 1: Image of circuit

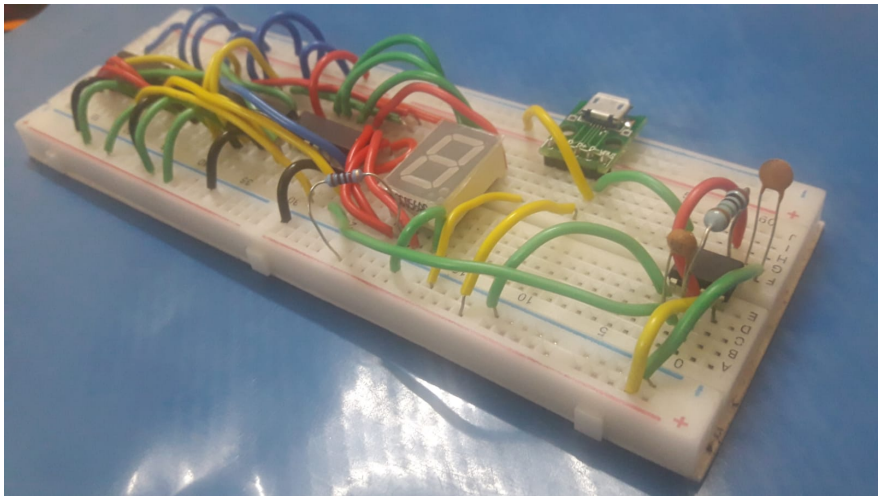

Figure 2: Image of circuit

Block Diagram

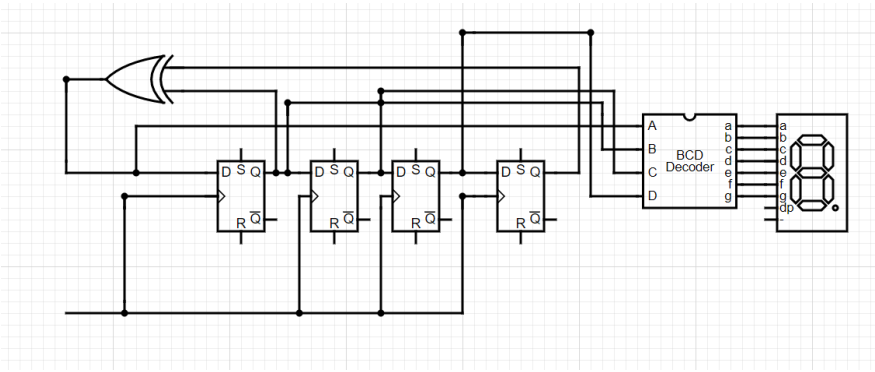

Figure 3: Block Diagram for circuit connections