

AI5030 - Hardware Assignment

Random number generation using Shift Registers

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Aim: To generate number in random order using shift registers

above project is playing an audio playlist in random order which is accomplished as the second part of the project as a Software assignment.

I. COMPONENTS

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	1 K Ω	1
Capacitor	100 nF	1
Capacitor	10 nF	1
Jumper Wires		

TABLE I
LIST OF COMPONENTS

II. PROCEDURE

- The 555 timer circuit is used to generate the clock output for the flipflops.
- The Clock output of 555 timer circuit is given to the clock signal of D-Flip flops.
- The circuit for generating random numbers is designed with shift registers using 4 D-Flip flops (i.e., two 7474 ICs).
- The XOR gate (7486 IC) is connected.
- The decoder (7447 IC) is connected and its A,B,C,D is connected to Q_0, Q_1, Q_2, Q_3 respectively.
- To visualise the output the seven segment display is connected to the decoder (7447 IC).

Conclusion: The project's primary objective of generating random numbers with uniform probability distribution is accomplished with the help of Flipflops acting as counters. One application of the

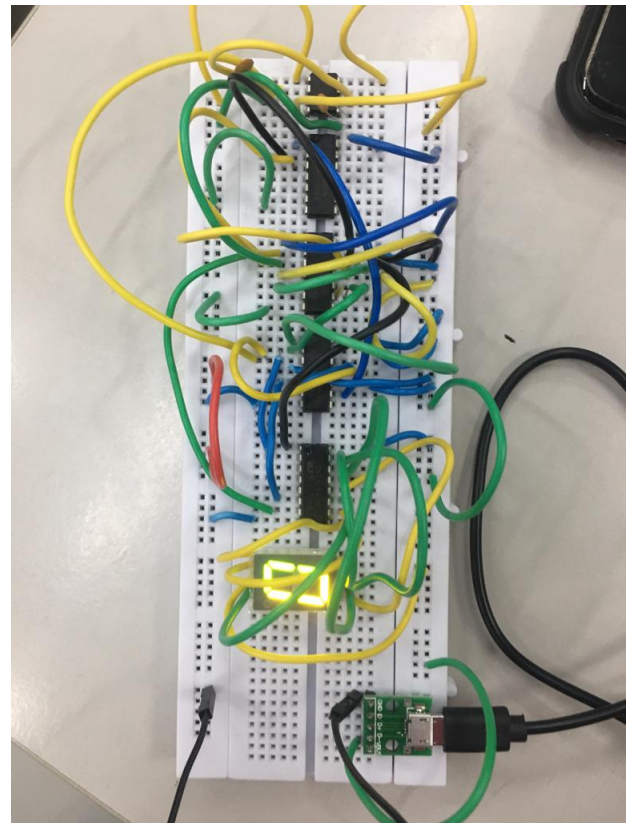


Fig. 1. Circuit displaying output