

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

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

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