HARDWARE PROJECT REPORT

Talasani Sri Varsha

INTRODUCTION:

The goal of this project is to generate random numbers using shift registers.The generation of random numbers holds significant importance in various fields and applications like Statistical Analysis,Cryptography,Gaming and Gambling,Quality Assurance and Testing.

This process requires

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	1KΩ	1
Resistor	1MΩ	1
Capacitor	100nF	1
Capacitor	10nF	1
Jumper Wires		20

DESCRIPTION:

1. Hardware Setup: You would need a shift register circuit, which can be built using flip-flops. Each flip-flop represents a bit. The number of flip-flops determines the length of the shift register and the number of possible random variables.

2. Initialization: Before the experiment starts, you need to set the initial state of the shift register. This is typically done by manually setting the values of the flip-flops or using some predefined pattern.

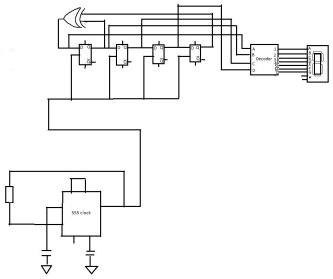
3. Clock Signal: A clock signal is used to control the movement of data in the shift register. It determines the speed at which the bits are shifted.

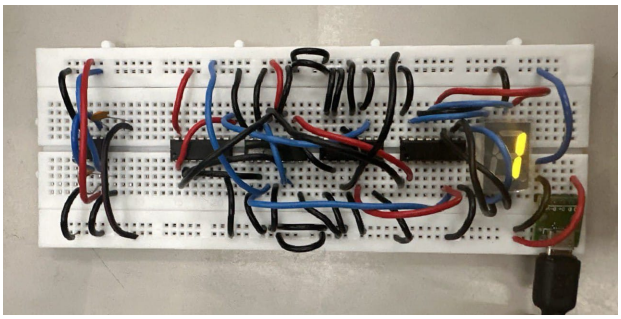
4. Feedback Connection: To introduce randomness, a feedback connection is created by connecting certain outputs of the shift register to its inputs. This creates a loop within the shift register circuit. The specific connections depend on the desired characteristics of the generated random variables.

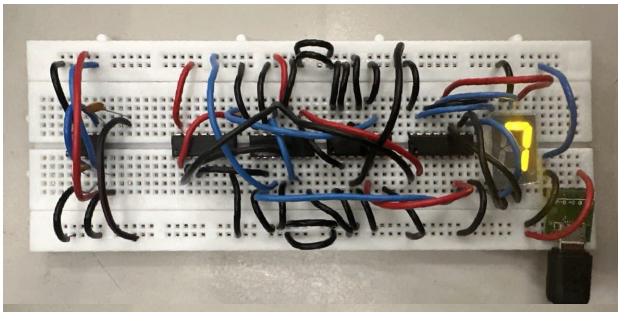
5. Output: The output of the shift register is taken from one or more selected flip-flops. The bits stored in these flip-flops represent the random variables generated by the experiment.

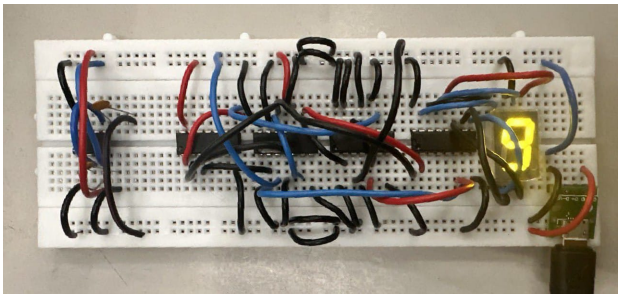
EXPERIMENTAL PROCEDURE:

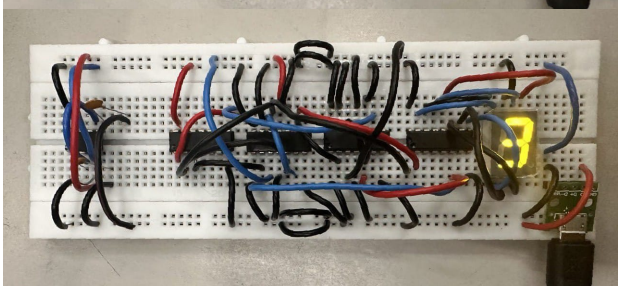
- Generate the CLOCK signal using the 555 timer circuit.
- Connect the CLOCK output of 555 timer circuit to CLOCK signal of D-Flip flops.
- Now make the cicuit for shift registers uisng 4 D-Flip flops (by using two 7474 IC's) and one X-OR gate (7486 IC) .Pin out for 7474 IC .











- Connect the output of each D-flip flop to Decoder IC (7447 IC), The pin out of 7447 IC.
- As per the pinout of IC 7474 [2,12] pins of both IC's need to connected to the [7,1,2,6] of decoder IC respectively.
- Make connections between the seven segment display and the 7447 IC .
- Additionally make conections like Vcc and GNG to every IC as per the respective IC pinout for IC's 7474,7447,7486.

CONCLUSION:

The experiment demonstrates the successful generation of random variables using shift registers. By carefully designing the shift register circuit and selecting appropriate feedback tap positions, it is possible to produce random sequences that can be transformed into random variables with desired probability distributions.