Hardware Assignment Report
AI1110 Probability and Random Variables

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1 Components

TABLE 0
Components used in experiment

Component	Value	Quantity
Breadboard		1
Micro USB		1
Seven Segment Display	Common Anode	1
Decoder	7447	1
Flip Flop	7474	2
X-OR GATE	7486	1
555 IC		1
Resistor	$1K\Omega$	1
Resistor	$1M\Omega$	1
Resistor	$10M\Omega$	1
Capacitor	100nF	1
Capacitor	10nF	1
Wires		3

2 Description

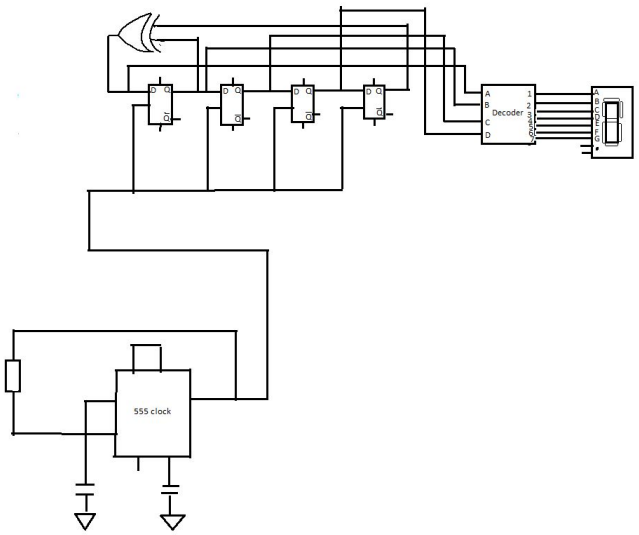
1.Micro USB is used to give power supply through which we generate two volatge nodes namely VCC and GND bus.VCC is higher voltage.

2.Clock circuit is built using 555 timer IC, capacitors and resistor for generating a time delay for the random numbers that will be generated.

3.Connect the clock output of 555 timer circuit to clock signal of D-Flip flops.

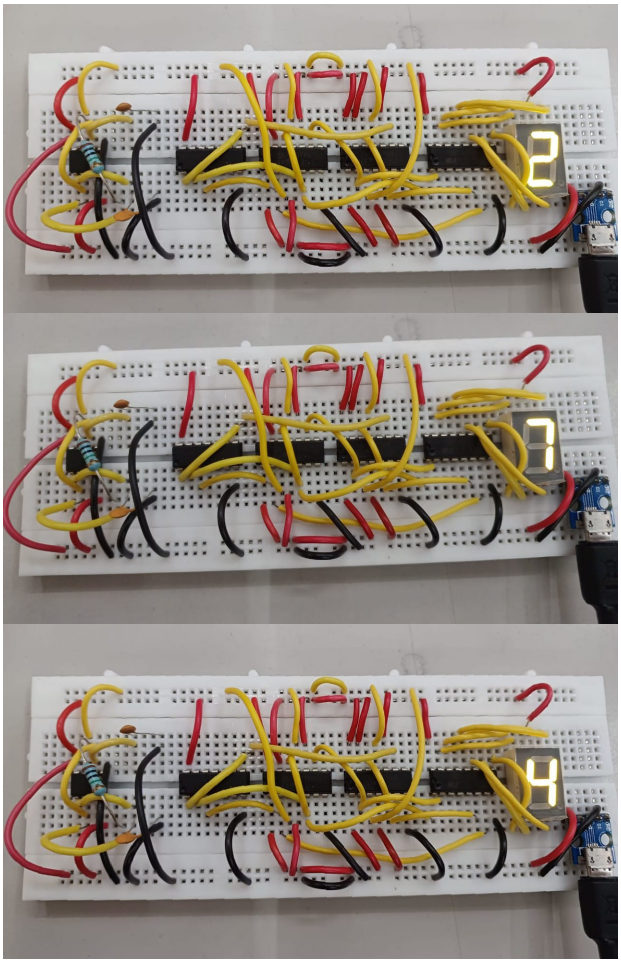
4.Another circuit for shift registers is made using 4 D-Flip flops(2 7474 IC's) and 1 X-OR gate(7486 IC).Connect the output of each D-Flip flop to the decoder IC(7447 IC).

5.To show the generated random number, a seven segment display is linked to this decoder. The output of the decoder is changed so that the corresponding segments on the seven segment display are lighted between 0 and 9.
The below figure shows block diagram of the circuit.



3 Observation

I have observed the below output shown.
The random number generation circuit produces a sequence of random numbers.The clock with its time delay and resistor in the circuit determines the timing and pace of the numbers displayed on the seven segment display.The binary numbers generated by flip flops is decoded and shown as digits on the seven segment display.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7
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