Hardwware Assignment

AI1110: Probability and Random Variables

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(a) Description : The random number generator project explores the utilization of an IC555 timer circuit with an XOR gate to generate random numbers.7-segment displays provide a convenient way of displaying numbers 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.

(b) Components :

TABLE (b): 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	1K ohms	1
Resistor	1M ohms	1
Capacitor	100nF	1
Capacitor	10nF	1
Jumper Wires		20

(c) Observation : The XOR gate introduces randomness by XORing the signals from the IC555 timer circuit. The resistor and capacitors influence the timing and stability of the circuit, affecting the randomness of the generated numbers. The displayer effectively presents the random numbers produced by the circuit.

(d) Block Diagram and Image of Circuit :

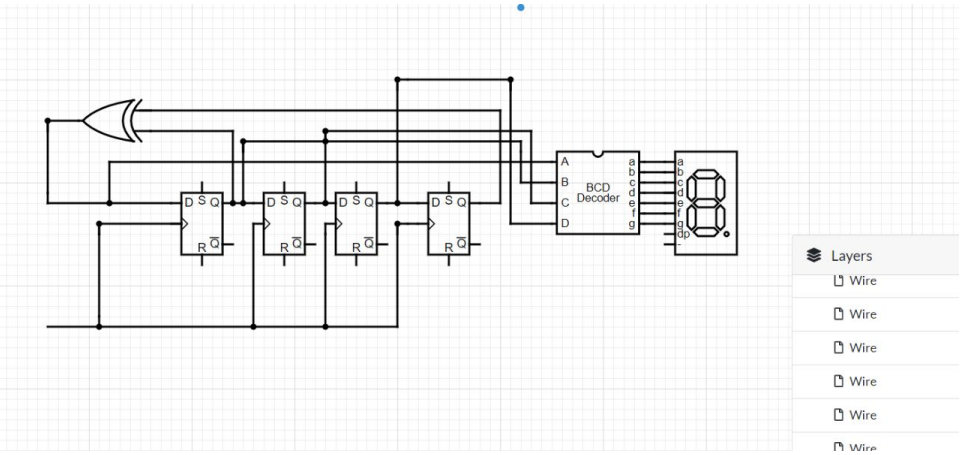

Fig. (d): Block Diagram

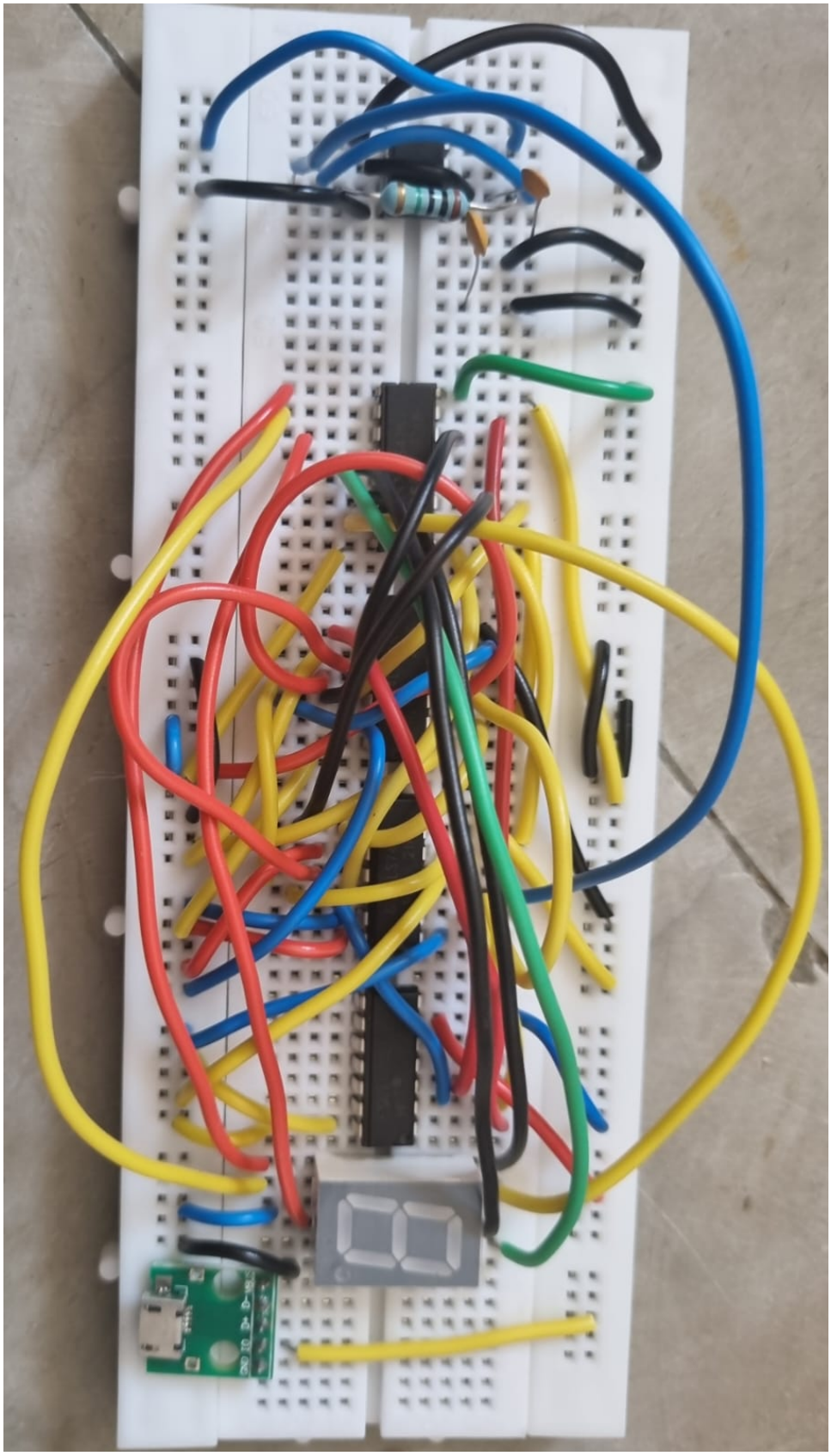

Fig. (d): Image of Circuit