CEL 122

DIGITAL LOGIC DESIGN

**PROJECT PROPOSAL**

***LED ROULETTE CIRCUIT***

**SUBMITTED BY:**

umm-e-habiba imran (048)

ZAINAB IDREES (051)

**submitted to:**

SIR ABDUL SALAM

# **Project Proposal:**

# **LED Roulette Circuit Using 555 Timer and 4017 IC**

**Course**: Digital Logic Design  
**Project Title**: LED Roulette Circuit with Adjustable Speed Using 555 Timer and 4017 IC

## **Objective**

The aim of this project is to design and implement an LED roulette circuit that demonstrates sequential LED flashing, controlled using a 555 timer IC in a stable mode and a 4017-decade counter IC. This project integrates fundamental digital logic design concepts, such as clock pulse generation, sequential logic, and counter operation.

## **Scope of the Project**

1. **Familiarize Students**: Provide hands-on experience with IC-based circuits, particularly 555 Timer and 4017 IC.
2. **Demonstrate Key Concepts**: Explain clock pulse generation, counters, and sequential logic applications.
3. **Develop Practical Skills**: Train students in reading schematics, assembling circuits, and troubleshooting hardware.

## **Hardware Requirements**

* 555 Timer IC
* 4017 Decade Counter IC
* LEDs (up to 10)
* Resistors (470Ω, 1kΩ, 47kΩ)
* Capacitor (1µF)
* Potentiometer
* Breadboard and connectors
* Power Supply (5-15V)

## **Working Principle**

1. **555 Timer Operation**:
   * Generates a clock pulse with a duty cycle and frequency set by external resistors and capacitors.
   * The speed of the LEDs flashing can be controlled by varying the resistance using a potentiometer.
2. **4017 Decade Counter**:
   * Sequentially activates its outputs (Q0–Q9) based on the input clock pulses from the 555 timer.
   * Each active output drives an LED, creating the appearance of movement or chasing.

## **Expected Outcomes**

* Demonstration of a working sequential LED display.
* Enhanced understanding of digital logic design principles and practical application of ICs.
* Improved circuit design and troubleshooting skills.

## **Conclusion**

This project is an excellent choice for exploring real-world applications of digital logic design concepts. By integrating theoretical knowledge with practical implementation, it provides a comprehensive understanding of sequential circuits and their applications.