





COA PROJECT

BY-ABHEESHT MISHRA



INTRODUCTION

Managing traffic flow efficiently is crucial for ensuring safety and order on the roads. In this project, we delve into the realm of digital circuit design by creating a simulated traffic light control system using Logisim, a versatile tool for constructing and simulating digital circuits.





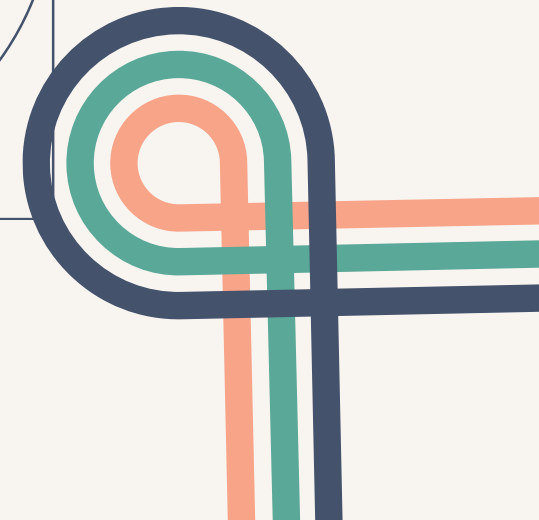
PROJECT OVERVIEW



The objective of this project is to mimic the functionality of a traffic light intersection where the signal timings for each direction—typically, red, yellow, and green lights—are regulated systematically. Through Logisim's graphical interface and logic gate components, we aim to design a digital model that emulates the behavior of a real-world traffic light system.

The project will involve constructing a control unit that manages the timing sequence of the traffic lights for different directions. The system will transition between red, yellow, and green lights in a synchronized manner, ensuring safety protocols are followed and traffic flows smoothly.

This project offers an opportunity to explore how digital circuits can emulate the behavior of complex real-world systems, showcasing the practical application of digital logic in a familiar scenario.



COMPONENTS

1-Clock
2-Counter
1-Button
2-ROM
2-Splitters
6-LEDs

- Clock: Provides regular pulses to synchronize and control the timing of operations within the circuit, simulating real-world clock signals.
- Counter: Keeps track of the number of clock cycles or events, often used for sequencing or generating specific patterns.
- Button: Acts as an input device allowing manual control or triggering of specific actions within the circuit.
- ROM (Read-Only Memory): Stores pre-defined data or instructions that can be retrieved based on specific addressing, used for program storage or data retrieval.
- Splitter: Divides a signal into multiple branches, allowing one signal to be sent to multiple components or sections of the circuit.
- LEDs (Light Emitting Diodes): Visual indicators used to display outputs, states, or results within the circuit, allowing easy observation of changes in signal values or statuses.
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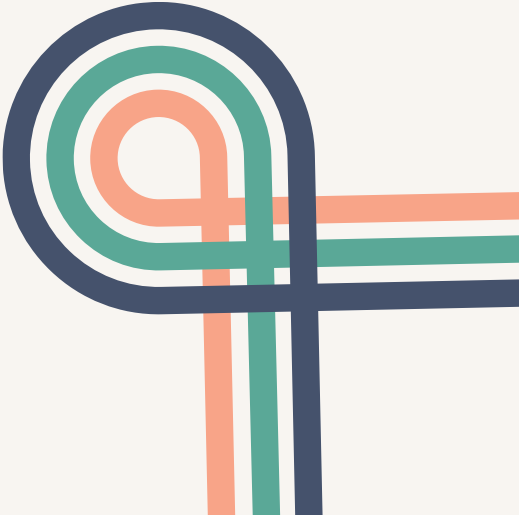


PROCESS

Traffic Lights (Upper LEDs):

- The 4x3 ROM likely stores sequences for traffic signal states (red, yellow, green).
- Clock inputs drive the ROMs, causing them to output data that represents different traffic light states based on clock cycles.
- The upper three LEDs represent traffic status:
 - Red, yellow, and green will light up sequentially based on the clock progression.
 - The sequence might cycle through states (e.g., red → green → yellow) based on ROM data and clock timing

Pedestrian Signals (Lower LEDs):

- The 4x2 ROM likely stores sequences for pedestrian signal states (green and red).
 - Connected to the clock, this ROM outputs data representing pedestrian signal states.
 - The lower two LEDs represent pedestrian status:
 - Green and red LEDs will light up based on the clock and ROM data.
 - These LEDs might indicate when it's safe (green) or unsafe (red) for pedestrians to cross.
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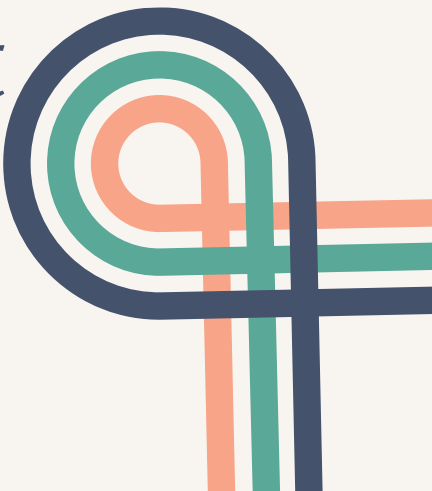



CONCLUSION

The circuit, driven by clocks and ROMs, simulates the behavior of a traffic light system where the upper LEDs display traffic signals (red, yellow, green) while the lower LEDs indicate pedestrian signals (green for go, red for stop).

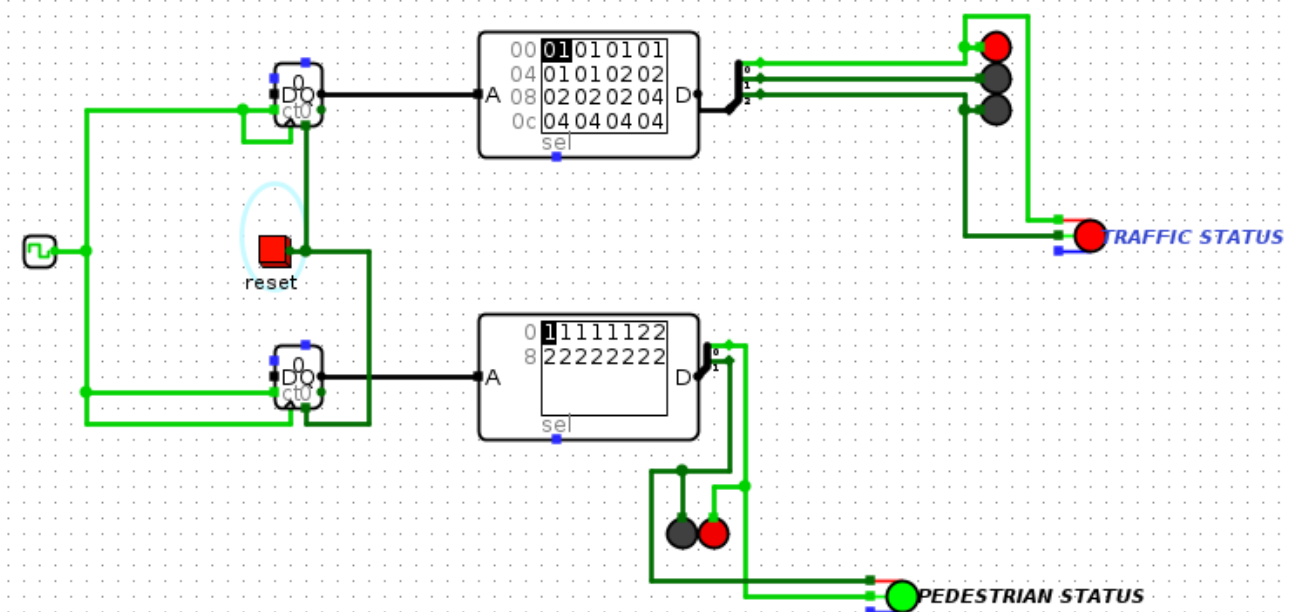
The clock progression drives the ROMs, causing the LEDs to change states based on the data retrieved from the ROMs. The reset button might initialize the sequence or return the system to a specific starting state.

This design aims to emulate the operation of a basic traffic light and pedestrian signal system within the simulation environment of Logisim.



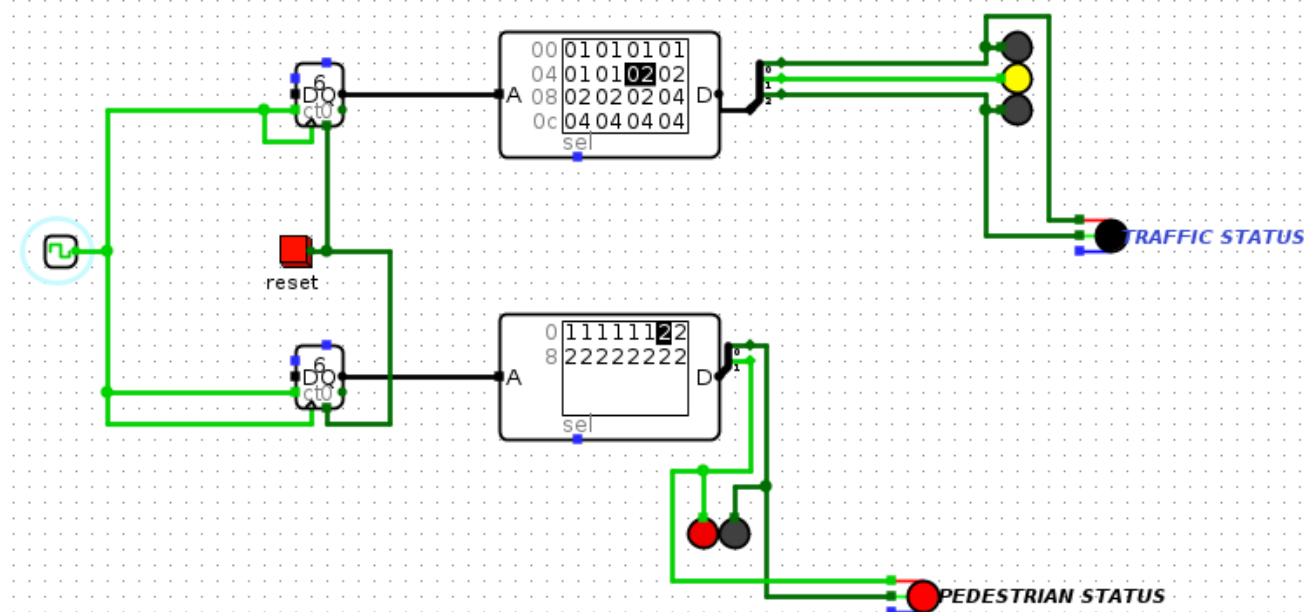
LED TRAFFIC LIGHT

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