SKILL LAB PROJECT
2023

PROJECT PSS

PROLIFT SAFETY SYSTEM

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PROJECT INTRODUCTION

Lifts or elevators are an essential part of modern life, particularly in tall buildings where they provide a fast and convenient way to move between floors. However, they can also be potentially dangerous, particularly in the event of an emergency such as a power failure or mechanical malfunction.

This project aims to address these safety concerns by designing and developing a lift security system that ensures a safe ground floor landing in case of emergencies.

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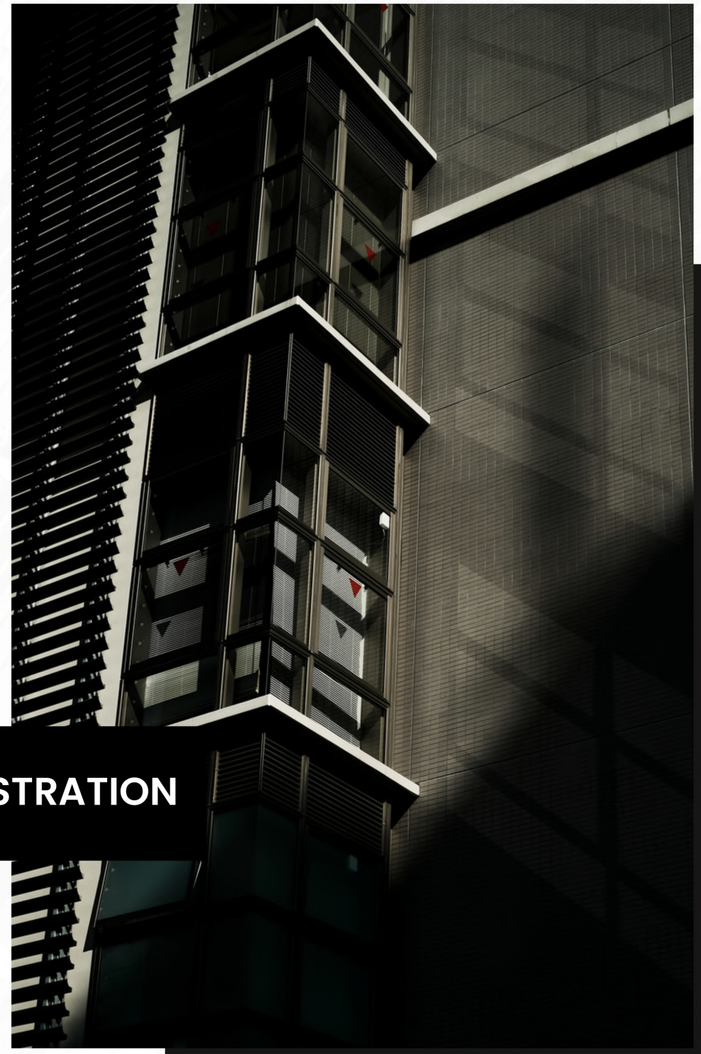
THE PROJECT PSS

Project PSS is a Prototype which operates as a normal lift and lets the passengers move to various floors by the help of push buttons. However in case of emergencies, when the main supply is cut-off, the backup circuit comes into play and ensures the safe de-elevation of the passengers by first, alerting the passengers & lift operators through a buzzer and then auto landing at the ground floor followed by the opening of the door through the push button.



DEMONSTRATION

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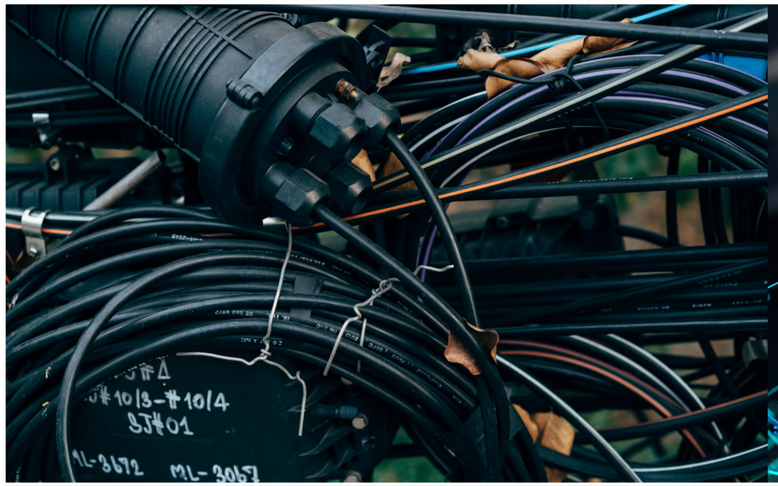

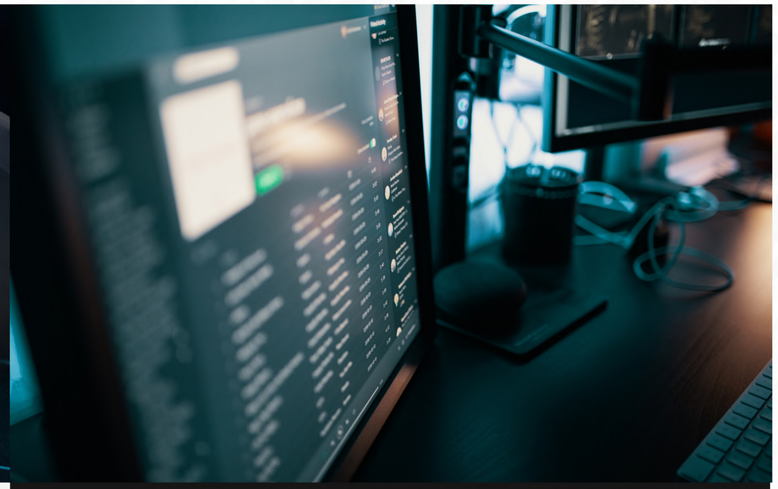

Emergency Power Supply

The emergency power supply is a battery backup system that provides power to the lift's control panel and other essential systems in the event of a power failure.

Emergency Brake

The emergency brake is a mechanical brake that engages automatically in the event of a power failure or a malfunction in the lift's electrical system.

Landing Controller

The landing controller is an electronic system that controls the lift's descent to the ground floor and ensures a safe landing in the event of an emergency.

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COMPONENTS

- Arduino UNO
- Side Shaft Motor & Pulley
- Piezo Buzzer
- L293D IC Motor Driver
- Bread Board Large & Mini
- Push Buttons
- Arduino NANO
- Servo Motor
- Resistor 100 & 1K ohms
- 16 x 2 i2c LCD Display
- 9V Battery
- Connecting & Jumper Wires

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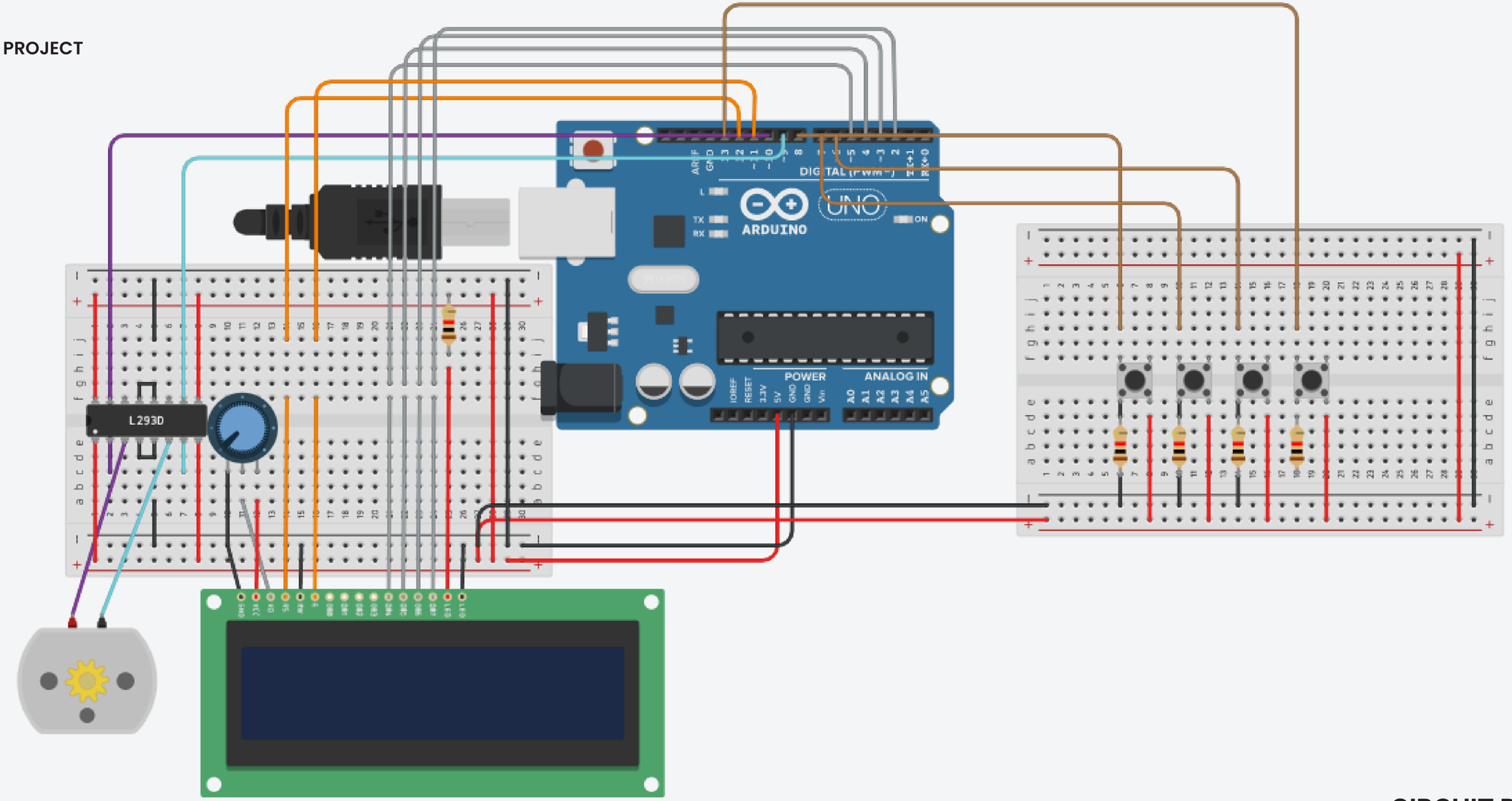

CIRCUIT DIAGRAM (FLOOR MOVEMENT OPERATION)

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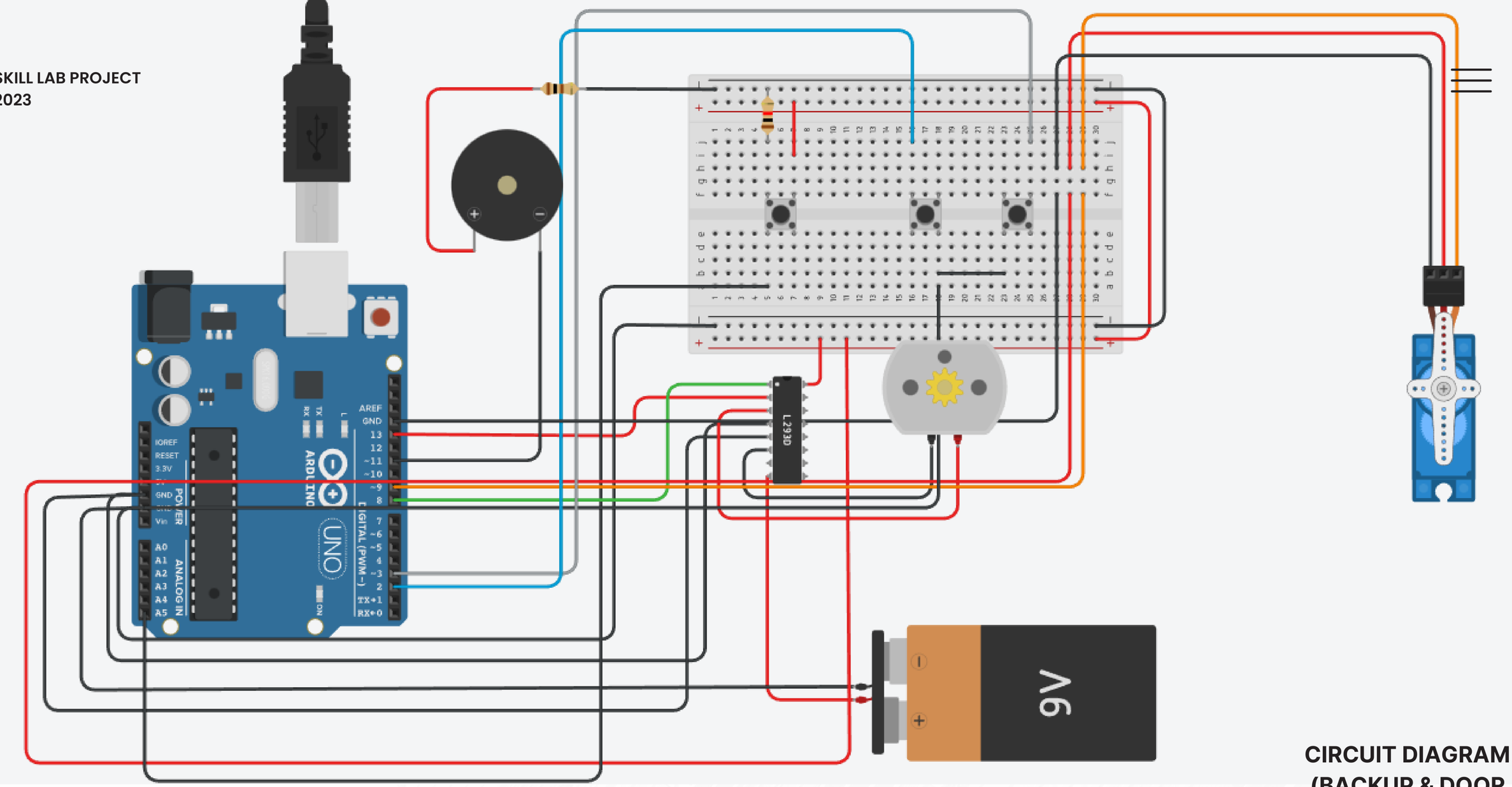

CIRCUIT DIAGRAM (BACKUP & DOOR OPERATION)

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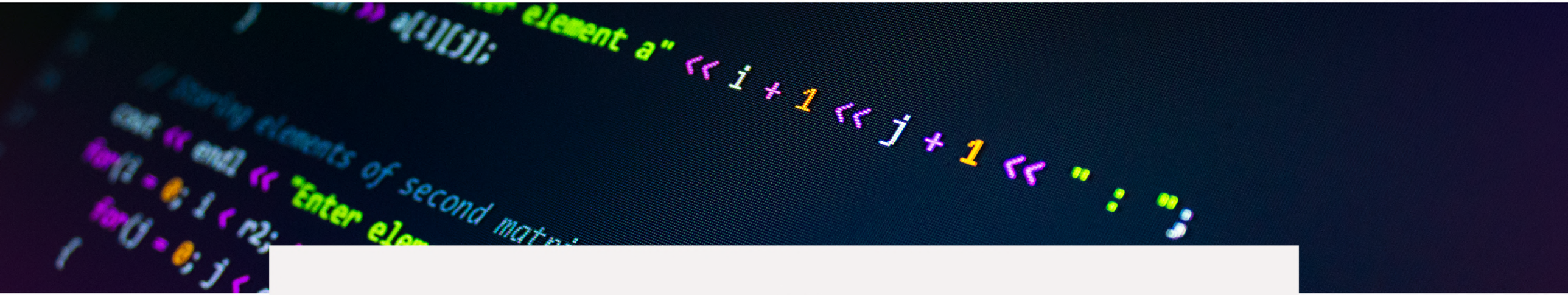
IMPLEMENTATION CODES



Description

The codes were written on ARDUINO IDE software for both the UNO & NANO, were uploaded on to the microcontrollers through USB posts which both act as a power source and data transfer medium.

VISIT THE CODE

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ADVANTAGES

Dual Operation

The lift can be operated to various floors by the lift passengers as well as the lift operator. The switches and buttons are available to the lift passengers and the same buttons and functions are available to the operator through internal connection.

Dual Alerting

In case of lift failures or emergency, an alert is triggered through the buzzer, alerting both the passengers and lift operators about the situation. Incase the auto de-elevation doesn't respond due to technical issues, the operator will be alerted.

Safe & Slow De-Elevation

Increases the safety and security of lift passengers & reduces the risk of injuries or fatalities in the event of an emergency. The processes is automated and the passengers are pre alerted before the de-elevation for the preparation.

ADVANTAGES

Retro Fittable

The system can be retrofitted to existing lifts, without the need for major structural modifications. The fitting of the safety system increases the performance and safety measures of the lift ensuring a safe elevation experience to the passengers.

Usage Customizable

The system can be customized to meet the specific requirements of different buildings or lift systems. Various places have various different purposes of lift. Some carry passengers, some carry items and more. The system is compatible for all types of usage.

Dual Combination

The system relies on a combination of electronic and mechanical components, making it more reliable than some existing lift security systems. The electrical triggering helps the mechanical operation to act and help in motion and brake calliberation.

APPLICATIONS

High-rise Buildings

Lift security systems are particularly important in high-rise buildings, where the lifts are often heavily used and can carry large numbers of passengers.

Hospitals

Hospitals rely on lifts to transport patients, visitors, and medical equipment between floors, making lift safety and security critical to their operations.

Shopping Centers and Malls

Shopping centers and malls typically have a high volume of foot traffic and require lifts to transport shoppers between floors, making lift safety and security a priority.

Office and Institute Buildings

Office & Institute buildings often have multiple tenants and require lifts to transport workers and visitors between floors, making lift safety and security important to their operations.

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THANK YOU

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