PROJECT REPORT

AUTOMATED SENSORIZED ELEVATOR

20ECTE401 - LIVE IN LAB II

Submitted by

AKASH A - 412520106007

JAIGANESH P - 412520106053

MAHIZHAN M - 412520106085

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ANNA UNIVERSITY: CHENNAI 600 025

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BONAFIDE CERTIFICATE

Certified that this project report **"AUTOMATED SENSORIZED ELEVATOR"** is the bonafide work of **"AKASH.M(412520106007), JAIGANESH.P (412520106053), MAHIZHAN.M (412520106085)"** Who carried out the 20ECTE401-LIVE IN LAB II project work under my supervision.

SIGNATURE **PROJECT GUIDE,** **Mr.K. DEVIBALAN, M.E.** **Department of Electronics and Communication Engineering, Sri Sairam Engineering College, (Autonomous) Chennai-600 044.**	**SIGNATURE** **PROJECT LAB INCHARGE,** **Dr.J. Anuarasi.** **Department of Electronics and Communication Engineering, Sri Sairam Engineering College, (Autonomous) Chennai-600 044**	**SIGNATURE** **HOD,** **Dr. J RAJA, M.E, Ph.D.** **Department of Electronics and Communication Engineering, Sri Sairam Engineering College, (Autonomous) Chennai-600 044.**

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

ABSTRACT

The main objective of the project is to reduce the unwanted energy and time loss during the unwanted functioning of elevator. This project comes under the domain of embedded systems. This project functions in low power supply which is energy efficient. This project is coming under Sustainable Development Goals number 9 and 11. In our day today life we mostly prefer elevators instead of stairs for our comfortability and to reduce the time waste, in the elevators the main CPU system will function as per the command from the command box which reads the input from the elevator buttons. These buttons give the main input for the CPU to determine whether the elevator moves upwards or downwards. It also controls the Elevator doors to open at the desired floors. One of the main issues in this elevator system is the elevators moves automatically to the floor when the buttons are triggered even though the absence of the person. During this unwanted movement that elevator uses some power to go to the desired floors. This project can rectify this type of unwanted power loss. This project module is directly connected to the CPU of the elevator system as this module has a pressure sensor, it continuously reads the pressure change. This change in pressure assumes that there is a person is waiting for the lift then it also checks weather the button of the elevator is triggered if the both the conditions are true then the CPU will process the data and send the elevator to the desired floor. Either one of the conditions is false then the lift will not come to the desired floor. By this we can reduce the excess power consumption and also helps us to save time in our day-to-day life. We also trying to improve the project by producing electricity from the pressure sensor as a future scope.

ACKNOWLEDGEMENT

A successful man is one who can lay a firm foundation with the bricks others have thrown at him. —*David Brinkley*

Such a successful personality is our beloved founder Chairman, **Thru. MJF. Ln. LEO MUTHU.** At first, we express our sincere gratitude to our beloved chairman through prayers, who in the form of a guiding star has spread his wings of external support with immortal blessings.

We express our gratitude to our CEO **Mr. J. SAI PRAKASH LEO MUTHU** and our Trustee **Mrs. J. SHARMILA RAJA** for their constant encouragement for completing this project.

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INTRODUCTION

1.1 OBJECTIVE:

The main objective of the project is to reduce the time and power waste while using the elevator. This project is mainly useful for multi floor apartments, companies and also for the hotels and soon., This project is coming under Sustainable Development Goals number 9 and 11. This project comes under the domain of embedded systems.

In our day today life we mostly prefer elevators instead of stairs for our comfortability and to reduce the time waste. Sometime the elevator moves to the floors when the button is triggered but the person who triggered the button will left from the area but the elevator moves to the floor where the button is triggered and opens the door. This cause some power loss as the elevator functions even though there is no one in front of the elevator doors. we hope that our project can bring a solution to this problem.

1.2 Motivation:

The main moto of the project is to reduce the power consumption of the elevator during unwanted movement of the elevator from one floor to another floor even there is absence of people but the button is triggered and also to reduce the time wastage while using the elevator by stopping the unwanted stopping of lift in the floors where the people is not waiting for the lift.

1.3 Relevance of the project:

This project is the exact replica of a AND gate. In this project the AND operation is done in between the output of the pressure sensor and the button trigger output. When the button is triggered and also the pressure difference in pressure sensor then the Arduino will process and give the command to the CPU of the elevator to move the elevator to the desired floor location. Either any one of the above conditions is false then the elevator will not move to that floor but the elevator functions as per the command given from the CPU of the elevator.

1.4 Design Methodology:

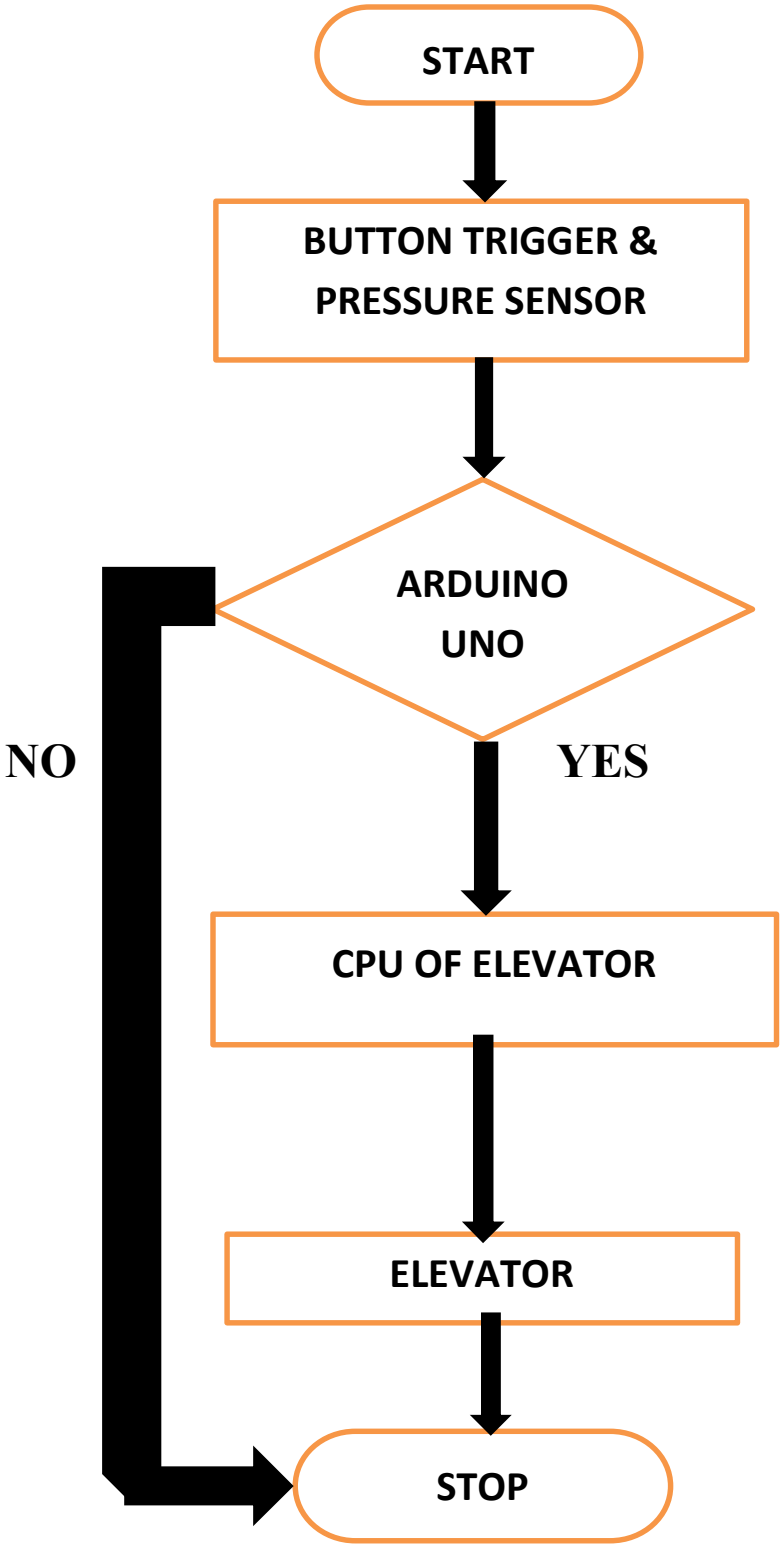

Fig:1.4.1

CHAPTER-2

LITERATURE SURVEY

S.NO	TITLE	AUTHOR	PUBLISHED IN	INFERENCE
1	Evaluation and Improvements of an RFID Based Indoor Navigation System for Visually Impaired and Blind People	Martijn Kiers, Elmar Krajnc, Markus Dornhofer and Werner Bischof,FH JOANNEUM	**2011**	This paper mainly gives the proper knowledge about interfacing the embedded system to the navigation and other indoor system.
2	PERCEPT Indoor Navigation System for the Blind and Visually Impaired: Architecture and Experimentation	Aura Ganz, James Schafer, Siddhesh Gandhi, Elaine Puleo, Carole Wilson and Meg Robertson3	**2012**	This paper speaks about the internal architecture of the indoor navigation and embedded systems.

3	Multimedia Tools and Applications	Cai Z, Han J and Liu L.	**2017**	This paper gives the information about embedded c and also about the major tools used for synchronizing Arduino with the external systems
4	The study concerning human-computer interaction used in the manual segmentation and identification of key techniques	Liu shi-lei	**2017**	This paper gives knowledge about the interfacing of humans and computer with the help of some external objects like Arduino
5	Laboratory Model of the Elevator Controlled by ARDUINO Platform	Marijo Andrija Balug, Tomislav Špoljarić and Goran Vujisić	**2017**	This paper gives the information about the basic model of elevator system which is controlled by the Arduino.

6	A Novel Dynamic Hand Gesture and Movement Trajectory Recognition model for Non-Touch HRI Interface	Kabir R, Ahmed N and Roy N	**2019**	This paper gives information about the non-touched HRI interface which helps us to interfere with the system without any physical contact
7	Smart Elevator Control System Based on Human Hand Gesture Recognition	Shangzhi Le, Qujiang Lei, Xiangying Wei, Jiahao Zhong, Yuhe Wang, Jimin Zhou, Weijun Wang	**2020**	In this paper they explain about the elevator controlling using human hand gestures

CHAPTER-3

EXISTING AND PROPOSED SYSTEM

3.1 EXISTING SYSTEM:

In a normal elevator system when the button of the elevator system is triggered the elevator will moves to the desired floor where the button is triggered as per the command given by the CPU of the elevator. As per the command the elevator will move to the desired floor in a multi-floor apartment when the button is triggered even though the person is left from the elevator. This is the existing system of the elevator.

3.2 PROPOSED SYSTEM:

This project module is directly connected to the CPU of the elevator system as this module has a pressure sensor, it continuously reads the pressure change. This change in pressure assumes that there is a person is waiting for the lift then it also checks weather the button of the elevator is triggered if the both the conditions are true then the CPU will process the data and send the elevator to the desired floor. Either one of the conditions is false then the lift will not come to the desired floor. By this we can reduce the excess power consumption and also helps us to save time in our day-to-day life.

CHAPTER-3
REQUIREMENT SPECIFICATION

4.1 Hardware requirements:

4.1.1 Arduino UNO:

Arduino is a single-board microcontroller meant to make the application more accessible which are interactive objects and its surroundings. The hardware features with an open-source hardware board designed around an 8-bit Atmel or a 32-bit Atmel ARM. Current models consists a USB interface, 6 analog input pins and 14 digital I/O pins that allows the user to attach.

The Arduino Uno board is a microcontroller on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. In order to get started, they are simply connected to a computer with a USB cable or with a AC-to-DC adapter or battery. Arduino Uno Board varies from all other boards and they will not use the FTDI USB-to-serial driver chip in them. It is featured by the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

There are various types of Arduinos in which many of them were third-party compatible versions. The most official versions available are the Arduino

Uno R3 and the Arduino Nano V3. Both of these run a 16MHz Atmel ATmega328P 8-bit microcontroller with 32KB of flash RAM 14 digital I/O and six analogue I/O and the 32KB will not sound like as if running Windows. Arduino projects can be stand-alone or they can communicate with software on running on a computer. For e.g., Flash, Processing, Max/MSP). The board is clocked by a 16 MHz ceramic resonator and has a USB connection for power and communication. You can easily add micro-SD/SD card storage for bigger tasks.

Features of the Arduino UNO:

- It is an easy USB interface. This allows interface with USB as this is like a serial device.
- The chip on the board plugs straight into your USB port and supports on your computer as a virtual serial port. The benefit of this setup is that serial communication is an extremely easy protocol which is time-tested and USB makes connection with modern computers and makes it comfortable.
- It is easy-to-find the microcontroller brain which is the ATmega328 chip. It has more number of hardware features like timers, external and internal interrupts, PWM pins and multiple sleep modes.
- It is an open-source design and there is an advantage of being open source is that it has a large community of people using and troubleshooting it. This makes it easy to help in debugging projects.
- It is a 16 MHz clock which is fast enough for most applications and does not speed up the microcontroller.
- It is very convenient to manage power inside it and it had a feature of built-in voltage regulation. This can also be powered directly off a USB port without any external power. You can connect an external power source of upto 12v and this regulates it to both 5v and 3.3v.
- 13 digital pins and 6 analog pins. This sort of pins allows you to connect hardware to your Arduino Uno board externally. These pins are used as a key for extending the computing capability of the Arduino Uno into

the real world. Simply plug your electronic devices and sensors into the sockets that correspond to each of these pins and you are good to go.

- This has an ICSP connector for bypassing the USB port and interfacing the Arduino directly as a serial device. This port is necessary to re-boatload your chip if it corrupts and can no longer used to your computer.
- It has a 32 KB of flash memory for storing your code.
- An on-board LED is attached to digital pin 13 to make fast the debugging of code and to make the debug process easy.
- Finally, it has a button to reset the program on the chip.

4.1.2 Pressure sensor:

A pressure sensor is a device for measurement of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. A pressure sensor usually acts as a transduce; it generates a signal as a function of the pressure imposed. For the purposes of this article, such a signal is electrical.

Pressure sensors are used for control and monitoring in thousands of everyday applications. Pressure sensors can also be used to indirectly measure other variables such as fluid/gas flow, speed, water level, and altitude. Pressure sensors can alternatively be called pressure transducers, pressure transmitters, pressuresenders, pressure
indicators, piezometers and manometers, among other names.

Pressure sensors can vary drastically in technology, design, performance, application suitability and cost. A conservative estimate would be that there

may be over 50 technologies and at least 300 companies making pressure sensors worldwide.

There is also a category of pressure sensors that are designed to measure in a dynamic mode for capturing very high-speed changes in pressure. Example applications for this type of sensor would be in the measuring of combustion pressure in an engine cylinder or in a gas turbine. These sensors are commonly manufactured out of materials such as quartz.

Some pressure sensors are pressure switches, which turn on or off at a particular pressure. For example, a water pump can be controlled by a pressure switch so that it starts when water is released from the system, reducing the pressure in a reservoir.

4.1.3 LED light :

LED is a highly energy-efficient lighting technology, and has the potential to fundamentally change the future of lighting in the United States. Residential LEDs -- especially ENERGY STAR rated products -- use at least 75% less energy, and last up to 25 times longer, than incandescent lighting.

Widespread use of LED lighting has a large potential impact on energy savings in the United States. By 2035, the majority of lighting installations are anticipated to use LED technology, and energy savings from LED lighting could top 569 TWh annually by 2035, equal to the annual energy output of

more than 92 1,000 MW power plants. LEDs use heat sinks to absorb the heat produced by the LED and dissipate it into the surrounding environment. This keeps LEDs from overheating and burning out. Thermal management is generally the single most important factor in the successful performance of an LED over its lifetime. The higher the temperature at which the LEDs are operated, the more quickly the light will degrade, and the shorter the useful life will be.

LED products use a variety of unique heat sink designs and configurations to manage heat. Today, advancements in materials have allowed manufacturers to design LED bulbs that match the shapes and sizes of traditional incandescent bulbs. Regardless of the heat sink design, all LED products that have earned the ENERGY STAR have been tested to ensure that they properly manage the heat so that the light output is properly maintained through the end of its rated life.

4.1.4 Push button:

A push-button (also spelled pushbutton) or simply button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal. The surface is usually flat or shaped to accommodate the human finger or hand, so as to be easily depressed or pushed. Buttons are most often biased switches although many un-biased buttons (due to their physical nature) still require a spring to return to their un-pushed state. Terms for the "pushing" of a button include pressing, depressing, mashing, slapping, hitting, and punching.

Uses :

The "push-button" has been utilized in calculator, push-button, telephone, kitchen application, and various other mechanical and electronic devices, home and commercial.

In industrial and commercial applications, push buttons can be connected together by a mechanical linkage so that the act of pushing one button causes the other button to be released. In this way, a stop button can "force" a start button to be released. This method of linkage is used in simple manual operations in which the machine or process has no electrical circuit for control.

Red pushbuttons can also have large heads (called mushroom heads) for easy operation and to facilitate the stopping of a machine. These pushbuttons are called emergency stop buttons and for increased safety are mandated by the electrical code in many jurisdictions. This large mushroom shape can also be found in buttons for use with operators who need to wear gloves for their work and could not actuate a regular flush-mountain push button. As an aid for operators and user in industrial or commercial applications, a pilot light is commonly added to draw the attention of the user and to provide feedback if the button is pushed. Typically, this light is included into the centre of the pushbutton and a lens replaces the pushbutton hard centre disk. The source of the energy to illuminate the light is not directly tied to the contacts on the back of the pushbutton but to the action the pushbutton controls. In this way a start button when pushed will cause the process or machine operation to be started and a secondary contact designed into the operation or process will close to

turn on the pilot light and signify the action of pushing the button caused the resultant process or action to start.

To avoid an operator from pushing the wrong button in error, pushbuttons are often colour-code to associate them with their function. Commonly used colors are red for stopping the machine or process and green for starting the machine or process.

In popular culture, the phrase "the button" (sometimes capitalized) refers to a (usually fictional) button that a military or government leader could press to launch nuclear weapon .

4.1.5 Jump wires:

A jump wire (also known as jumper wire, or jumper) is an electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

Jumper wires typically come in three versions: male-to-male, male-to-female and female-to-female. The difference between each is in the end point of the wire. Male ends have a pin protruding and can plug into things, while female ends do not and are used to plug things into. Male-to-male jumper wires are the most common and what you likely will use most often.

4.1.6 Bread board:

A breadboard, solderless breadboard, protoboard, or terminal array board is a construction base used to build semi-permanent prototype of electron circuit . Unlike stripboard (Veroboard), breadboards do not require soldering or destruction to tracks and are hence reusable. For this reason, breadboards are also popular with students and in technological education.

A variety of electronic systems may be prototyped by using breadboards, from small analog and digital circuits to complete CPU.

Compared to more permanent circuit connection methods, modern breadboards have high parasitic capacitance, relatively high resistance, and less reliable connections, which are subject to jostle and physical degradation. Signalling is limited to about 10 MHz, and not everything works properly even well below that frequency.

4.2 Software Requirements:

4.2.1 Arduino IDE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them.

Programs written using Arduino Software (IDE) are called sketches. These sketches are written in the text editor and are saved with the file extension. ino. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information. The bottom righthand corner of the window displays the configured board and serial port. The toolbar buttons allow you to verify and upload programs, create, open, and save sketches, and open the serial monitor.

4.2.2 Embedded C:

Embedded C is a set of language extensions for the C programming language by the C Standards Committee to address commonality issues that exist between C extensions for different embedded systems.

Embedded C programming typically requires nonstandard extensions to the C language in order to support enhanced microprocessor features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations. The C Standards Committee produced a Technical Report, most recently revised in 2008 and reviewed in 2013, providing a common standard for all implementations to adhere to. It includes a number of features not available in normal C, such as fixed-point arithmetic, named address spaces and basic I/O hardware addressing. Embedded C uses most of the syntax and semantics of standard C, e.g., main() function, variable definition, datatype declaration, conditional statements (if, switch case), loops (while, for), functions, arrays and strings, structures and union, bit operations, macros, etc.

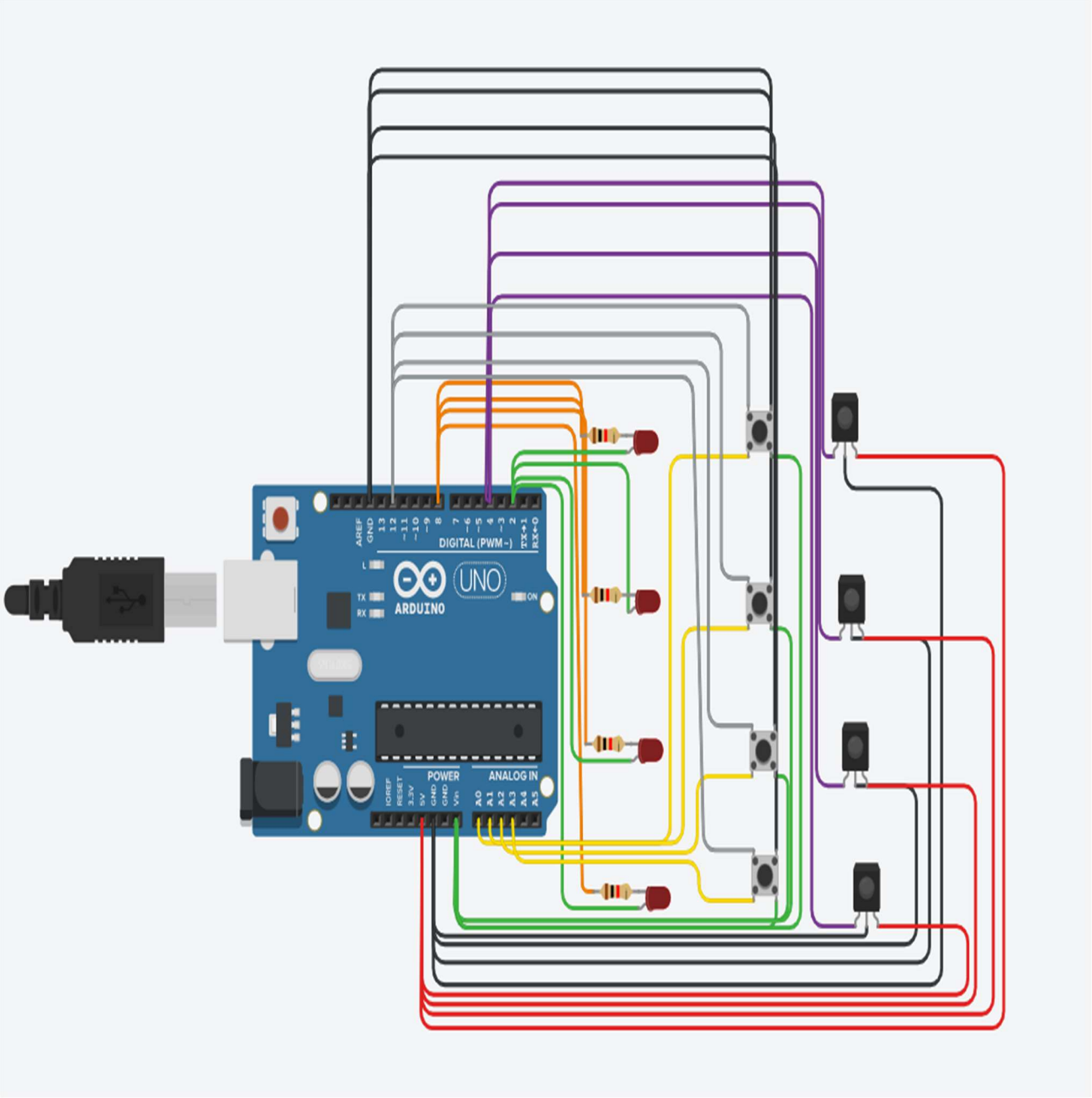

Fig:4.1

CHAPTER-5

CONCLUSION AND FUTURE SCOPE

5.1 Conclusion:

From this we can conclude that this project can rectify the major problems arises in the elevator system and also conserve time and energy by reducing the unwanted locomotion of the elevators from one floor to another floor. This helps us to conserve electricity and as this project is directly connected with the CPU of the elevator system.

5.2 Future scope:

We have planned to improve this project by generating the electricity with the help of the pressure sensor used in this project as the mechanical energy from the pressure sensor is converted into electrical energy and that energy is used for emergency power functional unit which is used in the elevators during power failures.

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7) Evaluation and Improvements of an RFID Based Indoor Navigation System for Visually Impaired and Blind People Martijn Kiers, Elmar Krajnc, Markus Dornhofer and Werner Bischof. FH JOANNEUM University of Applied Sciences Department of Energy, Transport and Environmental Management, Kapfenberg, Austria. FH JOANNEUM University of Applied Sciences Department of Internet technologies, Kapfenberg, Austria.