A

Mini Project Report

On

"IMPROVING THE SECURITY OF UNLOCKING SYSTEM USING ARDUINO"

Submitted to

CHADALAWADA RAMANAMMA ENGINEERING COLLEGE

In partial fulfillment of the requirement for the award of the Degree of

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS & COMMUNICATION ENGINEERING

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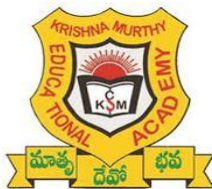**(Autonomous)**

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2018-2022

CHADALAWADA RAMANAMMA ENGINEERING COLLEGE

Department of Electronics & Communication Engineering

Certificate

This is to certify that the Project work entitled **"IMPROVING THE SECURITY OF UNLOCKING THE DOOR USING ARDUINO"** is a bonafide work done by **M.KAVYASAI (18P11A0467)** in the Department of **"ELECTRONICS & COMMUNICATION ENGINEERING"** and submitted to *Chadalawada Ramanamma Engineering College, Tirupati* is a project work carried out by them under my guidance during the academic year 2020-2021.

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DECLARATION

We are hereby declare that the project work on **"IMPROVING THE SECURITY OF UNLOCKING THE DOOR USING ARDUINO"** done by us under the guidance of **Dr.P.KRISHNA MURTHY,** M.Tech, Ph.D in **CHADALAWADA RAMANAMMA ENGINEERING COLLEGE(Autonomous)** is submitted in partial fulfillment of the requirements of the award of Degree of Bachelor of Technology.

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that, we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in our project report submission.

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ACKNOWLEDGEMENT

ABSTRACT

Security is a prime concern in our day-today life. Everyone wants to feel secure. An access control for doors forms a vital part in our security chain. Doors locked using conventional locks are not as safe as they used to be, anyone can break in by breaking these locks. Password based door lock system allows only authorized persons to access restricted are the system is fully controlled by Arduino is matched with the one stored in Arduino sends a one-time password to the given mobile number. After entering the correct one time password, it Instructs the motor driver to open the door.

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LIST OF ABBREVATIONS

LCD   -   Liquid Crystal Display

GSM   -   Global System for Mobile Communication

IDE   -   Integrated Development Environment

AREF   -   Analog Reference

SIM   -   Subscriber Identity Module

OTP   -   One Time Password

CHAPTER 1

INTRODUCTION

1.1 SECURITY SYSTEM

A security system is a device to detect intrusion and unauthorized access into a building or area. There are many examples of a security system, an Arduino is considered as one of the major components used to create a system for security. In this project, however the components to proponents used GSM module as a major component to provide additional projection in a certain area. A GSM module sends a One Time Password (OTP) to the required mobile number.

GSM services are a standard collection of applications and features available over the global system for mobile communication (GSM) to mobile phone subscribers all over the world. The GSM standards are defined by the 3GPP collaboration and implemented in hardware and software by equipment manufacture and mobile phone operators.

Arduino uno is an open-source platform used for building electronics projects. It consists of both a physical programmable circuit board (Often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on a computer, used to write and upload computer code to the physical board.

Need of security is the basic necessity of any individual. The feeling that we are safe and everything around us is all right is imperative for a peaceful living. But in this unsafe world, when crime, error and threats are on the preak, how can one attain that sense of security? Here, laser provides us with a solution and for this reason more and more people are installing them in order to stay safe and secure. Various electronic security system can be used at home and other important working places for security and safety purposes.

1.2 Motivation

The main motivation to do Arduino and GSM based security system is now-a-days people became so busy that they can't take care of some important things like land documents, jewellary etc. Daily for the protection and for the safety that are approaching the organizations like banks and for office work also we need some kind of security for important documents, in school also we need security for the question papers which are prepared for the examinations.

1.3 OBJECTIVE

The main objective of this project is to design and implement an Arduino-based security system using laser light.

Specific objectives:

- To determine the functionalities of an Arduino, global system for mobile communication and light dependent resistor;

- To increase the security level to prevent an unauthorized unlocking of the door

1.4 Problem statement

Nowadays, security can be considered as one of the most necessary things because of increasing crimes. These are many types of security system that are currently using by most people closed -circuit television (CCTV), alarms, etc.; but this system is very much different for other as it sends OTP when the owner entry correct password and after entering correct OTP the door opens. Security has been a growing issue these days. It is necessary to secure things and keep them in a safer place. Hence, we propose a device which gives message to the owner.

CHAPTER 2

LITERATURE REVIEW

2.1 EXISTING SYSTEM

The earliest security system comes from the early 1990's, They were very expansive at that time and hard to monitor an intrusion. Now the technology has developed very much more than the old days. Password protected election lock that provides a great benefit over a traditional lock, as well as great security. The system comprises of a keypad and 16×2 LCD along with a microcontroller. The present state is notified by the lcd to the uses. Uses can perform operations such as opening and closing the lock, changing the current password through keypad instruction.

The aim of this project is to make such type of lock which will ensure security as well as cost efficient implementation password protected electronic lock efficient implementation. Password protected electronic lock comprises of keypad as input, LCD display as output device and microcontroller
as controlling unit. The lock system is protected by a password which is set by the user. The lock is opened only when the correct password is inserted.

Science and technology have advanced our life in many ways. It facilitate the process of industrialization as well as modernization of the world. It has blessed as with many sophisticated devices by facilitating our life. Password based locking system is one of the modern electronic lock systems. To ensure security many electronic lock has been introduced. Electric locks use magnets, solenoid, or motor to actually the lock by either supplying or removing power. Some research works on electronic locks has been focused that will reveals the significance of the proposed system.

2.2 Implementation of existing method

An electronic lock allows activation of an electric appliance only on entering the correct password. Here we have presented such an electronic locking sytem in which a PIC18F452 microcontroller plays the role of the processing unit. The MCU is interfaced with a4x4 matrix keypad and a 16x2lcd to the user interface .Using this circuit,one can make any electrical appliance password protected It can be used as an electronic door lock by interfacing the output of the circuit with an electrically actuated door lock. The system turns on the appliance on entering a three digit's password.
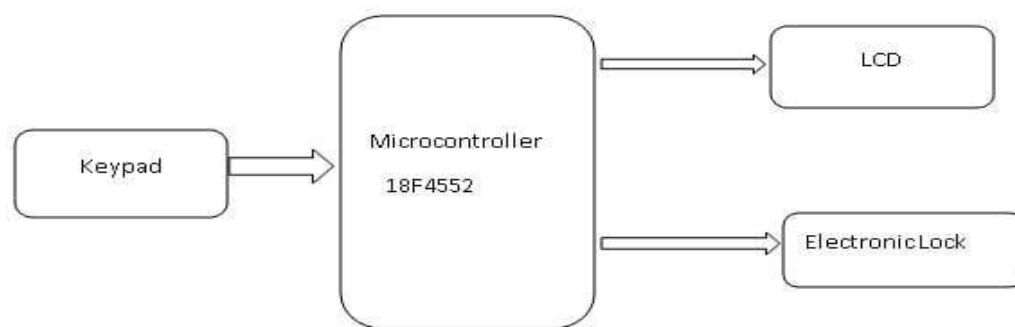
Figure 2.1: Block Diagram of Existing system

2.3 Scope and Limitations of Existing System

Password protected electronic lock system has the following scopes : -

- we can add finger prints sensor so we can allow entry to authorized user only.

- We can add fire and wind senor in case of emergency the door will automatically open.

The following are the limitations of the design:

- Code Hacking. Without a physical key. It is possible that someone could guess your password.

- It is a low range circuit, i.e. It is not possible to operate the circuit remotely.

CHAPTER-3
PROPOSED SYSTEM

3.1 Block Diagram of Proposed System
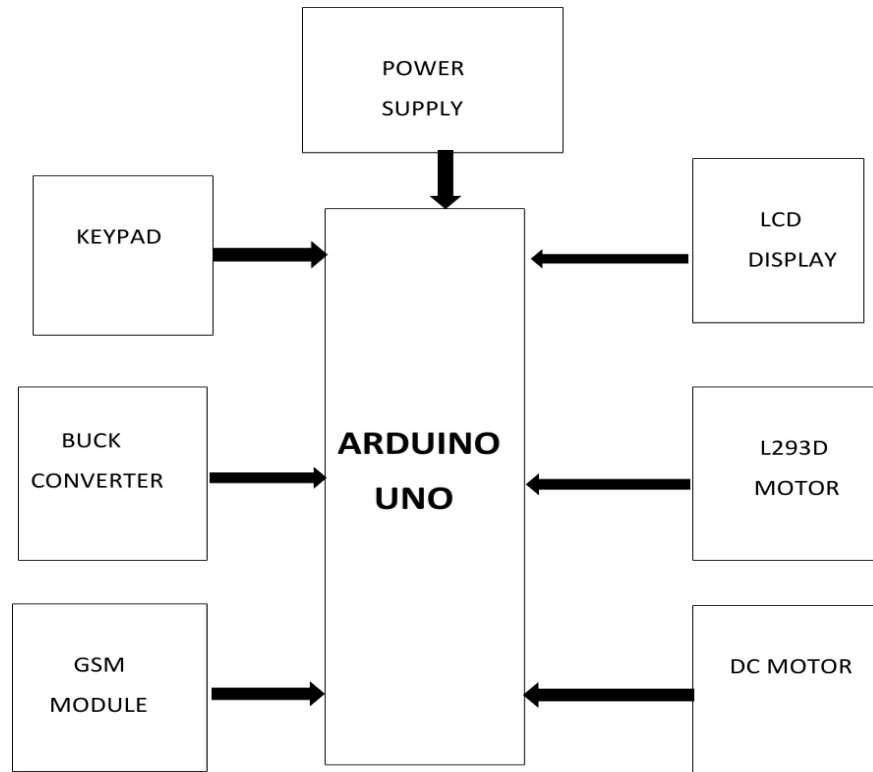
Figure 3.1: Block Diagram of Proposed Method

The block diagram of unlocking the door using password based on Arduino .power supply connected with Arduino .Arduino is connected with keypad ,buck converter, GSM modular to accept data from its.The given data is displayed on lcd display ,through Arduino .arduino gives instructions to the motor whether the door open or not. The Arduino sends OTP (one time password)through GSM module**.**

3.2 HARDWARE REQUIREMENTS

3.2.1 ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller. "UNO" means one in Italian and was chosen to mark the release of Arduino Software (IDE)1.0.

The Uno board and version 1.0 of Arduino Software (IDE) were the reference version of Arduino, now evolved to newer releases. This board is the first in a series of USB Arduino boards.

Communication

The Arduino Uno has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega8U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The '8U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, a file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and1).

A Software Serial library allows for serial communication on any of the Uno's digital pins. The ATmega328 also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus; see the documentation for details. For SPI communication, use the SPI library.

Programming

The Arduino Uno can be programmed with the Arduino software (download). Select "Arduino Uno from the Tools > Board menu (according to the microcontroller

on your board). For details, see the reference and tutorials. The ATmega328 on the FXX Arduino Uno comes pre-burned with a boot loader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500

protocol (reference, C header files). You can also bypass the boot loader and program the microcontroller through the ICSP (In-Circuit Serial Programming) header; see these instructions for details. The ATmega16U2 (or 8U2 in the rev1 and rev2 boards) firmware source code is available. The ATmega16U2/8U2 is loaded with a DFU boot loader, which can be activated by:

- On Rev1 boards: connecting the solder jumper on the back of the board (near the map of Italy) and then resetting the8U2.
- On Rev2 or later boards: there is a resistor that pulling the 8U2/16U2 HWB line to ground, making it easier to put into DFU mode.

You can then use Atmel's FLIP software (Windows) or the DFU programmer (Mac OS X and Linux) to load a new firmware. Or you can use the ISP header with an external programmer (overwriting the DFU boot loader). See this user-contributed tutorial for more information.

Automatic (Software) Reset

Rather than requiring a physical press of the reset button before an upload, the Arduino Uno is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of the ATmega8U2/16U2 is connected to the reset line of the ATmega328 via a 100 Nano-farad capacitor. When this line is asserted (taken low), the reset line drops long enough to reset the chip. The Arduino software uses this capability to allow you to upload code by simply pressing the upload button in the Arduino environment. This means that the boot loader can have a shorter timeout, as the lowering of DTR can be well-coordinated with the start of the upload.

When the Uno is connected to either a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following half second or so, the boot loader is running on the UNO. While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened.

If a sketch running on the board receives one-time configuration or other data when it first starts, make sure that the software with which it communicates waits a second after opening the connection and before sending this data. The Uno contains a trace that can be cut to disable the auto-reset. The pads on either side of the trace can be soldered together to re-enable it. It's labeled "RESET-EN". You may also be able to disable the auto-reset by connecting a 110 ohm resistor from 5V to the reset line; see this forum thread for details.

USB Over-current Protection

The Arduino Uno has a resettable poly-fuse that protects your computer's USB ports
from shorts and over current. Although most computers provide their own internal protection, the fuse provides an extra layer of protection. If more than 500 mA is applied to the USB port, the fuse will automatically break the connection until the short or overload is removed.
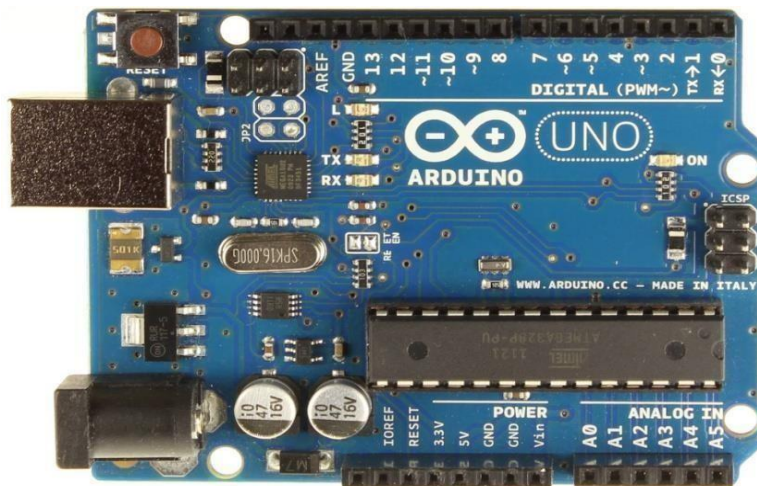
Figure 3.2:Arduino UNO

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage	7-12V
Input Voltage (limit)	6-20V
Digital I/O Pins	14
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O pin	20Ma
Dc Current for 3.3V pin	50Ma
Flash Memory	32 KB (ATmega328P)
SRAM	2 KB (ATmega328P)
EEPROM	1KB (ATmega328P)
Clock Speed	16 MHz
Length	68.6 mm
Width	53.4 mm
Weight	25 g
ADC resolution(bits)	8
UART serial ports	1

Table 3.1:Technical Specifications of Arduino UNO

3.2.2 ARDUINO PIN DIAGRAM
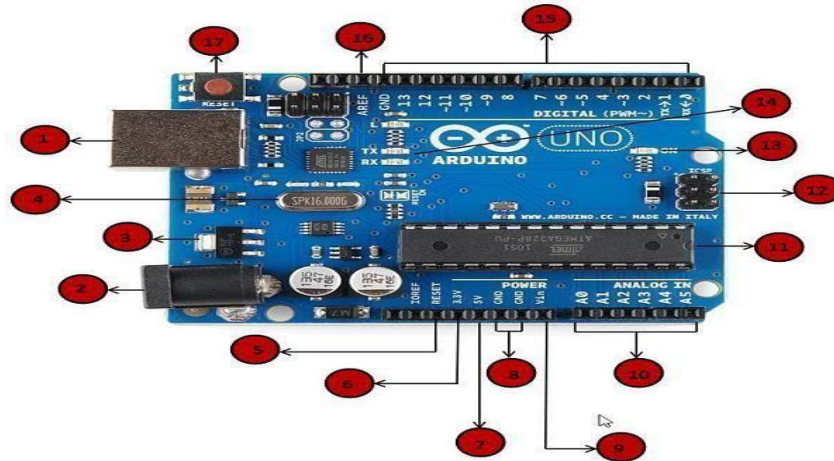
Figure 3.3: Arduino Pin Diagram

1. **Power USB**

   Arduino board is high-powered by victimization the USB cable from your laptop. All you would like to try to connect the USB cable to the USB affiliation (1).

2. **Power (Barrel Jack)**

   Arduino boards are often directly high-powered from the AC main power provide by connecting it to the Barrel Jack (2).

3. **Voltage Regulator**

   The main perform of transformer is to regulate the voltage given to the UNO board and stabilize the DC volt utilized by the processor and alternative parts.

4.   Crystal Oscillator

Crystal oscillator helps Arduino board in handling time problems. However will Arduino calculate time the solution is, by victimization the quartz oscillator. The amount written on high of the Arduino crystal is sixteen.000H9H. It tells North American nation that the frequency is 16,000,000 Hertz or sixteen Mega Hertz.

5.   Arduino Reset

You can reset your Arduino board, i.e., starts your program from the start. You'll reset the UNO board in 2 ways in which. First, by exploitation the push button (17) on the board.

6.   3.3 V, 5V Powerpin

- 3.3V (6) − Supply 3.3 output volt

- 5V (7) − Supply 5 output volt

- Most of the components used with Arduino board works fine with 3.3 volt and5volt.

7.   Vin, GND

- GND (8) (Ground) − There are several GND pins on the Arduino, any of which can be used to ground your circuit.
- Vin (9) − This pin also can be used to power the Arduino board from an external power source, like AC mains power supply.

8.   Analog pins

TheArduinoUNOboardhasfiveanaloginputpinsA0throughA5.Thesepins will scan the signal from AN analog device just like the gas device or humidness device and convert it into a digital price that may be scan by the silicon chip.

## 9.	Main microcontroller

Each Arduino board has its own microcontroller(11).You'll be able to assume it because the brain of your board. The most IC on the Arduino is slightly totally different from board to board. You need to recognize what IC your board has before loading up a replacement program from the Arduino IDE. For a lot of details concerning the IC construction and functions, you'll be able to confer with the information sheet.

## 10.	ICSP pin

Mostly, ICSP (12) is associate degree AVR, a small programming header for the Arduino consisting of MOSI, MISO, SCK, RESET, VCC, and GND. it's typically mentioned as associate degree SPI (Serial Peripheral Interface), that may well be thought-about as associate degree "expansion" of the output. Actually, you're slaving the output device to the master of the SPI bus.

## 11.	Power LED indicator

This diode activates once you plug your Arduino into an influence supply to indicating that your board is obtaining power properly. If this light-weight doesn't activate, t then there's one thing wrong within the hardware association.

## 12.	TX and RX LEDs

On your board, you'll notice 2 labels: TX-(Transmit) and RX-(receive). They seem in 2 places on the Arduino UNO board. First at the digital pins zero and one, to point the pins accountable for serial communication. Second, the Transmit and receive junction rectifier (13). The Transmit junction rectifier flashes with completely different speed whereas causing the serial knowledge.

13. Digital I/O

The Arduino UNO board has fourteen digital Input-output pins (15) (of that six give PWM (Pulse dimension Modulation) output. These pins will be organized to figure as input digital pins to browse logic values (0 or 1) or as digital output pins to drive completely different modules like LEDs, relays, etc.

14. AREF

AREF stands for Analog Reference. It's typically, wont to set Associate in nursing external reference voltage between zero and five Volts because the higher limit for the analog input pins.

3.2.3 GSM MODULE

GSM (GLOBAL SYSTEM FOR MOBILE COMMUNICATION)

GSM (Global System for Mobile Communications), is a standard developed by the European Telecommunications Standards Institute (ETSI). It was created to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones and is now the default global standard for mobile communications – with over 90% market share, operating in over 219 countries and territories.

GSM Modem

A GSM module or a GPRS module is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM or GPRS system. The modem (modulator-demodulator) is a critical parthere.

These modules consist of a GSM module or GPRS modem powered by a power supply circuit and communication interfaces (like RS-232, USB 2.0, and others) for computer.
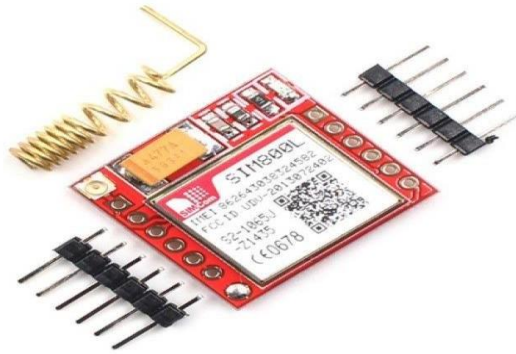
Figure 3.4: SIM800L GSM Modem

Module pin out

Pin out (bottom side - left):

- RING (not marked on PBC, first from top, square) - LOW state while receiving call
- DTR - sleep mode. Default in HIGH state (module in sleep mode, serial communication disabled). After setting it in LOW the module will wake up.
- MICP, MICN - microphone (P + / N -)
- SPKP, SPKN - speaker (P + / N -)

Pin out (bottom side - right):

- NET - antenna
- VCC - supply voltage
- RESET - reset
- RXD - serial communication
- TXD - serial communication
- GND – ground

3.2.4 L293D MOTOR DRIVER

The L293D Motor driver shield is one of the best way for controlling DC, Servo and Stepper motors especially if you are using Arduino UNO or MEGA in projects like robotics and CNC. Another rather common driver is the L298d motor

driver but unlike the L293D driver, this one mainly controls DC motor.

Structure of the L293D motor driver shield

This shield is based on the L293D IC and can drive 4 bi-directional DC motors , 2 stepper motors and 2 servo motors. It is mainly compatible with the Arduino UNO and MEGA boards.Take note that each channel of this module has the maximum current of 1.2A and doesn't work if the voltage is more than 25v or less than 4.5v.
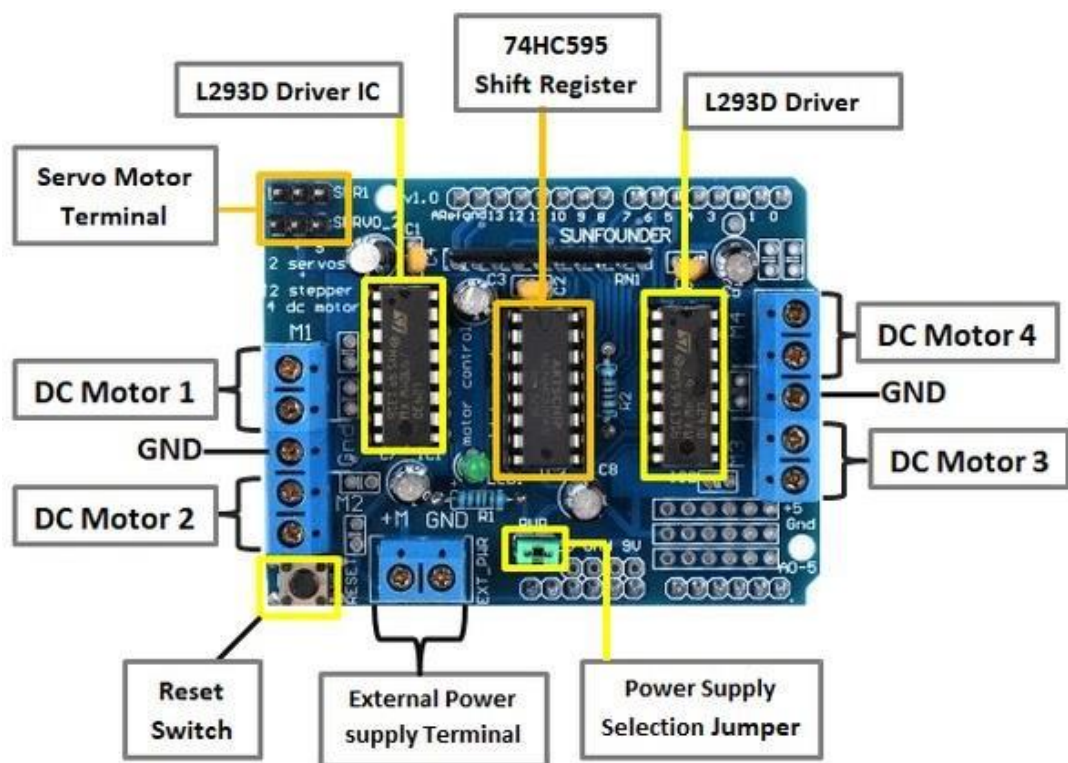

Figure 3.5 : L293D Motor Driver

3.2.5 BUCKCONVERTER

A buck converter (step-down converter) is a DC-to-DC power converter which steps down voltage (while stepping up current) from its input (supply) to its output (load). It is a class of switched-mode power supply (SMPS) typically containing at least two semiconductors (a diode and a transistor, although modern buck converters frequently replace the diode with a second transistor used for synchronous rectification)

and at least one energy storage element, a capacitor, inductor, or the two in combination. To reduce voltage ripple, filters made of capacitors (sometimes in combination with inductors) are normally added to such a converter's output (load-side filter) and input (supply-side filter).

Figure3.6: Buck converter

3.2.6 4X4 KEYPAD

This 4x4 matrix keypad has 16 built-in pushbutton contacts connected to row and columnlines. A microcontroller can scan these lines for a button-pressed state. In the keypad library, the Propeller sets all the column lines to input, and all the row lines to input. After that, it checks the column lines one at a time.
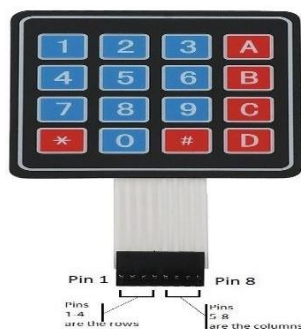

Figure 3.7:4x4 Keypad

3.2.716x2LCD DISPLAY

LCDs (Liquid Crystal Displays) are used in embedded system applications for displaying various parameters and status of the system.LCD 16x2 is a 16-pin device that has 2 rows that can accommodate 16 characters each.LCD 16x2 can be used in 4-bit mode or 8-bit mode.It is also possible to create custom characters.It has 8 data lines and 3 control lines that can be used for control purposes.For more information about LCD 16x2 and how to use it, refer the topic 16x2 LCD module in the sensors and modules section.

Figure3.8: 16 x 2 LCD Display

3.3 SOFTWARE REQUIREMENTS

3.3.1 ARDUINO INTEGRATED DEVELOPMENT ENVIRONMENT (IDE)

The Arduino Integrated progress Environment - or Arduino Software (IDE) - It includes a text editor to write a program, a message field, a text area, a toolbar which has buttons for a common method and a series of menus.

It connects with the Arduino and Genuino hardware to load the program and establish communication with them. These sketches are to be written in the text editor and are saved with the extension .UNO.

The editor has characteristics for cutting/pasting and for searching/replacing text. The message are a gives information while saving and also showerors. The console

shows text output by the Arduino Software (IDE), which includes complete error messages and other information.

The lowermost right-hand corner of the window shows the configured board and serial port. The toolbar buttons allow you to validate and upload programs, create, open and save the sketches and open the serial monitor.

Figure 3.9: Arduino IDE

The main code, also known as a sketch, created on the IDE platform will ultimately generate a Hex File which is then transferred and uploaded in the controller on the board.

The IDE environment mainly contains two basic parts: Editor and Compiler where former is used for writing the required code and later is used for compiling and uploading the code into the given Arduino Module. Now click on the Arduino IDE icon present on your Desktop. A window will appear like this.
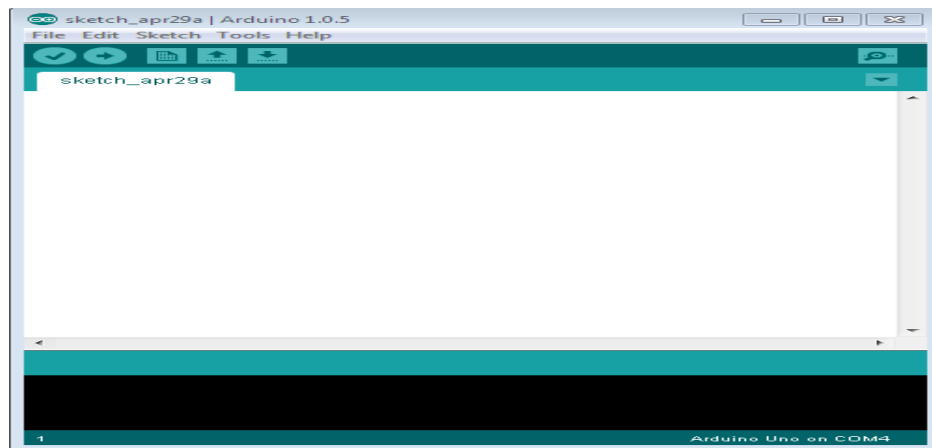
Figure 3.10: Arduino programming Area

For any sample programs, select FILE option ➐ Examples.

After Entering the Sample Code in the file, it would look like this shown in next figure.

Figure 3.11: Arduino Program Implementation

At this point you are ready to connect your Arduino to your computer. Plug one end of the USB cable to the Arduino Uno and then the other end of the USB to your computer's USB port.

Once the board is connected, you will need to go to **Tools** then **Board** then finally select **Arduino UNO.** Before Connecting we have to select which Board is used by the user, Basically UNO. By selecting

TOOLS ➐   Board ➐ ARDUINOUNO.

Figure 3.12: Arduino Tools

Now to dump the in the board Connect the Arduino to the PC through the USB port available in it. Like this TOOLS ➐ SERIAL PORT ➐ COMM4, COMM8 etc.

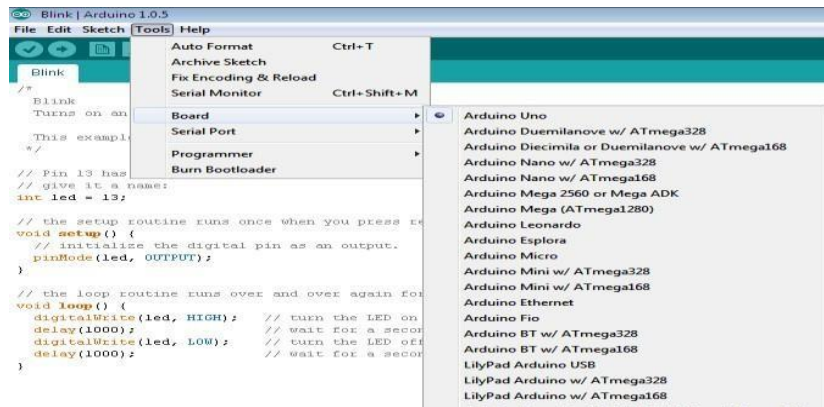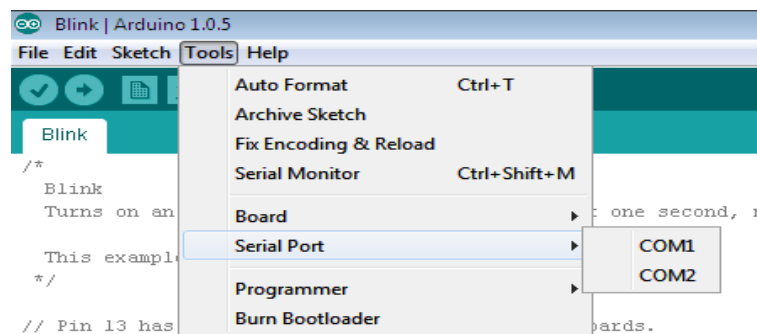**Figure 3.13: Arduino Serial port Implementation**

To verify the written Program select COMPILE option available in the software. Now Connect the Board and select the COMM port and then UPLOAD the file in ARDUINO (➐).

Our next menu is the sketch menu which gives us access to the verify/compile functions and some other useful functions you will use later on. These include the import Library option, which when clicked will bring up a list of the available libraries, stored. The next menu in the IDE is the Tools menu. Within this are the options to select the board and serial port we are using, as we did when setting up the arduino for the first time. Also we have the Auto Format function that formats your code to make it look nicer.

The copy for Forum option will copy the code within the Sketch window, but in a format that when pasted into the Arduino forum will show up the same as it is in the IDE, along with syntax Colorings. The archive sketch option will enable you to compress your sketch into a ZIP file and asks you were you wanted to store it.

CHAPTER-4

IMPLEMENTATION AND METHODOLOGY

4.1 HARDWARE IMPLEMENTATION

In Hardware implementation we have used ARDUINO UNO, a GSM modem to establish a wireless body area network. The device can be configured in such a way that it sends message to the owner when the safe locker is opened by an unauthorized person. Following is a discussion based on the overview of the connection setup.

4.2 CONNECTION SETUP

The hardware consists of power offer used for providing offer to the elements and therefore the chip. The facility offer output vary between 5V and 3.3V. The 5V is employed by Arduino and processor.

The first configured Arduino UNO board in order to get the messages from the required mobile number when unauthorized enters . Here we are using GSM which sends a message as OTP. The GSM modem, SIM800L are used in our project is also configured with the Arduino so that it is able to send message to the owner.
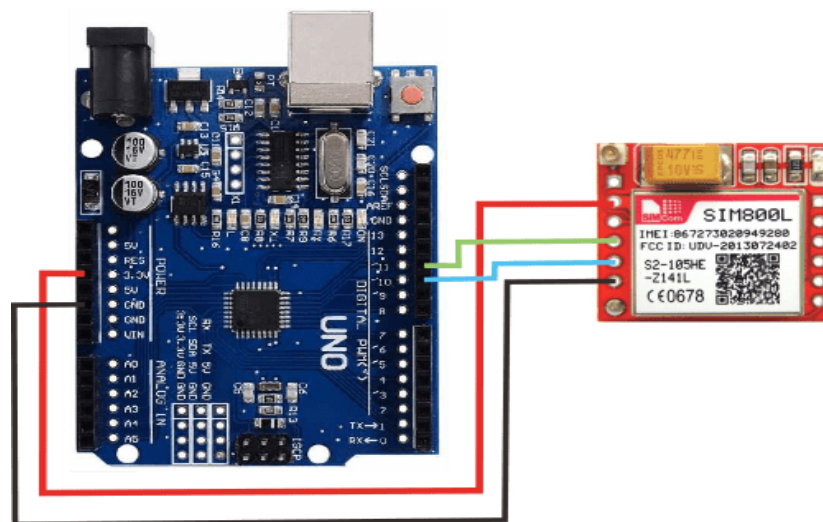
Figure 4.1: Arduino-GSM connectivity

The above diagram shows the GSM SIM800L with the Arduino module. From thecircuit diagram, we can observe that the Vcc pin of the GSM is connected to the 3.3V of the Arduino. The RXD pin of GSM is connected to the 11 pin of the arduino and also for the arduino pin 10 TXD of the GSM is connected. The both the GND of GSM and Arduino are connected. This process very simple, it requires fewer connection cables.

A GSM modem works like any other typical mobile phone. Since GSM SIM800L also comes with GPRS enable it has the criterian to provide inter connectivity.we have inserted a sim card activated with the GSM modem.GSM modem sends the message to the owner with the help of sim card activated in the GSM modem .The message will be sent to a particular person who is the owner of that things.the ground pin is connected with the ground pin in Arduino. The Arduino and GSM modem need to be supplied power which can be given by either connecting those to batteries or using adapters.
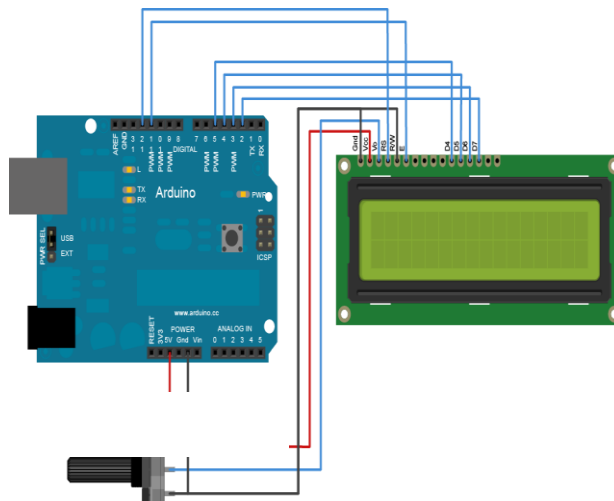
Figure 4.2:Arduino-LCD Display connectivity

A liquid crystal display, or LCD, is a video display that utilizes the light modulating properties of liquid crystals to display pictures or text on a screen. Since their invention in 1964, LCD screens have grown to be used in a very wide

variety of applications, including computer monitors, televisions, and instrument panels. One way to utilize an LCD is with an Arduino microcontroller. By wiring an Arduino microcontroller to the pins of an LCD display it is possible to program the microcontroller to display a desired text string or image on the screen.
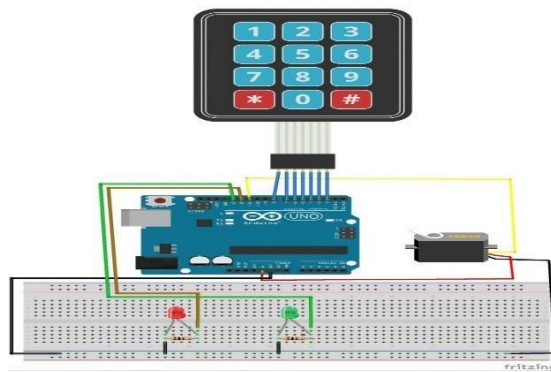
Figure 4.3:Arduino – keypad connectivity

Keypads are simply switches arranged in matrix form. This arrangement reduces the number of I/O pins needed for interfacing the switches. For example for a 4×4 keypad, if you use 16 individual push buttons, you would require 17 input pins (one for each key and a ground pin) in order to make them work. However, with matrix arrangement, you only need 8 microcontroller pins (4-columns and 4-rows) to scan through the pad.

4.3 METHODOLOGY

There are three essential components to a this security system: a GSM, a arduino and buck converter. The GSM works like any other typical mobile. The buck converter is used as voltage regulator. The keypad is connected to the Arduino UNO. When the authorized persons enters the correct password ,it sends the (OTP) to the required mobile.After entering the correct OTP ,the door will open.

The assignment mainly works on the Arduino .If any wants to open the locker box , The system asks password ,if they enter correct password then the system asks to enter OTP.The OTP receives to the registered mobile number.SO There no way of unauthorized unlocking the door/locker. The Arduino UNO has provided a power supply. Implement the program and upload it to the Arduino UNO with the help of cable. Then the GSM is connected with the Arduino UNO . The buck converter is connected to the Arduino Uno. The keypad is connected to the Arduino UNO as an output so that it can intimate to the owner.

This project will teach us how to make a smart device that can notify us whenever any unauthorized person opens the safe box/drawer. Basically, the device is based on Arduino . So, when any drawer or box is used to opens , the owner receives OTP so that he notifices that unauthorixed unlocking the door.Arduino IDE is installed in your PC, open the library manager and then install the "Adafruit Fona" library in it.

To begin coding, first, initialize the required library in the code. After that, define the pins for arduino and SIM800l for serial communication. Next, we will create a setup function where we start the software serial communication with SIM800l at a baud rate of 4800 (default baud rate of SIM800l) and then set the A1 pin as INPUT.

Next, we will create a loop function that will run repeatedly. In the loop function, we will check the Arduino value and create a code that reads the message on the SIM800l module. If the SIM800l has a new message, then it sets that message to the command string.The f condition() checks the Arduino value. If the value is greater than 2, it means that Arduino has been detected and the box is open. Then it checks the

command string to match with a preset command or you can say a unique code that only the user knows. If the command string did match then it sends an SMS alert , notifying that some unknown person is trying to open the safe box/drawerNow, you might think what if anyone triestoopen it at night? To find any box or drawer, the introducer wants to enter the correct password ,after entering correct password systemOTP.

4.4 FLOWCHART OF PROPOSED SYSTEM

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
              ┌──────────────────────┐
              │    Enter password    │
              └──────────────────────┘
                         │
                        ◇
      NO            NO Check
                    Password
                    correct?
                        ◇
                         │ YES
              ┌──────────────────────┐
              │    System Send OTP    │
              └──────────────────────┘
                         │
                        ◇
                       After
                      entering
                      correct
                        OTP
                        ◇
                         │
                    ┌─────────┐
                    │  Door   │
                    │ opened  │
                    └─────────┘
```
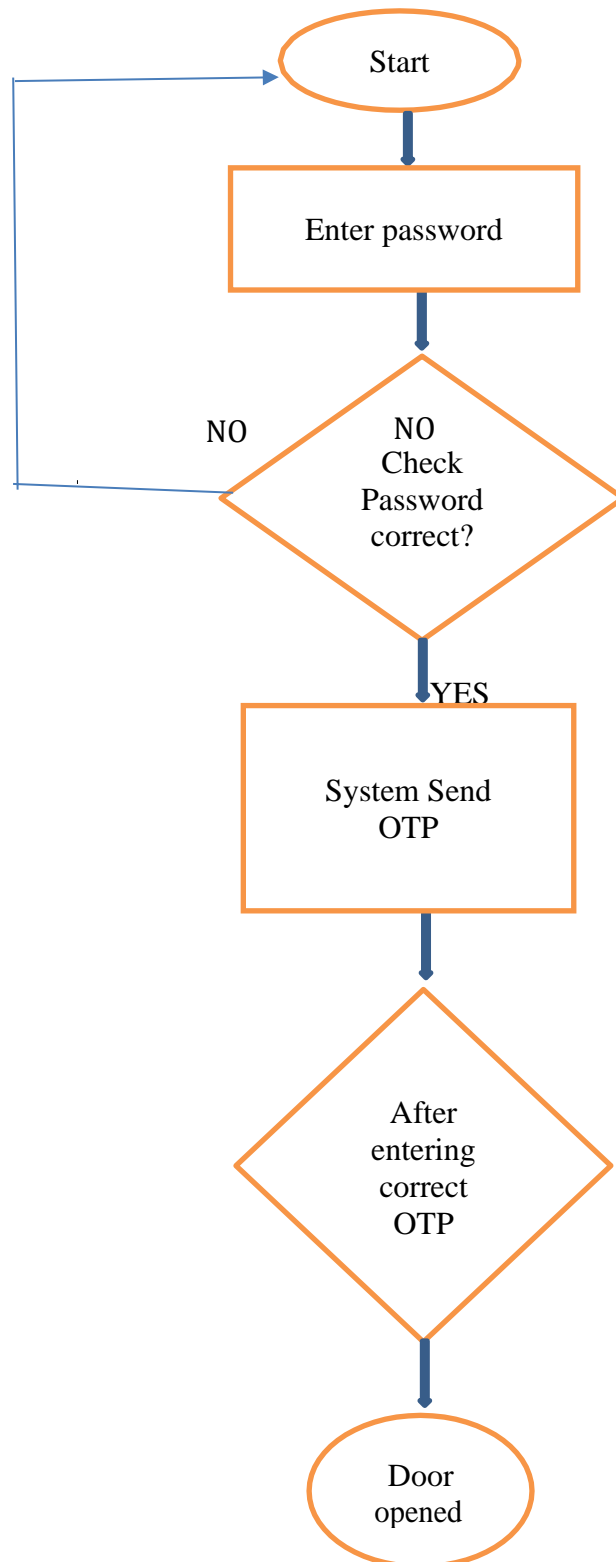
Figure 4.4 : Flow chart for proposed method

The figure illustrates and explains how the system works. It also represents the important role of each progression to execute the system all in all. It is seen that the safe locker is opened,When the correct password enters and correct OTP enters. If the unauthorized wants to open the door ,they need to enters correct OTP ,otherwise no chance of opening the door /locker.

The above figure shows the flow chart of proposed system,system consists of the Arduino used for controlling the system .when the process will be start, to open the door the authorized persons enter the correct password ,if the passwoed is correct the system send one time password (OTP).We already registered the required mobile number to which it wants to sends OTP.After entering the correct OTP the door will open.

If unauthorized tries to open the door ,by code hacking and the system asks to enter OTP, but OTP receives to the registered mobile numbers there is no chance of unauthorized unlocking the door.The system is more secure by adding the additional security ,i.e OTP based door locking.

CHAPTER-5

RESULTS AND OBSERVATIONS

5.1 RESULTS

After sensing the information from totally different devices, which are placed specially square measure of interest. The proponents mainly used the Arduino as a microcontroller, the GSM module to send sms, and the buckconverter that is used as voltage regulator . The program made use of algorithms that served as a main function of the code such as a loop.

In our project Arduino is the core of the security system. The circuit is all about when the authorized persons enters correct password the GSM module send OTP to the required mobile number. it will continuously sends one time password to make the system more secure . It send a message to the owner . Hence the system has an additional feature of sending messages after entering the correct password .keypad is used to enter the password ,lcd display is used to display the messages .

In this way it can increase the security to reduce the theif and intruders in our day to day life and it also helps in reducing manual works as this circuit is automatically operating one.The Arduino and GSM based security system has been successfully designed and developed. The buck converter is used as voltage regulator for circuit safety.the experimental model was made according to the circuit diagram and the results were as expected.

5.2 OBSERVATIONS
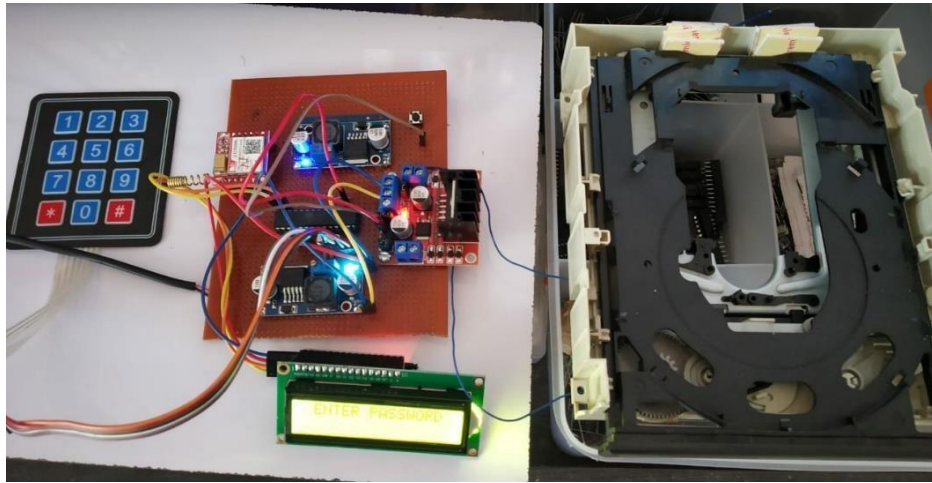

Figure5.1:Result
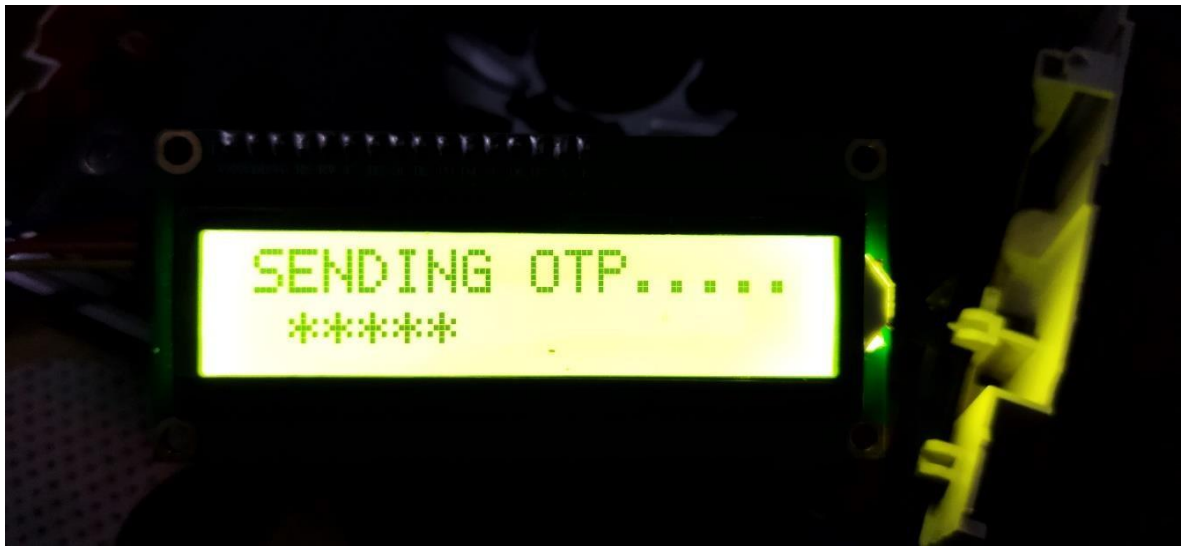

Figure 5.2: The status on the LCD Display

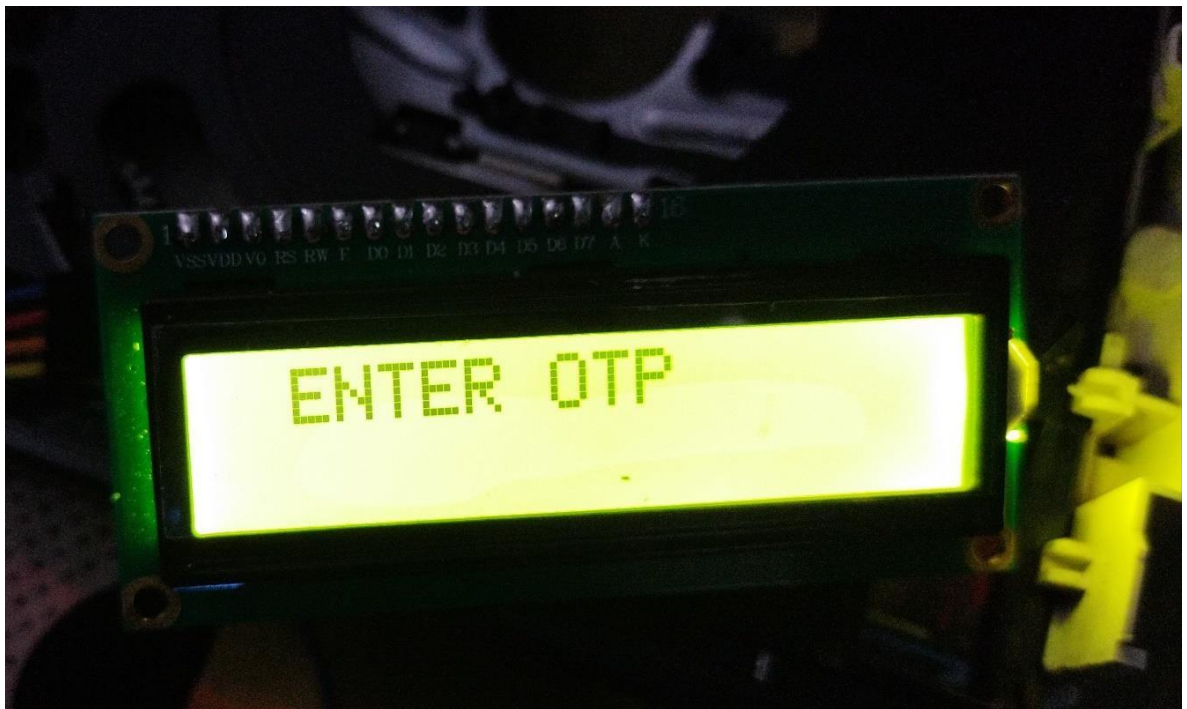 **Figure 5.3: The system sends OTP ,when the person enters correct predefined password.**

Figure 5.4:The system asks to enter the OTP,after sending the OTP.

CHAPTER- 6
CONCLUSION AND FUTURE SCOPE

6.1 CONCLUSION

Arduino and GSM based security system provides us the security against any crime, theft in our day to day life and so people are installing them in order to stay safe, secure and sound. Various electronic security systems can be used at home and other important working places for security and safety purposes. It is a great opportunity and source of saving man power contributing no wastage of electricity. The "Arduino and GSM based security system " is an important helping system.Using this system robbery, thefts & crime can be avoided to large extend. Avoiding thieves results in the safety of our financial assets and thereby this system provides us protection against all.In this project, the proponents were able to determine and utilize the functionalities of the GSM, and Arduino Uno. The combination of these components can create a Arduino and GSM based security system. The Arduino Uno is where the code is uploaded. The code that the proponents have created contains the functions of each component that is needed for the project. In understanding the functions of the components, the proponents were able to design and implement an Arduino-based security system using OTP.The Arduino and GSM system is highly sensitive with a great range of working. The system sends the one time password. The Arduino and GSM system is highly sensitive with a great range of working. The system sends one time password when the person enters correct predefined password. GSM module sends OTP to the registered mobile number.The use of GSM technology assures to provide information to the owner as long as the person is connected to any GSM network and thus overcomes geographical limitations.When the unknown person wants to open the door ,the system sends one time password by adding additional security feature to the system. Therefore it is well suited to surveillance, industrial application, in schools ,offices, banks etc.The use of GSM technology assures to provide information to the owner as long as the person is connected to any GSM network and thus overcomes geographical limitations.

6.2 FUTURE SCOPE

There are several ways in which the method proposed can be improvised at a greater length by using the modern security methods. For instance a high resolution camera can be used to take pictures of the person who has attempted a theft. Also data communications and networking is an upcoming field that can be exploited to achieve better performance in this area. For example, instead of GSM technology, a computer network (PC based) can be established to achieve efficient communication. Cybernetics and computer networks can be also used in order to quickly give information to the concerned authorities.We can also use microcontroller or some timer IC circuit to make the performance of this system better. Also with the help of sound sensing transducer, photo footage can be captured using secret camera as soon as the alarm rings.

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