Secret Knock Detecting Door Locker

A project submitted in partial fulfillment of the requirements for the Award of degree of Bachelor of Software Engineering

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APPROVAL

This **Project/Thesis** titled "**Secret Knock Detecting Door Locker**", submitted by **Mahadi Imam, ID: 151-35-1116 & Bulbul Ahmed, ID: 151-35-887** to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc in Software Engineering and approved as to its style and contents.

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DECLARATION

This is to certify that this project entitled "**Secret Knock Detecting Door Locker**" is done by the following students under my direct supervision and this work has been carried out by them in the laboratories of the department of Software Engineering under the faculty of Engineering of Daffodil International University in partial fulfillment of the requirements for the degree of Bachelor of Software Engineering.

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ABSTRACT

The Project idea was to build a knock detecting door locker which can identify the specific knocking pattern and unlock the door if the pattern is correct. This door locking system provides much security than systems which are currently using. When there are many users who use the door, error may occur because there is only one key to open the door. But here in this door locking system this kind of errors may not occur because the users who know the knocking pattern can open the door any time without a key.

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CHAPTER 1

Introduction

1.1 Project Overview

Secret knock detecting door locker is a mechanical and electronic keyless door lock system which is used for offices, houses and exit doors. It is hardware based system which is used to secure main door of any house. In this generation, this locker can provide advanced security and convenience, especially in a door locks. It is a security use for avoiding to open the door. There is many kinds of door locks currently use in the world. In high security systems it use electronic door locks. User will use this system for avoid unknown person to enter in his/her house and also help in all society person.

1.2 Project Purpose

This project is aimed to developing a secret door locking system. User will setup a pattern of knock which will help to unlock the door. In this system, any user can use any type of pattern to lock and unlock his/her house. User will choose a pattern of knock than he/she have to setup in the system. System will save this pattern in its memory to unlock the door. After unlocked, door automatically locked few minutes later. Knock pattern will secure to lock the door form unknown person who want to unlock it.

1.2.1 Background

Secret locking door locker is a system which is a security system for locking door. It build with Arduino Uno microcontroller which works to get proper secure system and controlling part of this locker. When a user will use this system than he/she have to ensure to setup his/her declare knock sequence.

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1.2.2 Benefits & Beneficiaries

- User friendliness is provided in the system with various locker.
- Less cost for any locking system.
- No need to carry any metal key for this locker.
- No risk to unlock in any type of knocking pattern.
- Automated entry and exit systems.
- Durability.
- Strong security system.

1.2.3 Goals

To making this system, User can secure his/her house door, office door, main door etc. It's like an automated system.

- To secure house door lock
- No need any metal key for locker
- Can easily unlock the door
- Unlock the door using a pattern knock
- This security system represents a major improvement in protection for home and property
- The system operates under microcontroller control and the software has been preprogrammed to suit the majority of applications

1.3 Stakeholders

Secret knocking door locker is a project to make more secure for house, office doors. This system is always become ready to get knock. Anybody are not using this system, but system always stay still ready for take response.

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1.4 Proposed System Model (block diagram)

Block Diagram: A general block diagram of the design of your solution. Physical Design (if applicable): A physical diagram of the project indicating things such as mechanical dimensions or placement of sensors and actuators. The physical diagram should also be accompanied by a brief one paragraph description.

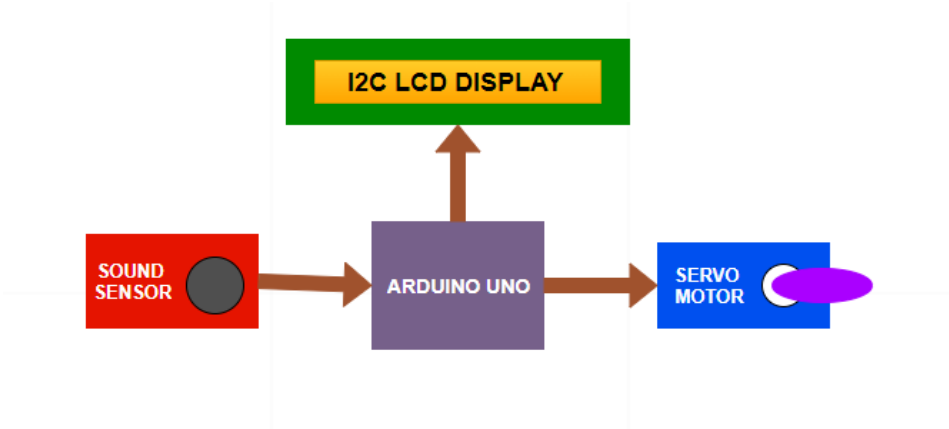

Figure 1.1: Block Diagram

This Project consists of a sound sensor, which is the main source of analog signal and is given to the charge digital signal for extracting arduino from send to notify display and also to maintain servo motor. sound conservation in door is controlled using microcontroller with sound sensor. The sound is detected using sound sensor which is inserted into the door.

1.5 Project Schedule

Secret knocking door locker is not an ordinary system that we build it in a few days. First we have to research it then we were decide to implement this system.

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1.5.1 Gantt Chart

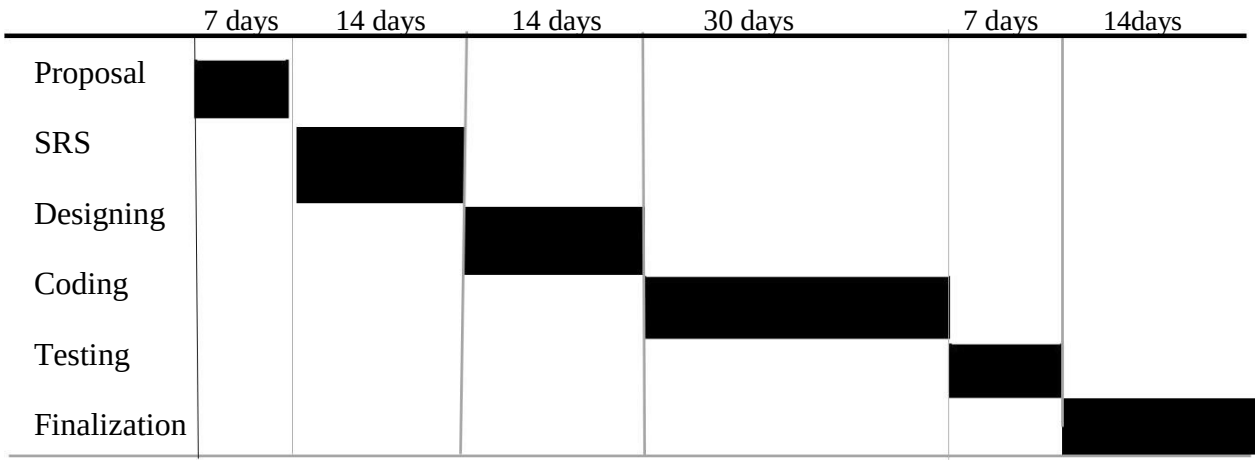

Table 1.1: Gantt Chart

1.5.2 Release Plan/Milestone

Secret knocking door locker is not a simple and easy system which it implement within few days. We need more than 3 months to complete this implementation. We first think about it and then we start that who to make it strong security and user friendly. After 3 months we will release it for users.

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Chapter 2

Software Requirement Specification

2.1 Functional Requirements

- User can setup new knock pattern
- User can change knock pattern
- User can save knock pattern
- User get matched accurate saved knock pattern
- System get saved user's knock pattern
- System able to get changed knock pattern by user
- System get compromised for unmatched knock pattern
- System get unlock the door after getting accurate knock pattern
- System get locked door after unlocking for a few minutes

2.2 Data Requirements

Secret knock detecting door locker system will conjuncts the user and it will provide the easiest way of service to a user who is looking for rapid service. Here, user can secure his /her house through this system. This system contains a highly secured micro-processor which will help the system to work properly and make it strong and safe. This microcontroller will able to recognize user's pattern and knock numbers. This system process their data manually it is a very major obstacle of their works. This system whole process is in automated way for increasing knock accuracy. It will try to provide a more secure, fast operational, risk managing, user friendly system which will give to user the best service.

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2.3 Performance Requirements

In this world, any type of security system cannot able to secure 100%. Like that, this system also can't make sure to able to get 100% security prof. But it will ensure not less than 90% security to sure. Because it is too first and safety. We design this system in a way which will help user to get highest security.

2.3.1 Speed and Latency Requirements

Secret knocking door locker is based on a microprocessor which is too fast to work properly. In a few seconds it will lock and unlock the door if it use wisely. It takes millisecond to work out its output and user will get feedback from this system.

2.3.2 Capacity Requirements

This project is one of the better system for security. This keyless locker can use any type of environment. This system is too small and low price which anyone can afford it. This project design based on all operational parameters such as confidentiality, reliability, maintainability, supportability, usability, affordability. Because it is one of the low range budget locker system for user and provide best security to secure main house.

2.4 Dependability Requirements

This system may be considered to be dependable if it operates without interruption, delivers the system that are expected by stakeholders, does not have adverse effects on the system's environment and doesn't damage its data or the system itself.

2.4.1 Reliability Requirements

It has good accuracy to get saved fresh knock pattern. It is user friendly. So user feel easy to use.

2.4.2 Availability Requirements

The locker is available for 24 hours. It is always available for user. User can give input any time.

2.4.3 Safety-Critical Requirements

Users knock and pattern and system input must be remain confidential.

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2.5 Maintainability and Supportability Requirements

2.5.1 Maintenance Requirements

Maintenance requirement is one of the important part in our project. In this project, our every equipment of this project are useful and work quite good. First of all user, microcontroller is the main head of his system. Arduino Uno R3 one of the strong module which is connect and maintain all of other modules.

2.5.2 Supportability Requirements

In this project, Arduino Uno R3 is the main in this system. This system is fully supported and meets all criteria from this microcontroller. This microcontroller board is a removable, dual inline-package (dip) based on ATmega328 AVR microcontroller. For this microcontroller, we are able to build the right systems and support to ensure our system is strong and secure.

2.5.3 Adaptability Requirements

Secret knock detecting door locker system will reduce the number of insecurity, budget money, problems in risk and unsecure percentages of house. It will increase unlocking speed, user satisfaction, service accuracy level. This project design based on all operational parameters such as confidentiality, reliability, maintainability, supportability, usability, affordability. Because it is one of the low range budget locker system for user and provide best security to secure main house.

2.6 Security Requirements

2.6.1 Access Requirements

Secret knocking door locker is one of the best security system. Because this system can’t accessible for unknown user. Only user can access it to change its system and can reset this system. For access this system, user should be like friendly and be careful when system are going to get input through users.

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2.6.2 Privacy Requirements

To ensure that confidentiality testing tests a specific system, the privacy requirements are implemented correctly in the system. This requirement we ensure personally identifiable information of any user (silicon). In this system, confidentiality is good enough to be known by experimental fraud and unknown person. It reduces the error cost and checks the system's usability for the user to setup.

2.7 Usability and Human-Interaction Requirements

2.7.1 Ease of Use Requirements

Ease of use is the usability of this system, service, tool, process or environment. Ease of use applies to a context such as a locker that is well secure to lock. It will measure of how easy the finished system is to use by its intended users. This system is good enough for user and get strong security also.

2.7.2 Accessibility Requirements

Secret unknown person knocking the door of the locker for any type of non-accessible. For this project, people with disabilities, to understand, navigate, and interact with systems and equipment, and that they can contribute equally without interruption**.**

2.7.3 User Documentation Requirements

In this system, any type of user can use this for security. But first of all, user have to understand about this system that how it works. For users we make a document which is useful for users. In this document, user are primarily teaching materials which include some technical explanation.

2.7.4 Training Requirements

Secret knocking door locker is a system for user which is not easy to understand for security. Because any user have to know about this system and then he/she can easily setup for his/her security. User should trained himself/herself when he/she is going to use this system. Otherwise system can be cracked or risky for users.

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2.8 Operational and Environmental Requirements

2.8.1 Expected Physical Environment

In this country, security system is too low for house, office. In this system, we are going to build a security model which is good for all houses. This system will attached with the main door of house. If user get knocked in his/her door than he/her will notify by the system. This system is too slow but it works wonderful.

2.8.2 Release Requirements

Secret knocking door locker is a security system which it can't build in a few days. First we have to gather all of the suitable criteria than we have to marge the tools and apply functionalities. After that this system can detect legal users which we have to define in this system. Doing all this, it need minimum 3 months to complete it. Otherwise it can't be a good enough for user.

2.9 Legal Requirements

2.9.1 Compliance Requirements

Door locker is always available in market but keyless door locker isn't available. That's why we are going to build a keyless door locker system which is worked on knock pattern. If a user use this system than he/her can get approximately 80% security for his/her house. Also get benefits for using this system. Which way user want to maintain this system, it will work on this way. Its user friendly system. Any user can like it if he/she use it wisely.

2.9.2 Standards Requirements

This system is standard because it is freely and publicly available under royalty-free conditions at reasonable and non-discriminatory costs. There is no need to implement any requirements for the approval of the license agreement, grant, click-through, or the implementation of the functionality of any other form. Under the Royalty-Free Terms for Unregulated Use, all patents required for the implementation of such standards of license.

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Chapter 3

System Analysis

3.1 Use Case Diagram

In a used case the picture is a graphical illustration of interactions between a system components. There is a method used in system analysis for using a lawsuit, marking, specifying, and organizing system requirements. The relationship between and between the actor and the use case.

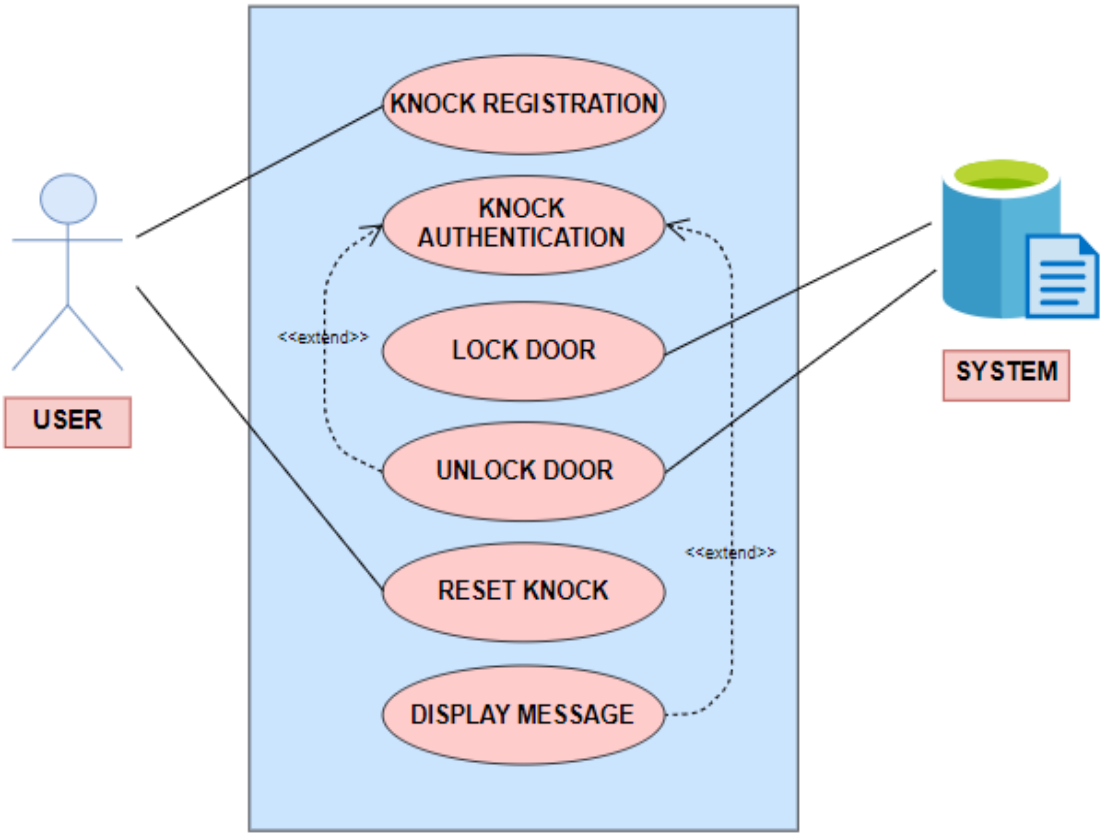

Figure 3.1: Use Case Diagram

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3.2 Use Case Description (for each use case)

The following system scenarios were identified:

- User create knock in system and reset the knock
- The sensor capture knock
- The system save the knock and authentication the knock
- If knock is authentication then the system door on and off
- System get notify.

On the basis of these scenarios, the following three actors can be identified: User; Sensor; System.

3.3 Activity Diagram (for each use case)

3.3.1 Activity Diagram for knock entered by user

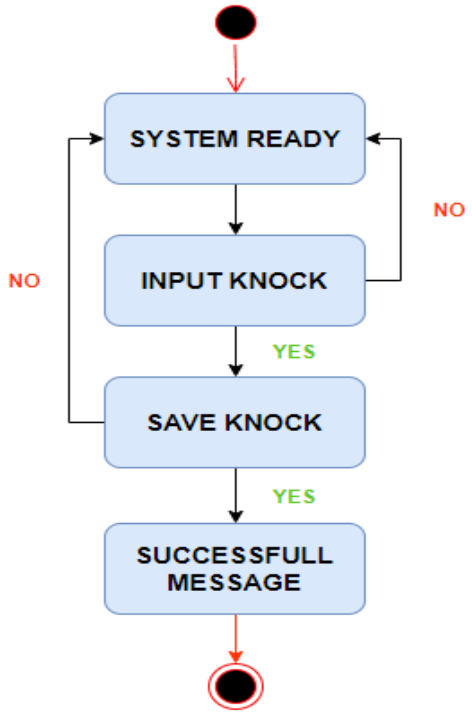

Figure 3.2: Activity Diagram-1

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Algorithm

Write an algorithm knock entered by user.

Step 1: Start

Step 2: System Ready.

Step 3: Read Input Knock.

Step 4: Save knock

Step 5: Successful message

Step 6: Stop.

3.3.2 Activity Diagram for knock Authentication by user

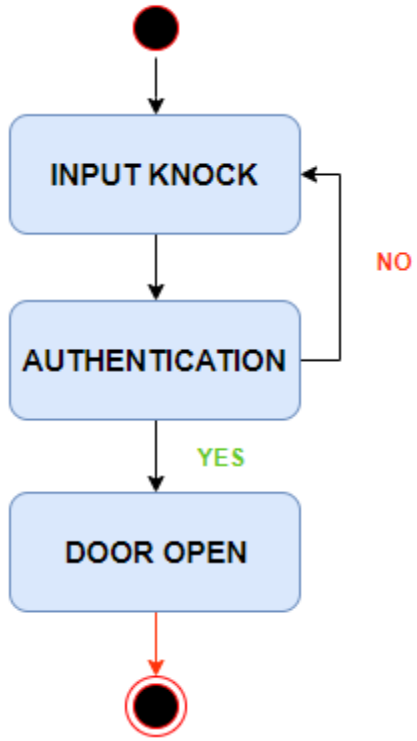

Figure 3.3: Activity Diagram-2

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Algorithm

Write an algorithm knock Authentication by user

Step 1: Start

Step 2: Read Input Knock.

Step 3: Authentication knock

Step 4: Stop.

3.3.3 Activity Diagram for reset knock by user

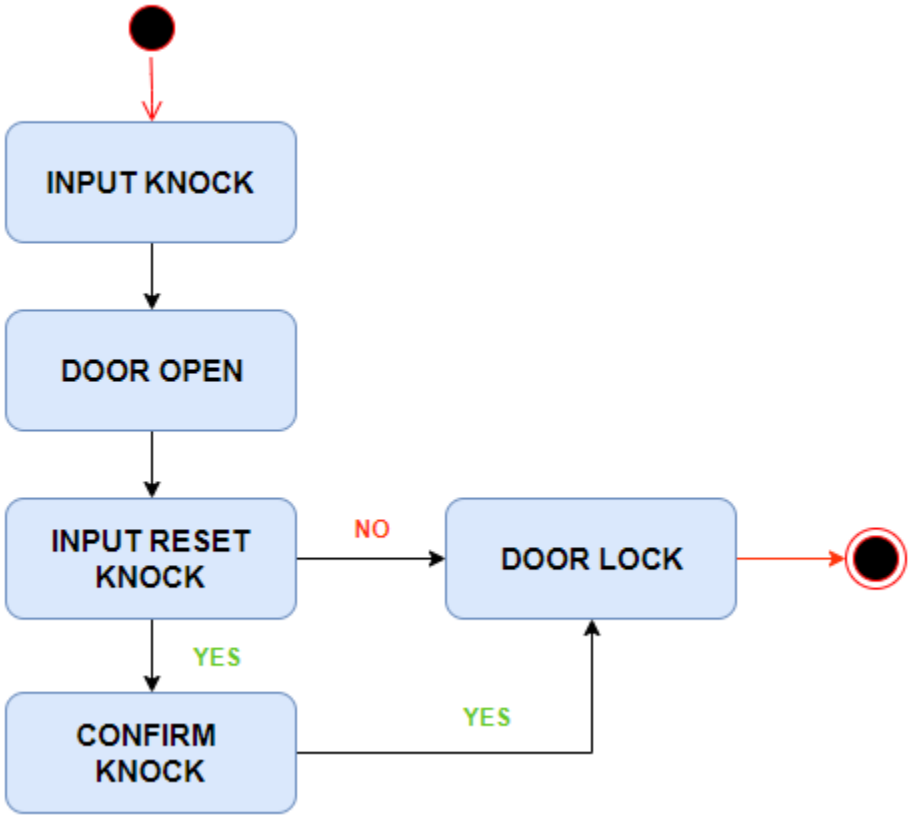

Figure 3.4: Activity Digram-3

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Algorithm

Write an algorithm reset knock by user

Step 1: Start

Step 2: System Ready.

Step 3: Read Input Knock.

Step 4: Door Open

Step 5: If Reset Input Is Yes the Confirm Knock Is Reset or Input Is No the Door Is Lock.

Step: 6 The Reset Knock Is Confirm the Door Is Lock

Step 7: Stop.

3.4 System Sequence Diagram (for each use case)

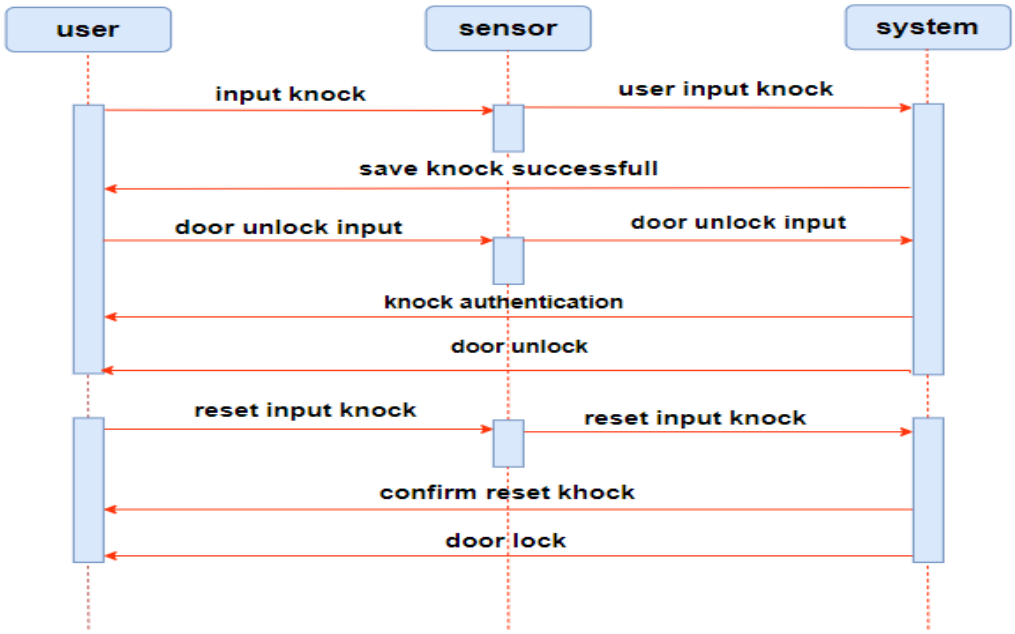

Figure 3.5: System Sequence Diagram

In sequence diagram, user give input through sensor. Sensor will send the blueprint to system as a user input knock. After that, system will successfully save the knock which get from user. For open the door, user will give input as a knock for unlock to sensor. Sensor will send to the system for authentication. If authentication did right than system will unlock the door. User also can use reset save knock to change it.

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3.5 System Circuit Diagram

A graphical representation of an electric circuit of a circuit image (electrical image, initial image, electronically designed). A painting circuit images use common images of elements, when a schematic diagram shows circuits components and interactions using appropriate symbolic presentations. In the schematic diagram, the interconnection presentation is not related to the physical system of the device.

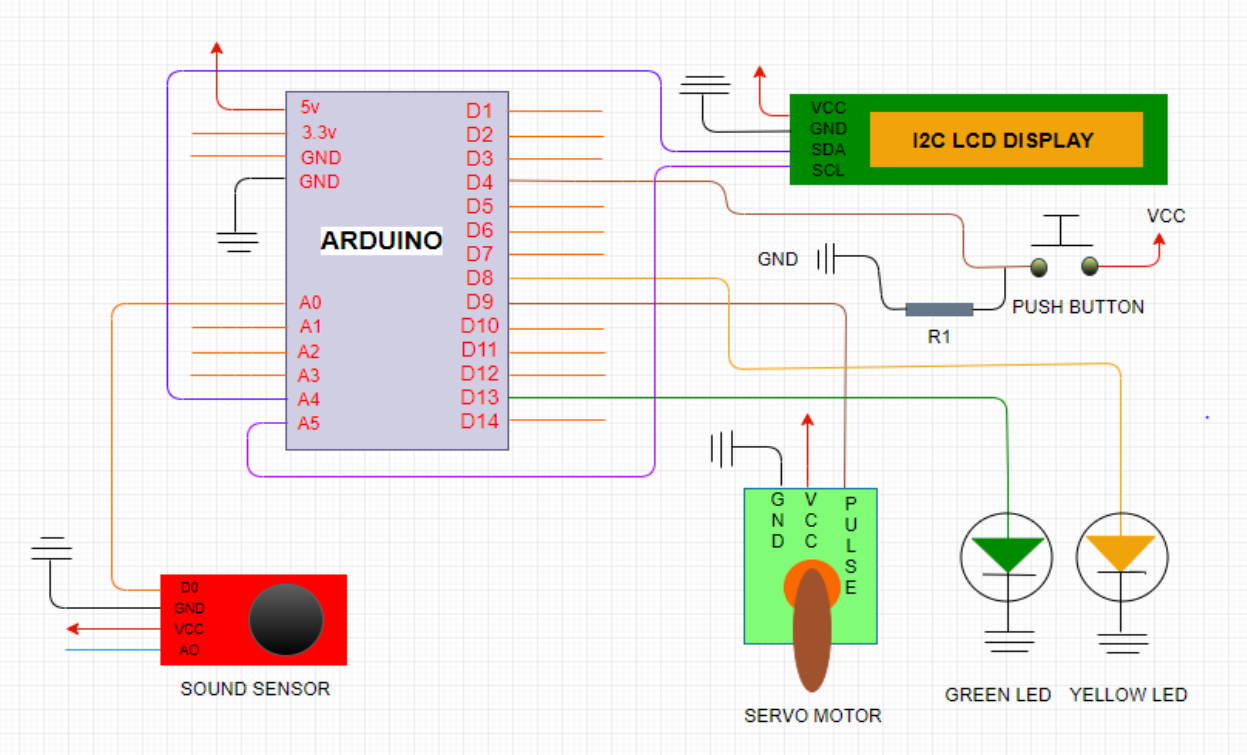

Figure 3.6: Circuit Diagram

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Chapter 4

System Design Specification

4.1 Development Tools & Technology

Various concepts are developed to develop a secret design identification door locker system and are later given space for their positive and negative attributes. Below is a description of all the main elements used in this project?

4.1.1 Arduino

Arduino is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontrollers. Under the GNU Laser General Public License (LGPL) or the GNU General Public License (GPL), the arduino Board and the technical distribution of software are distributed. Arduino board commercially available as preassembled form or DIY (DIY) toy.

Figure 4.1: Arduino-1

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Arduino platform just started to start with electronics, and became reasonably popular with people due to good reasons. Unlike previous programmable circuit boards, there is no separate part of Arduino hardware (programmer) to load new code on board - you can only use one USB cable. In addition, using a simplified version of Arduino IDE C, it makes the program easier to learn. Finally, Arduino provides a standard factor factor that disables the micro-controller functions in more accessible packages.

In 2003, the Arduino project was started as a program for students in the Ikaria city of Interactive Design Institute, Ivory, which aims at providing low cost and easy-to-use and easy-to-use devices for professionals' communication. Using sensors and activators, with their environment Common examples of such devices designed for beginner hobbyists include simple robot, thermostat and motion detection.

The Arduino name came from a bar in Italian city of Ikaria, where some founders of the project used to meet. The name of the bar is named Adriano of Ikaria, who was the manager of Ovarian March and the King of Italy from 1002 to 1014.

Uses of Arduino

Arduino was designed for hardware and software artists, designers, hobbyists, hackers, newbies, and anyone interested in creating interactive objects or environments. You can contact your smart phone with Arduino button, LED, motor, speaker, GPS unit, camera, internet, and even or you're on TV! This flexibility combined with the fact that Arduino software is free, the hardware board is quite cheap, and users of both software and hardware have learned to have a large community who have contributed to the code and has released a huge variety of instructions to make Arduino-based projects.

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Major equipment on Arduino boards

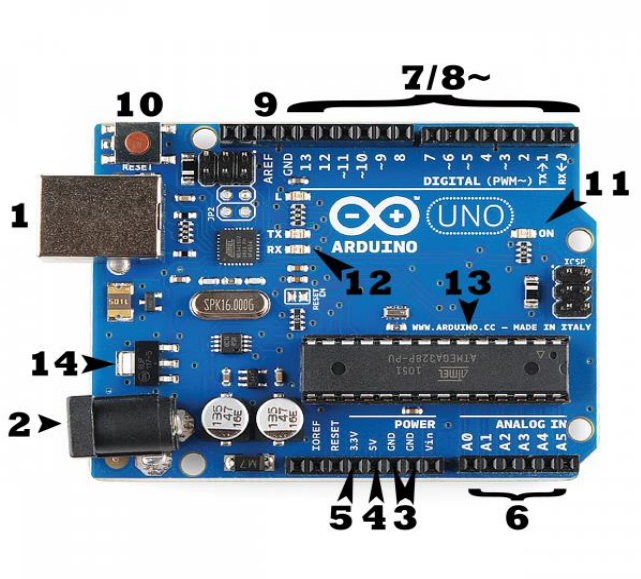

Figure 4.2: Arduino-2

Power (USB / Barrel Jack)

Pins (5V, 3.3V, GND, Analog, Digital, PWM, AREF)

There are two power stations at Arduino "VIN" and "5V". VIN VIN Pin (duh) and DC Barrel Jack are attached to this node's on-board 5V controller input. "5V" node is connected with 5V pin, controller output, and USB.As arbarnhart, you do not want to supply a 5V on 5V pin and it is connected to USB at the same time. This node has a voltage drop and will not cause better.

USB is also used for programming and Arduino as well. The pipeline jack DC wall adapter provides a voltage of 5 volts, when the connection is possible to connect voltage up to 9 to 12 volts.

Basically, the barrel jack is connected with the voltage regulator and this voltage regulator atmega328 provides a signal of 5 volts.

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Pins on your Arduino are places where you have a doll wrapped with a breadboard and some wire possibly to form a circuit. There are various kinds of Arduino Pin, each which is used on the label and different functions on the board.

- □ GND (3): Short for 'Ground'. Arduino has a few GND pins, which can be used on your circuit ground.
- □ 5V (4) and 3.3V (5): You can assume that 5V pin provides 5 volt power and 3.3V pin provides 3.3 volt power. The simplest components used with Arduino run happily 5 or 3.3 volts off.
- □ Analog (6): All gone in pin area pins under 'analog in' label (A5 via UNIX A5). These pins can read the signal from an analog sensor (like a temperature sensor) and convert it to a digital quality that we can read.
- □ Digital (7): Digital pins from analog pins (13 to 13 at UNO). These pins can be used for both digital input (not to say if a button is pushed) and digital output (like an LED powering).
- □ PWM (8): You may notice some digital pins (3, 5, 6, 9, 10 and 11) in the UNO tilde (~). These pins work as normal digital pins, but they can also use some pulse-width modulation (PWM). We have a tutorial on PWM, but for now, think of being able to simulate these analog outputs (like fading inside and outside an LED).
- □ AREF (9): Standing for analog references. You can leave this PIN for most of the time. It is sometimes used to set the external reference voltage (between 0 and 5 volts) as the upper limit for analog input pins.

Reset Button

Reset button is not nearly the same as unplugged the board and it resumes again. Restart your program from the beginning of it.

The same thing happens when you press the Reset button press button for your USB interface - the board program. So then enter the boot loader for a second or two so try it and program it.

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Power LED Indicator

Electronics, an LED circuit or LED driver is a light emitting diode (LED) power used in an electric circuit. The circuit will provide sufficient light to provide LED lighting at the current required brightness, but the LED harmful resistance is not limited to the current. So you say that even if I'll be led with a resistor, the L293D driver pin will see the incoming voltage as 5 volts? But when I test it with the multimeter it shows me that the voltage is ~ 3.2V.

Main IC

RX and TX pins are standing for receiving and sending Arduino pins used for serial communication. They have LEDs arduino fabrication combined with them. In this way, whenever Arduino receives bytes by serial data, the LED connected to the RX pin becomes shuffled and whenever it delivers a byte data serially, the LED pin bluenose is connected. However, Arduino has multiple serial ports. Read this serial 0 port and is thus TX0 and RX0. This arduino code is used for uploading. For this reason, the Pin Blinds of TX is connected when the hack code is sent to Arduino (laptop / PC) and the RX PIN codes after each spacing of the code, so it is connected to the connected LED.

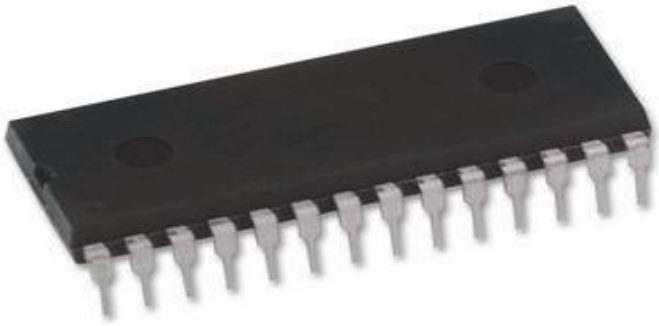

Figure 4.3: IC

To board the Arduino Uno based on a microcontroller ATmega328P (litterage). 14 digital input / output pins (which can be used as 6 PWM outputs), 6 analog inputs, a 16 MHz quartz

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Crystal is a USB connection, a power jack, an ICSP header and a reset button. To board the Arduino Uno based on a micro controller such as AT 328 (Data Set). There were 14 digital input / output pins (which can be used as 6 PWM outputs), 6 analog inputs, 16 megahhs ceramic resonators, a USB connection, power jack, an ICSP header and reset button. .

It makes everything possible to support the microcontroller; Simply connect it to a computer with a USB cable or turn on the AC to DC adapter or battery. Unlike all previous boards of the United Nations, it does not use FTDI USB-to-serial driver chips. Instead, it is the ATMEG 16U2 (version R2 is up to Atmega8U2) which is programmed as a USB-to-serial converter.

Voltage Regulator

`

Figure 4.4: Regulator

I power up the board through 5V pins from a controlled power supply and came back to Arduino's life! It looked like the voltage regulator was the only damaged material. According to the Arduino documentation, the UNO uses a 5-volt linear voltage controller in a vane 223 SMD and package. Apparently, compatible voltage controllers have eBay for less than 10 packs! You do not have the patience you need from China for the package.

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4.1.2 Sound sensor module

Description

The sound sensor module is used to provide an easy way to detect the sound and usually detect the intensity of the sound. This module can be used for security, switch, and monitoring of applications. Its accuracy can be adjusted for ease of use. It's a microphone that uses amplifier, peak detector and buffer input. The sensor detects a word, then processes it into an output signal voltage that is sent to the microcontroller and then performs the necessary processing.

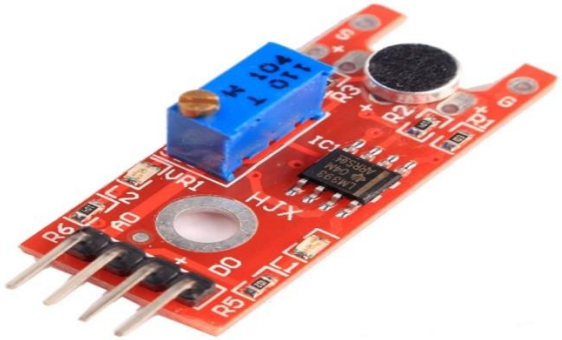

Figure 4.5: Sound sensor

Main Features:

1. Adopt LM393 main chip
2. Electric condenser microphone
3. Features single channel signal output
4. Low level output signal used for sound control light
5. Great module for sound alarm system
6. Working voltage: DC 4 – 6V
7. With AO / GND / VCC / DO
8. Two red LED indication: POWER (power is off) and SENSOR
9. Mainly Compatible with: Arduino.

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4.1.3 Servo motor

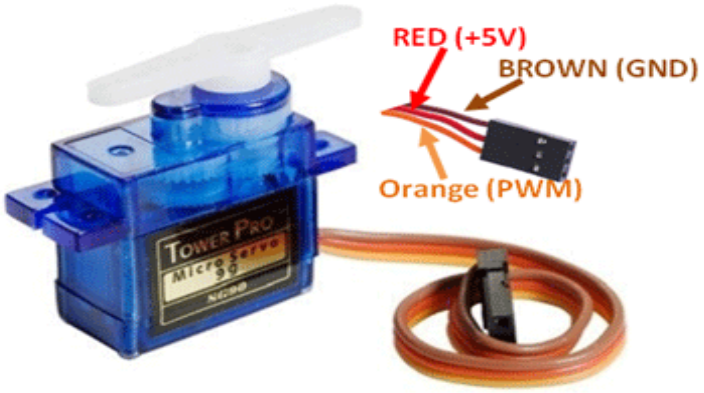

Figure 4.6: Servo Motor

Light with small and high output power. Servo rotates around 180 degrees (90 in each direction), and can not only work like standard types but small. You can use any server code, hardware or library to control these servos. Respondents who respond and pick up clothes without a motor controller building with gear box, especially since its good for those who want it to fit in smaller places. It comes with a 3 horn (weapon) and hardware.

Wire Configuration

Wire Number	Wire Color	Description
1	Brown	Ground wire connected to the ground of system
2	Red	Powers the motor typically +5V is used
3	Orange	PWM signal is given in through this wire to drive the motor

Table 4.1: Wire Configuration

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Tower Pro SG-90 Features

- Operating voltage + 5V is generally
- Torque: 2.5 kg / cm
- Operating speed is 0.1s / 60 °
- Gear type: Plastic
- Rotation: 0 ° -180 °
- Weight of motor: 9gm
- Includes package gear horn & screwSG-90 Servo Motor Equivalent

MG90S Metal Gear, MG995 High Torque Metal Gear, VTS-08A Analog Servo.

4.1.4 LCD display

This is another great blue / yellow backlight LCD display. As the Arduino controller limits the pin resources, after your project the sensor or SD card may not be able to use the normal LCD shield connected with a certain amount. However, in this i2c interface, LCD module, you will only be able to realize the information displayed through 2 dolls. If you already have i2c devices in your project, then this LCD module actually costs no more resources at all. It makes it fantastic for Arduino-based projects.

Figure 4.7: LCD Display

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Product features

I2c 1602, LCD modules are displayed in 2 lines according to a 16 character interfaced in an i2c daughter board. I2c interface requires only 2 data connections, quality +5 VDC and GND work to run.

Specifications

	2 lines by 16 character
I2C Address Range	0x20 to 0x27 (Default=0x27, addressable)
Operating Voltage	5 Vdc
Backlight	White
Contrast	Adjustable by potentiometer on I2c interface
Size	80mm x 36mm x 20 mm
Viewable area	66mm x 16mm

Power

The device is powered by a single 5Vdc connection.

Pin out Diagram

Figure 4.8: Pin out Diagram

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Pin/Control Descriptions

Pin #	Name	Type	Description
1	GND	Power	Supply & Logic ground
2	VCC	Power	Digital I/O 0 or RX (serial receive)
3	SDA	I/O	Serial Data line
4	SCL	CLK	Serial Clock line
A0	A0	Jumper	Optional address selection A0 - see below
A1	A1	Jumper	Optional address selection A1 - see below
A2	A2	Jumper	Optional address selection A2 - see below
Backlight		Jumper	Jumpered - enable backlight, Open - disable backlight
Contrast		Pot	Adjust for best viewing

Table 4.2: Pin/ Control

Addressing

A0	A1	A2	Address
Open	Open	Open	0x27
Jumper	Open	Open	0x26
Open	Jumper	Open	0x25
Jumper	Jumper	Open	0x24
Open	Open	Jumper	0x23
Jumper	Open	Jumper	0x22
Open	Jumper	Jumper	0x21
Jumper	Jumper	Jumper	0x20

Table 4.3: Addressing

4.1.5 Bread Broad

A breadboard is a solderless device electronic circuit that can be confined by inserting their leads or terminals and then connecting through the connections via cable to the maximum electronic components. The breadboard connects the metal strips and boards. The metal strips are filled in the form of the image below. Keep in mind that the top and bottom rows of the holes are connected

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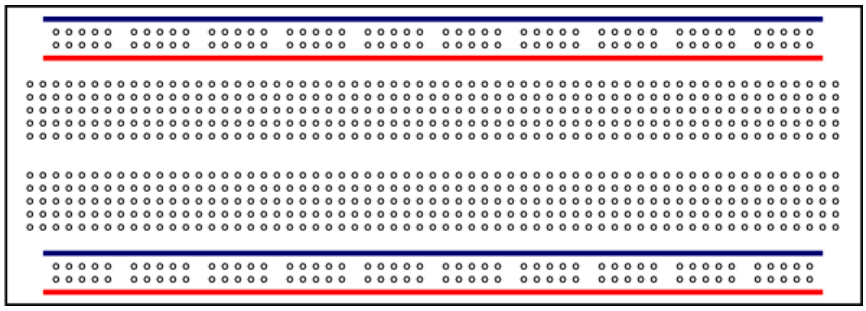
horizontally and in the middle division, the remaining holes are vertically attached. A typical breadboard is shown below:



Bread Board metal strips that run at the bottom of the board and the board has the connection holes. Metal strips are laid out as shown below. Note that holes are connected to the rest of the holes in the top and bottom rows horizontally, vertically attached.

Figure 4.9: Bread Board-1

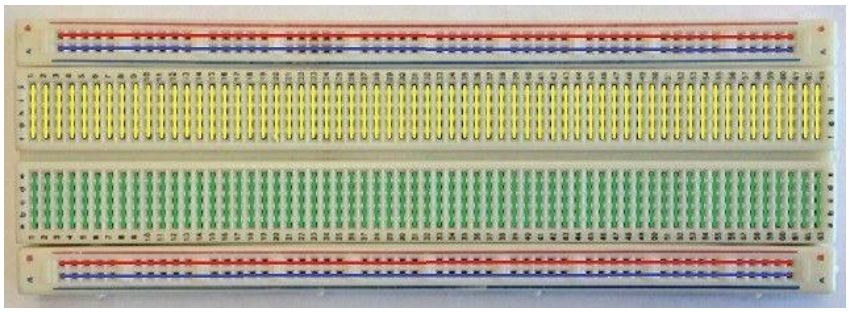


Figure 4.10: Bread Board-2

To use the bread board, the material is placed in the foot hole. Each set of a hole connected by a metal strip is a node form. A limit is a circuit where two elements are attached. The connections between the various components are formed by putting their foot into a common node. Holes are used for long lasting and low-cost power supply connections. The circuit components are located and combines with their jumbo wire. , The IC is placed in the middle of the board so that half the foot is on the middle of the middle line and the other half.

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4.1.6 Jumper Wire

A jumper wire (also known as Jampa Wire, or Jumper), an electric cable, or a group of one of its groups is commonly used (or sometimes - only "tin" only) with a connector or pins of each connection That is to connect internally to a band board or other prototype or test circuit, internally or otherwise With n tools or components, without ring.

Separate jump workers are equipped with their "last connectors" slot, including a routine, a headboard in the circuit board or a part of the test equipment.

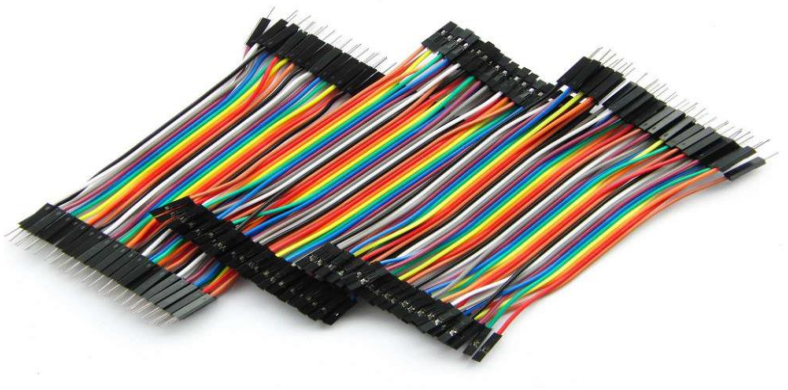

Figure 4.11: Jumper Wire

The term "jumbo wire" simply refers to establishing an electrical connection between two points of a circuit by making an effect wire. You can use jumper wire to fix a circuit or to identify the problem of the circuit. The following steps outline how you can safely use the jumper wire in different electrical applications**.**

4.1.7 LED Light

A light emitting diode (LED) is not the source of two lead semiconductor light. This is a PN diagonal diode that lights when active. When the current leads are applied, electrons are reunited with the hole in the device, allowing the release of energy in the form of photons.

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Figure 4.12: LED Light

LED benefits

LED fixtures provide various advantages over the luminous fixer:

- Lower energy consumption (three to six times less)
- Long life with lower maintenance costs
- Increased impact / vibration resistance
- Instant On / off functionality
- Advanced lighting control options (Dimmable)
- Low heat generation, resulting in reduced cooling costs

Resistor

A resistor as a passive two-terminal circuit element in electrical components, using electrical resistance. Electronic circuits, the current flow of the air stream of the active ingredients, reduce the signal level to adjust the voltages, and the transmission lines used to stop.

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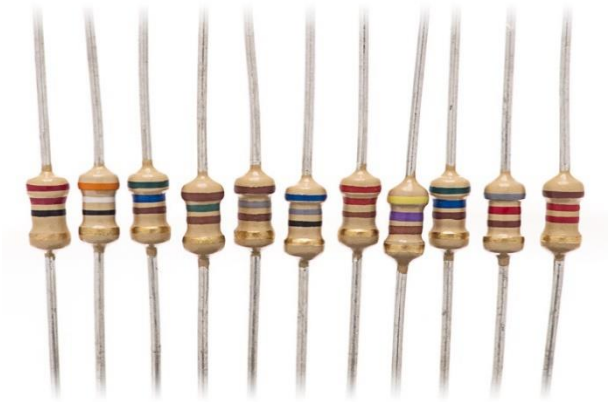

Figure 4.13: Resistor

Resistor color code

Color	Numeric Value	Multiplier	Tolerance	Temperature coefficient
BLACK	0	1Ω		250
BROWN	1	10 Ω	±1%	100
RED	2	100 Ω	±2%	50
ORANGE	3	1K Ω		15
YELLOW	4	10 Ω		25
GREEN	5	100 Ω	±0.5%	20
BLUE	6	1M Ω	±0.25%	10
VIOLET	7		±0.1%	5
GREY	8			1
WHITE	9			
GOLD			±5%	
SILVER			±10%	

Table 4.4: Resistor color code

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4.1.9 Two pin push button

A pushbutton (also spell-pocket button) or simply button a simple switch mechanism to control a machine or some direction in a process. The buttons are usually made of solid components, usually plastic or metal. The surface is shaped to fit the human finger or hand, usually flat or so as to be easily depressed or pushed. The button is often biased switch, although many non-biased buttons are included by pressing, weak mashing, slapping, hitting, and swinging.

Figure 4.14: Push Button

Used 2 pin push button

These small two PINs are intended for mounting PCBs passing passing tactile buttons, but they can be plugged into standard 0.1 "bread boards. They can work as well as reset buttons and connect microcontroller inputs to serve as a user interface component.

4.2 Implementation Tools & Platforms

4.2.1 Arduino IDE 1.8.7 Platform

In this project, we use Arduino IDE compiler to implement the code of C programing language.

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4.2.2 Software Language

Here, only one Languages are used for this project. Now, that is given below:

- C Programming Language

4.2.3 Implementation and Discussion

Results are output of a project. The results represent a project success. We find out successful results of this project by various exams. In this chapter we get the results that we have received from beginning to end of our project, shown step by step photo.

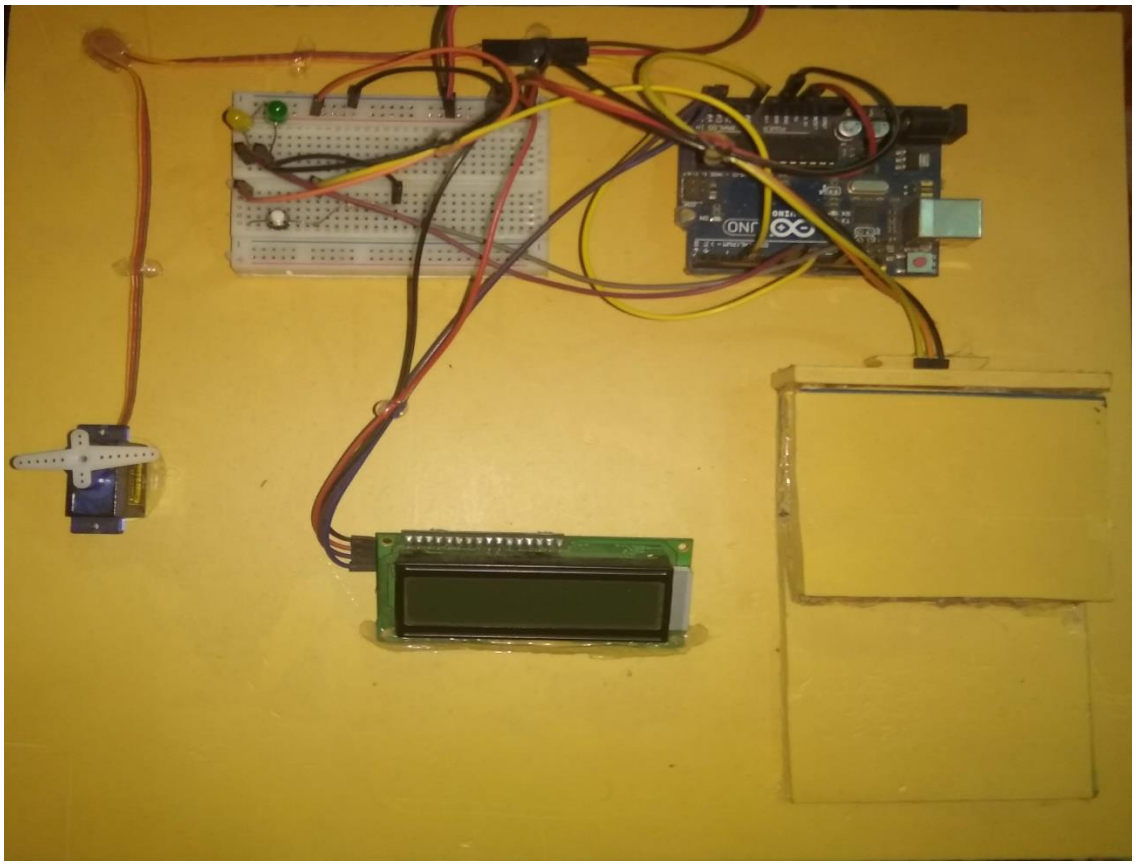

Figure 4.15: Before start the system

This is all about **Secret Knock Detecting Door Locker** system using a sound sensor.

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An arduino in this project is used to control the whole system by observing the sensors. When the sensors sense the sound then the sound sends the command to the arduino, and also it sends instruction to the transistor IC then, it reminds rotted the servo motor. Here comparator acts as an interface between the sensing arrangement and the arduino. The status of the sensor and the servo motor is displayed on the LCD which is interfaced to the arduino. In the same way, when the user push the button and change the knock request in the system as then the arduino sends instruction to the confirm request knock.

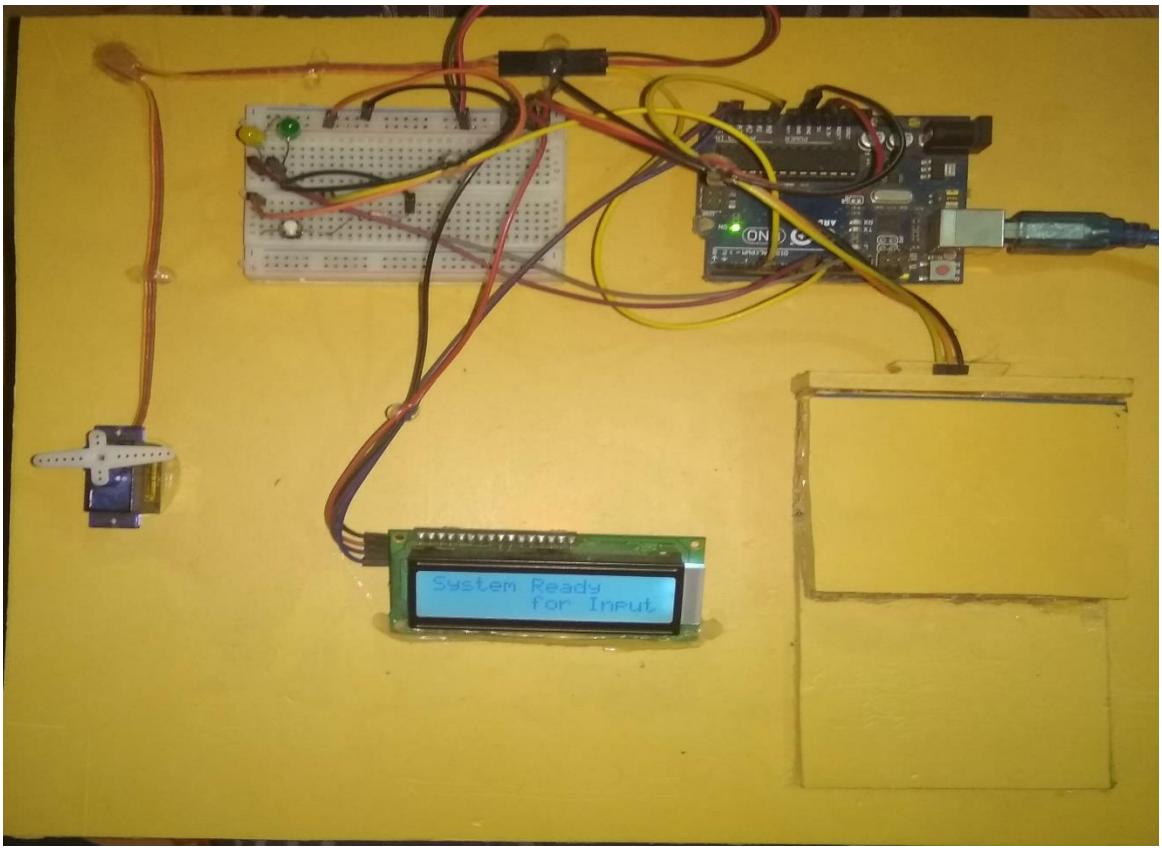

Figure 4.16: After start the system

After start the system the knock of the sound is identified by using the sound sensor. The servo motor of rotate is displayed in the LCD display. In this display we can also see door open, door close, reset request and confirm request.

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Figure 4.17: Door Open

Here we can see the user knock door the door automatically open and the servo motor rotate.

Figure 4.18: Door Close

Here we can see the door automatically close and the servo motor rotate.

Figure 4.19: Reset Request

Here we can see the user push the button and the system ready to knock.

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Figure 4.20: Successfully Changed Password

Here we can see the user again push the button by confirm knock and the system confirm the user knock.

Result

Our project are properly done. It is working accurately.

Discussion

The aim of this study has undoubtedly been achieved. The main goal of this project is to develop system in the door by using knock and it has many advantages it`s security is best and low coasted. Everyone can get and use this product easily.

Summary

Firstly we discuss about control the system, use then show the project setup, and after we showed the project when it’s working and lastly we discuss about discussion.

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Chapter 5

System Testing

5.1 Testing features

In this project, we have to test only two module which are really working good or not. After testing we need some improvement which we have already done it. Without testing any project, we can't get accuracy result for this system.

5.1.1 Features to be tested

- Sound Sensor
- Servo Motor

5.1.2 Features not to be tested

- Arduino Uno R3
- LCD Display

5.2 Testing Strategies

5.2.1 Test Approach

A test strategy document developed by a high-level document and usually the project manager. This document will help to achieve the targets defined experimental "approach to software testing." However, for larger projects, the test strategy document and the number of Test Plan for each phase or level of testing.

5.2.2 Pass/Fail Criteria

Secret knocking door locker is a security system which we tested two features. They are sound sensor and servo motor. Firstly in sound sensor, we are trying to solve accurate input but it become fail because of environment. Sound sensor are going input from environment automatically. It

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became fail. Than we use array to get the value accuracy to solve it. After that, it get input correctly and servo motor are getting proper response to unlock or lock the door locker.

5.2.3 Suspension and Resumption

We tested two features in this system. The reason behind the suspension is are few. One is getting proper input from sound sensor during execution. But it become too much lacked that can't detect the knock sound to execute the servo motor as a locker. This system are not generating the proper execution to get result and resolve this criteria and finally testing is suspended.

5.2.4 Testing Schedule

Sound Sensor

Test Case ID: LTC1	Test Design by: Bulbul Ahmed
Test Priority: High	Test Design Date: 22-08-2018
Module Name: Sound sensor	Test Execute by: Bulbul Ahmed
Description: This section covers the functionality of input new users	Test Execute Date: 1-12-2018

Table 5.1: Testing Schedule-1

Servo Motor

Test Case ID: LTC2	Test Design by: Mahadi Imam
Test Priority: High	Test Design Date: 25-08-2018
Module Name: Servo motor	Test Execute by: Mahadi Imam
Description: This section refers the system for getting proper locker for new users.	Test Execute Date: 2-12-2018

Table 5.2: Testing Schedule-2

5.3 Testing Environment (Hardware/Software Requirements)

- Test data

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5.4 Test Cases

Precondition: User has no precondition

Dependencies: Enter input required knock

Step	Test cases	Test data	Expected result	P/f	Actual result
01	Enter empty knock for any required field		Display show system ready	Pass	System ready for knock
02	Enter knock greater than or equal 3	12	Display error message “knock length must be garter than or equal 3”	Pass	Display error message “knock length must be garter than or equal 3”
03	Enter knock less than or equal 15	123456789567754545456	Display error message “knock length must be less than or equal 15”	pass	Display error message “knock length must be less than or equal 15”
04	Enter knock frequency greater than 500	300	Display error message “knock length must be frequency greater than 500”	pass	Display error message “knock length must be frequency greater than 500”

Table 5.3: Test Cases

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Chapter 6

User Manual

6.1 User Manual (Type A User)

User Manual is one of the important of any projects. Users are able to use this system by taking help from user manual. If any user need to access this system this system than firstly he/she have to setup this system in the backside of the door. After that user drill the door to fixed the system into it. After setup, user have to unlock the lock and press reset button to create new knock number. By creating the knock number, data will store in the system and lock the door.

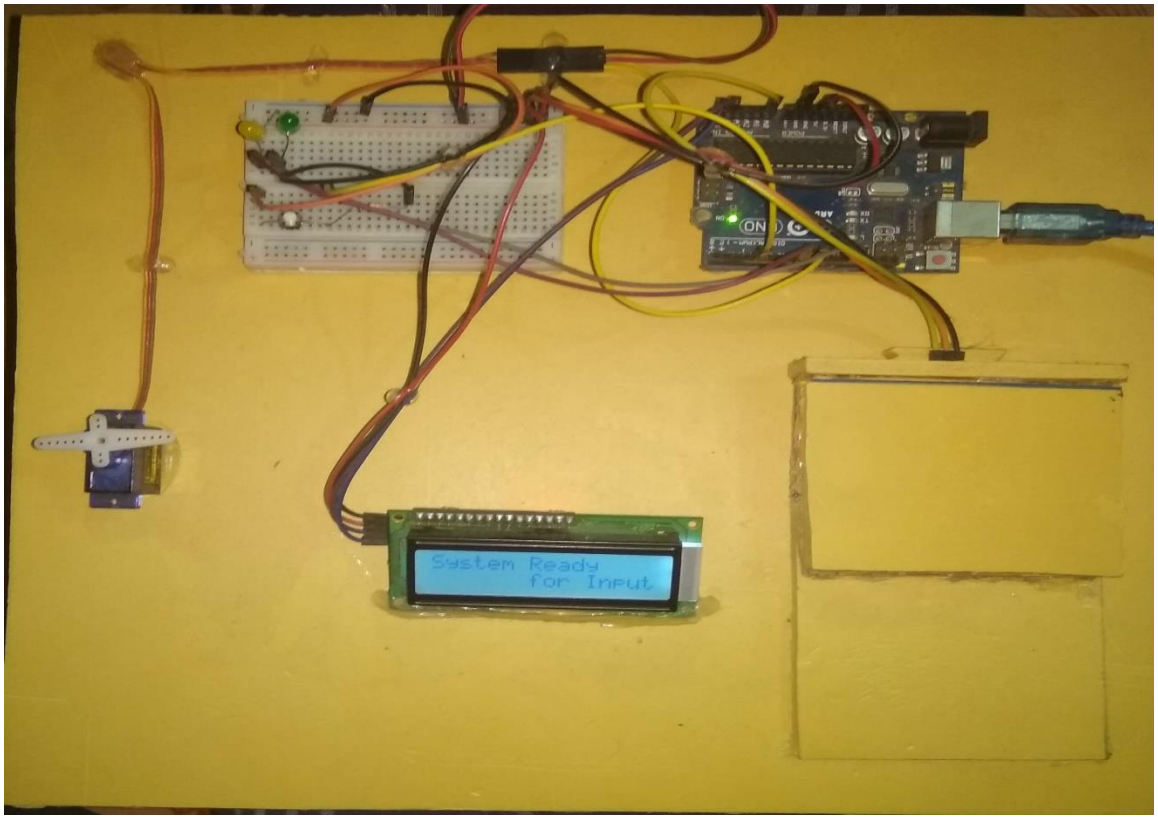

Figure 6.1: System Ready

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6.2 User Manual (Type B User)

User first create knock number in this system and pressing the button reset the data. After create it, User will lock the door and always system is ready to get input. After save this knock number in the system, user will knock in the door to unlock it. User have to knock accurately to unlock it. If any user did wrong knock number than display will show the Invalid input. After unlock the door, system will take time to lock the door automatically.

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Chapter 7

Project Summary

7.1 Critical Evolution

By using the automated system it optimizes the usage of security by reducing unsecured for people. If user is not comfortable with this system he/she should have problem with it. User must know how to setup knock and how to use it properly. He/she should have good knowledge of using any hardware for security.

7.2 Limitations

- In our project, we use microcontroller, which is easy to calibrate. But, there is not so many output ports in this controller. If we use any other board like Arduino Nano, GSM, camera etc. we can add many other features.
- In our project, we use just one cheap sound sensor that's why we mayn't get better result. If we use more sensor then we will get better result. But it become very costly.

7.3 Obstacles & Achievements

It has been a great pleasure to work on this project. This project help to know new technology. This project thing is some kind of weird thing but it is highly secured for users. Helping people with developing a system make a better world.

7.4 Future Scope

In this system, we are thinking to make it more secure. If we get scope than we include GSM and camera in this system. GSM will get SMS to user's phone if any kind of unknown person are knocked. On the other hand, camera will help for user to watch live, if any known/unknown person are knocking in his/her door. If this hardware use properly and user can understand its usability. It can use for other sites like apartments, schools, college and others. It can use all the business, Local

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and all the building in all over the world to make it fully secure. It can improve for other things if it is useful for user and they got help from this system.

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