

SMART OFFICE AUTOMATION SYSTEM

BY

SRIJAN KUMAR GHOSH

ID: 142-15-4043

NANDITA BAGCHI

ID: 142-15-3648

SK. ABDULLAH AL ARAFATH

ID: 142-15-3707

This Report Presented in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Science in Computer Science and Engineering

Supervised By

Md. Sadekur Rahman

Assistant Professor

Department of CSE

Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

MAY 2018

APPROVAL

This Project titled “**Smart Office Automation System**”, submitted by Srijan Kumar Ghosh, Nandita Bagchi and SK Abdullah Al Arafath to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering (BSc) and approved as to its style and contents. The presentation has been held on 05 May 2018.

BOARD OF EXAMINERS

Dr. Syed Akhter Hossain
Professor and Head

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Chairman

Dr. Sheak Rashed Haider Noori
Associate Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner

MD. Zahid Hasan
Assistant Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner

Dr. Mohammad Shorif Uddin
Professor

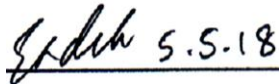
Department of Computer Science and Engineering
Jahangirnagar University

External Examiner

DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Sadekur Rahman, Assistant Professor, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:

 5.5.18

Md. Sadekur Rahman
Assistant Professor
Department of CSE
Daffodil International University

Submitted by:

Srijan Kumar Ghosh
ID: 142-15-4043
Department of CSE
Daffodil International University

Nandita Bagchi
ID: 142-15-4043
Department of CSE
Daffodil International University

SK Abdullah Al Arafath
ID: 142-15-3707
Department of CSE
Daffodil International University

ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project successfully.

We really grateful and wish our profound our indebtedness to **Md. Sadekur Rahman, Assistant Professor**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of “Embedded Systems Circuits and Programming” motivated us to carry out this project. His endless patience ,scholarly guidance ,continual encouragement , constant and energetic supervision, constructive criticism , valuable advice ,reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Prof. Dr. Syed Akhter Hossain and Head, Department of CSE**, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patience of our parents.

ABSTRACT

Technology is developing at a furious pace. Recent technological development in chip and telecommunications have provided the basis of office automation. Automation plays a very important role in our lives. It makes the work easier and simpler so for a simplified and easy living. **“Smart Office Automation System”** is a project that aims to target to facilitate the Smartphone users to control their appliances through their Smartphones by sending a message. An Arduino microcontroller is used in our project to connect all the office appliances to manipulate this system by a mobile app. User can use the mobile app to control their appliances using message.

CONTENTS

TABLE OF CONTENTS	PAGE
Board of examiners	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
 CHAPTER	
 CHAPTER 1: Introduction	 01-02
1.1 Overview	01
1.2 Motivation	01
1.3 Objectives	01
1.4 Expected Outcome	02
1.5 Report Layout	02
 CHAPTER 2: DESCRIPTION OF HARDWARE PARTS	 03-10
2.1 Name of tools and materials	03
2.2 Arduino Uno	03
2.3 Jumper Wires	04
2.4 Types of Jumper Wires	05
2.5 Battery - Lithium polymer battery	05
2.6 USB Cable	06
2.7 Breadboard	07
2.8 Resistor	07
2.9 LED Bulb	08
2.10 LCD (Liquid Crystal Display)	08
2.11 Bluetooth Module HC-05	09
2.12 Motor Driver L293D	09
2.13 Output Device (Fan, Tube Light, LED Bulb)	10

CHAPTER 3: REQUIRMENTS AND DESIGN SPECIFICATION	11-16
3.1 Introduce to IDE	11
3.2 Business Processing Modeling	11
3.3 Use Case Modeling and Description	12
3.4 MIT app inventor and Android studio	13
3.5 Development Process	14
3.6 GUI for this Project	15
3.6.1 User Interfaces	15
3.6.1 User Interfaces and Search Bluetooth Module	15
3.6.2 Typing Interface and After Sending Message	16
CHAPTER 4: HARDWARE CONNECTIONS	17-24
4.1 Introduction	17
4.2 Initial system module connections	17
4.2.1 Motor Driver Connection	17
4.2.2 Fan Connection	19
4.2.3 Configure Bluetooth Module HC-05	20
4.2.4 Configure LED and mini tube light	20
4.2.5 Configure LCD	21
4.2.6 Circuit diagram of LCD	23
4.3 Upgraded system module connections	24
CHAPTER 5: IMPLEMENTATION AND TESTING	25-29
5.1 Display	25
5.2 Mini Tube Light	25
5.3 Projector and AC	27
5.4 Fan	28
5.5 Final Output	29

CHAPTER 6: CONCLUSION AND FUTURE SCOPE	30-30
6.1 Current Limitations	30
6.2 Future Scopes	30
REFERENCES	31
APPENDIX	32

LIST OF FIGURES	PAGE
Fig 2.2: Arduino Uno	4
Fig 2.4: Types of Wires	5
Fig 2.5: Battery - Lithium polymer battery	5
Fig 2.6: USB Cable	6
Fig 2.7: Breadboard	7
Fig 2.8: Resistor	7
Fig 2.9: LED Bulb	8
Fig 2.10: LCD	8
Fig 2.11: Bluetooth Module HC-05	9
Fig 2.12: Motor Deriver L293D	9
Fig 2.13: Light, Fan & LED	10
Fig 3.2: Business Process Modeling	11
Fig 3.3: Use Case Model	12
Fig 3.4: MIT app inventor IDE	13
Fig 3.5: Development Process	14
Fig 3.6.1A: User Interface	15
Fig 3.6.1B: Search Bluetooth Module	15
Fig 3.6.2A: Typing Interface	16
Fig 3.6.2B: After Send Message	16
Fig 4.2.1: Motor Driver	18
Fig 4.2.1: Motor Driver Connection	19
Fig 4.2.2: Fan Connection	20
Fig 4.2.3: Bluetooth Module	20
Fig 4.2.3: Bluetooth Module connection	20
Fig 4.2.4: Mini Tube Light	21
Fig 4.2.5: Pin Diagram in LCD	22
Fig 4.2.6: Circuit Diagram of LCD	23
Fig 4.2.6: LCD Connection	23
Fig 4.3: Completed Connection	24

Fig 5.1: LCD Display Output	25
Fig 5.2.1: Brightness High	26
Fig 5.2.2: Brightness Medium	26
Fig 5.2.4: Tube Light Off	26
Fig 5.3.1: Brightness High	27
Fig 5.3.2: Brightness Medium	27
Fig 5.3.3: Brightness Medium	27
Fig 5.4.1: Fan On	28
Fig 5.4.2: Fan Off	28
Fig 5.4.1: Final Output All Appliance OFF	29
Fig 5.4.1: Final Output All Appliance On	29

CHAPTER 1

INTRODUCTION

1.1 Overview

Within modern world, people's life changes day by day with the aid of science. Although People in the advanced country like USA, UNITED KINGDOM, Australia can invest thousands of dollar or euro for automated office system by using some automation company like "One Button", our project members imagined a complete smart office automation system with a very reasonable low cost.

Moreover people all over the world and even in our very own country uses Smartphone for their daily purposes. We can add a new dimension to this usages list by controlling our office appliance plus much more with the help of smartphone.

1.2 Motivation

The primary object of our project is to provide a communication link between office appliances and Smartphone towards the remote user but with a low cost system. As a result we have chosen Arduino Uno. Because it's an inexpensive microcontroller with a significant power to control many more device. This is the microcontroller which people uses all around the globe. Therefore, if we can make system with the help of Arduino Uno hen people all over the world will be able to use it with minimum cost.

Every person with either a mobile or computer with an internet connection can imagine an IOT based automated life through our awesome and life-changing product.

As we live in a world where most of the people have smartphone, just imagine a simple home kit running through embedded system could control a person's every single appliances and multiple appliance.

1.3 Objectives

The main objectives of the project are as follows:-

- To develop an app that will provide users to control their appliances via SMS.

- To use a microcontroller device to connect all the office appliance like Light, Fan, AC, Projector, PC etc.
- To enable our system to control the brightness of our project, and LED.
- To use Bluetooth module HC-05 for connecting the apps to control the appliances.

1.4 Expected Outcome

We want to control office appliance like Light, Fan, Projector, AC etc. by sending message through our app. In order to control any specific electronics appliances of any room to off, on or to control the brightness of light, we go to our app and we will type room no, appliance name, and action. Like we want to off a Fan room number 302 then we will type rm302 fan off and we want to control a projector room number 540 then we will type rm540 projector brightness normal, high, and low.

1.5 Report Layout

Chapter 1: In this chapter we have just added a simple overview, motivation, objective, expected outcome of our work. How we are motivated to this project and added the objectives of our project.

Chapter 2: This chapter includes the description about the hardware components like Arduino Uno, rechargeable battery, led bulb and mini tube light, Bluetooth Module HC-05, Motor Driver L293D etc.

Chapter 3: Here we describe about the graphical user interface of our application and how the Bluetooth Module was connected with the Application and working procedure of the application.

Chapter 4: This is the most important chapter, we describe about the connection of our Hardware Components.

Chapter 5: Here we've described the working procedure of our project implementation and testing procedure.

Chapter 6: This chapter highlights current limitation and future scope of our project.

CHAPTER 2

DESCRIPTION OF HARDWARE PARTS

2.1 Name of tools and materials

Tools and materials used in our project are listed below followed by their description:

1. Arduino Uno
2. Rechargeable Battery
3. Led Bulb and mini tube light
4. Jumper Wires
5. Breadboard
6. USB Cable
7. Resistor
8. LCD
9. Bluetooth Module HC-05
10. Motor Driver L293D
11. Output devices (Light & Fan and others)

2.2 Arduino Uno

Arduino Uno is one kind of single board microcontrollers and open-source electronics platform and it makes easy to communicate between hardware and software.

The Arduino Uno board will be the brain of the robot, as it will be running the software that will control all the other parts. In the Figure-2.1 show the Arduino Uno which product we are used in our project. Arduino Uno is the most popular board and it has many different components. These components are described given below [1].

- Power USB: It's mainly used to supply power from computer to Arduino board. This is supplied by a USB cable.
- Voltage Regulator: It controls how much voltage that is let into the Arduino board.
- Arduino Reset: Reset Arduino board and start our program right from the beginning.
- Pins(5V , 3.3V, GND, Digital, Analog, PWM, AREF):
 - 5V & 3.3V: Supplies 5 and 3.3 Volts of power.

- GND: 3 GND pin on a Arduino board which are useful to ground our circuit.
- Digital: Arduino board has 14 digital pins (0-13). These pins are often used to both digital input and output.
- Analog: Arduino board has 6 analog pins (A0-A5). These pins are often used to analog input.
- PWM: Some digital pins are used to analog output (3, 5, 6, 9, 10, and 11) that is called PWM pins.
- AREF: It's used for Analog Reference.
- Power LED Indicator: when we plug in our Arduino board into a power supply then LED will blinking.
- TX and RX: TX- transmit data and RX- receive data from Arduino board.
- Main IC: The brain of Arduino board.

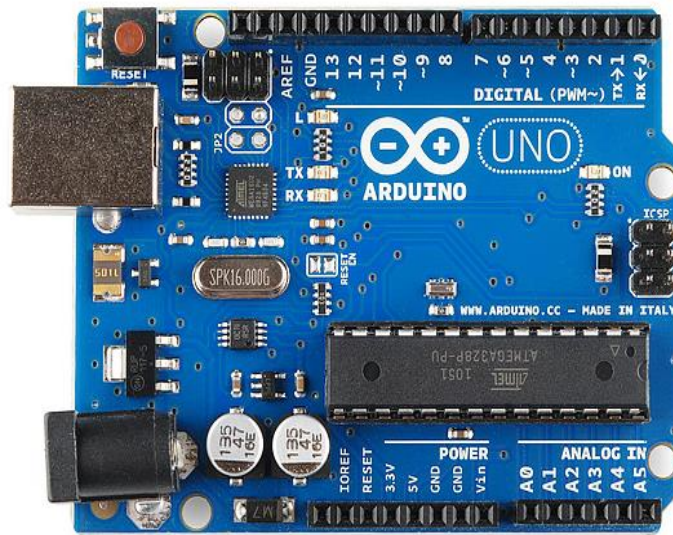


Fig 2.2: Arduino Uno [2]

2.3 Jumper Wires

Jumper wires is an electrical wire with a solid tip at each end, which is normally used to interconnect the components in a breadboard. They are used to transfer electrical signals on the breadboard to Arduino board.

2.4 Types of Jumper Wires

Variation of jump wires with insulated terminals as per male-female combinations:

- Male - Male
- Male – Female
- Female – female

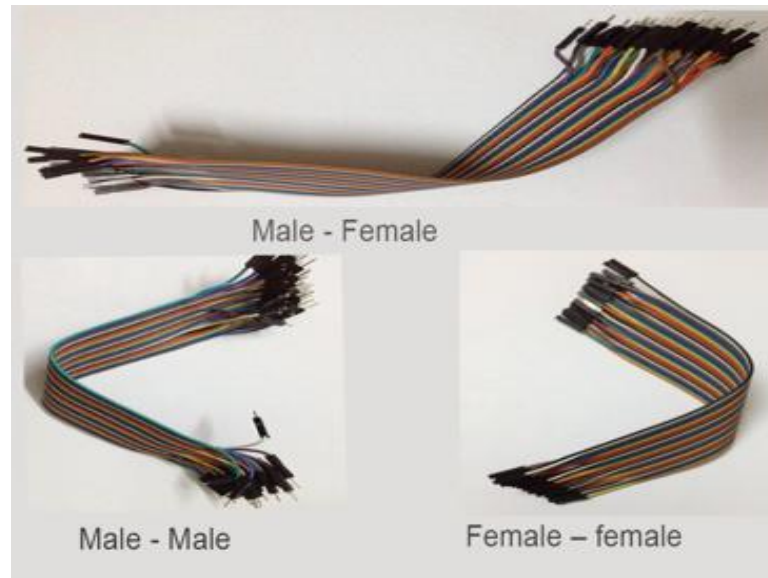


Fig 2.4: Types of Wires

2.5 Battery - Lithium polymer battery

Lithium polymer battery, rechargeable lithium ion battery technology. Unlike cylinders and primary cells, use flexible packaging, which makes them light but not too sturdy.



Fig 2.5: Battery - Lithium polymer battery

2.6 USB Cable

This USB cable is used to upload the program to the Arduino Board. The cable is connected to the computer one at a time, and the other to the Arduino board.



Fig 2.6: USB Cable

2.7 Breadboard

Breadboard is a prototype of electronic construction base. We are working with this jumper and led connection. It consists of interconnected electrical terminals.

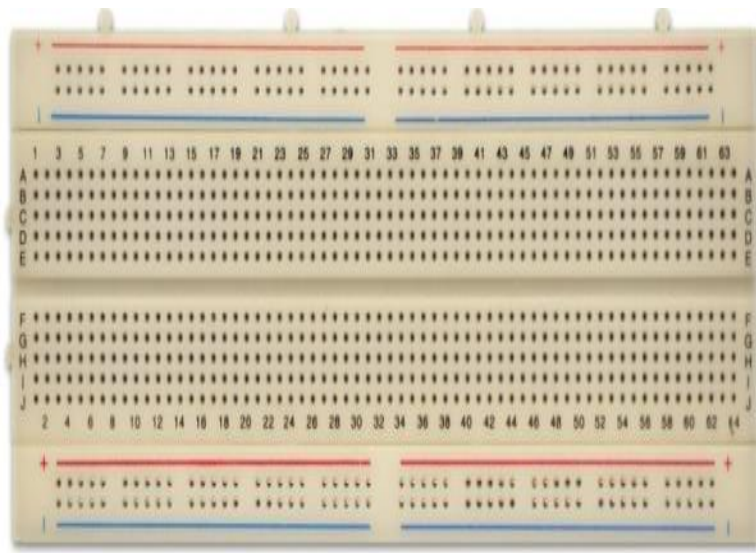


Fig 2.7: Breadboard [3]

2.8 Resistor

A resistor is a double-ended electrical component that can be used as a passive component to reduce current while reducing the voltage in the circuit.

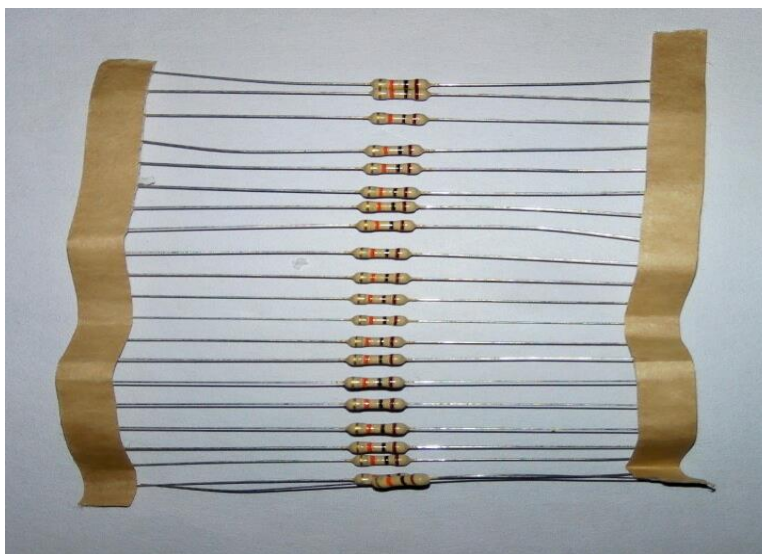


Fig 2.8: Resistor

2.9 LED Bulb

LED bulbs use semiconductor devices that emit visible light when current is passed through.

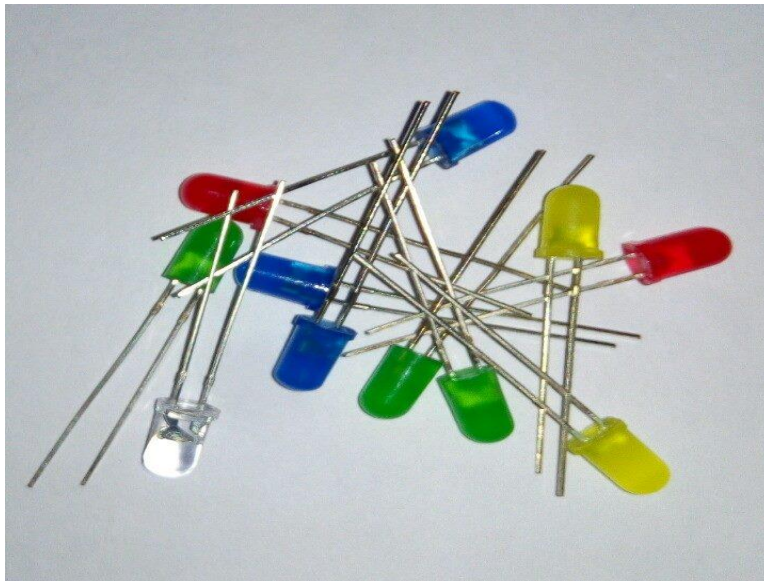


Fig 2.9: LED Bulb

2.10 LCD (Liquid Crystal Display)

A liquid crystal display is a non-light emitting device that produces an images by polarizing light from an internal light source. LCD is mainly used for small systems such as calculators, laptops and computers.



Fig 2.10: LCD

2.11 Bluetooth Module HC-05

HC-05 Bluetooth Module is a wireless device that connected our smartphone via an apps and control our project appliance like as fan, light, AC, projector etc. HC-05 works on serial communication.

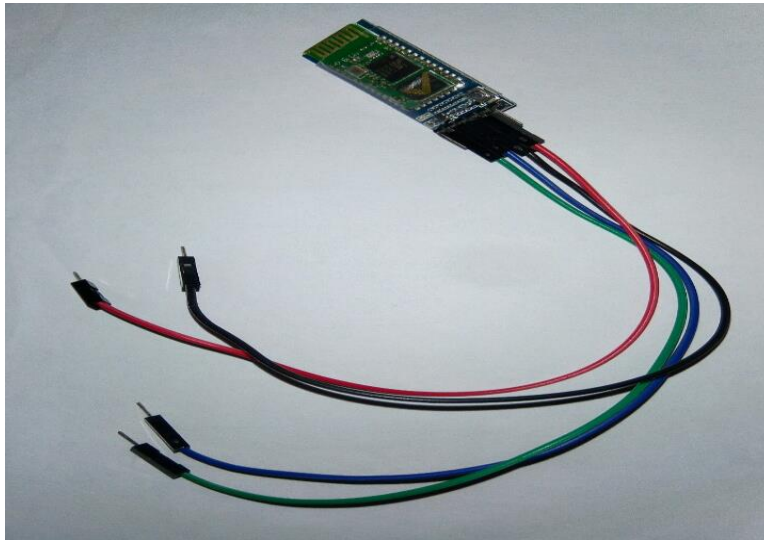


Fig 2.11: Bluetooth Module HC-05

2.12 Motor Driver L293D

L293D is an integrated circuit and bi-directional motor driver. Motor driver stand for an interface between Arduino and the motors. Motor driver has 16pin- 2Enable, 2VCC, 4Input, 4 Output and 4GND.

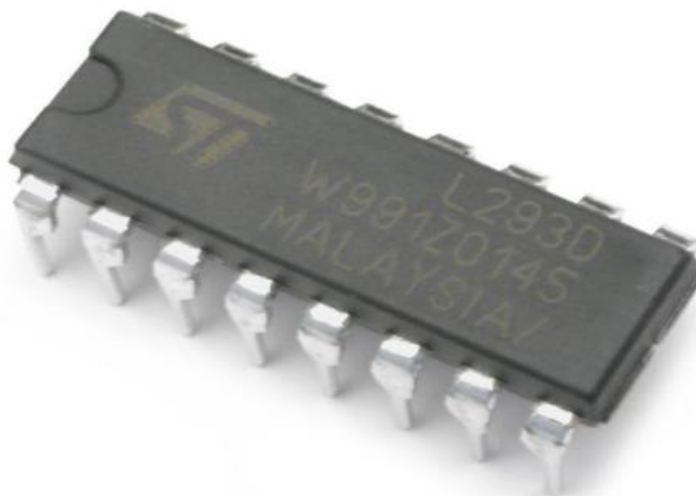


Fig 2.12: Motor Deriver L293D [6]

2.13 Output Device (Fan, Tube Light, LED Bulb)

We are using this appliance for our project output, here is some LED bulb, Fan and Mini Tube Light.

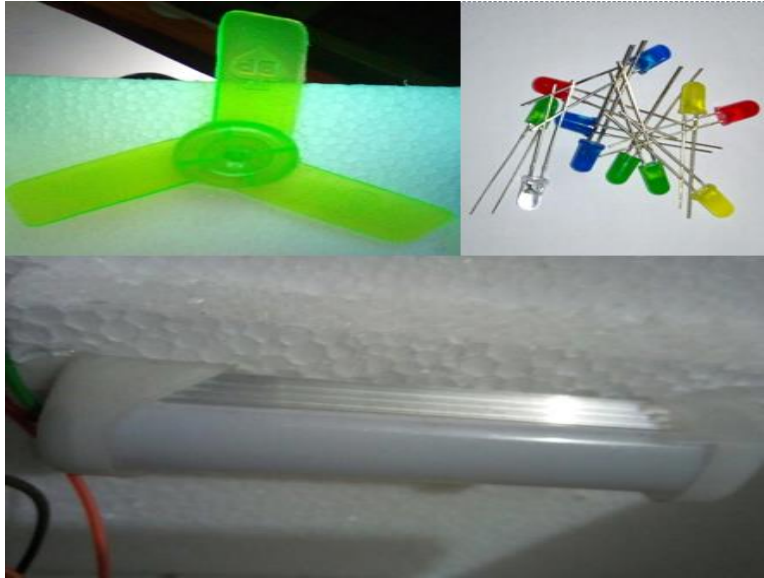


Fig 2.13: Light, Fan & LED

CHAPTER 3

REQUIREMENTS AND DESIGN SPECIFICATION

3.1 Introduce to IDE

Integrated Development Environment (IDE) is a software application that provides computer programmers with an integrated facility for developing any software. Here for our Smartphone app we have to work on different IDE [8].

3.2 Business Process Modeling

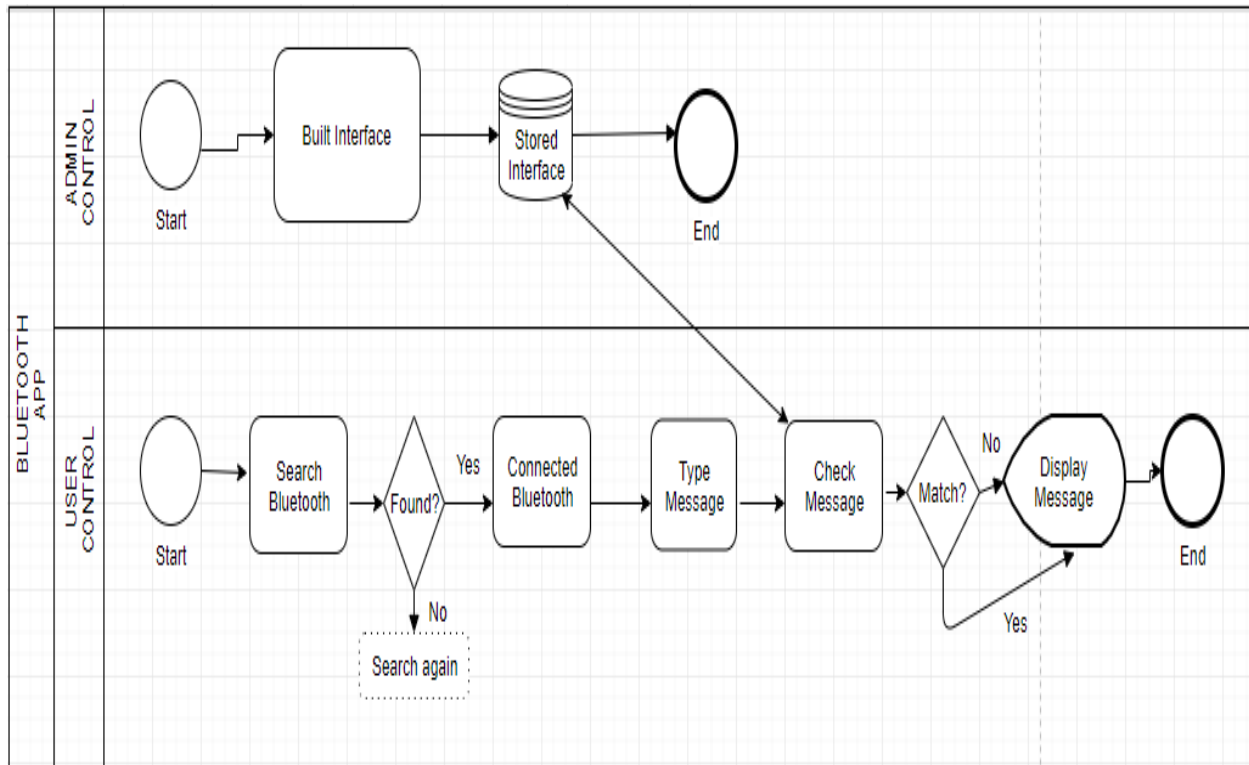


Fig 3.2: Business Process Modeling

In our BPM we use two separate pools for the User control and Admin control. This way, we can clearly define who is in control of which process.

In the Admin control pool, Admin built the interface and stored the interface as command or code.

In the User control pool, User searched and connect the Bluetooth. Type an interface as a message and send the message via Bluetooth. It will check with the built-in command if it is correct command the text color will be blue otherwise it will show red color.

3.3 Use Case Modeling and Description

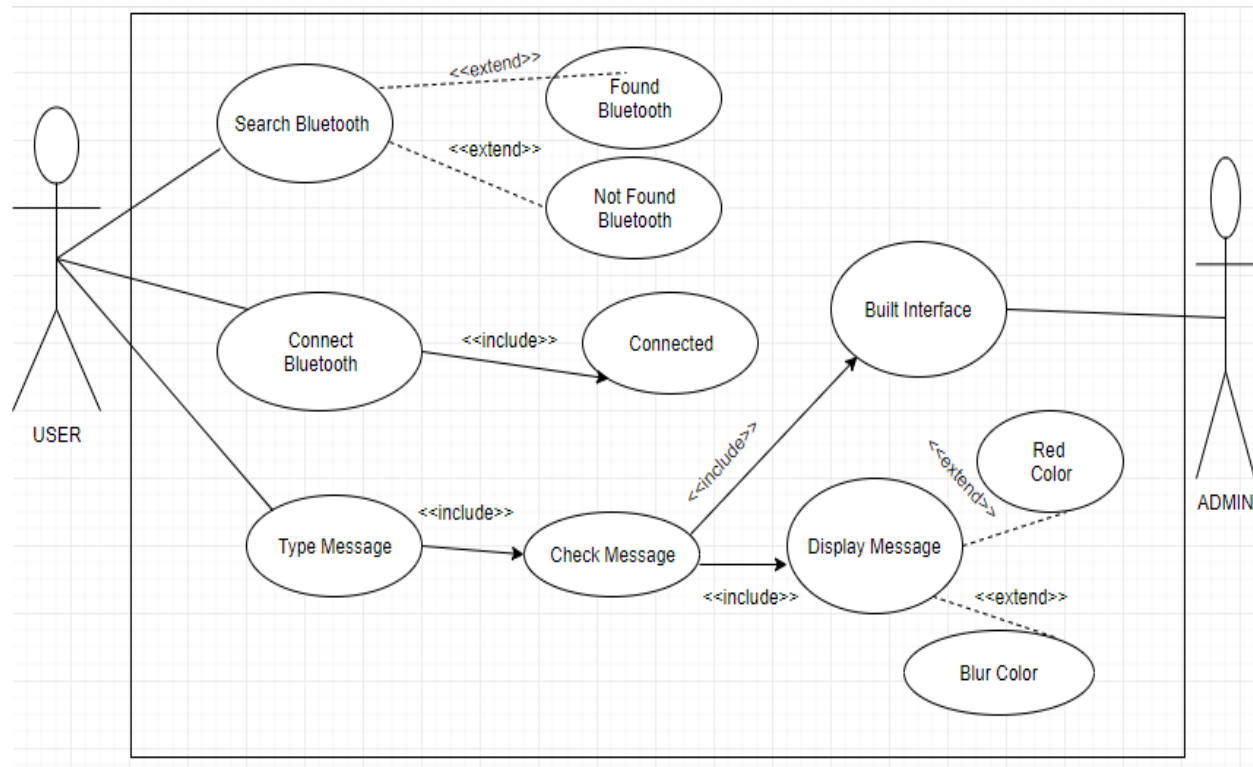


Fig 3.3: Use Case Model

Use case Description:

Use case ID: 001

Use case Name: Bluetooth App

Description: This use case allows users to connect their smartphone with Bluetooth module. Users also have to type interface as a message and send. Correct input shown as blue color and wrong input shown as red color.

Primary Actor: User

Secondary Actor: Admin

Pre-condition:

- User have to Search Bluetooth.
- User hove to Connect Bluetooth.

Post-condition:

- The system display the relevant command with the color.

Normal Flow:

- Search Bluetooth.
- Connect Bluetooth.
- Type Interface.
- Check Interface.
- Display Message.

Alternative Flows:

- After searching Bluetooth will be found or not found.
- Connection will be Secure, In Secure, Make Discoverable or Setup.
- Display Message color Blue or Red.

3.4 MIT app inventor and Android studio

Here for our project, we will use Android Studio and MIT APP Inventor to develop our first Android-based mobile application. We also want to develop it on other platforms such as IOS after completing our project.

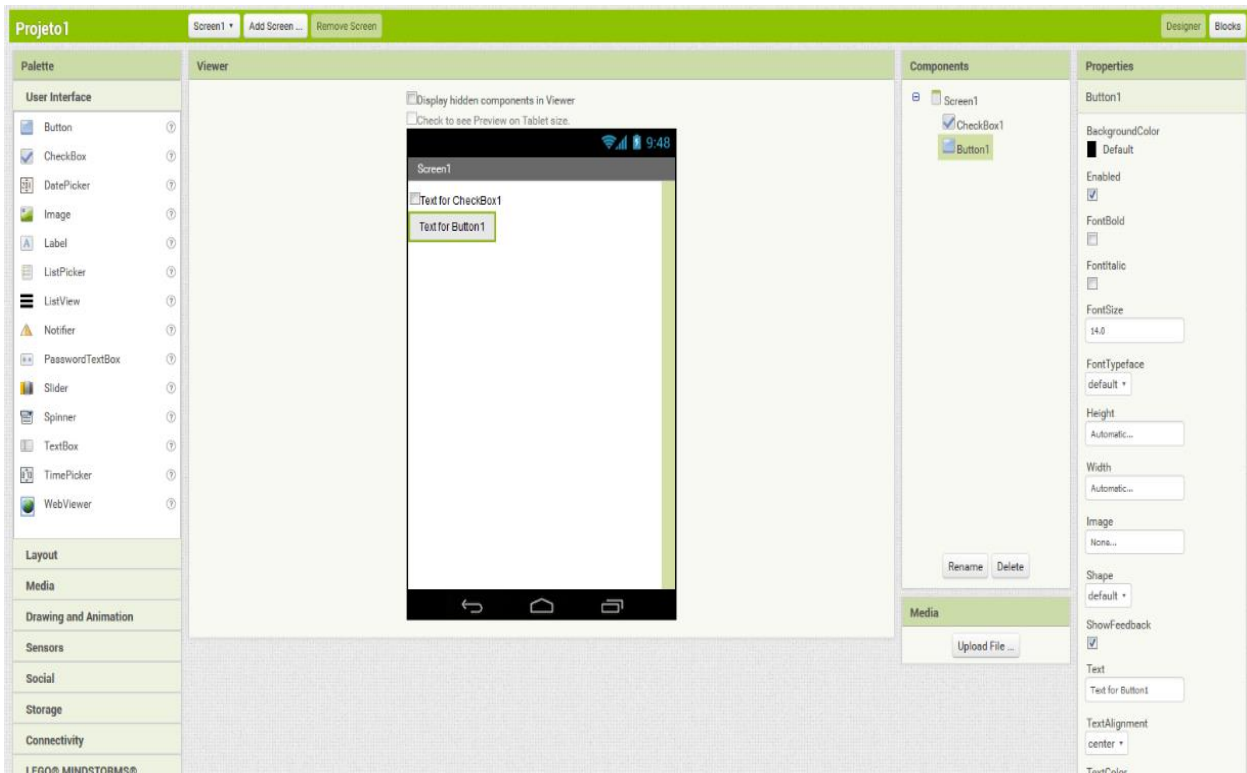


Fig 3.4: MIT app inventor IDE

3.5 Development Process

App Inventor Interface has two section Designer and Block. Designer Viewer section also known as user interface. User interface has many components like as Button, Check Box, Label, Image, List View, Image, Text Box etc. This component just drag and drop viewer section.

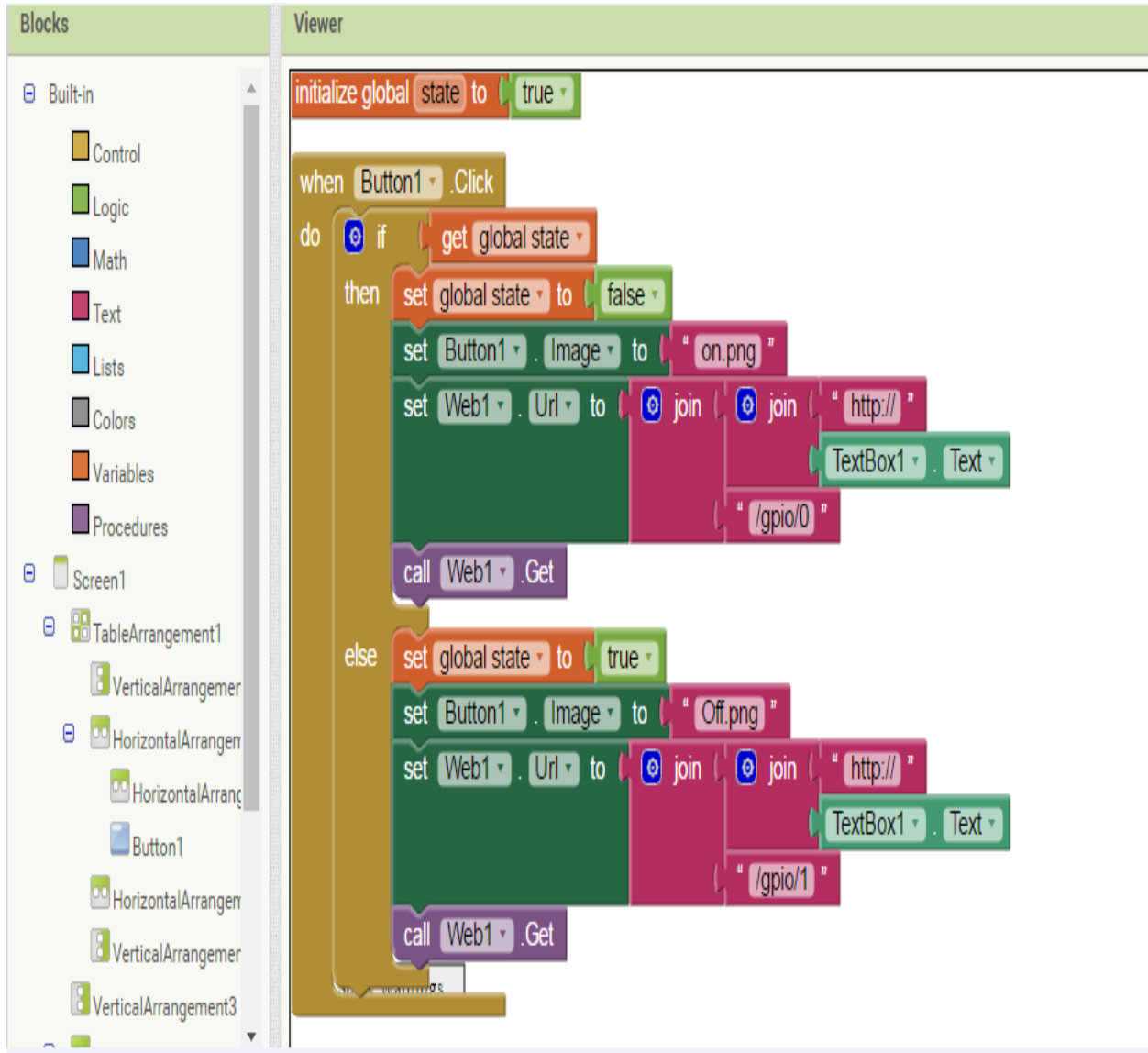


Fig 3.5: Development Process

3.6 GUI for this Project

3.6.1 User Interfaces and Search Bluetooth Module

After development our app interface is Fig 3.6.1A here we are keeping search menu option in right side.

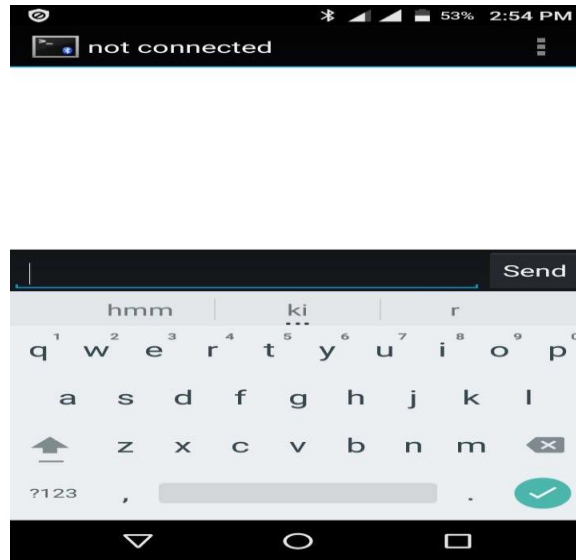


Fig 3.6.1A: User Interface

When we are searching, our Bluetooth module hc-05 is showing our app this interface Fig3.6.1B and any other nearest device is showing.

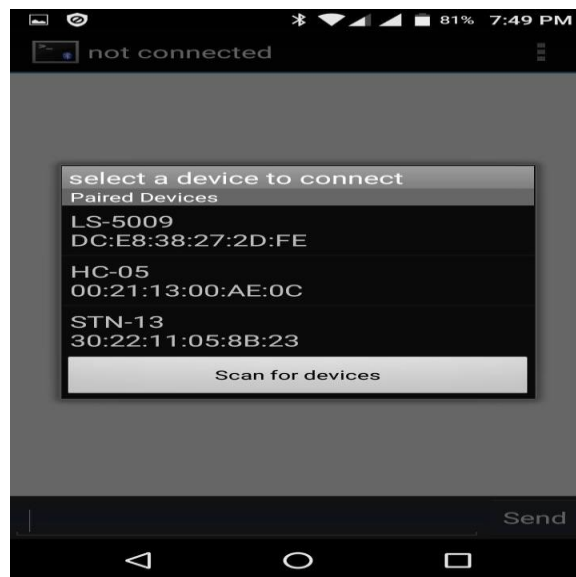


Fig 3.6.1B: Search Bluetooth Module

3.6.2 Typing Interface and After Sending Message

Fig 3.6.2A we are showing typing interface of our app. Left side is text area and right side is sending option.



Fig 3.6.2A: Typing Interface

After sending SMS our app interface is Fig 3.6.2B when we are sending any incorrect SMS then our app is showing this SMS red color otherwise our app is showing this SMS blue color.



Fig 3.6.2B: After Send Message

CHAPTER 4

HARDWARE CONNECTIONS

4.1 Introduction

In this chapter, we will discuss the hardware connection in our project. Hardware connections is the most important part in our project or any Arduino base project.

We will divided into two parts in our connection of our project:

One is Initial system module connections.

Another is Upgraded system module connections.

4.2 Initial system module connections

Initial system module connections mainly used to testing purpose connections in our project.

4.2.1 Motor Driver Connection

Hardware Required

- Arduino Uno
- Breadboard
- L293D Motor Driver
- Jumper Wire

The L293D is a 16 pin IC, and its two side divided by 8pins each side. There are 4 INPUT pins, 4 OUTPUT pins, 4 GND pins, 2 VCC pins and 2 ENABLE pins for each motor [1].

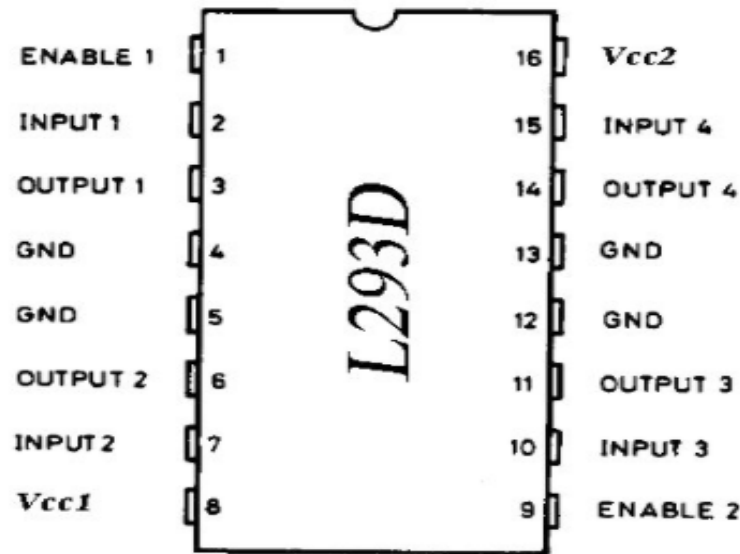


Fig 4.2.1: Motor Driver [6].

Pin 1: When Enable1 is high, the left side of the IC is working.

Pin 2: Input 1, when this pin is high, current will flow through output 1.

Pin 3: Output 1, this pin is connected to one end of the motor.

Pin 4/5: GND pin.

Pin 6: Output 2, this pin is connected to one end of the motor.

Pin 7: Input 2, when this pin is high, current will flow through output 2.

Pin 8: VCC1, used to supply power to the connected motor. The maximum voltage is 5V to 36V.

Pin 9: When Enable2 is high, the right half of the IC will work.

Pin 10: Input 4, when this pin is high, current will flow through output 4.

Pin 11: Output 4, this pin is connected to one end of the motor.

Pin 12/13: GND pin.

Pin 14: Output 3, this pin is connected to one end of the motor.

Pin 15: Input 3, when this pin is high, current will flow through output 3.

Pin 16: VCC, used to power the IC, i.e. 5V.

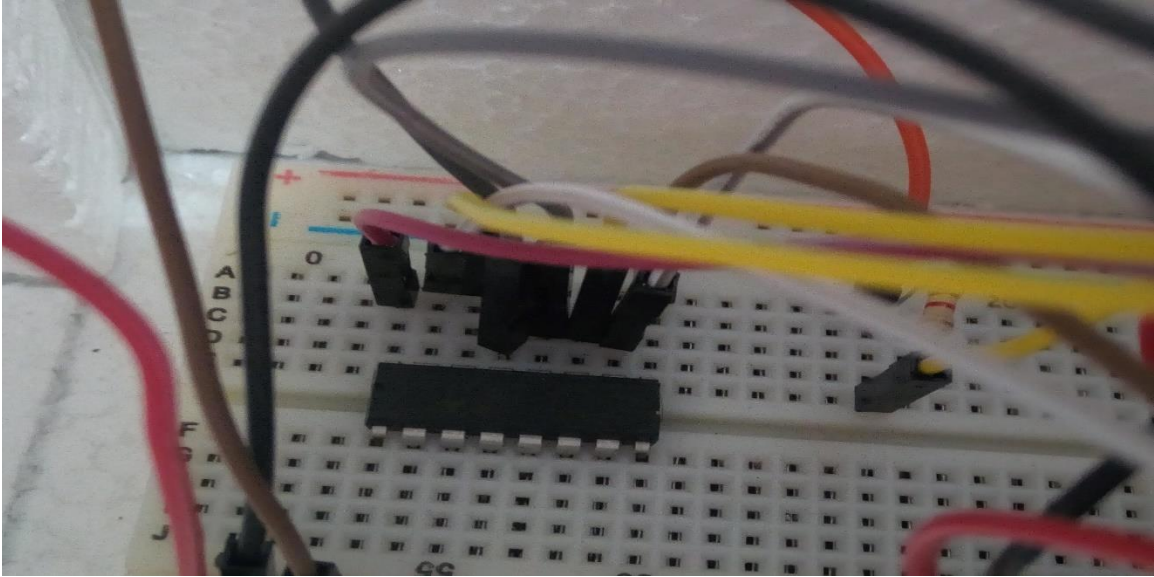


Fig 4.2.1: Motor Driver Connection

4.2.2 Fan Connection

Pin 3, 6 and pin 11, 14 motor driver output pin will be connected to motor. Given below we are showing picture in our project of fan connection.

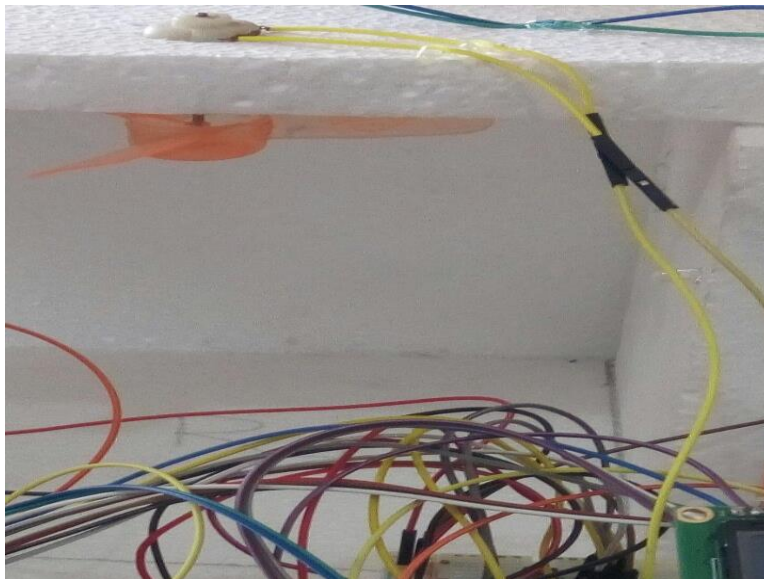


Fig 4.2.2: Fan Connection

4.2.3 Configure Bluetooth Module HC-05

Hardware Required

- Arduino Uno
- Breadboard
- Bluetooth Module HC-05
- Jumper Wire

Bluetooth Module HC-05 has 4 parts, TX, RX, GND and VCC.

TX pin: Transmit data.

RX pin: Receive data.

GND pin: Ground Connection.

VCC pin: For Power Supply.



Fig 4.2.3: Bluetooth Module [5]

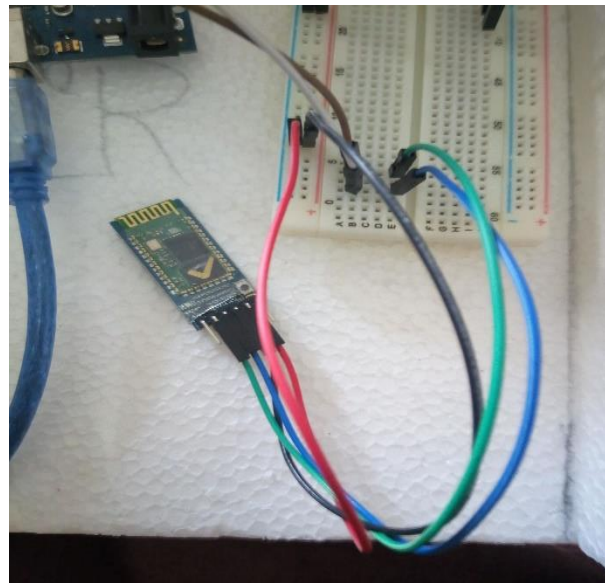


Fig 4.2.3: Bluetooth Module connection

4.2.4 Configure LED and mini tube light

Hardware Required

- Arduino Uno
- Breadboard

- LED
- Jumper Wire
- 10kΩ resistor

LED and mini tube light has two part anode and cathode. Anode pin will be connected any digital pins in our Arduino board and cathode pin will be connected GND pins with the resistor. Given below we are showing picture in our project of fan connection.

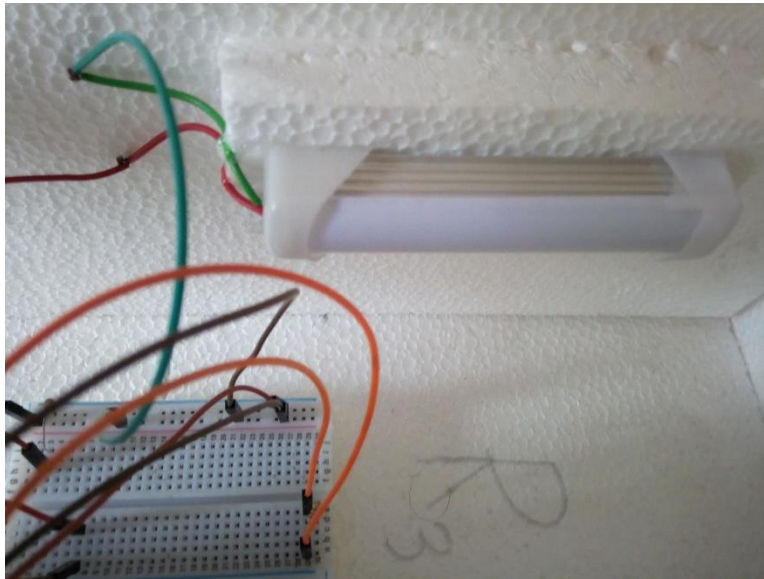


Fig 4.2.4: Mini Tube Light

4.2.5 Configure LCD

Hardware Required

- Arduino Uno
- Breadboard
- LCD
- Jumper Wire
- 10kΩ resistor

The LCD module has 16 pins and can be operated in 8bit mode or 4bit mode. We will use in 4bit mode in our project. Pin diagram is given below:

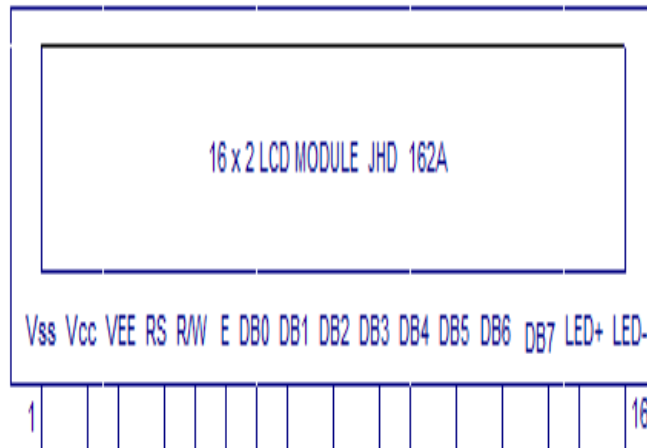


Fig 4.2.5: Pin Diagram in LCD [4]

The name and functionality of each pin are given below.

Pin1 (VSS): Connected will be GND pin of the LCD.

Pin2 (VCC): Connected will be VCC pin of the LCD module (+5V).

Pin3 (VEE): Contrast adjustment pin.

Pin4 (RS): Register select pin of Arduino board.

Pin5 (R/W): Read/Write modes of Arduino Uno. This pin is used for selecting between read and write modes. A logic high on this pin activates read mode and a logic low on this pin activates write mode.

Pin6 (E): Enable pin of the Arduino board.

Pin7 (DB0) to Pin14 (DB7): Between DB0 to DB7 are data pins.

Pin15 (LED+): Anode of the back light LED.

Pin16 (LED-): Cathode of the back light LED.

4.2.6 Circuit diagram of LCD

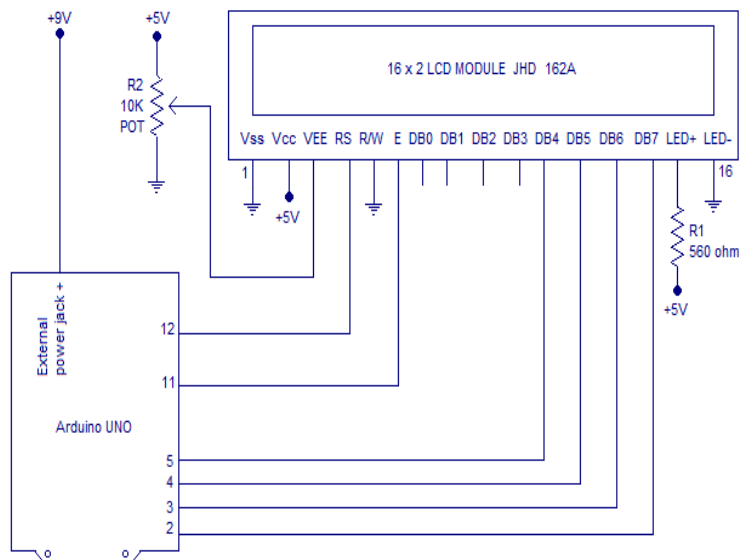


Fig 4.2.6: Circuit Diagram of LCD [4]

In this project we are using 4bit modes that means only 4 digital input lines of the LCD.

Pin 1, 3 & 16 are connected GND, 2, 15 are connected VCC (+5V), digital pins are connected 2, 11, 12, and 13 pots of the Arduino board, and enable pin is connected 8 no ports. Given below we are showing picture in our project of LCD connection.

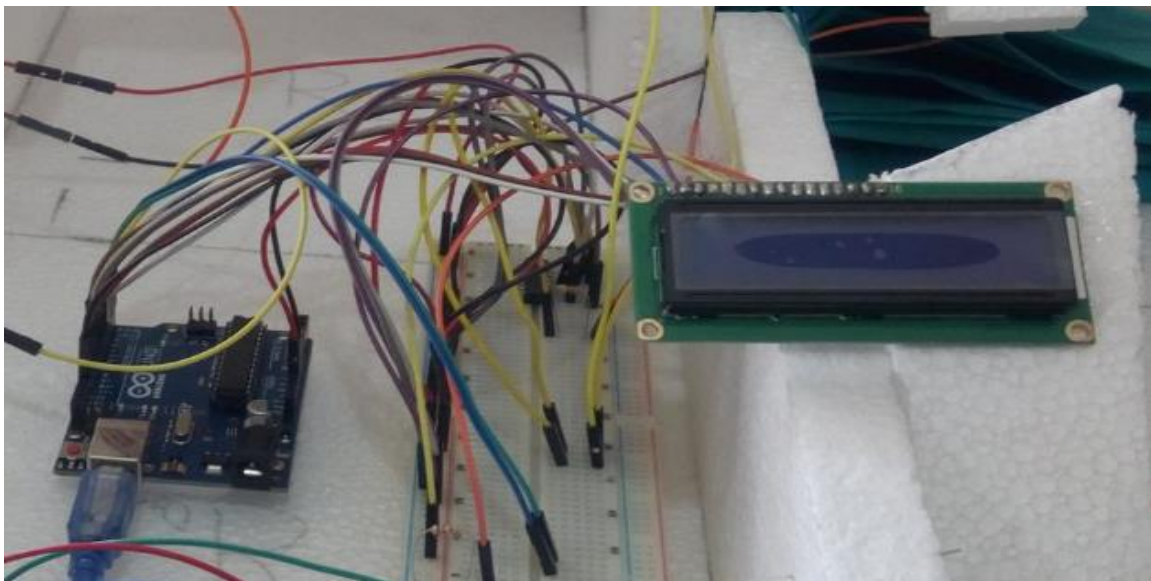


Fig 4.2.6: LCD Connection

4.3 Upgraded system module connections

At last, we are showing our completed project with Bluetooth module, LCD, Mini tube light, Led, Fan, Motor driver, Arduino Uno, Breadboard Jumper wire etc.

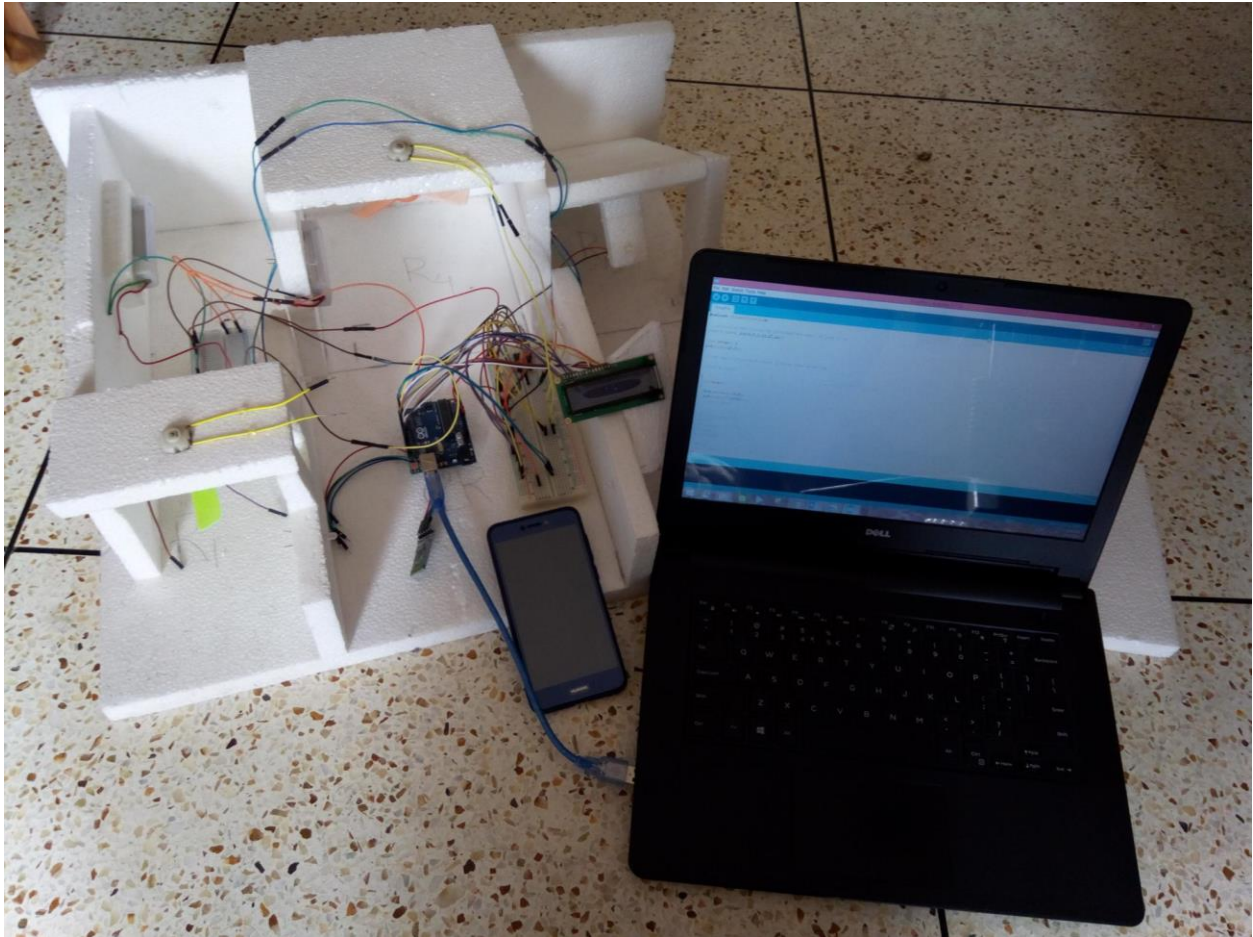


Fig 4.3: Completed Connection

CHAPTER 5

IMPLEMENTATION AND TESTING

In this chapter, we will discuss final output of our Arduino base project Smart Office Automation System. Different type of output in our project is shown below.

5.1 Display

We are using LCD display in our project for showing name of the control room and on, off appliance that are using in our project.



Fig 5.1: LCD Display Output

5.2 Mini Tube Light

We are using mini tube light at room number 3. When we are sending message After Bluetooth module connection between smart phone and Arduino Uno then tube light given our expected output. Given below, we are showing some output picture of our mini tube light output.

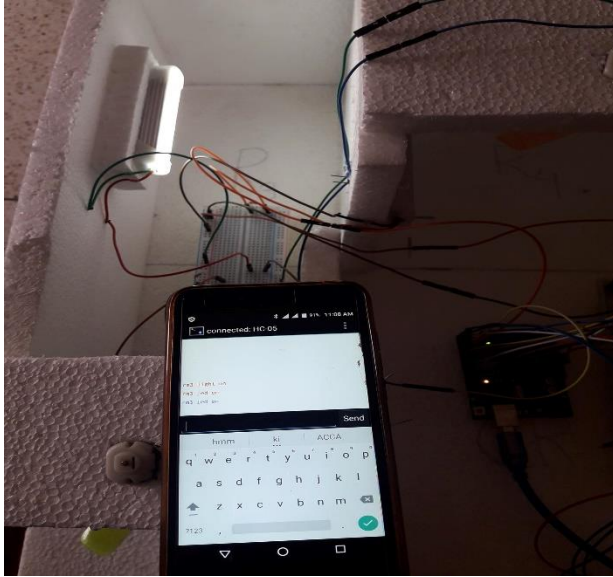


Fig 5.2.1: Brightness High



Fig 5.2.2: Brightness Medium

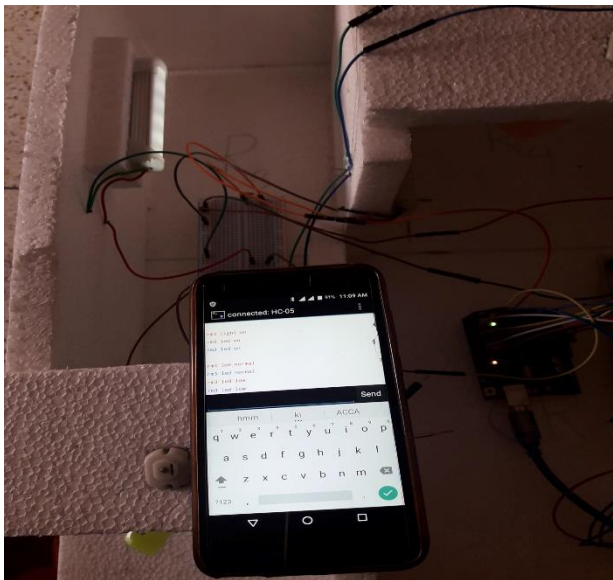


Fig 5.2.3: Brightness Low

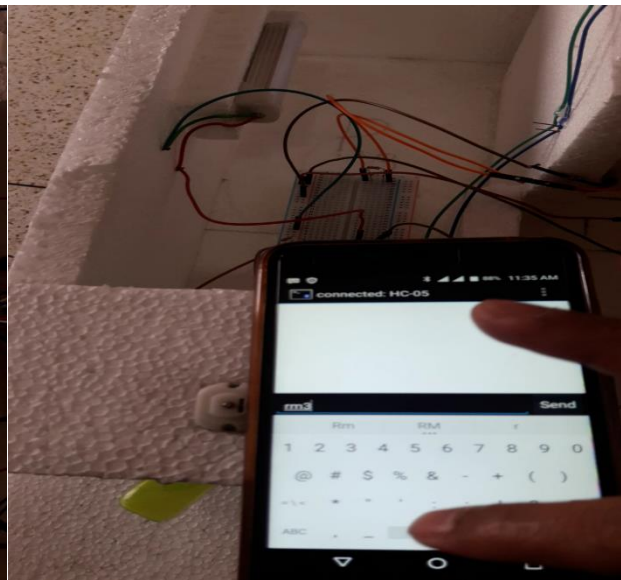


Fig 5.2.4: Tube Light Off

When we are sending message “rm3 light on”, the tube light on high brightness Fig 5.2.1, and “rm3 light normal”, the tube light on medium brightness Fig 5.2.2 and “rm3 light low”, the tube light on low brightness Fig 5.2.3 and “rm3 light off”, the tube light off Fig 5.2.4.

5.3 Projector and AC

We are using Projector and AC at room number 5. When we are sending message our expected output given. Given below, we are showing some output picture of Projector or AC output.

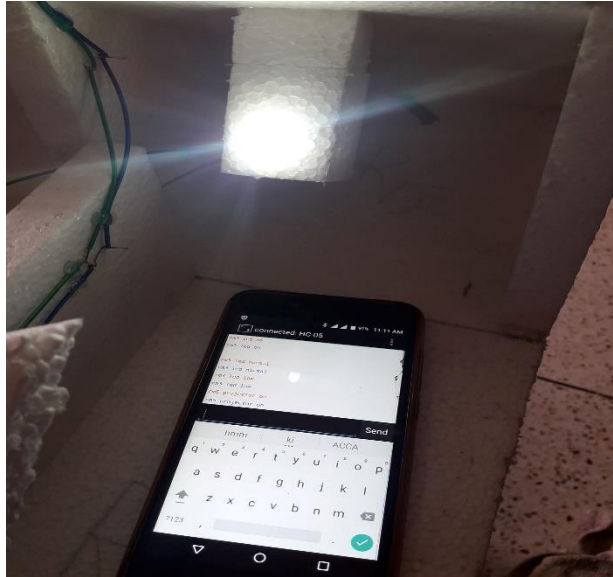


Fig 5.3.1: Brightness High

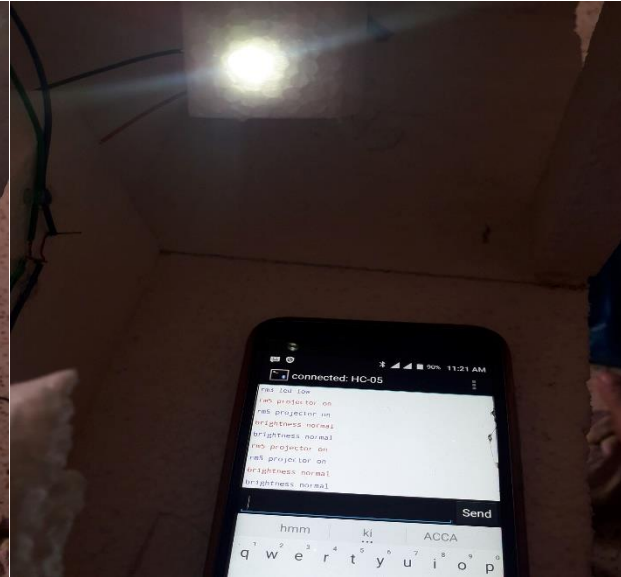


Fig 5.3.2: Brightness Medium



Fig 5.3.3: Brightness Medium

When we are sending message “rm5 projector on”, the projector on high brightness Fig 5.3.1, and “brightness normal”, the projector given standard brightness Fig 5.3.2 and “rm5 projector off”, the projector off Fig 5.2.3

5.4 Fan

We are using Fan at room number 4. When we are sending message, our expected output given. Given below, we are showing some output picture of Fan output.

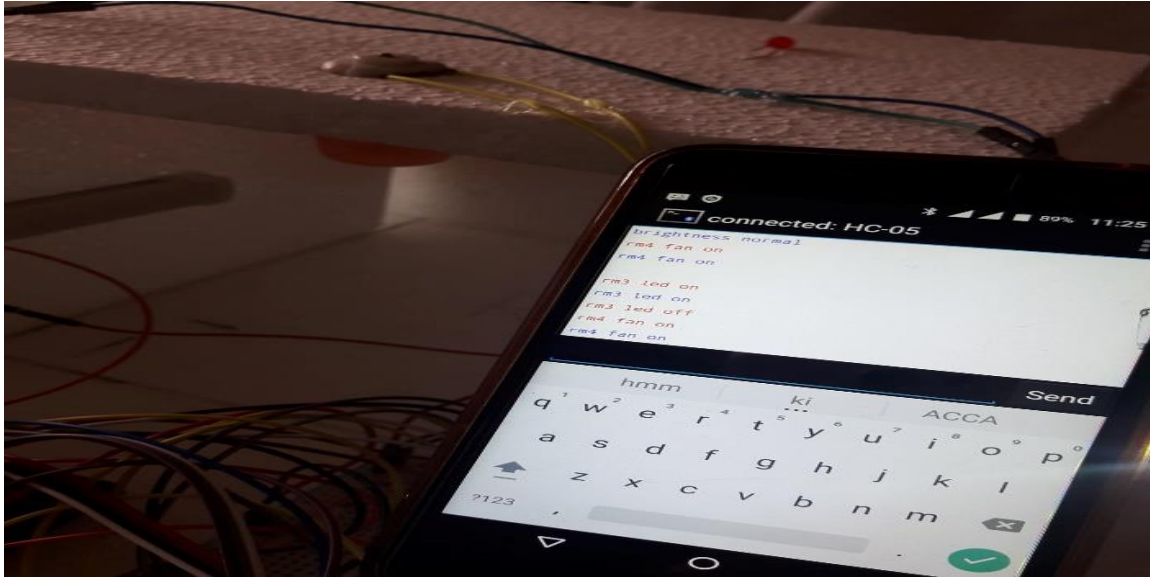


Fig 5.4.1: Fan On

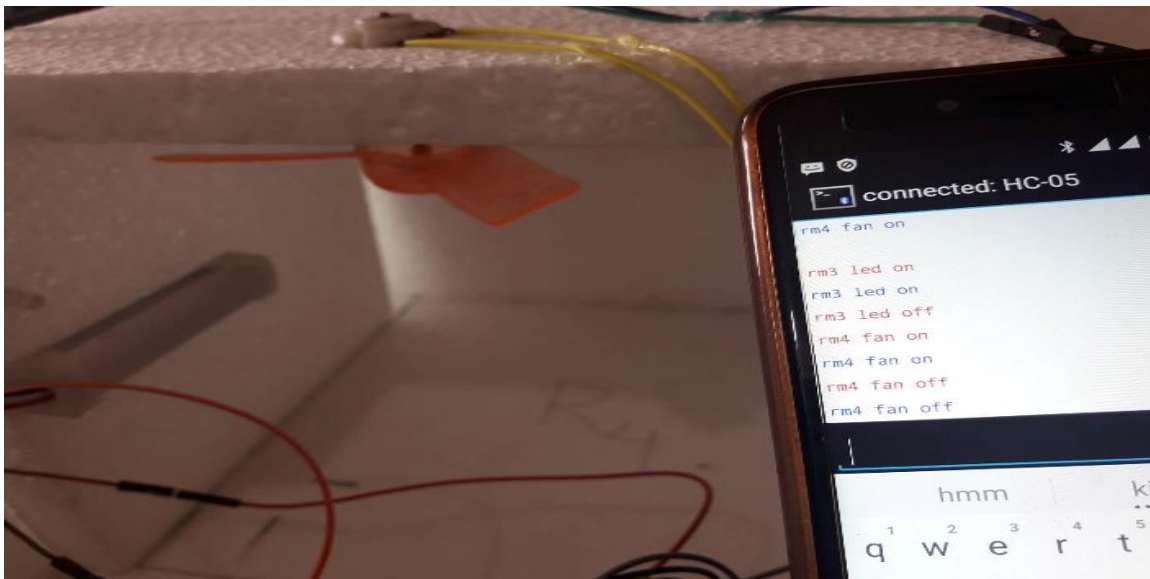


Fig 5.4.2: Fan Off

When we are sending message “rm4 fan on”, the Fan on Fig 5.4.1, and “rm4 fan off”, the fan off Fig 5.4.2

5.5 Final Output

Given below, we are showing some output picture of our project final output.

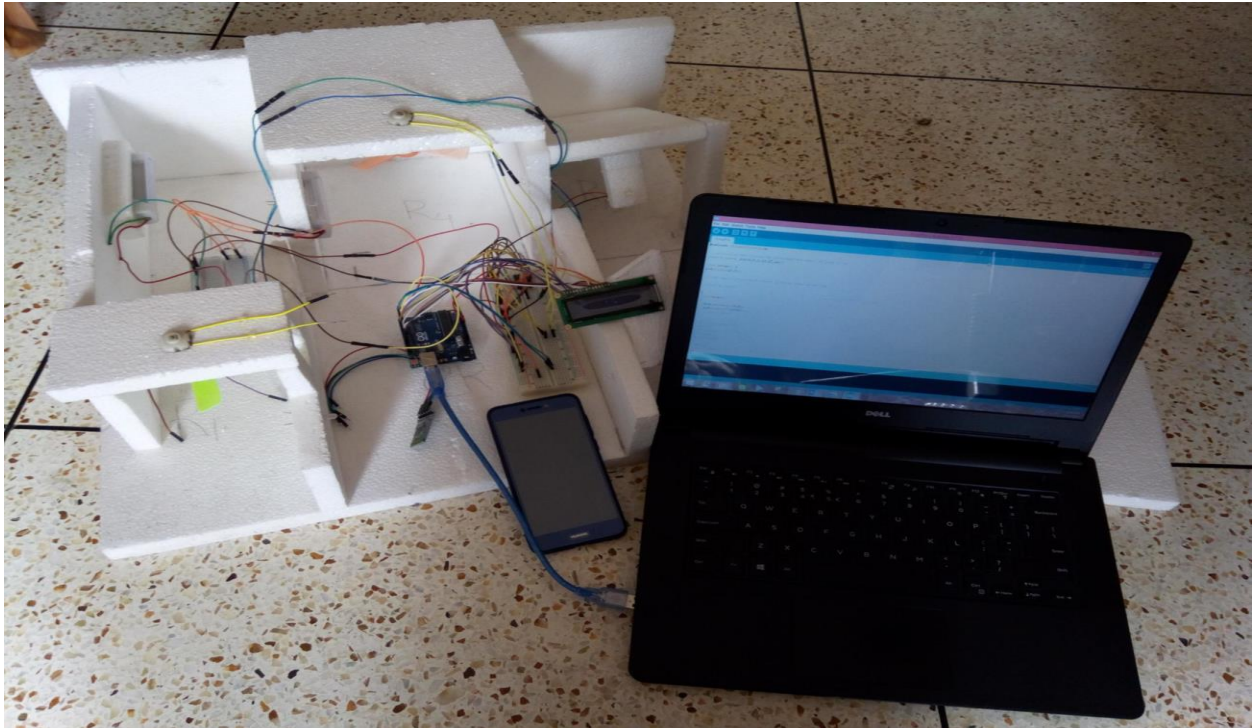


Fig 5.4.1: Final Output All Appliance OFF

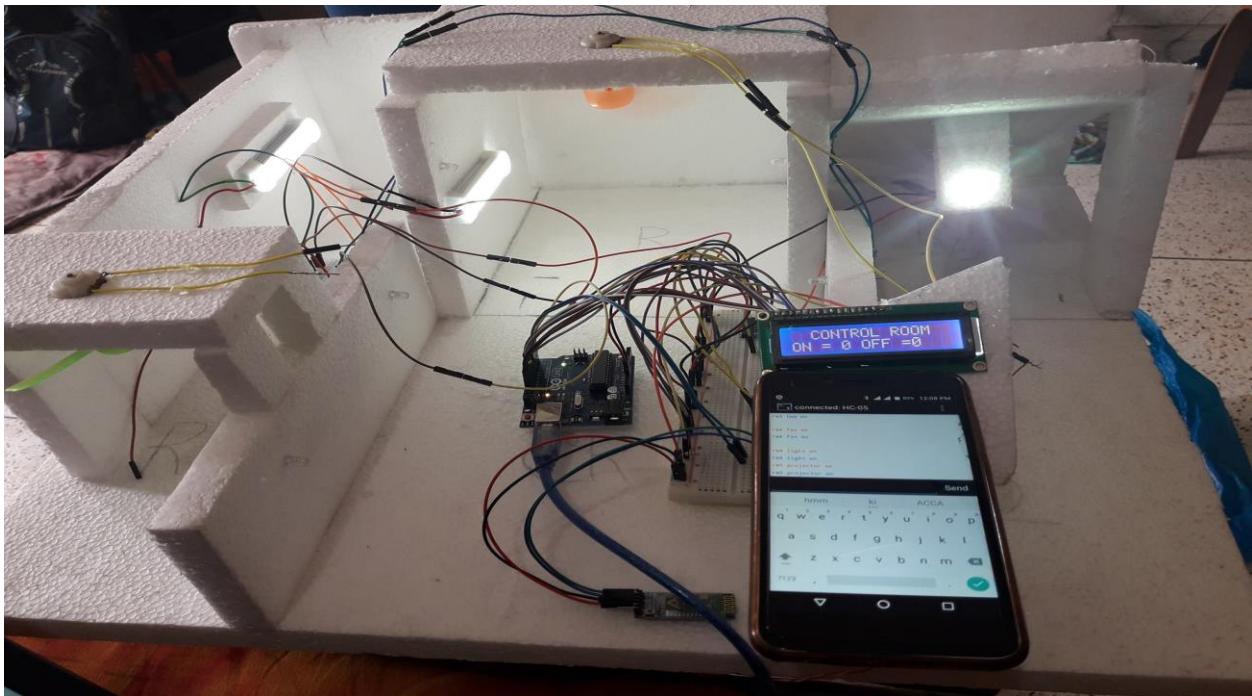


Fig 5.4.1: Final Output All Appliance On

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Current Limitations

We tried our best to develop our project but having some limitations and obstacles. Here we will discuss some of those limitations which might be solved in future.

- Our mobile apps currently support only on android platform.
- We do not have dedicated server to control our system more professionally.
- Currently we are not intended to control all home appliances product like music system.
- For controlling appliances through voice we only integrated API in English language (International).

6.2 Future Scopes

Today we live in an age of technology. And embedded system helping people like in the sector of electronics, wireless communications, networking, cognitive and affective computing and robotics, devices around us communicate in more ways than we ever imagined.

So, here we therefore planned for making our project more advanced and add some new “tech” support to it. After doing so people could get more facilities with our home automation product. That is the thing what we will discuss about in this chapter.

Obviously we do have some objectives and preplanning for our project to make it advance. So let's discuss it here in short and precise.

- Some of the product in our project may be upgraded or replaced according to our necessity.
- We will try control our all office appliance through a website. That will make our project very upgradeable.
- We will Upgraded our mobile apps (now it's for android) for all platform.
- In future People will control their appliances with their natural mother tongue, so language processing API for NLP (Natural Language Processing) would be in consideration.

REFERENCES

- [1]. Arduino Description. Internet:
https://www.tutorialspoint.com/arduino/arduino_board_description.htm, [Last access May, 03, 2018].
- [2]. Arduino Photo. Internet: <http://forefront.io/attachments/uno.jpg>, [Last access May, 03, 2018].
- [3]. Breadboard. Internet:
<https://potentiallabs.com/cart/image/cache/catalog/New%20Components/breadboard-600x315.jpg>, [Last access May, 03, 2018].
- [4]. LCD. Internet: <http://www.circuitstoday.com/interfacing-lcd-to-arduino>, [Last access May, 03, 2018].
- [5]. Bluetooth module hc-05. Internet: <https://roboindia.com/tutorials/arduino-hc-05-at-mode>, [Last access May, 04, 2018].
- [6]. Photo. Internet: https://www.engineersgarage.com/sites/default/files/L293D_1.jpg, [Last access May, 04, 2018].
- [7]. Motor Driver. Internet: <https://roboindia.com/tutorials/motor-driver-arduino>, [Last access May, 04, 2018].
- [8]. IDE. Internet: <https://www.allaboutcircuits.com/technical-articles/what-are-integrated-development-environments/>, [Last access May, 04, 2018].

APPENDIX

When we started our project we are very much excited and afraid too. The main challenges for our project were collect all the components. But we went to the market and bought all the necessary things we want. Every step of our project was a new challenge for us. Every member of our group give their 100% effort for the project, we solve the all complicated part of our project and successfully done our work.

Therefore when we had given Bluetooth module connection, then it's does not work currently. After hard work when I was failed then I posted our problem in Arduino Uno page of Facebook.

After sometimes I was given some solution, but I was followed the solution that's reply from Australia and his solution is perfectly work in our project.

After that when I faced any problem then I posted this Arduino Uno page of Facebook then I got my accepted outcome.

Finally we could complete our project.

PLAGIARISM REPORT

The screenshot shows the Plagiarism Report interface for a document titled "Smart Office Automation System.doc" uploaded 1 month ago. The interface features a dark blue sidebar with navigation options: Upload, Papers, Payments, Free, and Earn money. Below these are "RATE US" (5 stars) and "CONTACT US" (chat icon). The main content area displays a similarity score of 15% in a donut chart. Below the chart, three categories are listed: Paraphrase (2%), Improper Citations (0%), and Matches (16). A red starburst icon indicates a "HIGHEST PLAGIARISM RISK". A pink button at the bottom right says "View detailed report".

Category	Percentage/Count
Paraphrase	2%
Improper Citations	0%
Matches	16