

# **REMOTE CONTROL HOME AUTOMATION**

**This project report has been submitted to the Department of Electrical and Electronic Engineering in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering.**

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**December 2018**

# Certification

This is to certify that this project and thesis entitled “Remote control Home Automation” 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 Electrical and Electronic Engineering under the Faculty of Engineering of Daffodil International University in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering. The presentation of the work was held on December 2018.

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# List of Abbreviations

IC	Integrated Circuit
PCB	Printed Circuit Board
LED	Light Emitting Diode
DC	Direct Current
AC	Alternating Current
PVC	Polyvinyl Chloride
GSM	Global System for Mobile Communication
EMF	Electromotive Force
PWB	Printed Wiring Board
PCA	Printed Circuit Assembly
CT	Current Transformer
PT	Potential Transformer



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# ABSTRACT

This paper displays the general structure of Home Automation System with minimal effort and remote control. This framework is intended to help and offer help so as to satisfy the necessities of elderly and incapacitated in home. Additionally, the keen home idea in the framework enhances the standard living at home. The principle control framework executes remote control innovation to give remote access from PC/workstation or advanced mobile phone. The plan remains the current electrical switches and gives more security control on the switches with low voltage actuating strategy. The switches status is synchronized in all the control framework whereby each UI demonstrates the continuous existing switches status. The framework planned to control electrical machines and gadgets in house with generally minimal effort structure, easy to understand interface and simplicity of establishment.

So as to accomplish the best house computerization framework, more finders or sensors can be associated with the microcontroller yield port where it tends to be reinvent by client utilizing their PC at home. As the outcome, the infrared movement identifier is competent to distinguish movement while the microcontroller is able to control the entire task of the mechanization framework.

# CHAPTER 1

## INTRODUCTION

### **1.1 INTRODUCTION:**

Home mechanization is a general term that covers an assortment of mechanical abilities you can introduce in your home. Home computerization can incorporate controlling parts of your home remotely through a PC or telephone, programming electronic gadgets to react naturally to specific conditions or situations, or bringing together the control of an assortment of things in your home into a solitary control focus.

To build up a Remote control Home Automation with Arduino UNO board and an android application.

Remote controlled home mechanization framework furnishes a more straightforward arrangement with android application innovation.

Remote activity is accomplished by any advanced cell/Tablet and so on with Android OS, upon a GUI (Graphical User Interface) based touch screen task.

Among the mainstream uses of home mechanization is lighting. Not exclusively would you be able to change the lighting controls and customize their yield to your necessities, however you can likewise set aside extra cash by utilizing the lighting all the more proficiently.

Control every one of the lights in and around your home from one focal area. There's no convincing motivation to get up or go first floor in case you fail to murder a light – do what should be done remotely.

Not only does home automation make your home continuously powerful and less requesting to work, it can in like manner empower you to keep it kept up.

## **1.2. GOALS AND OBJECTIVES:**

Building isn't just a hypothetical report yet it is an execution of all examination for making something new and making things all the more simple and helpful through commonsense investigation. It is a craftsmanship which can be picked up with precise investigation, perception and practice. In the school educational modules we typically get the hypothetical learning of ventures, and a smidgen of execution information that how it is functions? Be that as it may, how might we demonstrate our down to earth information to expand the profitability or productivity of the business? Don't take the chance of becoming victim of burglary, which is often accompanied by violence. Protect our family and valuables with this microcontroller based home automation system that will let us rest our head knowing that should anyone trying to break into our home. With the same approach in mind, we have taken up the Microcontroller Based Home automation System and as our final year project. Automated systems are a useful addition to today's home where safety is an important issue. Vision-based automation systems have the advantage of being easy to setup, in expensive and non-obtrusive.

Microcontroller based home automation system is available in market is high pricing where as our designed device is the cheapest one. We have justified in the local market price before making our project.

Basically our design Microcontroller based home automation system is operated and total cost is Take 2500.

So we decided that the designed automation system can implement commercially.

## **1.3 MOTIVATION:**

In present time of electronic development and astute structures, home motorization has ended up being one of the fastest making application-put together advances with respect to the planet. The likelihood of open to living in home has since changed for whatever length of time that decade as cutting edge, vision and remote advances are composed into it. Canny homes, in fundamental terms, can be delineated as homes that are totally mechanized similarly as completing a destined endeavor, offering contribution to the customers, and responding as necessities be to conditions. By the day's end, it fundamentally allows various parts of the home

structure, for instance, temperature and lighting control, framework and trades, incitement system, emergency response and security watching systems to be mechanized and controlled, both close and at a detachment. Automated security systems expect a basic employment of giving an

Extra layer of security through customer check to balance break-ins at area centers and moreover to pursue illegal interferences or unconstrained activities inside the district of the home (inside and outside).

There has been much research done in the structure of various types of motorized systems. Sensor-set up together structures that depend as for contact or advancement sensors or contact-based systems, for instance, one of a kind stamp and palm print compass or keypad commencement that require liberal proportion of contact with a data device.

Various motorization systems rely upon only a single structure. In an event of system frustration or intrusion of the customer approval, there is no support structure to screen the home reliably. This insufficiency can be overseen using various robotization systems. Regardless, multi-structure use will be also asking similar to computational cost and affiliation.

#### **1.4. METHODOLOGY:**

By utilizing this framework we can anchor industry or home effortlessly. This framework comprises of a sensor which screens the region and gives a yield at whatever point an individual is moving at the premises. The yield of the sensor is given to the control unit, when the control unit gets a contribution from the sensor then it creates a sense likewise sends a direction to the Remote flag so that the. This framework persistently screens the status of sensors associated with it. On the off chance that any of the sensor gives the yield sign, microcontroller based framework naturally sends the call cautions to the client. After consummation of the order usage this framework sends the affirmation.

## **1.5. IMPORTANCE:**

Mechanization has turning into a vital issue all over the place. Microcontroller based Home computerization is getting to be vital these days as the conceivable outcomes of interruption are expanding step by step. The sort of robotization frameworks are comprehensively used inside corporate work places,

Business places, strip malls and so forth. These frameworks are additionally utilized in store room, bank, open and so forth. The frameworks have significantly invited, since it may be worked from a versatile correspondence. As we are realize that the wrongdoing rates are expanding step by step so a large portion of the general population are typically not feeling solace until the point when they give a beyond any doubt to their security it is possible that it might be at office or home. So we ought to pick a superior electronic framework for anchoring reason.

- ⇒ Increase your independence.
- ⇒ Easy your personal life.
- ⇒ Medium cost.

## **1.6. PROJECT OUTLINE:**

The project is organized as follows:

Chapter 1: Introduces Introduction, Goals and objectives, Motivation, Methodology, and Importance.

Chapter 2: Design and construction, equipment's name, Relay, Bluetooth Module, at mega 16 Microcontroller, Transistor, and Circuit diagram.

Chapter 3: Presents the Testing result.

Chapter 4: Analysis the Cost sheet.

Chapter 5: Describes Summery of the project work, Limitation of the project, Future scope, Conclusion.

# CHAPTER 2

## DESIGN AND CONSTRUCTION

**2.1. Block Diagram:** Block Diagram of Microcontroller Based Home Automation System

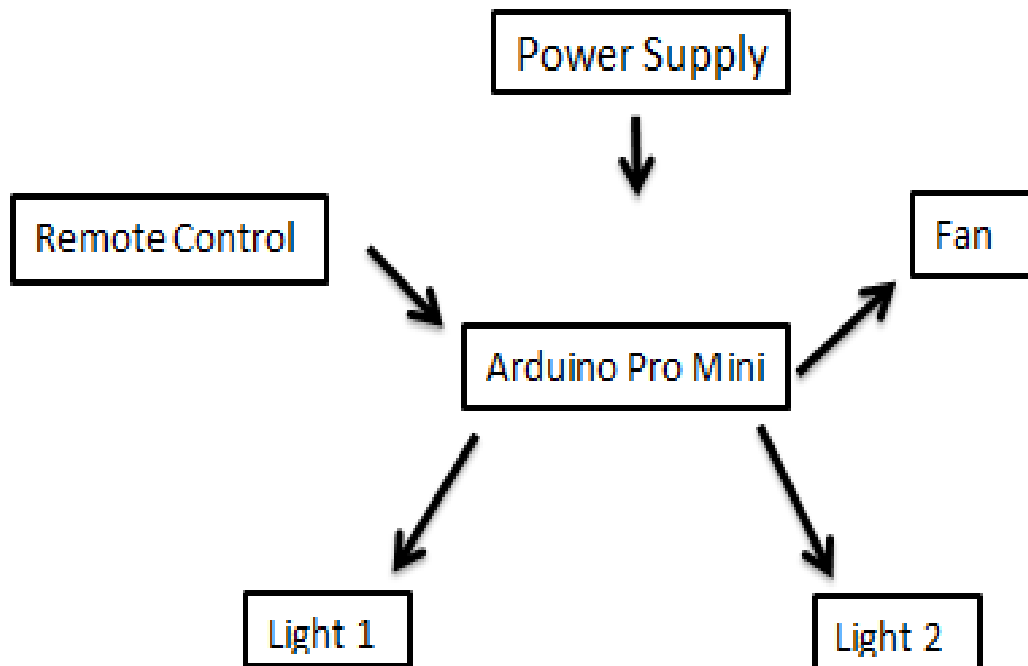


Fig. 2.1: Block Diagram of Remote control Home Automation.

## 2.2. Equipment Used:

Table 2.1: Equipment's used in the Circuit.

No	Equipment	Quantity
1	Adapter12V	1
2	Resister	7
3	Capacitor	2
4	Transistor (BC547)	5
5	Voltage Regulator (7805)	1
6	Relay (1-5V)	3
8	Bluetooth Module (HC06)	1
9	Connector	10
10	DC Connector	2
14	Switch	2
15	Holder	3
16	Bulb	3
18	Cork Shit	2.0 feet
19	Glue Stick	2
22	Wires	2 Gage
23	Soldering Iron	1
24	Android Phone	1



## 2.3. Equipment's Description:

### 2.3.1. Adapter Circuit:

An (electrical) connector or connector is a device that changes over attributes of one electrical contraption or structure to those of a for the most part opposite device or system. Some change power or banner characteristics, while others just alter the physical sort of one electrical connector to another.

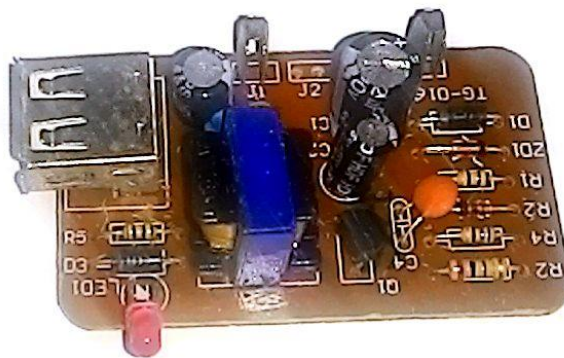


Fig. 2.2: Adapter Circuit

An AC connector, likewise called a "control solid shape" or "recharger", is a little power supply that changes family unit electric flow from mains voltage ( either 120 or 230 volts AC) to low voltage appropriate for customer hardware. Additionally alluded to as a power supply or power connector, an AC connector connects to a standard electrical outlet and changes over the AC electrical flow from the

divider outlet to the details required by the electrical gadget that is connected. The AC connector is a container joined to the power rope, either toward the finish of the rope where the gadget connects to the divider outlet or amidst the power string. Huge amounts of gadgets around your

home depend on AC connectors for their capacity supply. Workstations, PDAs, cordless telephones, computerized photograph outlines, minimal plate players, computer game frameworks and that just names a couple. Innovation presently can't seem to lead us to a period when AC connectors will wind up all inclusive to every single electronic gadget.

### **2.3.1. a. How an AC Adaptor Works:**

So, an AC Adaptor changes over the electric flows gotten by the electrical outlet into a commonly lower exchanging flow that an electronic gadget can utilize. Inside the AC connector are two wire windings that fold over a solitary iron center. The first of the windings gets the 120-volt exchanging flow conveyed to the electrical outlet, and makes an electric field in the iron center. The second wire winding transforms the recently made electric field into a littler rotating electric flow. The proportion of the subsequent rotating current is reliant upon the quantity of curls in the second wire twisting in connection to the number in the primary winding. On the off chance that the second winding is half of the primary winding, the rotating current will gauge half of what it did when it entered the AC connector. Accordingly, if there were 100 loops on the main winding, the second winding will have just 50 curls.

### **2.3.2. RESISTOR:**

A resistor is a reserved two-terminal electrical fragment that realizes electrical hindrance as a circuit part. Resistors act to diminish current stream, and meanwhile, exhibit to cut down voltage levels inside circuits. In electronic circuits, resistors are used to limit current stream, to alter signal dimensions, tendency powerful parts, and end transmission lines among various livelihoods. High-control resistors, that can disperse various watts of electrical power as warmth, may be used as a segment of motor controls, in power dissemination structures, or as test loads for generators. Settled resistors have assurances that simply change to some degree with temperature, time or working voltage. Variable resistors can be used to change circuit segments, (for instance, a volume control or a light dimmer), or

As identifying devices for warmth, light, wetness, power, or compound development. Unit of Resistance is Ohm ( $\Omega$ ).



Fig. 2.3: Resistor

### 2.3.3. TRANSISTOR:

A transistor is a semiconductor contraption used to strengthen or switch electronic signs and electrical power. It is made out of semiconductor material with something close to three terminals for relationship with an outside circuit. A voltage or current associated with one lots of the transistor's terminals changes the current through another consolidate of terminals. Since the controlled (yield) power can be higher than the controlling (input) control, a transistor can improve a banner. Today, a couple of transistors are packaged only, yet much more are found introduced in joined circuits. The transistor is the focal building square of current electronic contraptions, and is general in present day electronic systems.

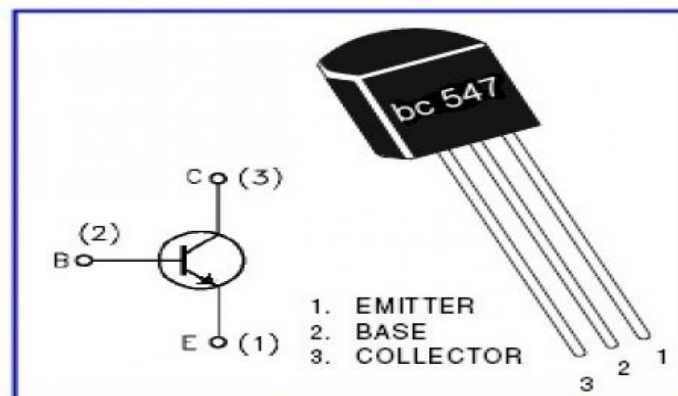


Fig. 2.4: BC 547 Transistor

### **2.3.3. a. Types of Transistor:**

Transistors are fundamentally ordered into two kinds; they are Bipolar Junction Transistors (BJT) and Field Effect Transistors (FET). The BJTs are again characterized into NPN and PNP transistors. The FET transistors are grouped into JFET and MOSFET. Intersection FET transistors are characterized into N-channel JFET and P-channel JFET relying upon their capacity. MOSFET transistors are ordered into Depletion mode and Enhancement mode. Again exhaustion and improvement mode transistors are characterized into N-channel JFET and P-channel.

### **2.3.3. b. NPN Transistor:**

NPN is one of the two sorts of Bipolar Junction Transistors (BJT). The NPN transistor comprises of two n-type semiconductor materials and they are isolated by a thin layer of p-type semiconductor. Here the lion's share charge bearers are electrons and gaps are the minority charge transporters. The streaming of electrons from producer to authority frames the present stream in the

Transistor through the base terminal. The BC 547 is a typical NPN bipolar intersection transistor (BJT) utilized for universally useful low-control intensifying or exchanging applications. It is intended for low to medium current, low power, medium voltage, and can work at reasonably high speeds. It was initially made in the TO-18 metal. The BC 547 is viewed as an extremely basic transistor, and is utilized as a model of a NPN transistor. It is often utilized as a little flag transistor, and it remains a little universally useful transistor of continuing notoriety.

### **2.3.3.c. PNP Transistor:**

The PNP is another sort of Bipolar Junction Transistors (BJT). The PNP transistors contain two p-type semiconductor materials and are isolated by a thin layer of n-type semiconductor. The greater part charge transporters in the PNP transistors are gaps and electrons are minority charge

bearers. The bolt in the producer terminal of transistor demonstrates the stream of traditional current. In PNP transistor the present streams from Emitter to Collector.

### 2.3.4 LCD Display:

16x2 LCD is named so on the grounds that; it has 16 Columns and 2 Rows. There are a great deal of mixes accessible like, 8x1, 8x2, 10x2, 16x1, and so forth. However, the most utilized one is the 16\*2 LCD; henceforth we are utilizing it here.

All the previously mentioned LCD show will have 16 Pins and the programming approach is likewise the equivalent and thus the decision is left to you. The following are the Pinout and Pin Description of 16x2 LCD

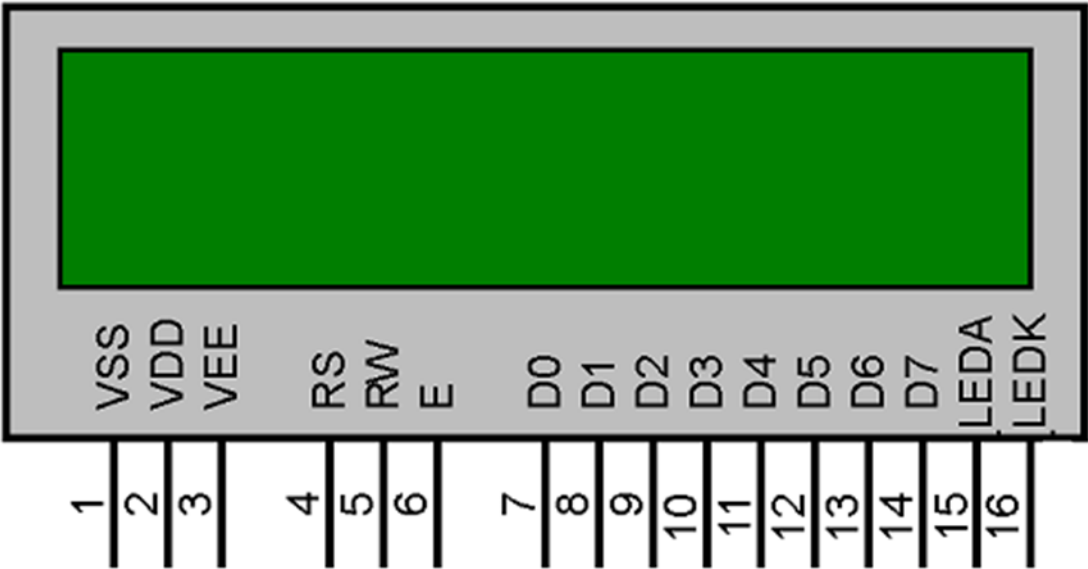


Fig. 2.5: LCD Display

### 2.3.5. a. Advantages:

78xx plan ICs don't require additional sections to give an enduring, oversight wellspring of force, making them easy to utilize, and furthermore mild and viable businesses of room. Other voltage controllers may require additional parts to set the yield voltage level, or to help the course methodology. Some extraordinary plans, (for instance, a traded mode control supply) may require impressive building aptitude to execute.

### **2.3.5. b. Disadvantages:**

The data voltage ought to reliably be higher than the yield voltage by some base aggregate (customarily 2.5 volts). This can make these contraptions unacceptable for powering a couple of devices from specific sorts of force sources (for example, controlling a circuit that requires 5 volts using 6-volt batteries won't work using a 7805).

As they rely upon a straight controller structure, the data current required is constantly equal to the yield current. As the information voltage ought to constantly be higher than the yield voltage, this suggests the total power (voltage expanded by current) going into the 78xx will be more than the yield control gave. What makes a difference is dispersed as warmth. This suggests both that for a couple

Applications an adequate warmth sink must be given, and moreover that an (every now and again liberal) fragment of the data control is wasted in the midst of the system, rendering them less capable than some unique sorts of power supplies. Exactly when the data voltage is inside and out higher than the controlled yield voltage (for example, driving a 7805 using a 24 volt control source), this inefficiency can be an immense issue. Buck converters may be supported over 78xx controllers since they are progressively capable and don't require warm sinks, anyway they are logically exorbitant.

### **2.3.6. Relay:**

An exchange is an electrically worked switch. Numerous exchanges use an electromagnet to mechanically work a switch, yet other working norms are moreover used, for instance, solid state exchanges. Exchanges are used where it is vital to control a circuit by a low-control movement (with complete electrical confinement among control and controlled circuits), or where a couple of circuits must be controlled by one banner. The main moves were used in long detachment communicate circuits as enhancers: they repeated the banner coming in from one circuit and re-transmitted it on another circuit. Exchanges were used comprehensively in telephone exchanges and early PCs to perform reliable assignments.

A sort of exchange that can manage the high power required to explicitly control an electric motor or distinctive weights is known as a contactor. Solid state exchanges control circuits with no moving parts,

Or maybe using a semiconductor contraption to perform trading. Exchanges with adjusted working traits and every so often unique working circles are used to shield electrical circuits from over-weight or faults; in flow electric power structures these limits are performed by cutting edge instruments still called "guarded exchanges".

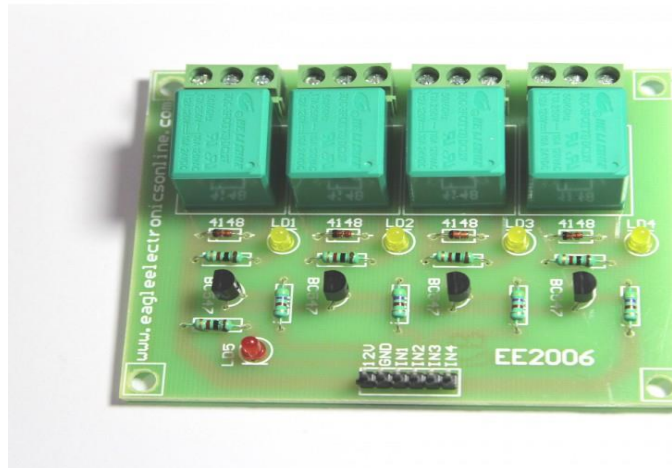


Fig. 2.6: Relay

### 2.3.6. a. Advantages:

They can be utilized for both air conditioning and dc frameworks for insurance of air conditioning and dc equipment's.

Electromagnetic transfers working rates which can work in milliseconds are additionally can be conceivable.

They have the properties, for example, straightforward, vigorous, smaller and generally solid.

### 2.3.6. b. Disadvantages:

High weight level instrument transformers are required (CTs and PTs of high weight is required for working the electromagnetic transfers contrasted with static transfers).

The directional component is missing in electromagnetic transfers.

Requires intermittent support and testing not at all like static transfers.

### **2.3.6. c. Applications:**

Electromagnetic transfers are utilized for the insurance of different air conditioning and dc equipment.

The over under current and voltage insurance of different air conditioning and dc equipment.

For differential insurance.

Utilized as assistant transfers in the contact frameworks of defensive hand-off plans.

### **2.3.7 Switch:**

An electrical switch is any contraption used to meddle with the flood of electrons in a circuit. Switches are fundamentally twofold devices: they are either absolutely on ("close") or thoroughly off ("open"). There are a wide scope of sorts of switches, and we will research a bit of these sorts in this area.



Fig. 2.7: Switch



### 2.3.8 TV Remote :

In devices, the remote control is a portion of an electronic contraption used to work the device from a partition, commonly remotely. For example, in customer equipment, the remote control can be used to work contraptions, for instance, a TV, DVD player, or other home device, from a short partition. The remote control is mainly a convenience feature for the customer and can allow the movement of devices that are out of accommodating range for the immediate errand of controls. Now and again, remote controls empower a person to work a contraption that they for the most part would not have the ability to reach, as when a garage door opener is actuated from outside or when a Digital Light Processing projector that is mounted on a high rooftop is controlled by a person from the floor level



Fig. 2.8: TV Remote

Early TV remote controls (1956– 1977) utilized ultrasonic tones. Present-day remote controls are usually customer infrared gadgets which send carefully coded beats of infrared radiation to control capacities, for example, control, volume, channels, playback, track change, warm, fan speed, or different highlights fluctuating from gadget to gadget.

### 2.3.9 Arduino Pro Mini

This microcontroller depends on the ATmega 328. There are aggregate of 20 pins (0-19) out of which 6 are simple information sources which can likewise be utilized as universally useful pins, an artistic resonator of recurrence 16MHz, a USB association, a power jack and a reset catch. It contains everything expected to help a microcontroller..

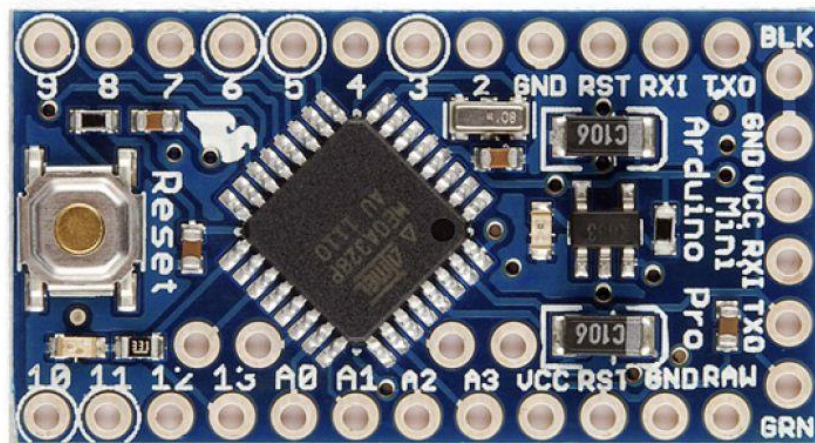


Figure 2.9 Arduino Pro Mini

Rundown on Arduino Pro Mini

Microcontroller ATmega 328

Clock Speed 16MHz

Simple Input pins 6

Computerized input yield pins 14 (6 pins give PWM voltage)

Info voltage 6-20V

Working Voltage 5V single word guidelines o All single-cycle  
directions with the exception of program branches o Flash memory:

14.3KB (8192 words)

### 2.3.9. a. Microcontroller

A microcontroller is a singular chip littler scale PC on a single composed circuit containing a processor focus, memory, and programmable data/yield peripherals. On a very basic level microcontrollers are used in therefore controlled things and contraptions, for instance, vehicle engine control structures, implantable restorative devices, remote controls, office machines, devices, control gadgets, toys and other introduced systems. A microcontroller is open in different word lengths like microchips (4bit,8bit,16bit,32bit,64bit and 128 piece microcontrollers are available today). Here we use Atmega328 microcontrollers.

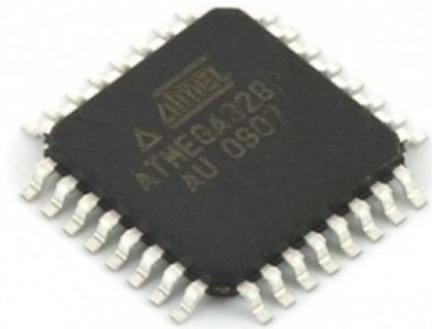


Fig. 2.10 Atmega328 Microcontroller

In this article, we will go over the pinout of the Atmega328 chip. The Atmega328 is an exceptionally well known microcontroller chip delivered by Atmel. It is a 8-bit microcontroller that has 32K of glimmer memory, 1K of EEPROM, and 2K of interior SRAM. The Atmega328 is one of the microcontroller chips that are utilized with the mainstream Arduino Duemilanove sheets. The Arduino Duemilanove board accompanies either 1 of 2 microcontroller chips, the Atmega168 or the Atmega328. Of these 2, the Atmega328 is the overhauled, further developed chip. Dissimilar to the Atmega168 which has 16K of glimmer program memory and 512 bytes of inside SRAM, the Atmega328 has 32K of blaze program memory and 2K of Internal SRAM. The Atmega328 has 28 pins.

It has 14 computerized I/O pins, of which 6 can be utilized as PWM yields and 6 simple info pins. These I/O pins represent 20 of the pins

### 2.3.9.b Atmega328 Pin Diagram

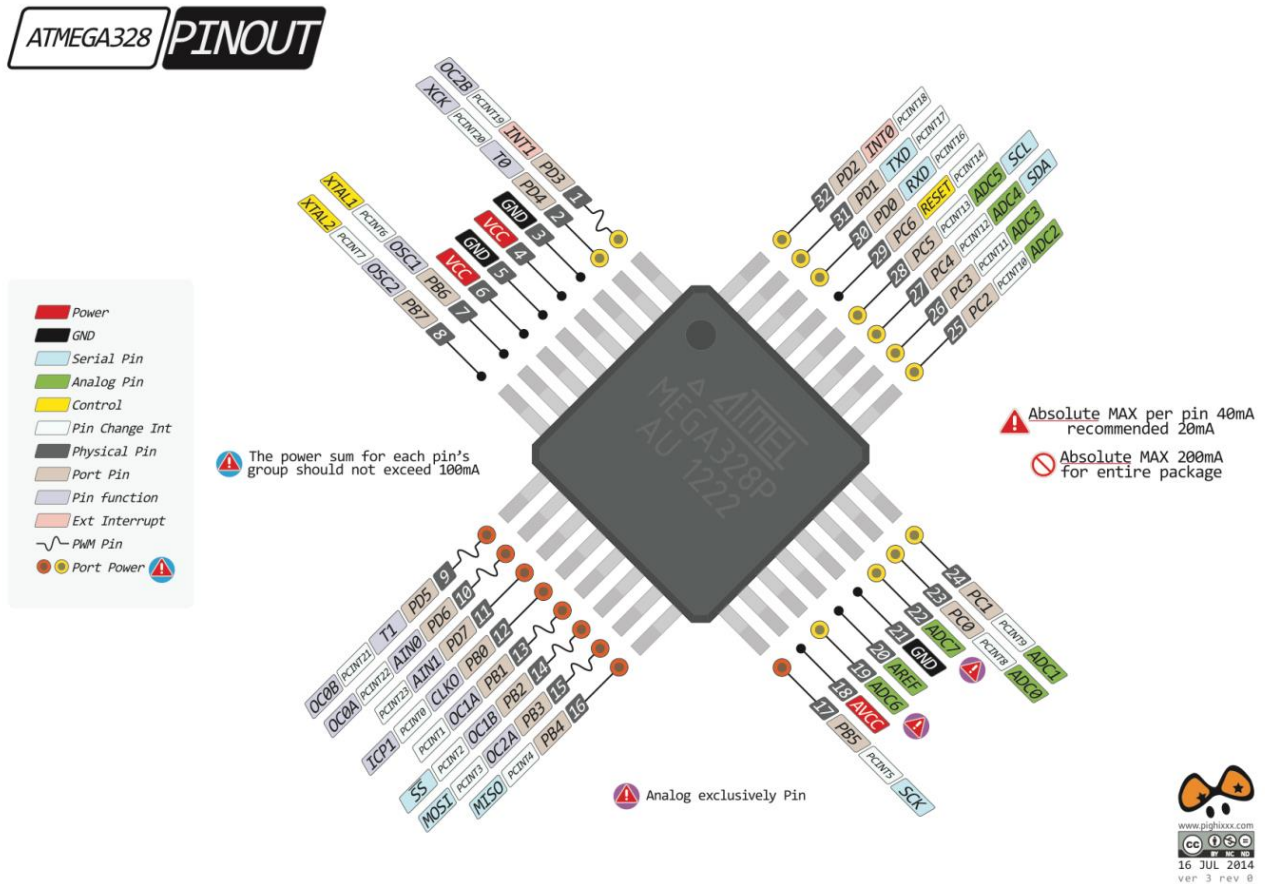


Fig .2.11 Atmega328 Microcontroller Pin Diagram

### 2.3.10 Features:

Superior, Low-control AVR® 8-bit Microcontroller

- Advanced RISC Architecture
- 131 Powerful Instructions 131 Powerful Instructions – Most Single Most Single-clock Cycle Execution clock Cycle Execution
- 32 x 8 General Purpose Working Registers

- Fully Static Operation
  - Up to 16 MIPS Throughput at 16 MHz
  - On-chip 2-cycle Multiplier
  - High Endurance Non-unstable Memory portions
  - 16K Bytes of In-System Self-programmable Flash program memory
  - 512 Bytes EEPROM
  - 1K Byte Internal SRAM
  - Write/Erase Cycles: 10,000 Flash/100,000 EEPROM – D to 20 t 85
- Information maintenance: 20 years at 85°C/100 t 25 C/100 years at 25°C (1)

### **2.3.11. PVC WIRES:**

It is a vinyl polymer built of rehashing vinyl gatherings (ethanol's) having one of their hydrogen's supplanted with a chloride gathering. Polyvinyl chloride is the third most broadly created plastic, after polyethylene and polypropylene. PVC is broadly utilized in development since it is shoddy, solid, and simple to gather. PVC creation is required to surpass 40 million 2016. It tends to be made gentler and increasingly adaptable by the expansion of plasticizers, the most broadly utilized being phthalates. In this shape, it is utilized in dress and upholstery, and to make adaptable hoses and tubing, flooring, to material films, and electrical link protection. It is additionally regularly utilized in dolls and in inflatable items, for example, waterbeds, pool toys, and inflatable structures.



Fig. 2.12: PVC Wires

### 2.3.12. CONNECTOR:

A connector is an electro-mechanical gadget for joining electrical circuits as an interface utilizing a mechanical get together. Connectors comprise of fittings (male-finished) and jacks (female-finished). The association might be brief, with respect to convenient gear, require a device for get together and expulsion, or fill in as a changeless electrical joint between two wires or gadgets. A connector can be utilized to viably unite disparate connectors.

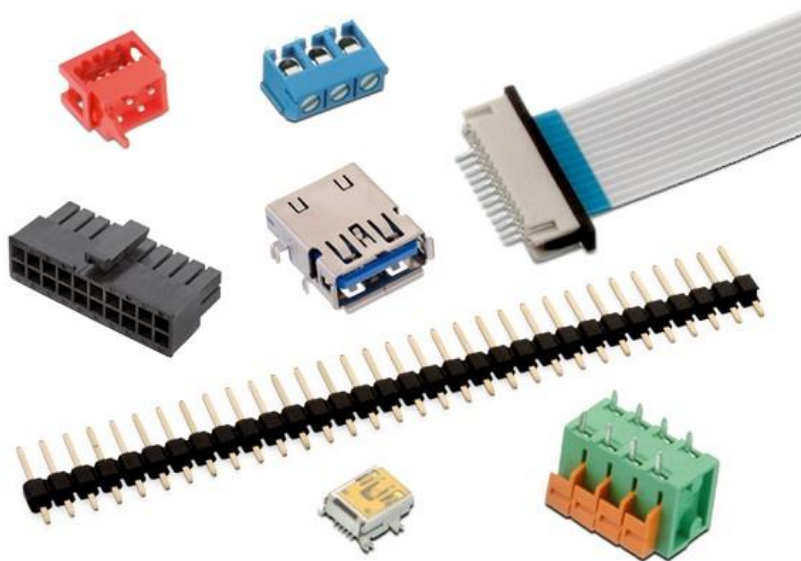


Fig. 2.13: Connector

### 2.3.13. DC CONNECTOR:

A DC connector (or DC plug, for one regular sort of connector) is an electrical connector for providing direct flow (DC) control. Contrasted with local AC control fittings and attachments, DC connectors have a lot increasingly standard sorts that are not tradable. The measurements and game plan of DC connectors can be avoided incidental interconnection of contrary sources and loads. Types fluctuate from little coaxial connectors used to control compact electronic gadgets from AC connectors, to connectors utilized for car adornments and for battery packs in convenient hardware.



Fig. 2.14: DC Connector

### 2.3.14. Holder:

A device for securing a lamp to its support; specifically, a socket or holder fitted with electric terminals, into which the top of the glass globe of an incandescent lamp is fitted, or from which it hangs.



Fig. 2.15: Holder



### 2.3.15. Soldering Iron:

A patching iron is a hand instrument utilized in binding. It supplies warmth to dissolve patch with the goal that it can stream into the joint between two work pieces. A patching iron is made out of a warmed metal tip and a protected handle. Warming is frequently accomplished electrically, by passing an electric flow (provided through an electrical string or battery links) through a resistive warming component. Cordless irons can be warmed by burning of gas put away in a little tank, regularly utilizing a reactant warmer as opposed to a fire. Basic irons less generally utilized than in the past were basically a vast copper bit on a handle, warmed in a fire. Binding irons are frequently utilized for establishment, fixes, and restricted creation work in hardware get together. High-volume generation lines utilize other welding strategies. Extensive irons might be utilized for fastening joints in sheet metal articles. Less regular uses incorporate pyrography (consuming plans into wood) and plastic welding.



Fig. 2.16: Soldering Iron

## 2.4. Circuit Diagram:

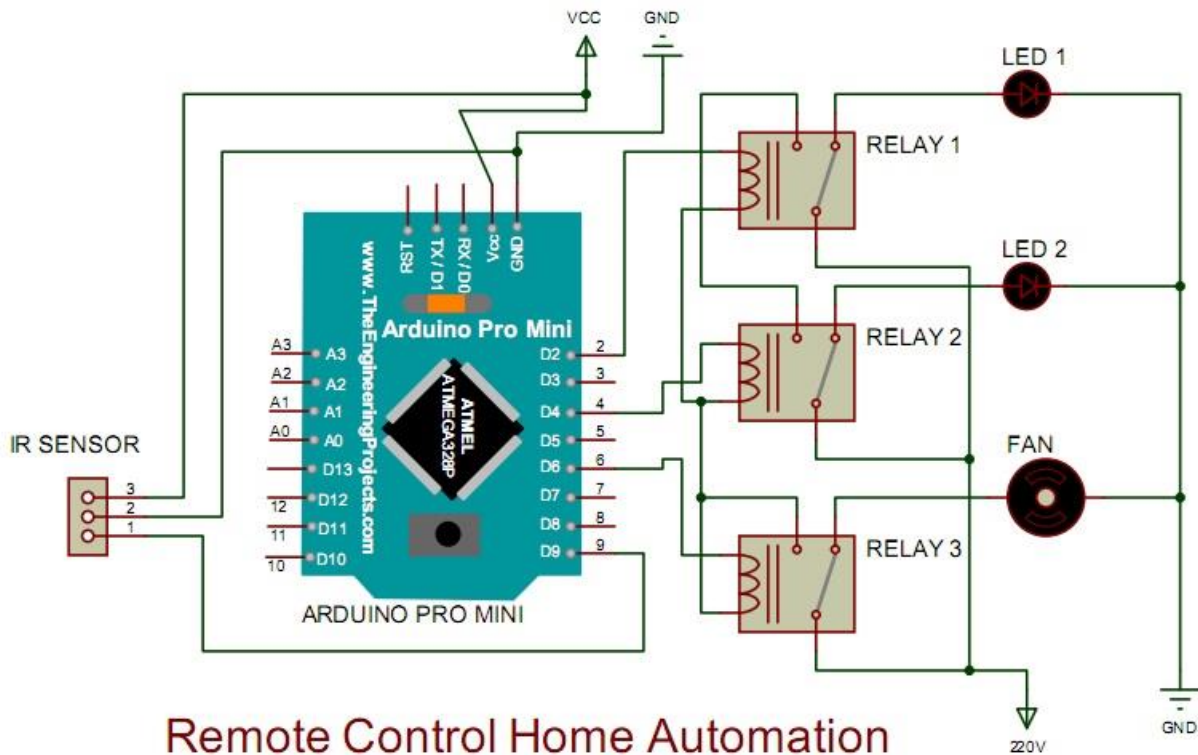


Fig.2.17: Circuit Diagram.

## 2.5. Operating Principle:

Above all else in this venture we have utilized AT super 16 for controlling the entire procedure of this task. Furthermore, a Bluetooth module is utilized for controlling the home machines remotely. Home machines will be turned ON and OFF when the client will contact catch in the Bluetooth versatile application in Android cell phone. To run this undertaking, first we have to download Bluetooth application from Google play store. We can utilize any Bluetooth application that can send information utilizing Bluetooth. Subsequent to introducing the App, you have to open it and after that seek Bluetooth gadget and select HC-06 Bluetooth gadget. First column's ON and OFF catches are utilized to ON and OFF the light, second line's catches are for

fan and third ones are for entryway. Presently, when we contact any catch in Bluetooth controller application then Android telephone sends an incentive to Bluetooth module, subsequent to accepting this esteem, Bluetooth module sends the got an incentive to the AT uber 16 and afterward AT super 16 understands it and contrast it and predefined esteem. Same activity will played out each time when catch squeezed. Presently, when client contact 'light On' catch in Bluetooth controller application then AT super 16 gets '1' by means of Bluetooth module and after that controller Switch 'On' the light by utilizing transfer driver and hand-off. Furthermore, when client contact 'light Off' catch in Bluetooth controller application then microcontroller gets '2' by means of Bluetooth module and afterward controller Switch 'Off' the light by utilizing transfer driver and hand-off. In like manner Fan, entryway are sent by Android Phone and work a similar procedure for the entire circuit.

## 2.6. Our Project:

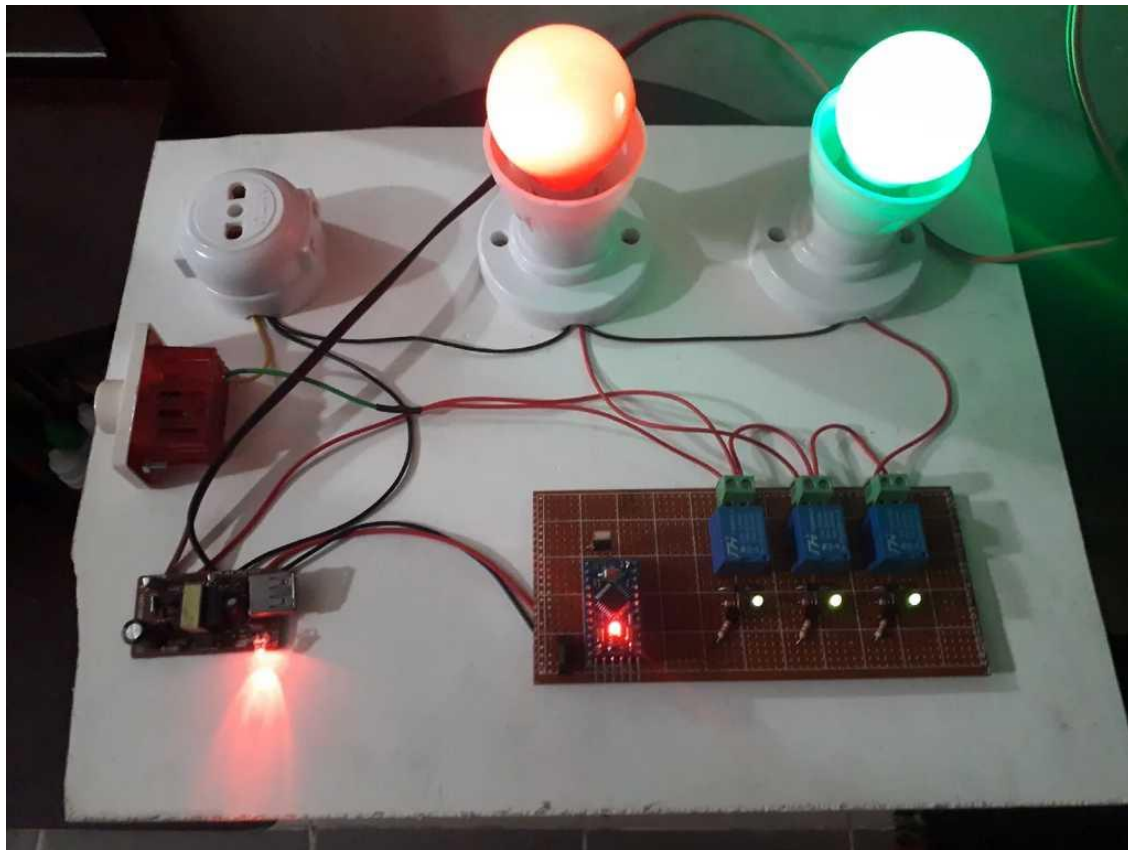


Fig.2.18: Our Project

# CHAPTER 3

## TESTING

### 3.1. Testing:

Testing is one of the essential stages in the advancement of any new item or fix of existing ones. Since it is extremely hard to follow a blame in a completed work, particularly when the work to be tried is excessively unpredictable. With the end goal of this venture, two phases of testing are included –

- I. Pre-usage testing.
- ii. Post-usage testing.

#### 3.1.1. Pre- Implementation Testing:

It is done on the segments previously they are welded to the Vero-board. This is to guarantee that every part is in great working condition before they are at long last welded to the board. The parts utilized in this plan are assembled into two.

- i. Discrete parts e.g. resistors, light emanating diodes, capacitors, transistors, and so forth.
- ii. Integrated circuit parts. The discrete parts are tried with a millimeter by changing the meter to the required esteem and range relating to ease discrete segment to check for progression.

#### 3.1.2. Post-Implementation Testing:

In the wake of executing the circuit on a task board, the diverse areas of the entire framework were tried to guarantee that they were in great working condition. The coherence test completed is to guarantee that the circuit or segments are legitimately connected together. This test was

done before power was provided to the circuit. At last, in the wake of investigating has been done on the

entire circuit, control was provided to the circuit. Visual investigating was additionally done at this phase to guarantee that the parts don't wear out. After all the test and perceptions as clarified over, the venture was presently affirmed prepared for bundling.

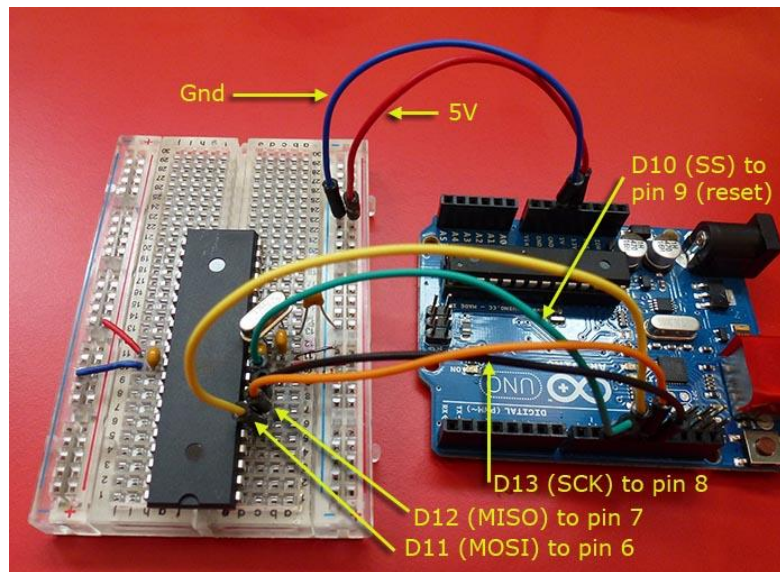


Fig.3.1: Post -Implementation Testing.

### 3.2. Result:

The outcomes got amid the development states after essential investigating were tasteful. The framework had the ability to react effectively to anchor home/office/go down and so on. Additionally, the microcontroller capacities as indicated by the program utilized for the product plan usage. It merits referencing that it is so interesting to see a structured task working agreeably.

# CHAPTER 4

## COST ANALYSIS

### 4.1. Cost Sheet:

Table 4.1: Cost Sheet

No	Equipment	Quantity	Price
1			
2	Arduino Pro Mini	1	250
3	Remote	1	100
4	Holder	3	150
5	Adapter Circuit	1	120
6	Transistor (BC547)	5	35
7	Varoboard	1	30
8	Relay 5V	3	75
9	Bulb	2	90
10	Soldering Iron	1	300
11	Connector	10	50
12	DC Connector	2	30
13	Switch	2	10
14	Wood Board	1	150
15	Resister	5	20
16	Diode	5	20
17	Wires	2 Gage	50

18	Connector	1	10
19	Two pin	1	30
20	Wire Connector	5	20
21	Variable Resistor	1	10
22	Glue Stick	2	40
23	LED	4	10

## 4.2. COST COMPARISON:

Microcontroller based home automation system is available in market is high pricing where as our designed device is the cheapest one. We have justified in the local market price before making our project. There are many types of Microcontroller based home automation system which are sold till Tk.30000-4000. Basically our design Microcontroller based home automation system is operated and total cost is Tk.2000. Above table 4.1 shown, the cost of material per unit cost and total cost. So we say that the cost involved in constructing our Microcontroller based home automation system is cheaper and the materials needed for replacement are also available in the local market.

# CHAPTER 5

## CONCLUSION

### 5.1. Summary of the project work:

At first we constructed our designed circuit in a bread board. We got the expected output.

Then we setup the circuit in a Vero board. From the performance test we see that the output is very close to actual value.

### 5.2. Limitation of the Project:

- i) The circuit is noise sensitive.
- ii) The circuit required an adapter to convert the I/P: AC100-240V  
O/P:12V-2A.
- iii) The circuit performance goes down in high density noise area.

### 5.3. Future Scope:

The future ramifications of the undertaking are extremely incredible thinking about the measure of time and assets it spares. The task we have embraced can be utilized as a source of perspective or as a base for understanding a plan to be executed in different undertakings of more prominent dimension Automation framework. The venture itself can be altered to accomplish an entire home robotization framework which will at that point make a stage for the client to interface among himself and his family unit.



## **5.4. Conclusion:**

The task we have embraced has helped us gain a superior point of view on different viewpoints identified with our course of concentrate and additionally down to earth learning of electronic gear and correspondence. The broad capacities of this framework are what make it so fascinating. From the comfort of a straightforward mobile phone, a client can control and screen for all intents and purposes any electrical gadgets. This makes it feasible for clients to rest guaranteed that their effects are secure and that the TV and other electrical apparatuses was not gone out to simply list a couple of the numerous employments of this framework. The final result will have a shortsighted plan making it simple for clients to collaborate with. This will be fundamental due to the wide scope of specialized information that property holders have.

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