



Dharmsinh Desai University, Nadiad

Faculty of Technology

Department of Computer Engineering

B. Tech. CE Semester – IV

Subject: Software Project

Project title: IOT Based Home Automation

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1. Introduction

The **Internet of Things (IOT)** is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

We are going to develop Home Automation System with the concepts of internet of things by using Raspberry-Pi 2 Model B .

The **Internet of Things** refers to the ever-growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other Internet-enabled devices and systems.

Here user have to first create his/her account ,then he/she has to login with their username and password.After login user can use control panel of full system . User can also see his user information.from control panel he can turn on/of LED's and fan.and from work board option he can edit GPIO of PI.

2. Software Requirement Specifications

R.1 Login Panel

Description : User can login from here and also create new user from here.

Input : Enter user id and password by user
Output : confirmation message displayed.

Management devices by area:

R.2.1: Selected the area:

Description : User selects area and area wise he/she can control devices.

Input : Select the area in which display on the screen
Output : Display the area in which iot based devices installed.

Next function: go to 2.2

R.2.2 conformed the area one again:

Description : User redirect to control panel.

Input : Select the area in which display on the screen for conformation
yes or no.

Next function: If yes then go to 3 otherwise go to 2.1

R.3 Control Panel

Description : User selects area here.

Input : Choose From Room1,Room2 and Kitchen(Ex. Room1)
Output : Control System for **Room1**.

R.3.1 Room1

Description : It display control panel for Room 1

Input : Choose Function from Fan,AC, LED(Ex.Fan)
Output : Fan control system

R.3.1.1 Fan control system

Description : User control device (Fan) of area (room1).

Input : Choose function from fan from turn on/off .

Output : fan on/off and speed is increase/decrease as our requirement.

R.3.1.2 LED control system

Description : User control device (Led) of area (room1).

Input : Choose function from led from turn on/off .

Output : led on/off and brightness is increase/decrease as our requirement .

R.3.1.3 AC control system

Description : User control device (AC) of area (room1).

Input : Choose function from AC from turn on/off

Output : AC is on/off and temperature is increase/decrease as our requirement

R.3.2 Kitchen

Description : It display control panel for Kitchen

Input : Choose Function from Fridge,LED (Ex.Fridge)

Output : Fridge control system

R.3.2.1 Fridge control system

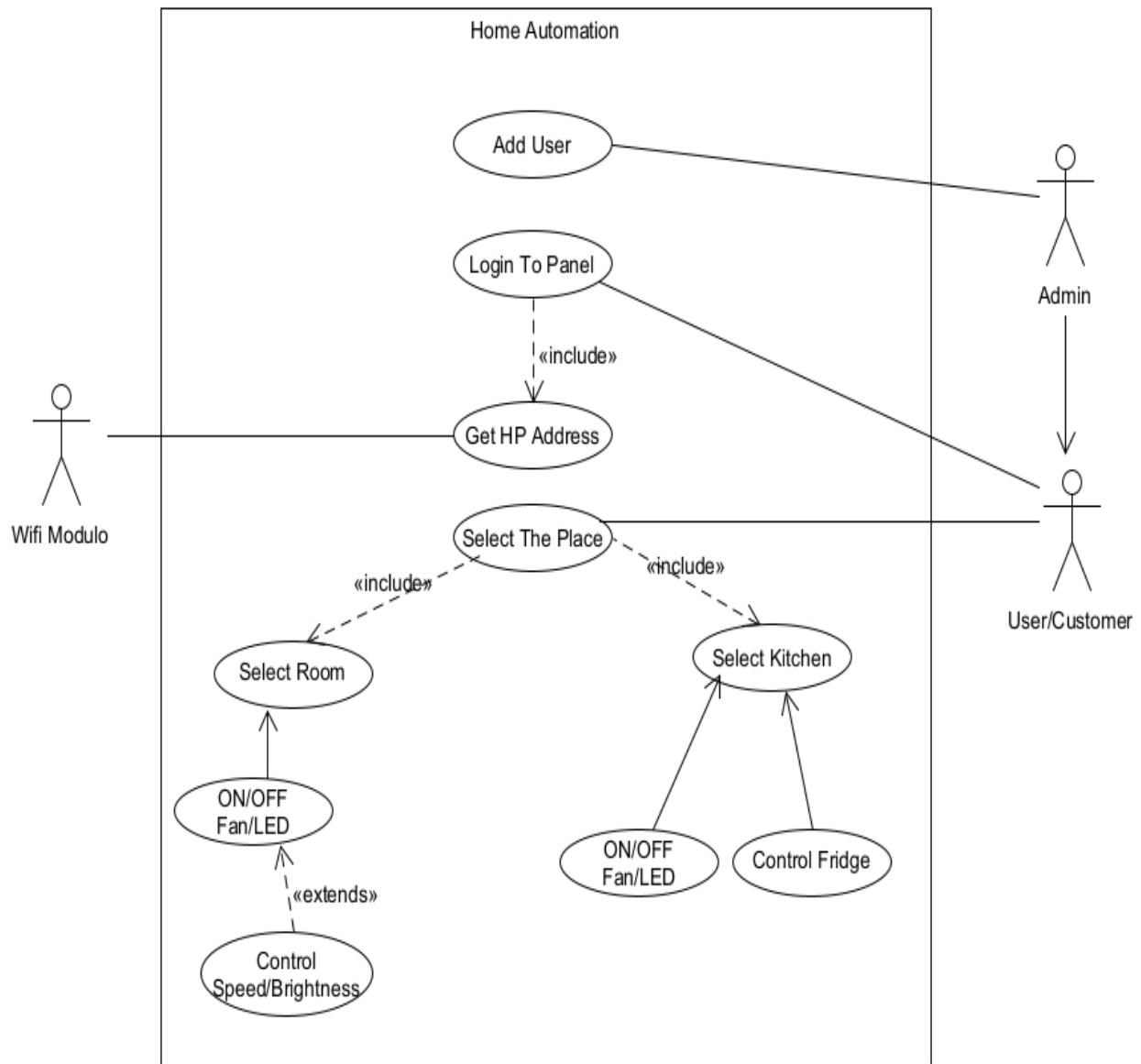
Description : User control device (Fridge) of area (Kitchen).

Input : Choose function from Fridge to turn on/off

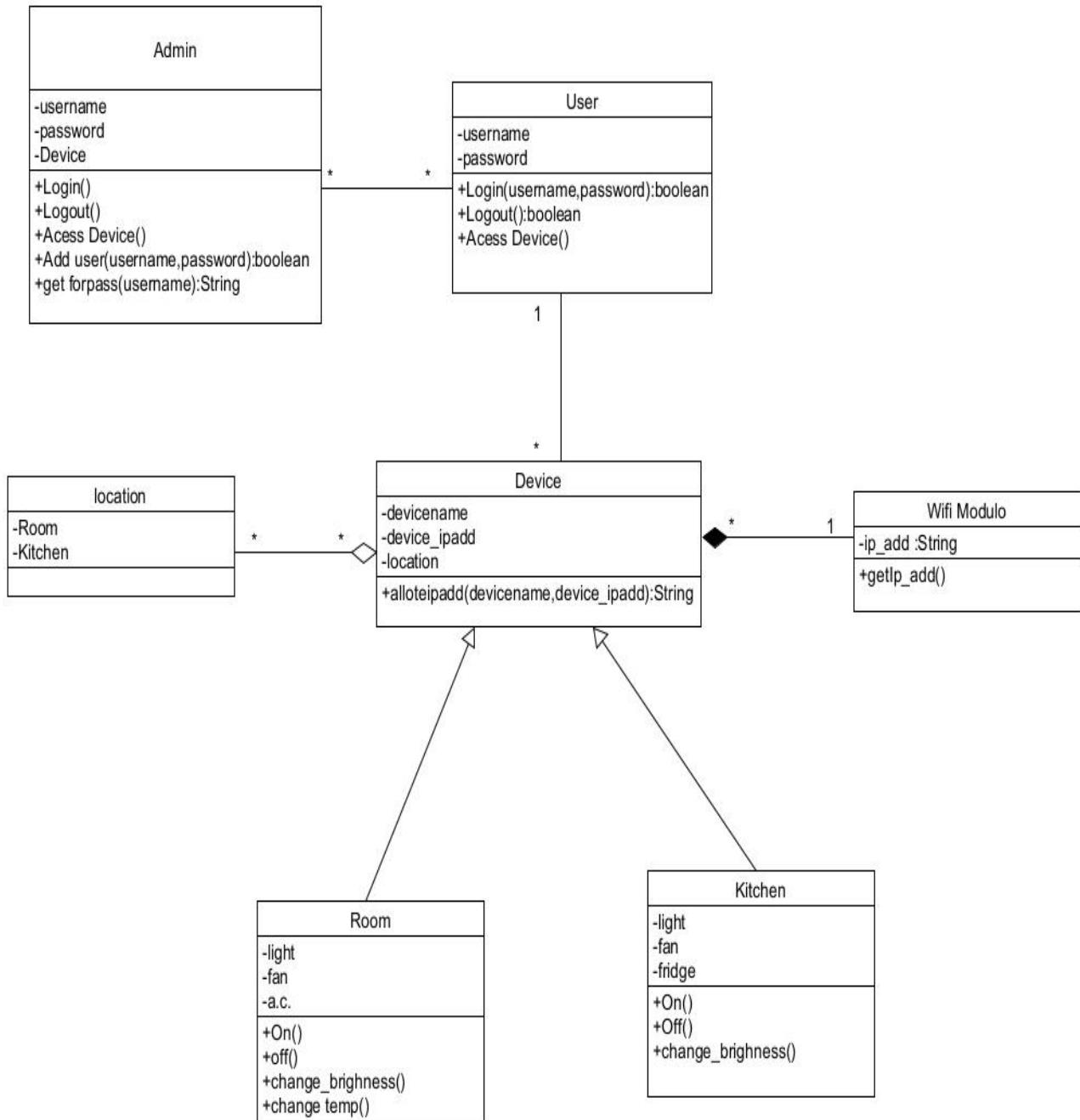
Output : Fridge is on/off and temperature is increase/decrease as our Requirement.

3. Design Documents

- Use Case

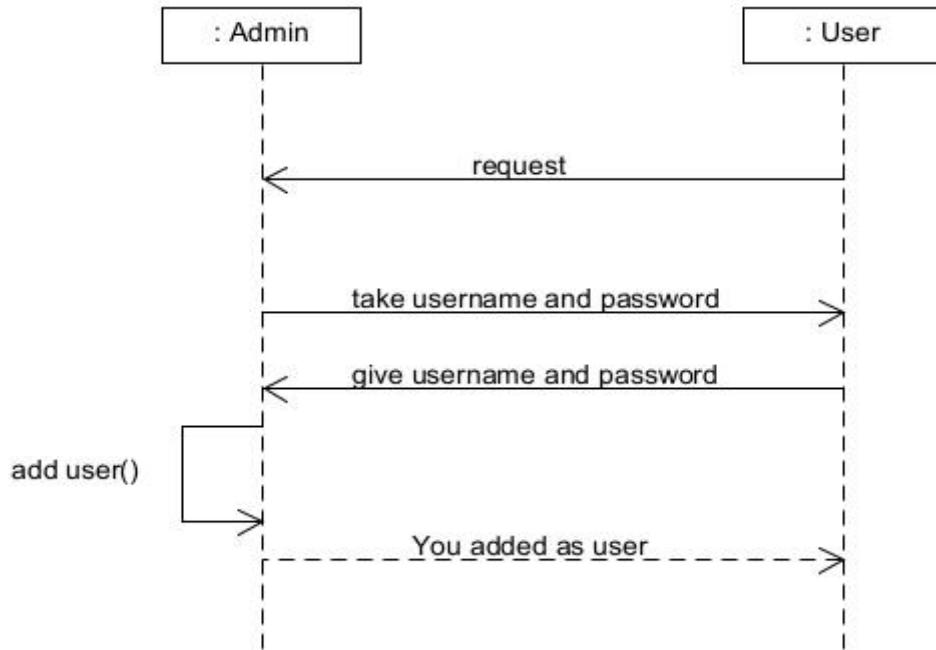


- Class diagram

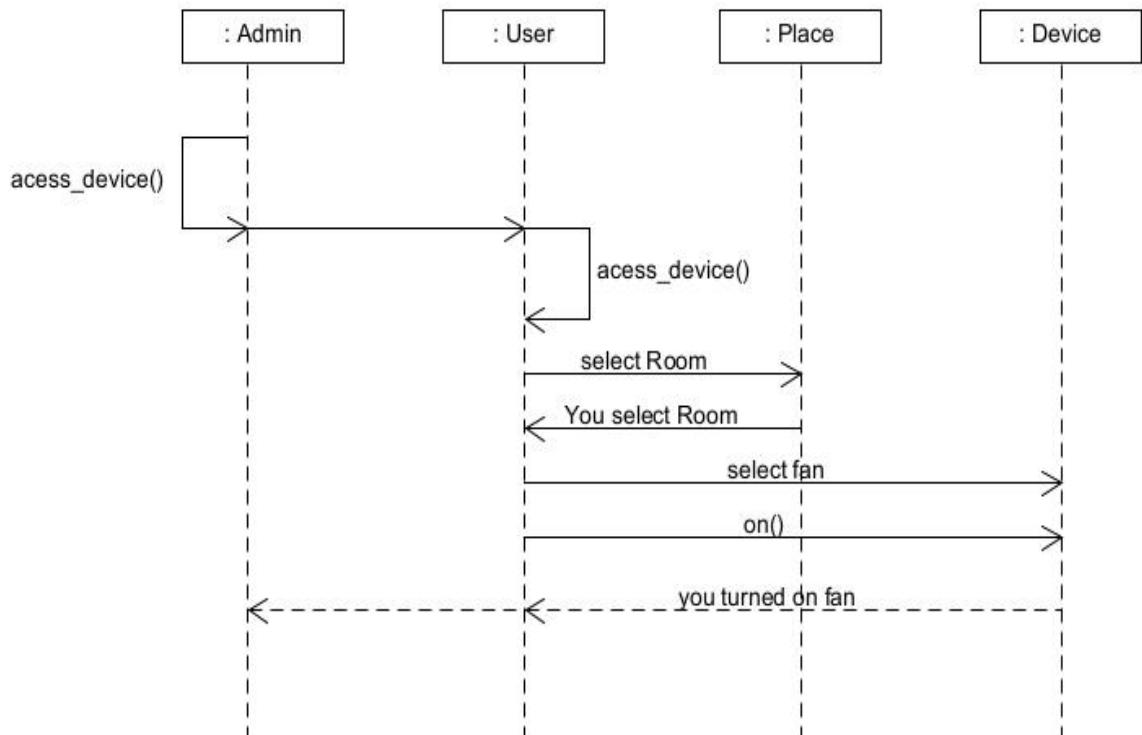


- Sequence diagram

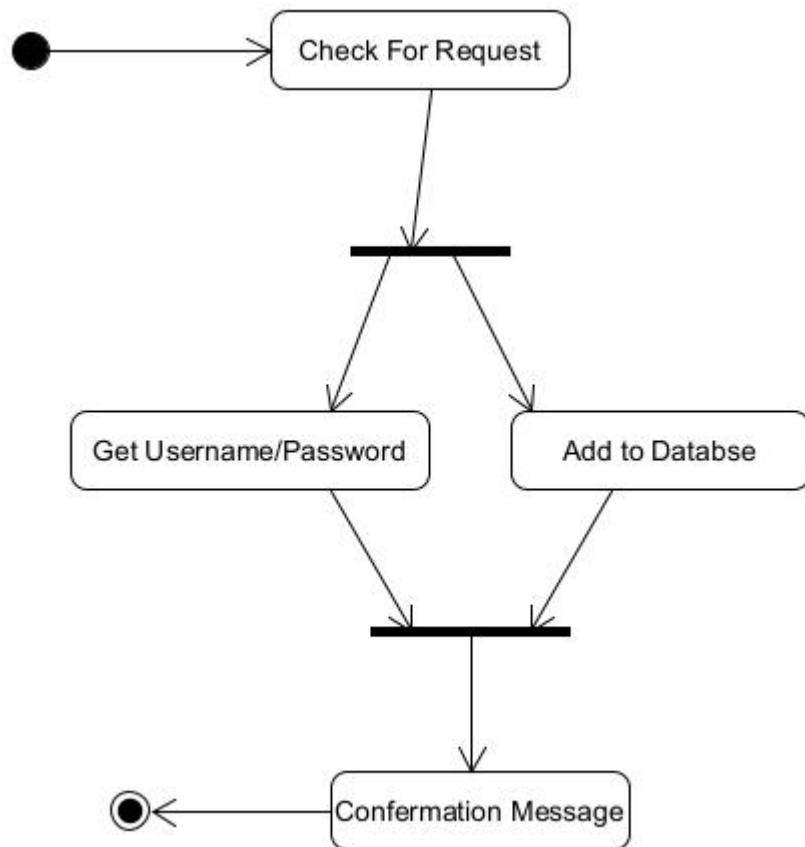
Add user

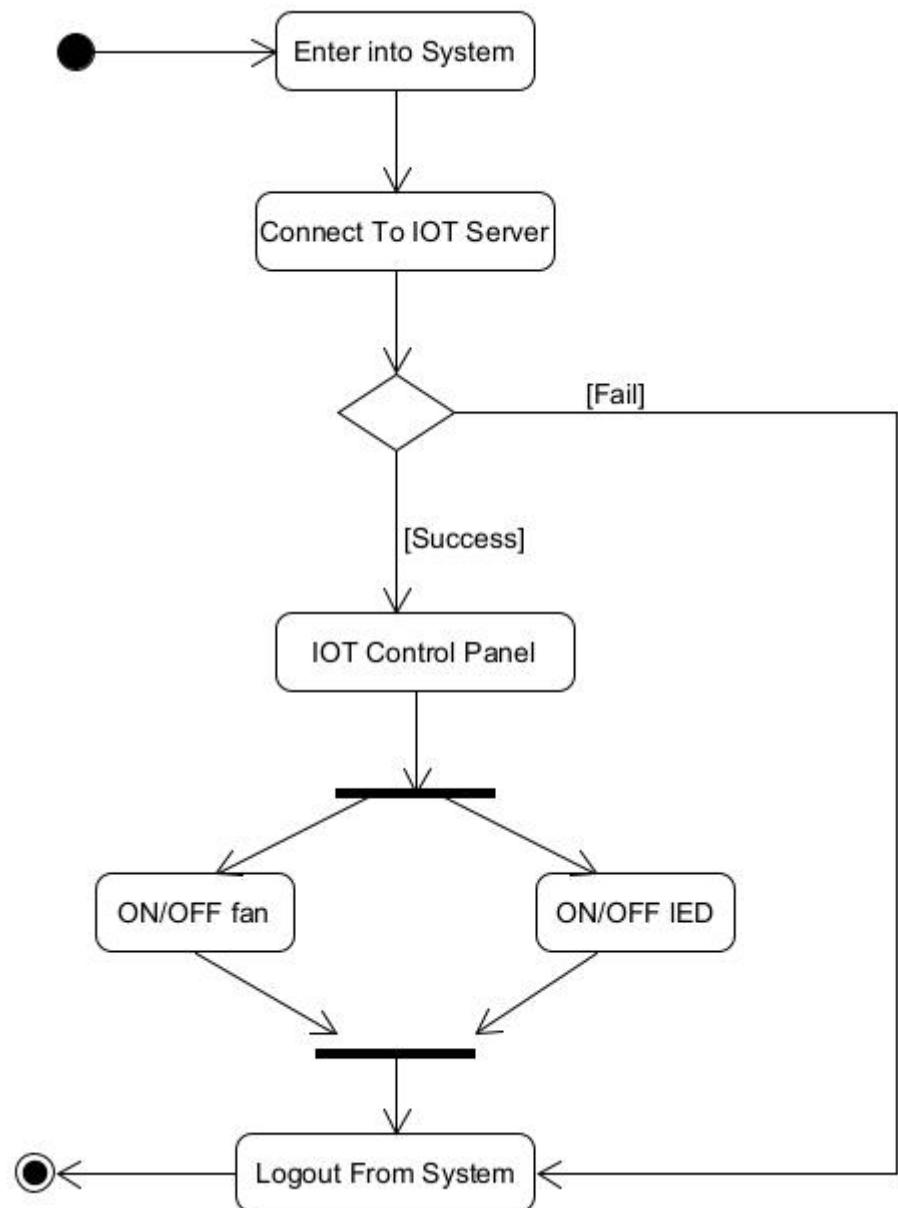


Control Device



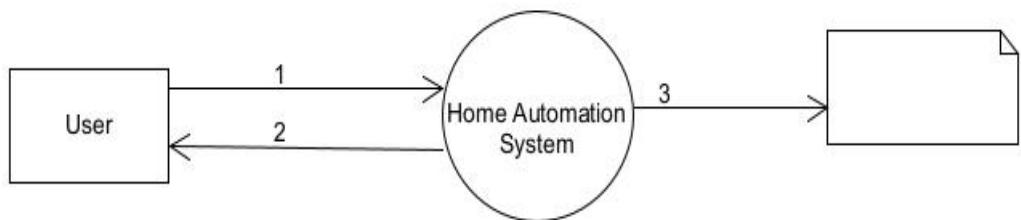
- Activity diagram



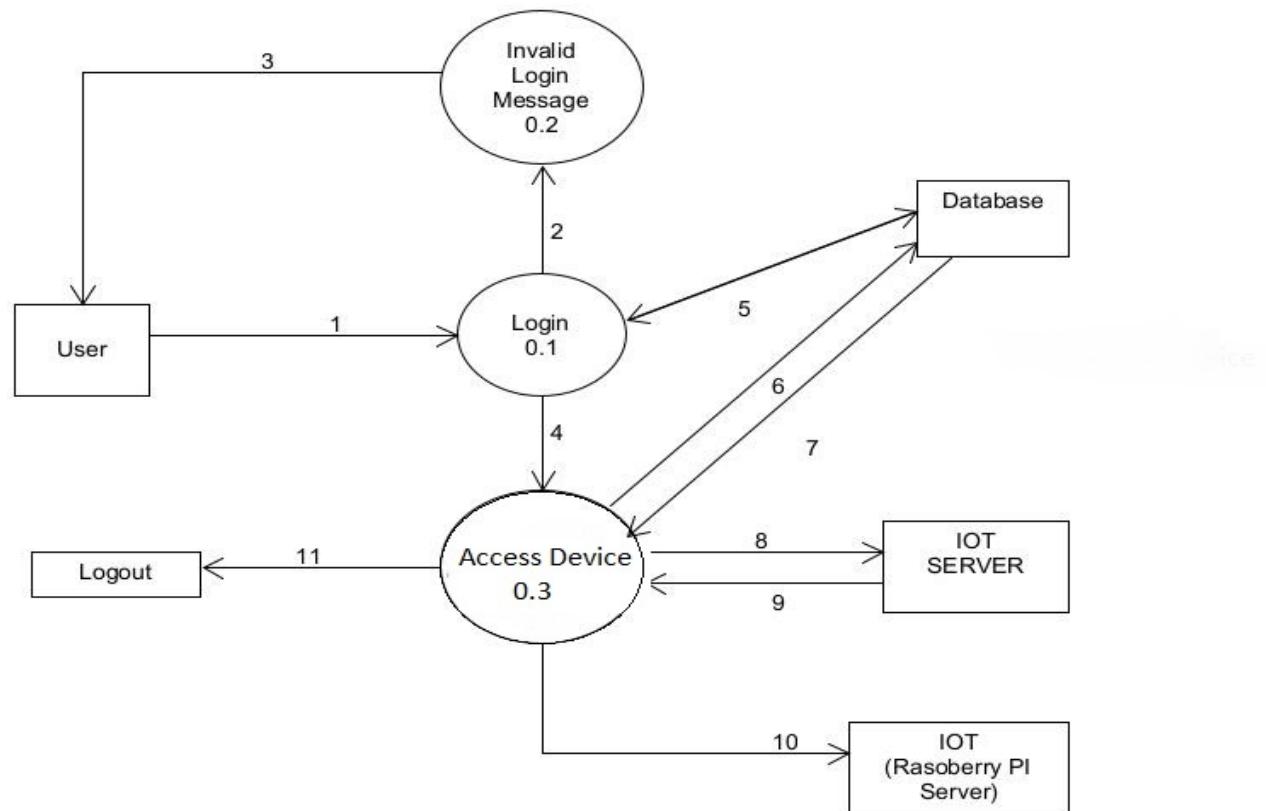


- Data Flow diagram

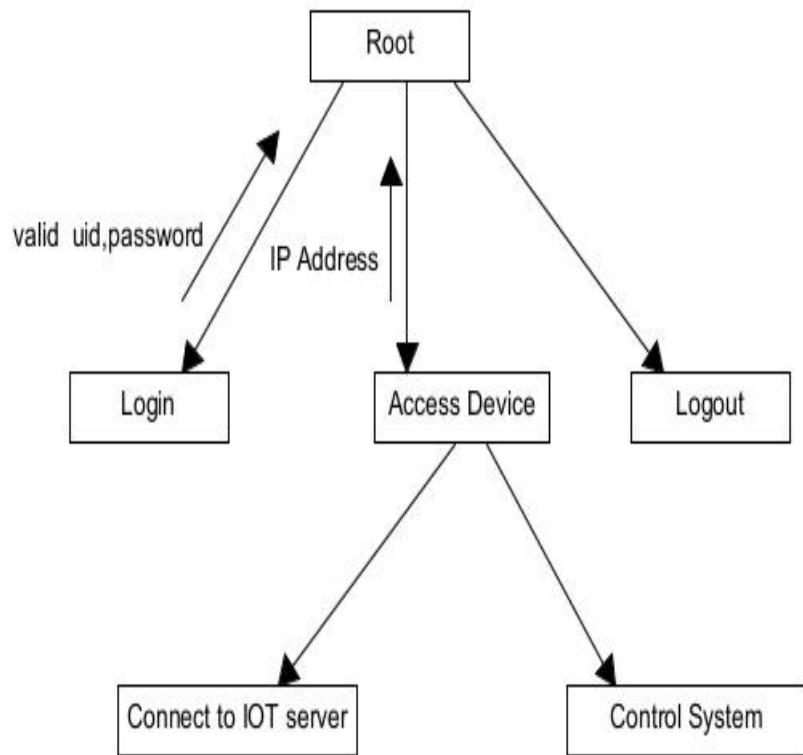
- Context Diagram



- Level -1 Diagram



- Structured Chart



- Data dictionary

UserInfo

Sr.	Name	Type	Size	PK/FK	Referred Table	Unique	Desc.
1	id	int	11	PK	-	yes	Auto increment
2	name	varchar	255	-	-	no	-
3	email	varchar	255	-	-	yes	-
4	Address	varchar	255	-	-	no	-
5	no	decimal	10	-	-	yes	-
6	password	varchar	255	-	-	no	-

4. Components

- Mobile Devices: For Easy- access and installation of app.
- VNC viewer APP
- Raspberry PI 2 - Model B
- Bc547 Transistor
- Registers
- Multimeter
- Power Adapter
- DC Motor (5 V.)
- Raspbian Linux
- Windows 10 IOT Cores
- Python,PHP, HTML/ CSS
- WIFI Module and Patch code

5. Implementation Detail:

1. Modules

In the following section the brief details of each module is given.

Login

In the login module user fill their credentials. If user enter the correct username and password then go to the next home page otherwise the error message is shown in the screen.

New User

In that module if user visit first time then sign up with such details of user. successfully added as user then user is permit to login via login module.

About us

In that module the details of developers are given.

Help

In the help module user direct mail the query regarding the problem while using app to the developer.

User Info

In that module user can see their details.

Dashboard

In that module user can turn on/off the led and fans. Also user can see the live temperature of that area.

Work banch

In that module user can manage the all plug in and connection related work of hardware.

2. Major Function prototype

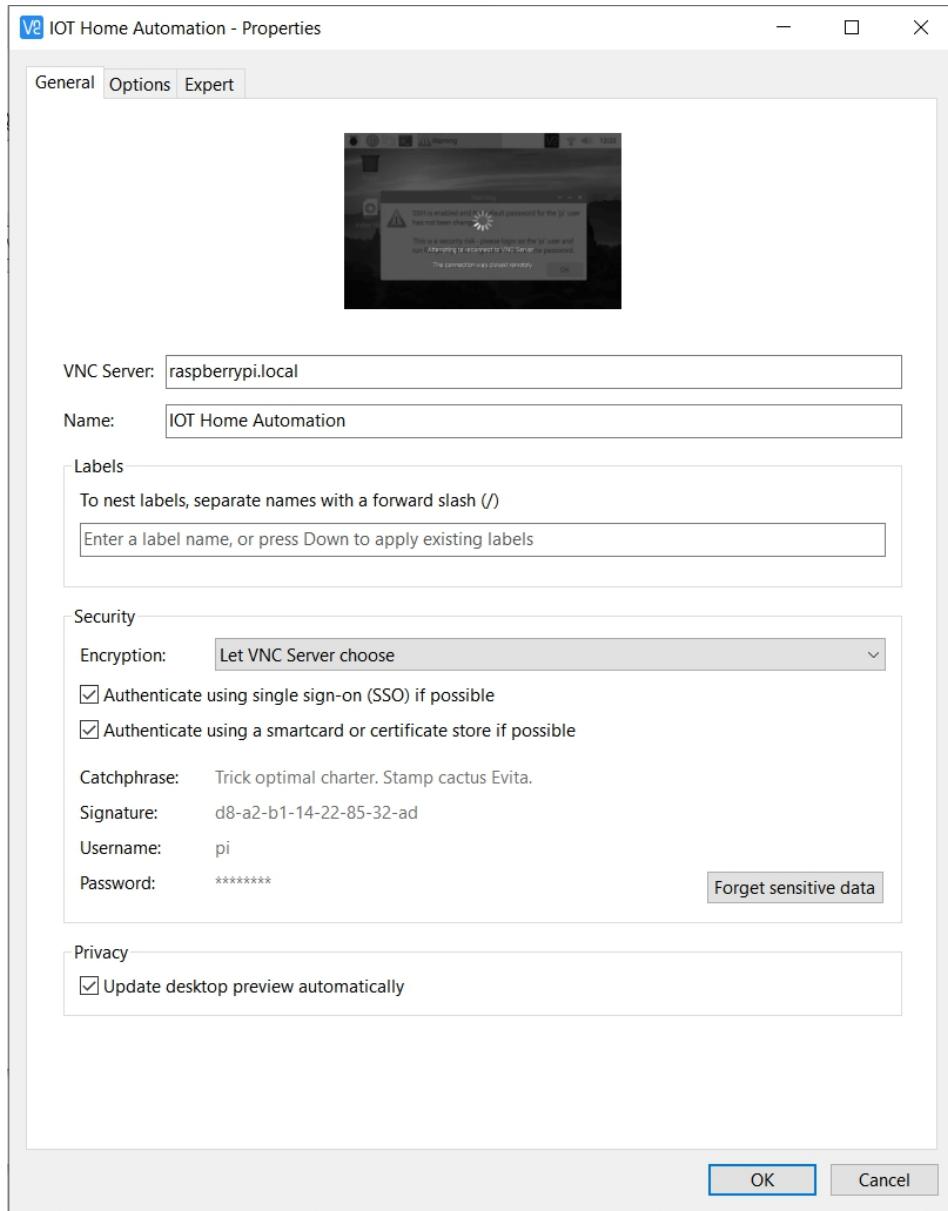
1. Dashboard:

Dashboard is the main function of the project.in that function user can manage all the device are wise. User can turn on or off leds and fan on that function.

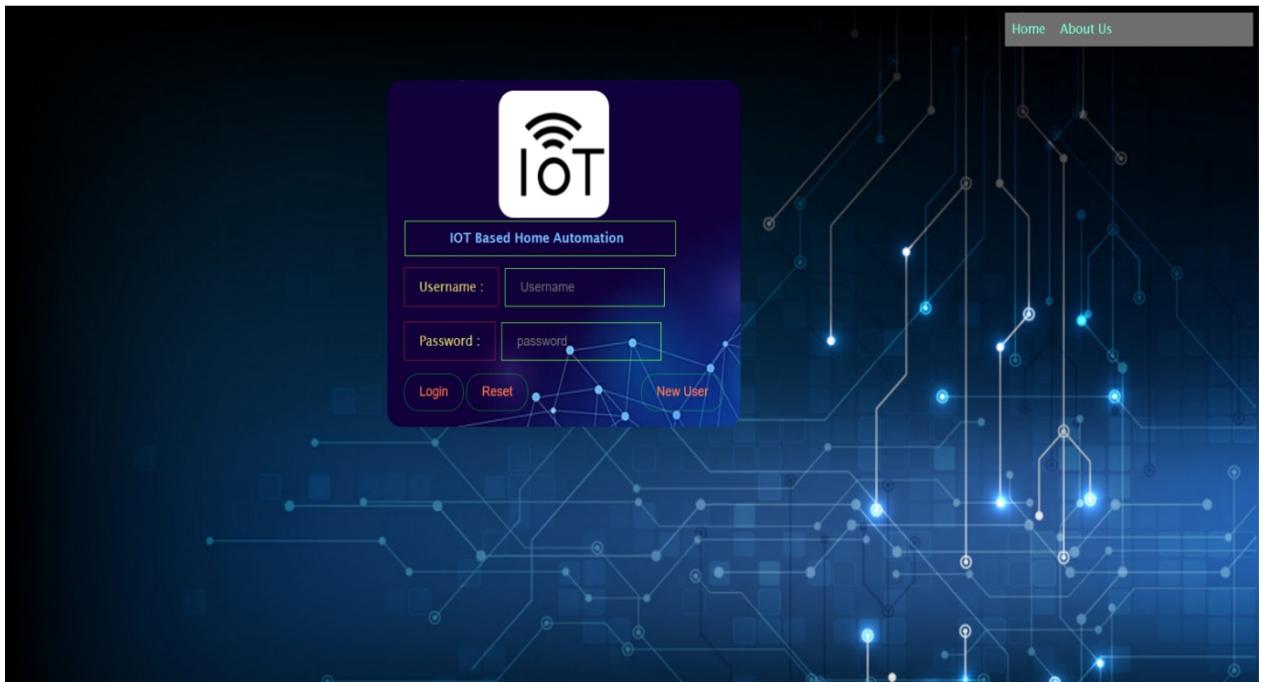
```
1 <html>
2   <head><title>User Login</title>
3   <link rel="stylesheet" href="style.css">
4   </head>
5   <?php $id=$_GET['id'];?>
6   <body>
7   <ul>
8     <li><a href="home.php">Home</a></li>
9     <li><a href="AboutUs.php">About Us</a></li>
10    <li><a href="userInfo.php?id=<?php echo $id;?>">User Info</a></li>
11    <li><a href="help.php?id=<?php echo $id;?>">Help</a></li>
12
13    <li><a href="logout.php">logout</a></li>
14  </ul>
15
16  <form>
17
18  <table >
19
20  <div class="fm">
21
22  <b>IOT Based Home Automation</b>
23  </div>
24
25  <input type="button" onclick="window.location.href='http://169.254.81.214:1880/ui#!/0?socketid=scG0s4D8z_FUpGZHAAAI';" value="Dash Board" />
26  <input type="button" onclick="window.location.href='http://169.254.81.214:1880/#flow/c20877c4.54baa8';" value="Work Banch" />
27  </td></tr>
28
29
30 </table>
31 </form>
32 <body>
33 </html>
```

6. Work Flow/Layouts:

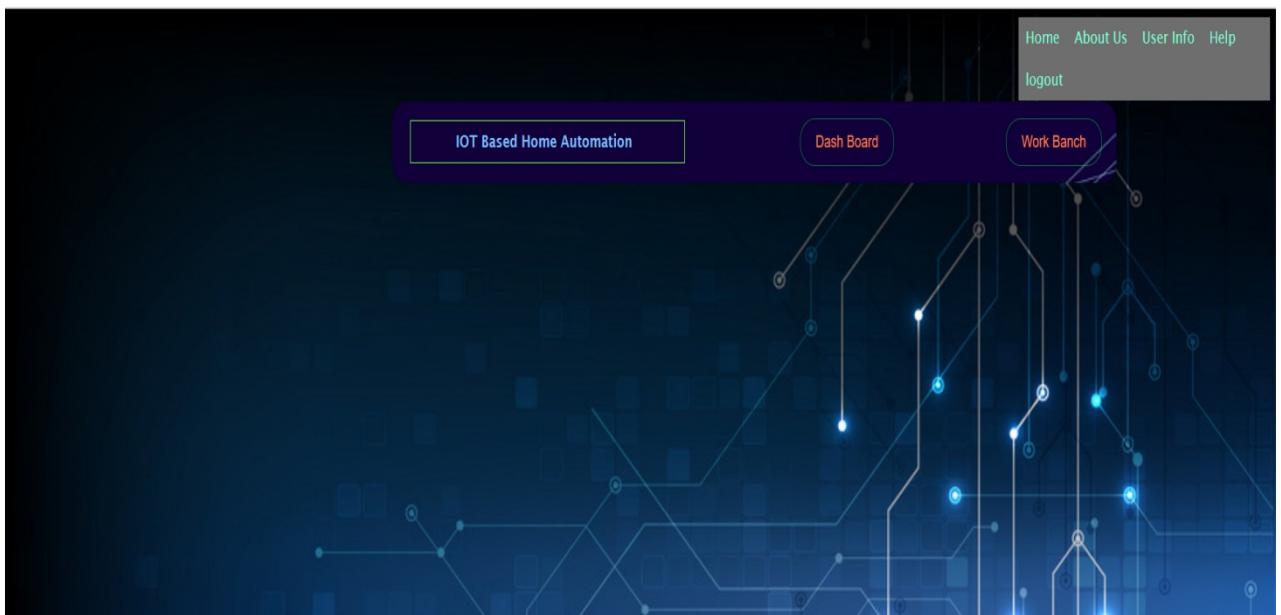
Step-1: Connect to the raspberry pi with VNC viewer.



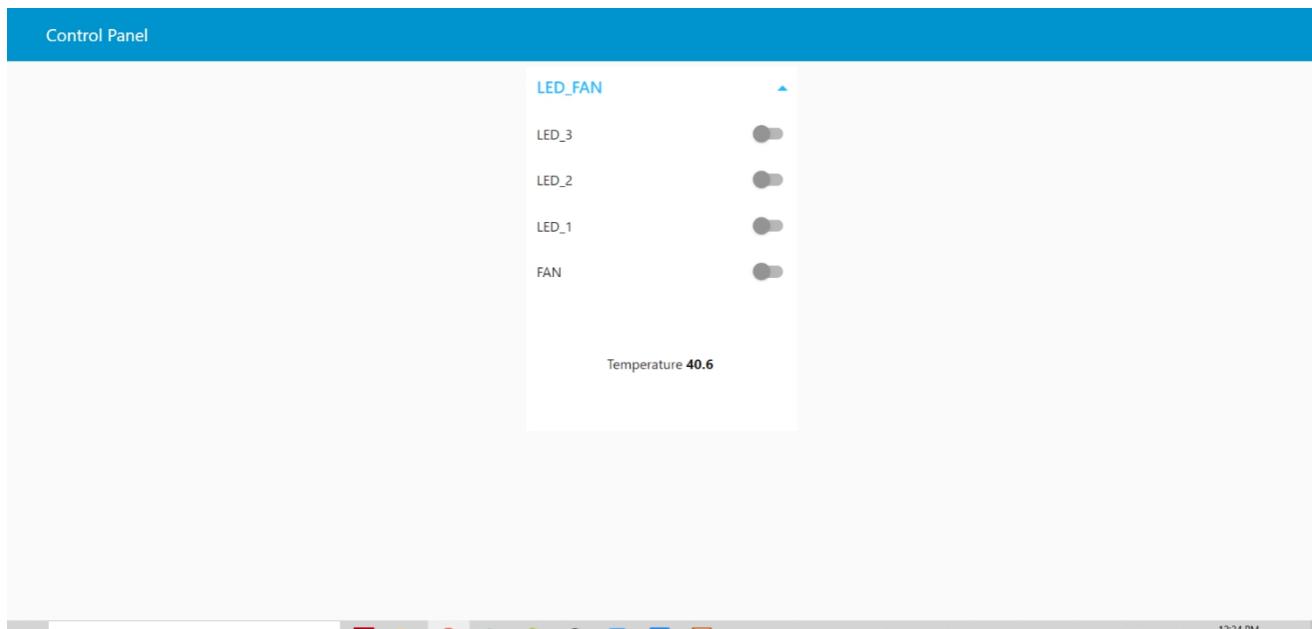
Step-2: after successfully connect to the raspberry pi user can log in.



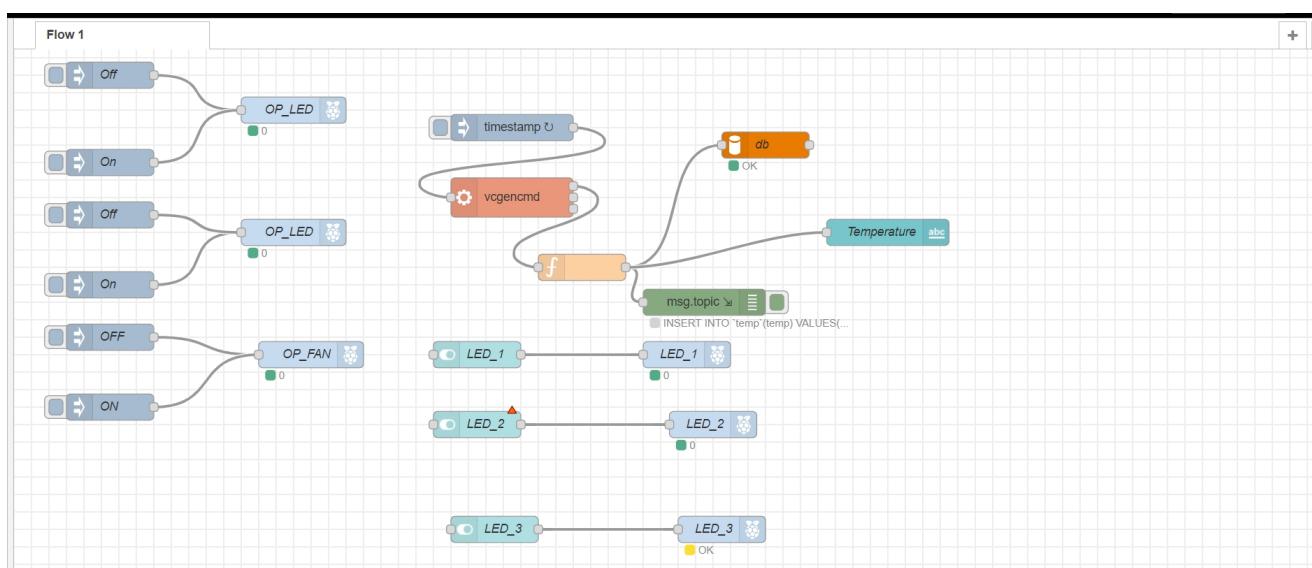
Step-3: After login user redirect to dashboard page.



Step-4: after user go to dashboard/control panel and manage all device and show the live temperature.

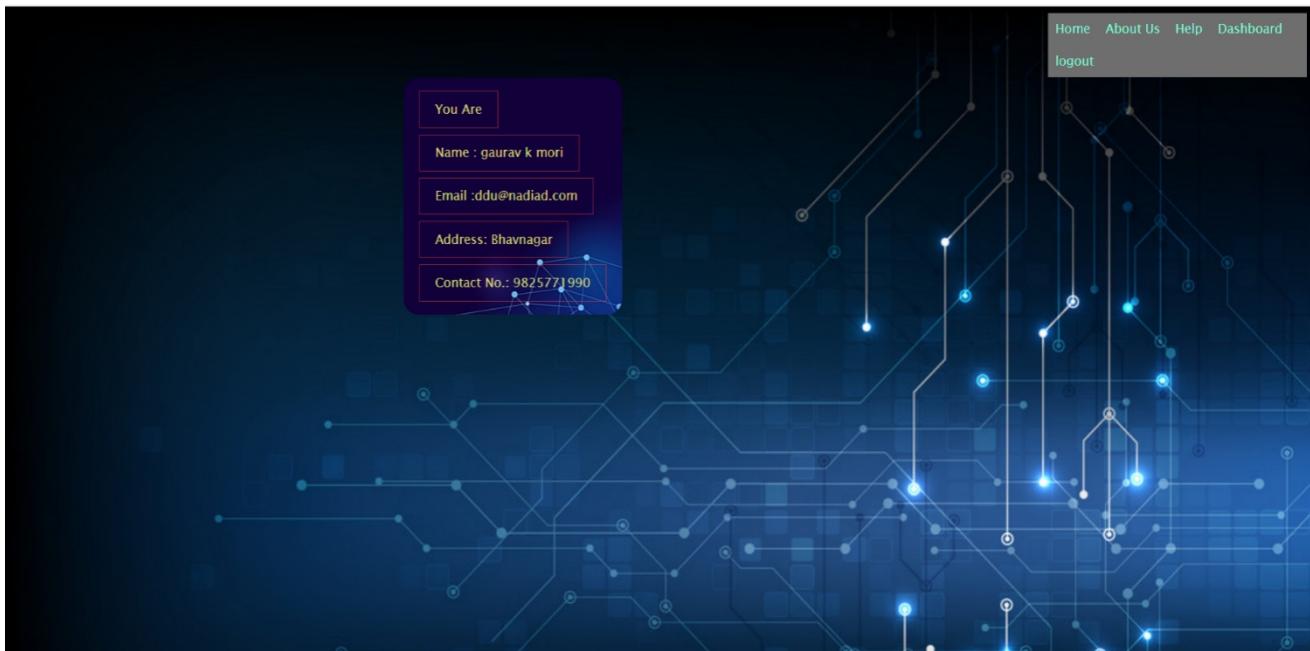


Also user manage GPIO pins and connection to device via workbench.

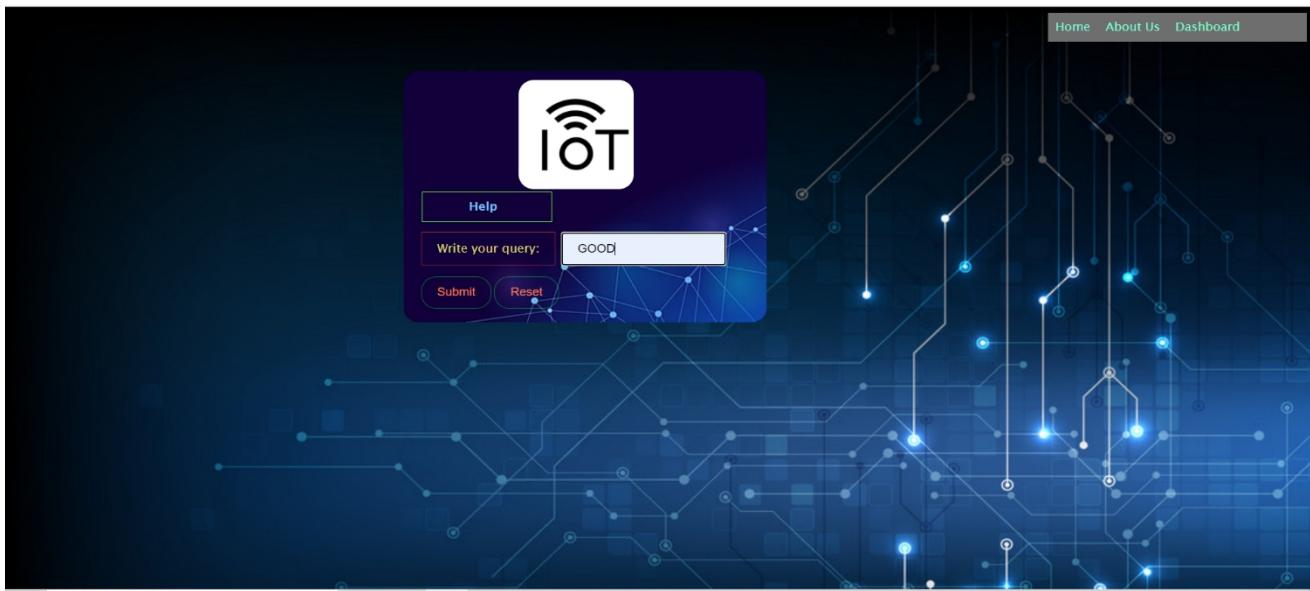


Some additional features:

User can view their info:

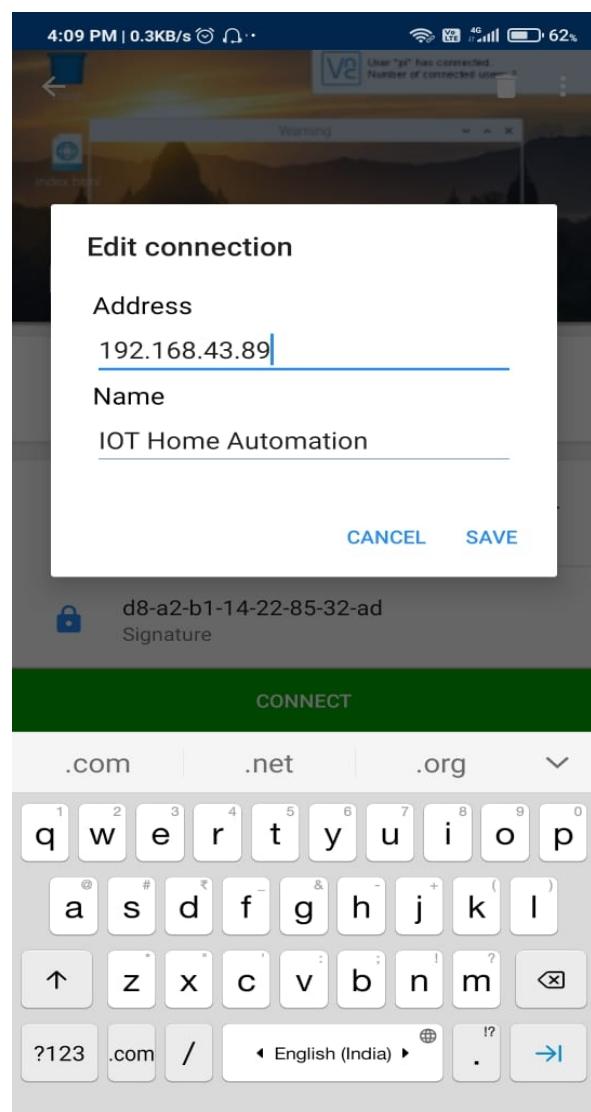
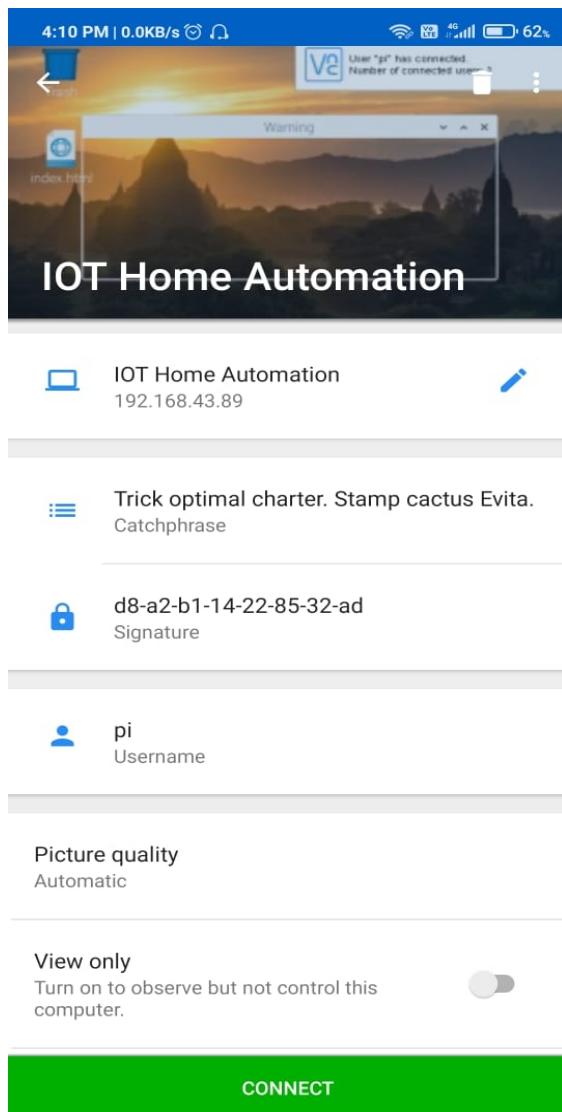


In help section user mail query regarding problem. It would mail to admin



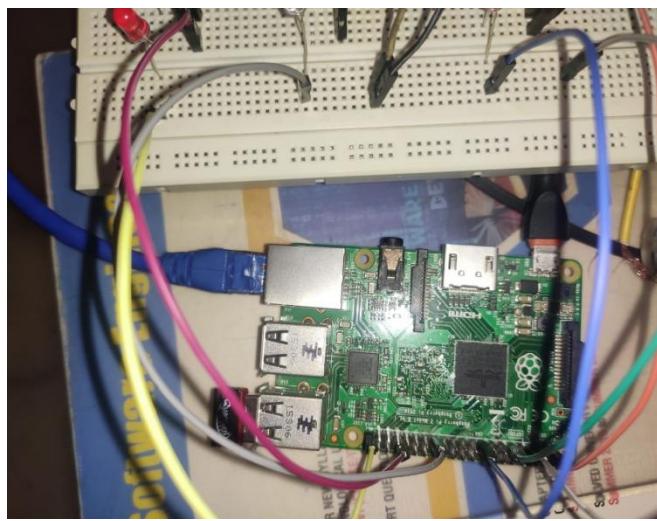
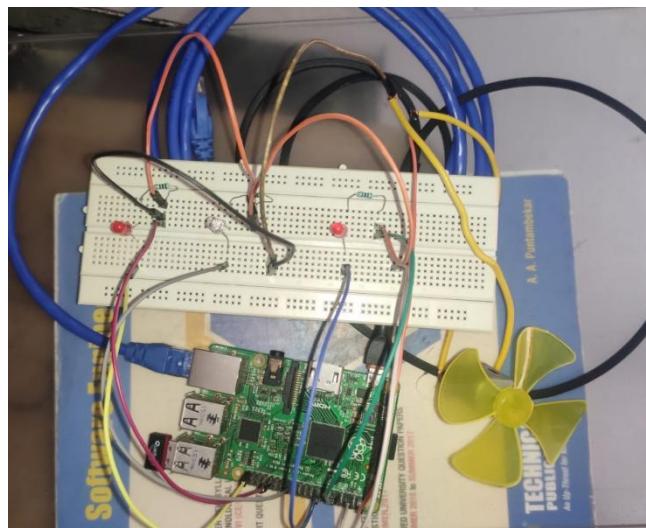
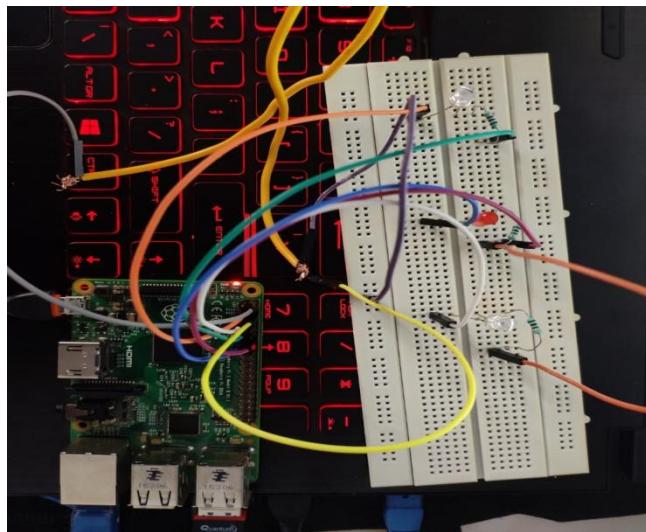
Controlling from mobile :

Via VNC viewer app.

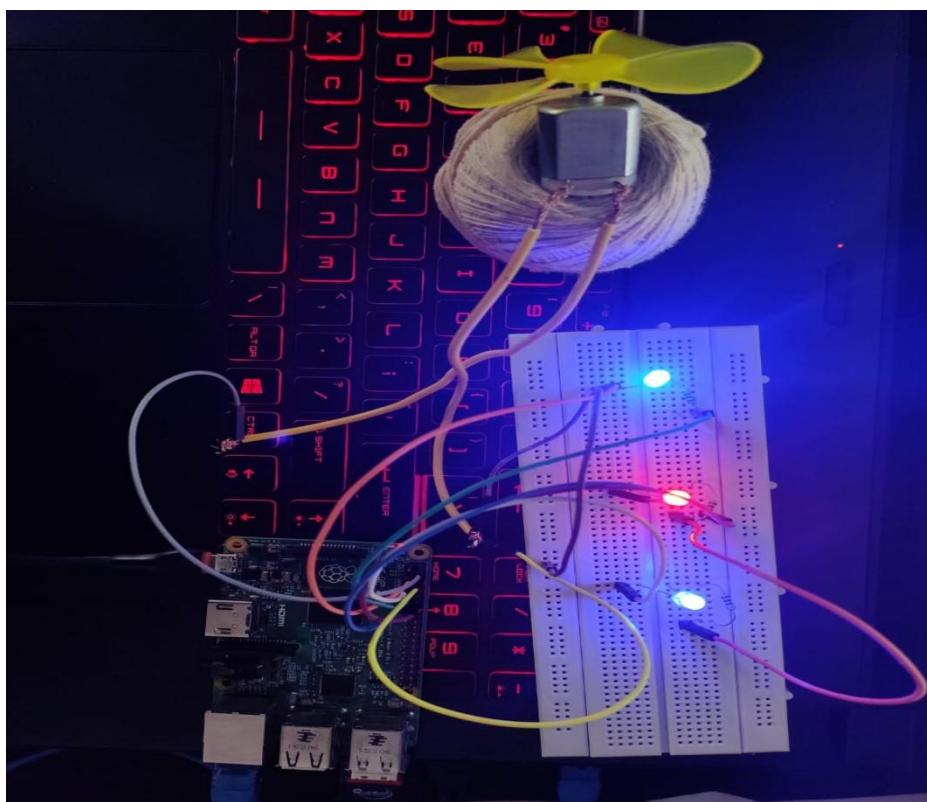
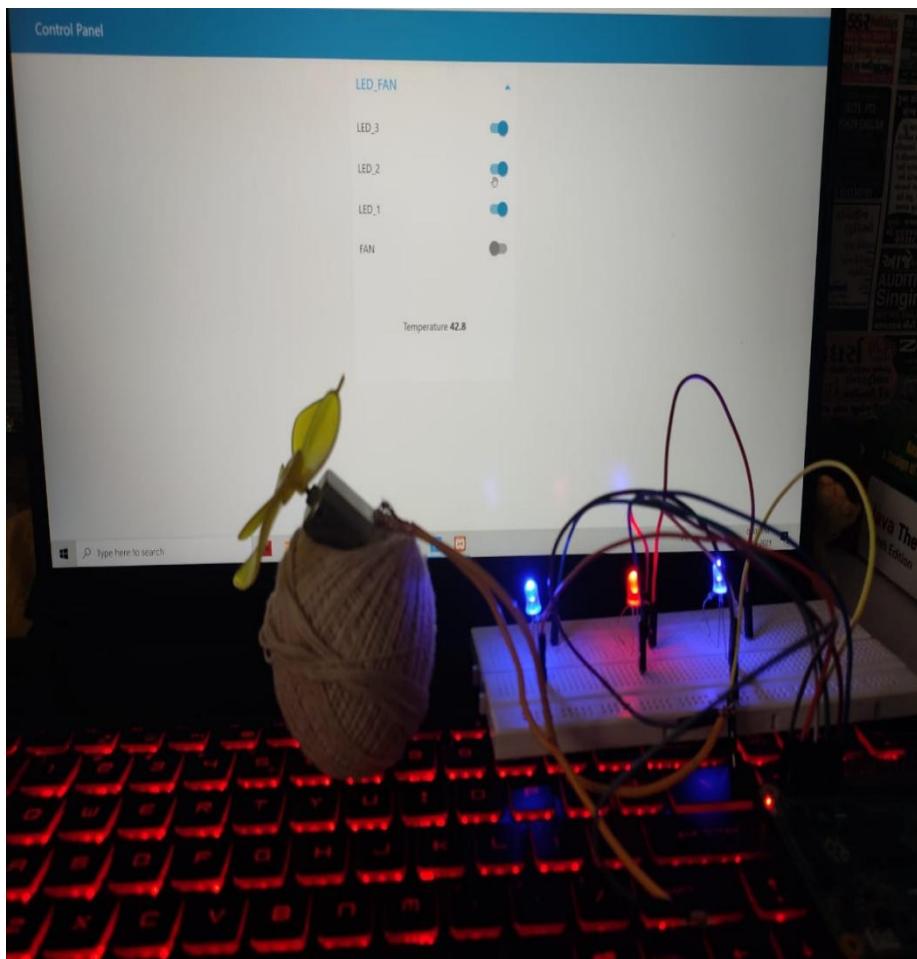


7. Hardware Portion

Circuit Connection



Control Panel



8. Conclusion

IOT based smart home system will bring more convenience and comfort to people lives. The android and web based smart home application communicates with the Raspberry pi via an internet. Any android supported device can be used to install the smart home application. Using android application user can control and monitor the smart home environment. These home automation systems are mandatory because sometimes human can forgot to switch off the appliances when there is no need to use and in this situation, the home automation system is used to reduce the wastage of electricity.

The Internet of Things involves associate increasing range of sen-sible interconnected devices and sensors (e.g. cameras, biometric and medical sensors) that area unit typically non-intrusive, clear and invisible. An IoT has been transportation new set of techno-logical changes in our daily lives, that successively serving to America to form our life less complicated and lighter. Although IoT has plentiful edges, there area unit some flaws within the IoT design and its implementation. that the main observation of the paper is that IoT design can in all probability best be delineate by a reference model than one design which there'll be many various until now unknown applications/services that may connect with the IoT applies additionally to object resolution mechanisms. IoT applications believe a communication infrastructure for exchang-ing info thus it's vital from a public policy purpose of read to con-firm that IoT applications, that embody aid, energy management, transportation, or the other innovative applications, can enjoy a good access to the present infrastructure

9. Limitations and Future Extensions

- Limitation**

- 1. Installation**

Depending on the complexity of the system, installing a home automation device can be a significant burden on the homeowner. It can either cost you money if you hire an outside contractor or cost you time if you venture to do it yourself.

- 2. Complex Technology**

Automating everything in life may sound extremely appealing, but sometimes a good old-fashioned flip of the switch is a lot easier than reaching for your smart phone to turn lights on and off. Before you decide which system is right for you, think about how far you really want to take home automation in your household.

- 3. Cost**

Even though the price of home automation systems has become much more affordable in recent years, the cost to purchase and install a device can still add up. Consumer Reports offers a wide range of information and insights – including costs – on the best home automation systems on the

- Future Extensions**

Future scope for the home automation systems involves making homes even smarter. Homes can be interfaced with sensors including motion sensors, light sensors and temperature sensors and provide automated toggling of devices based on conditions.

The future of IoT has the potential to be limitless. Advances to the industrial internet will be accelerated through increased network agility, integrated artificial intelligence (AI) and the capacity to deploy, automate, orchestrate and secure diverse use cases at hyper scale.

10. Bibliography

For Implementation

- https://www.youtube.com/watch?v=IouIGH_NNXU&list=LL&index=16

For Installation

- <https://www.youtube.com/watch?v=RXvpYHK2Q-I&list=LL&index=21>
- <https://www.youtube.com/watch?v=zYvkxup76-s&list=LL&index=24>

11. Video Link For Our Project

<https://drive.google.com/drive/u/0/folders/1Xdh4E76JATYffSexzYiJZDTBp3v8FS8g>

[* must watch]