**AM Home Automation**

**A Project Report**

**Submitted by:**

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in partial fulfillment for the award of the degree

of

**BACHELOR OF COMPUTER APPLICATION**

at

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**Department of Computer Science**

**INDUS UNIVERSITY**

**MAY 2019**

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**CERTIFICATE**

This is to certify that the project titled AM Home Automation is the bona fide work carried out by Rishee Barthakur, a student of Integrated MCA SEM - VI during the academic year 2018-19, in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Application.

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| --- | --- |
| **Internal Guide Signature :** | **Head of Dept. Signature :** |
| **Date :** | **Date :** |

**AM Home Automation**

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I also want to express my appreciation to my classmates and friends who helped me in one way or another during the course of developing this project. They endured the long hours of my absence during the development of this project.

Finally, I express my gratitude to the Almighty God, the most beneficent & the most merciful, for granting me the opportunity to write this project report.

**2.Introduction**

The Home automation AM board is a smart IoT based switch board having four switching components which can be installed in Flats, Apartments or Offices to operated your electrical devices like lights, fans ACs wirelessly through your mobile phone as well in a traditional manner. This device is cheap and user friendly compared to those smart switch board which are available in Amazon or any other E-Commerce site.

**3.Synopsis**

* 1. **Existing system:**

1. The smart switch boards having component of for switch is costlier than this product.
2. You have to replace the whole traditional switch board in order to install a smart switch board at your premises.
3. Existing system does not have the option for Auto-Manual(Switch).

**3.2 Problem Areas:**

1. IoT based smart boards which are available in the market are quite costlier than this device.
2. You have to replace the old switch board in order to install a new IoT based switch board but if you use this device you just have to connect it with your previous switch which you are using at your home by a electrician.
3. There are some smart IoT switch which may fail when there is no internet connection available.

**3.3 Need for the system :**

1. This device reduces human effort, saves electricity and time.
2. Using this device the user can access their electronic appliance through phone using internet connection.
3. If the internet is not working then also the user can operate the board manually.

**3.4 Proposed System:**

Objectives to be fulfilled:

* Helping in saving electricity
  + This switch board provides the facility to operate your appliances from anywhere in the world using IoT technology. Hence, sometimes if you forget to switch off your Fan or TV, Lights or any other appliances you don’t worry about anything, you just have to press one button from your mobile app which will control the switch board and will make your appliance turned off. This leads saving of electricity and reduces human anxiety when their appliances are turned on and they are out of station.
* User Friendly
  + In countries like India the people from rural area or we can say the people who don’t have the proper knowledge in operating a mobile app for them, they can use it in the traditional way the way all the switch boards are operated .Hence we can say that this smart switch board can be operated by the people or our generation and our older generation who might have a little knowledge compared to us in smart technologies. *This point focus village area*
* Helping in reducing human effort
  + The user can Turn ON or Turn OFF lights, fans etc. from sitting on a single place.

**4.Preambles**

**4.1 Project Description:**

The Home automation AM board is a smart IoT based switch board having four switching components which can be installed in Flats, Apartments or Offices to operated your electrical devices like lights, fans ACs wirelessly through your mobile phone as well in a traditional manner. This device is cheap and user friendly compared to those smart switch board which are available in Amazon or any other E-Commerce site. This project is created by using new technologies.

**4.2 Module Description:**

* Hardware side:
  + Arduino board
    - It’s a hardware board where the programmed is stored. It has inbuilt microprocess where we write the program in C++
  + ESP8266
    - This is the built in board which helps us to connect the device with the internet. Without this internet connection is not possible.
  + Relay module
    - We require four relay module to operate four switch. Each relay will be connected to each switch.
  + DC voltage converter
    - This will supply voltage to the Arduino Board (5V)
  + Male-Female connecting wires
    - It will be used to connect the Arduino board to the Relay
* Application side:
  + Register
    - Switch board ID
    - Email address
    - Password
    - Confirm password
    - Phone number
  + Log In
    - Board Id
    - Password
  + Dashboard
    - Select board
      * To select the board of a particular room
    - On (Four component)
      * To turn on the appliances
    - Off (Four component)
      * To turn off the appliances
    - Settings
      * To change the password of the device
    - Log Out

**5 Technical Description:**

* 1. **Hardware Requirements:**

5.1.1 Arduino board (IC)

* + - This is mother board for the project. It has inbuilt microcontroller inside which controls all the programs
    1. ESP8266
    - It is a chip attached to Arduino which enables and connects the devices to the internet.

5.1.3 Four relay module

* + - Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. Here the relay is operated by the Arduino when the instruction is given to the Arduino using your android phone.

5.1.4 One switch board

* + - It is a normal or traditional switch board
    1. Four one way switches
    2. One two way switch

5.1.7 Android phone

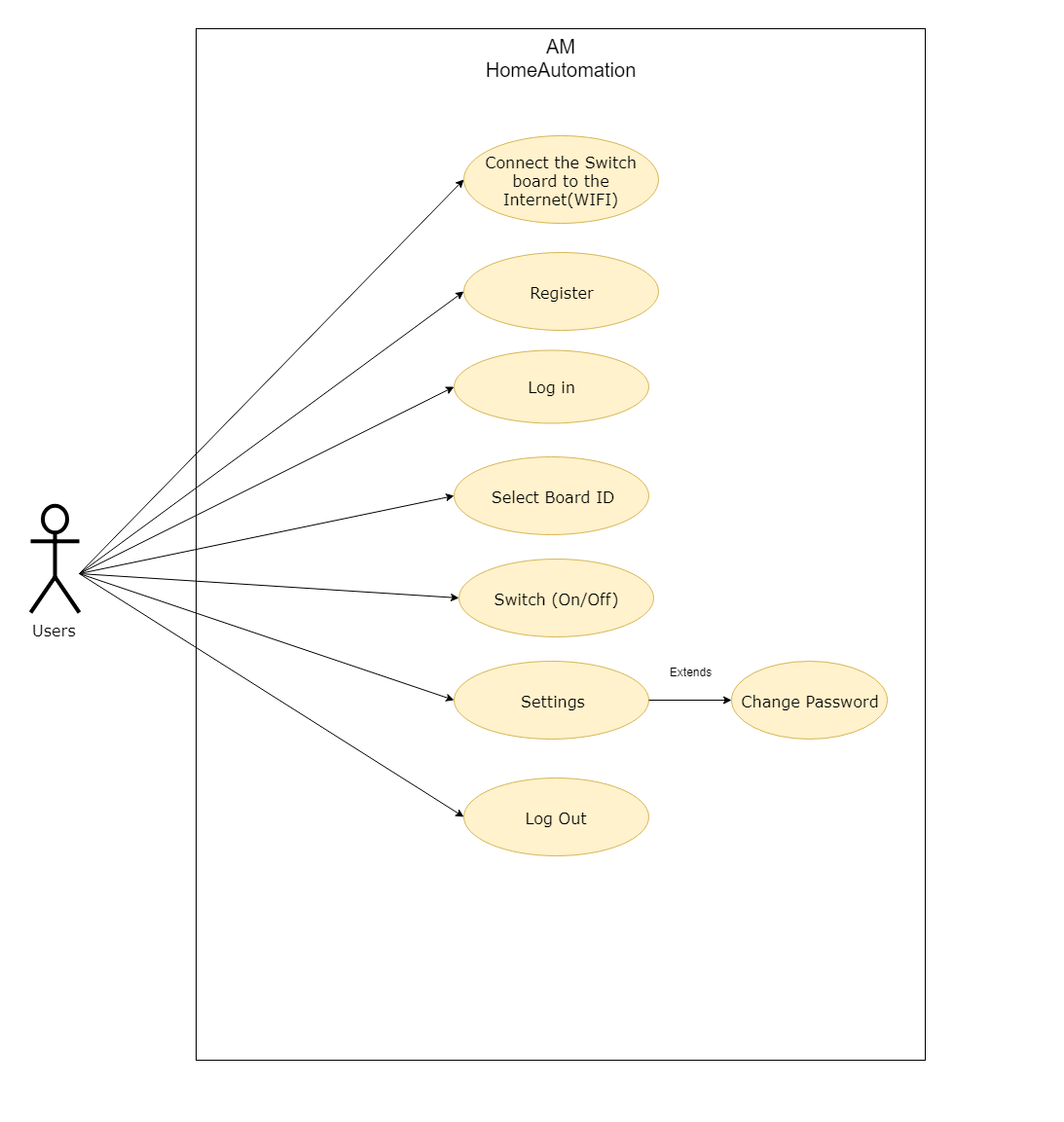
* 1. **Software Requirements:**
     1. NoSQL for the database
     2. Android as in Operating System
  2. **Technology**
     1. **IoT:**

IoT stands for Internet of Things. The Internet of Things refers to the ever-growing network of physical objects that feature an [IP address](https://www.webopedia.com/TERM/I/IP_address.html) for [internet](https://www.webopedia.com/TERM/I/Internet.html) connectivity, and the communication that occurs between these objects and other Internet-enabled devices and systems. It uses protocols to connect your devices to the webserver or cloud or mobile phone**.** It is basically a technology which enables us to embed all these hardware and software to get a proper output using internet.

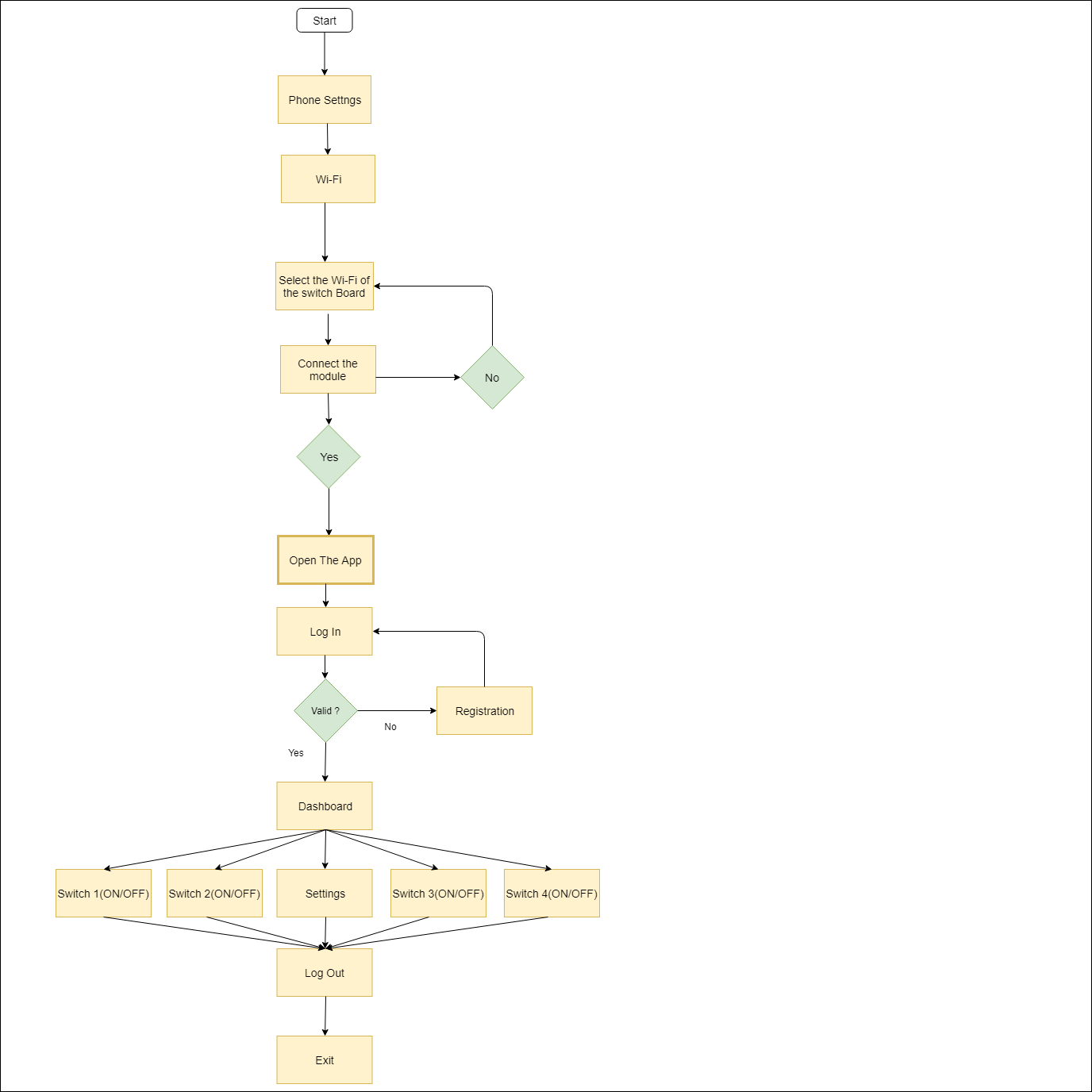
* 1. **Programming Language:**
     1. C++
     2. Java

**6. System Design & Development**

**6.1 USE CASE diagram**

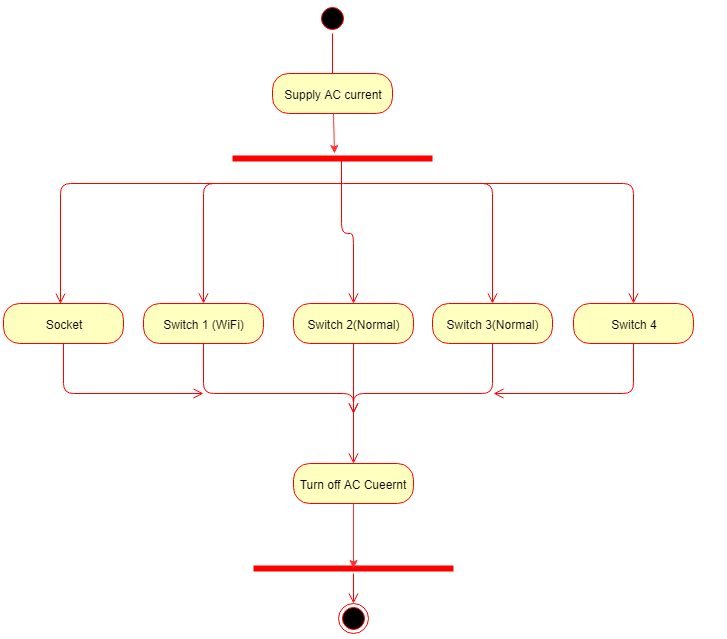
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**6.2 System flowchart**

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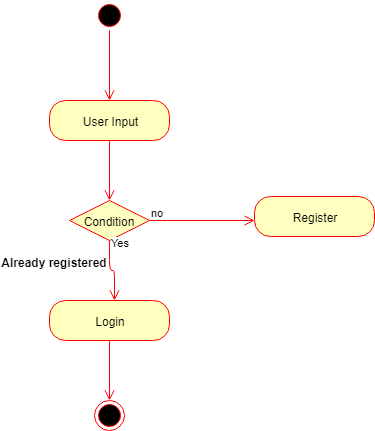
**6.3 Activity diagram**

**6.3.1. Hardware side**

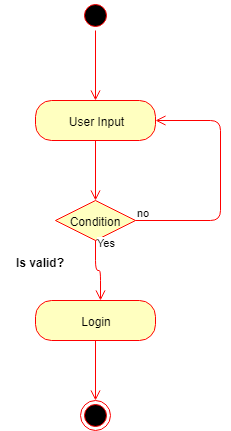
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**6.3.2 Application side**

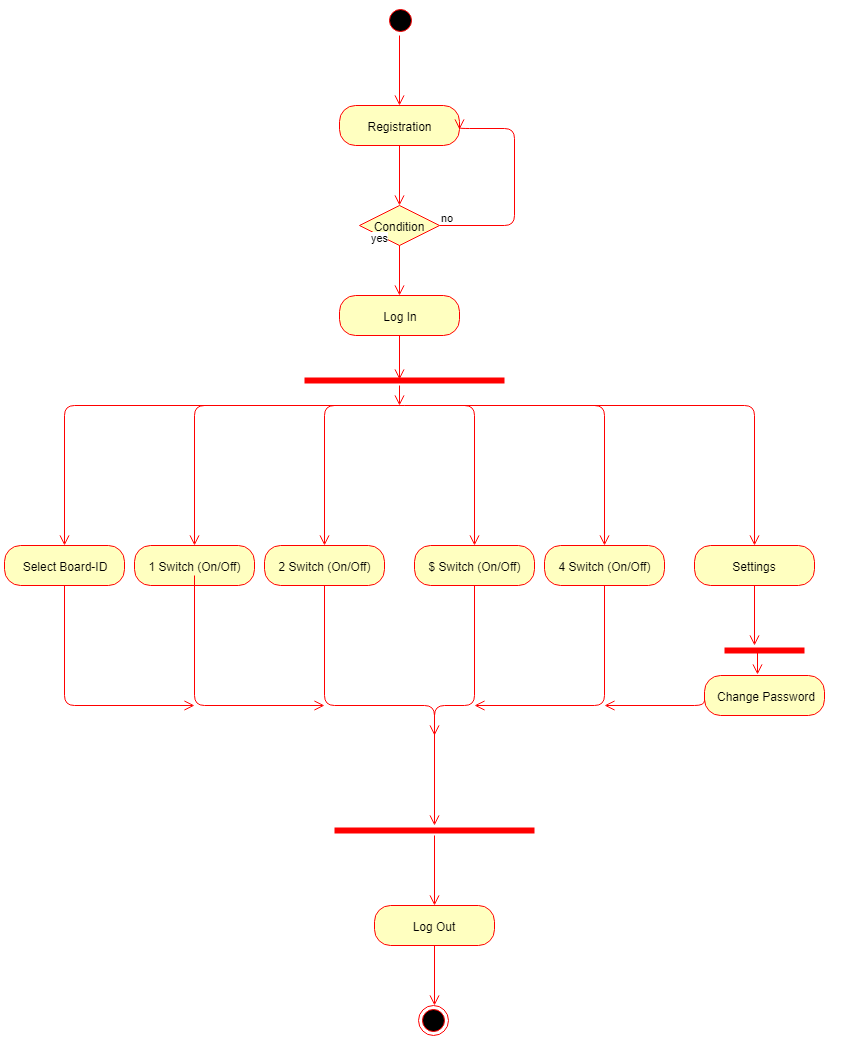
**Registration**

****

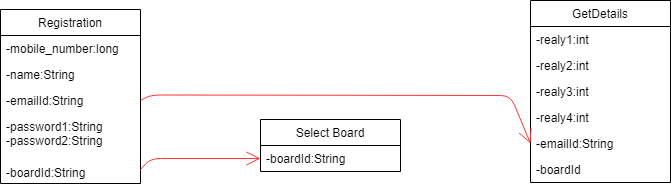
**Login**



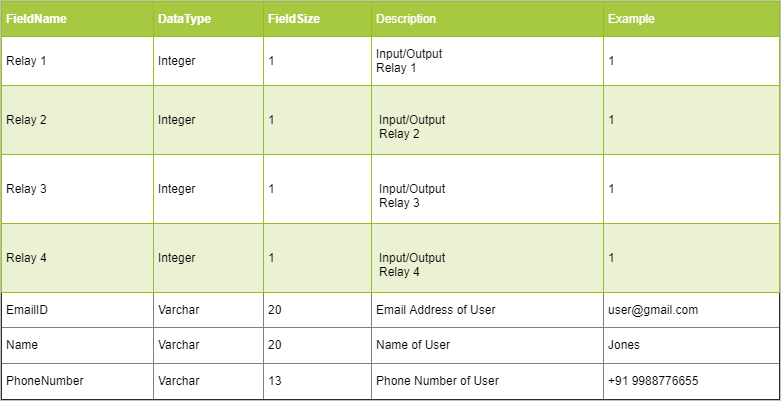
**Overall System**



**6.4Class Diagram**

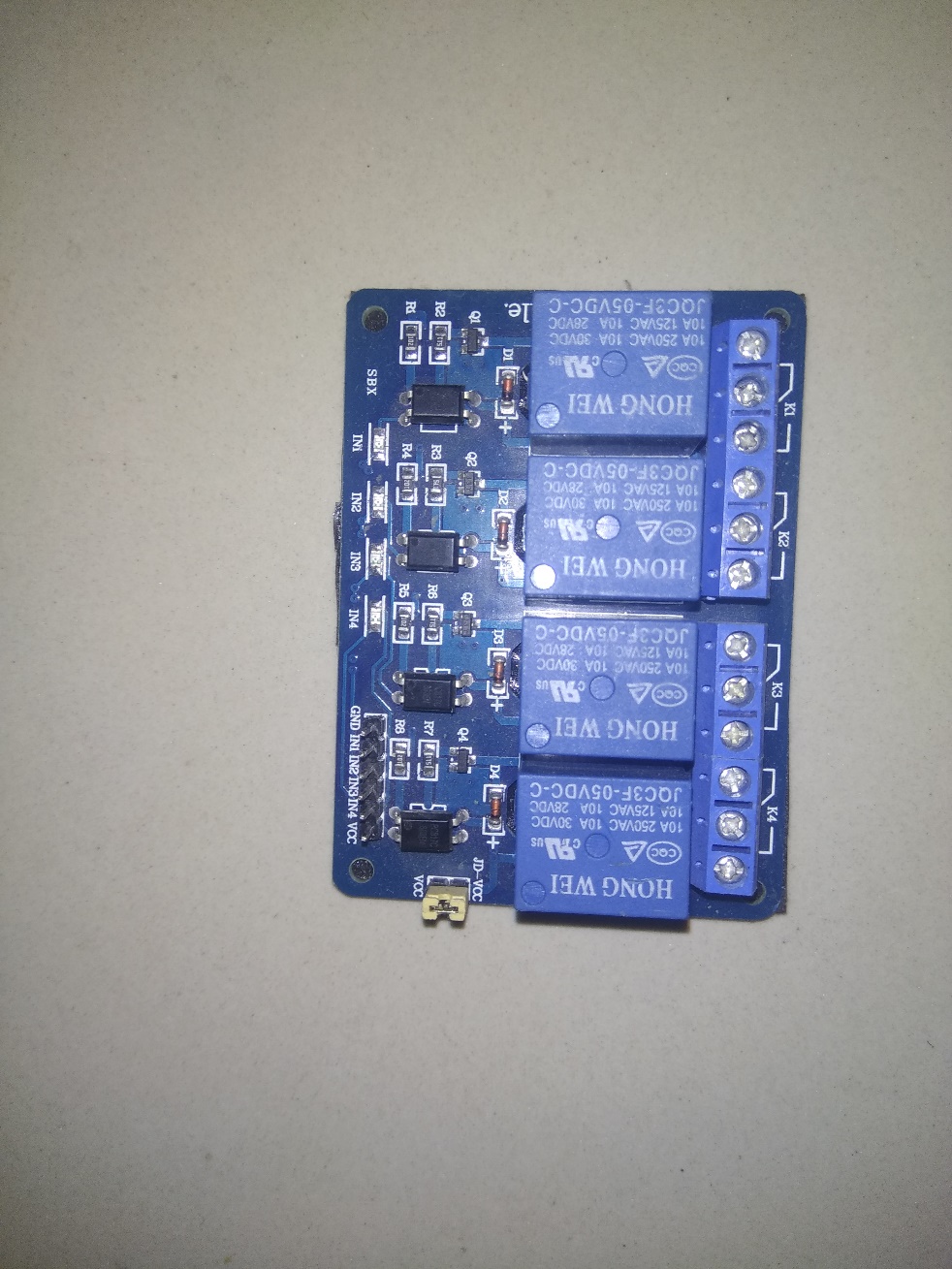
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**7.Data dictionary**

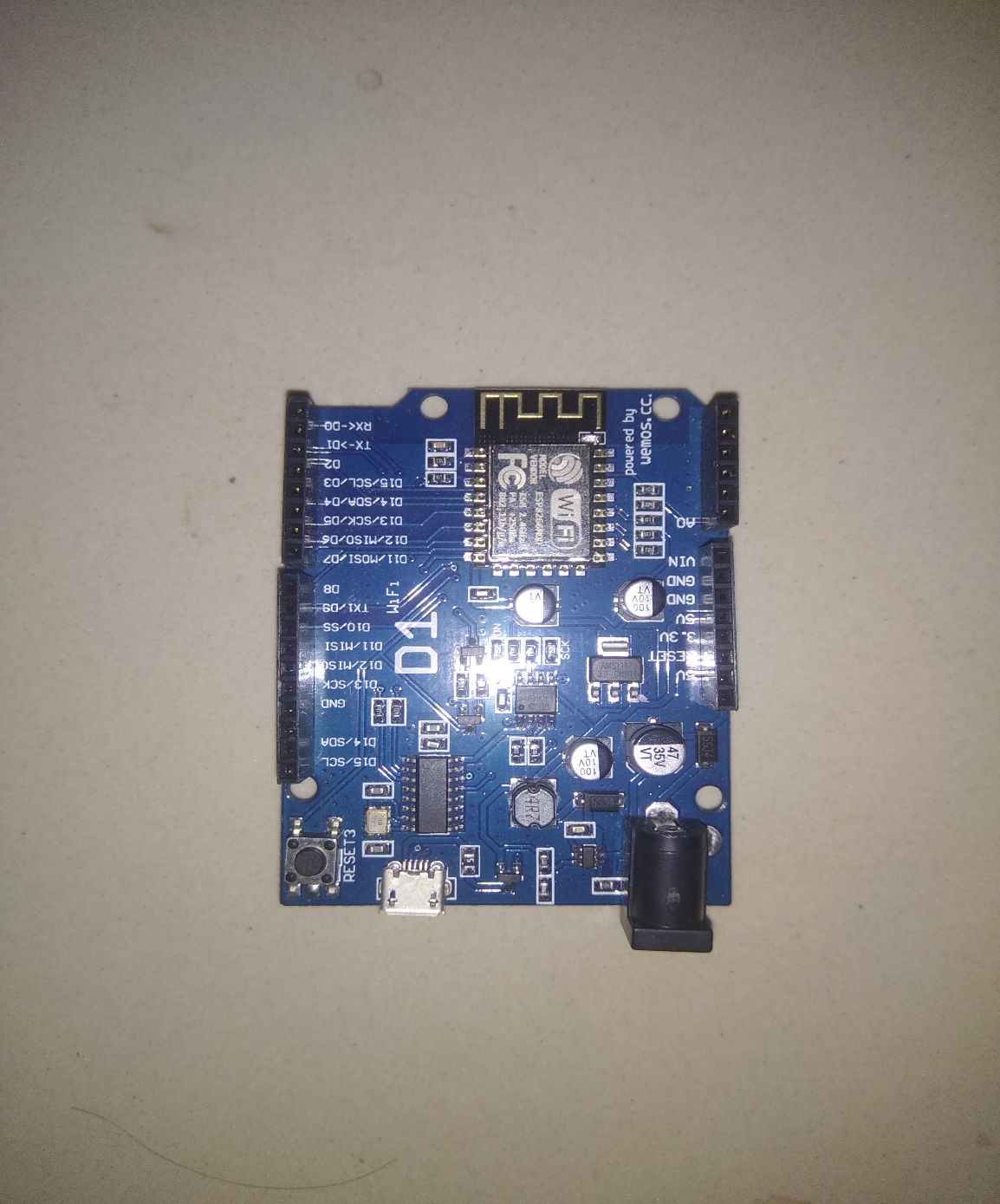


**8.Representation of all modules**

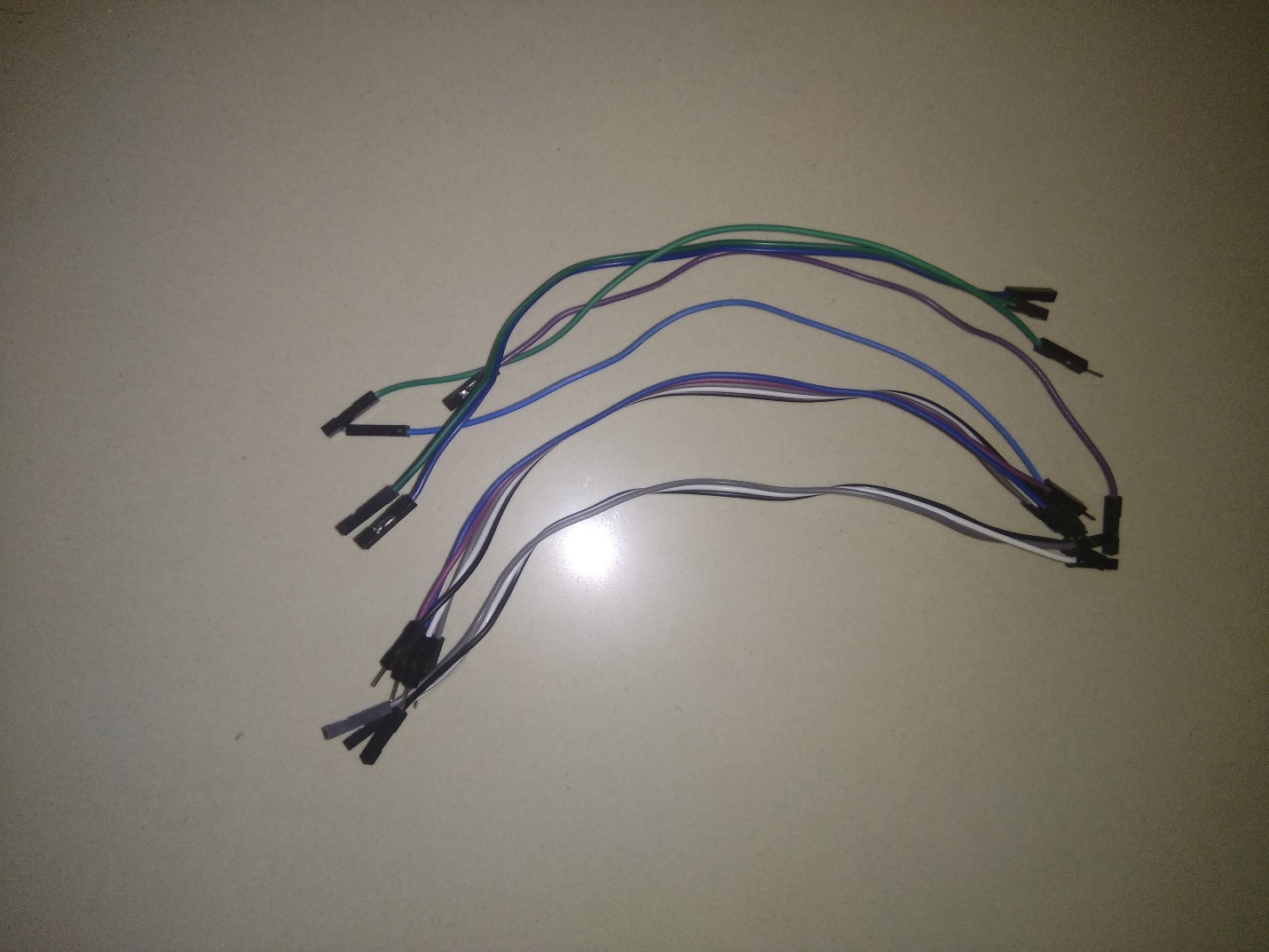
**8.1 Relay Component 4**

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**8.2 Arduino D1**

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**8.3 Connecting wires**

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**8.4 Switch Board**

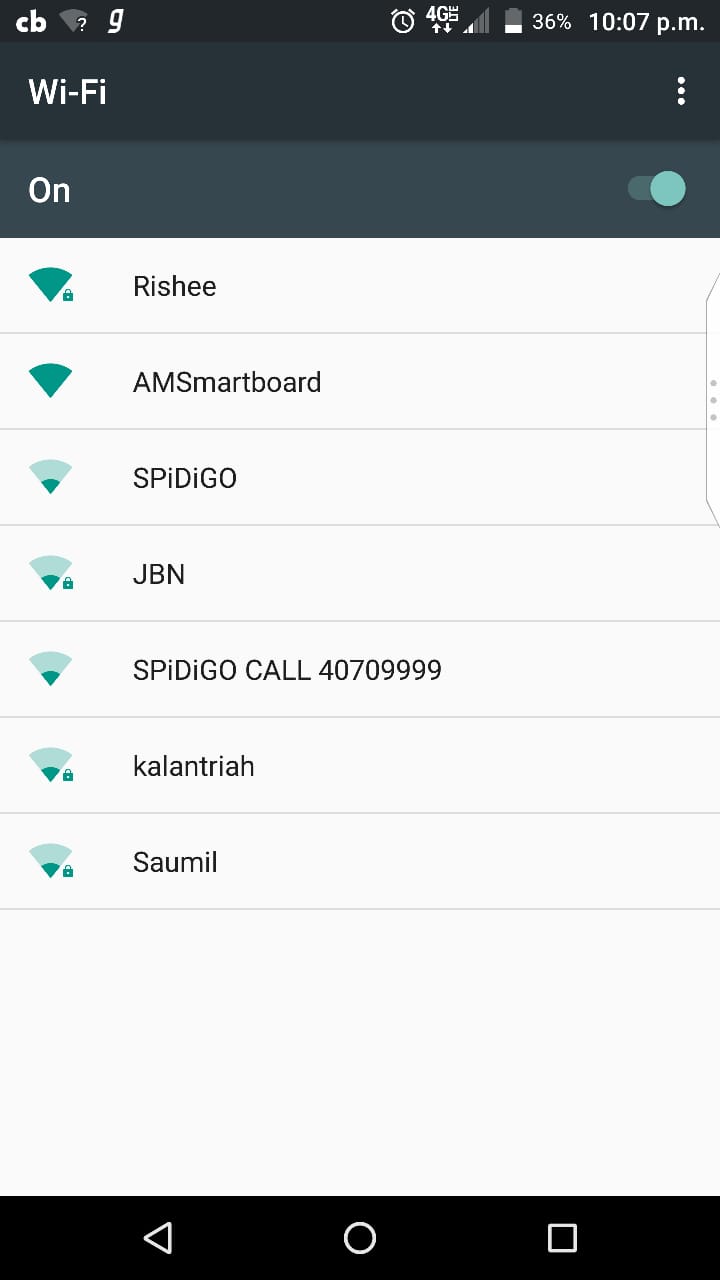
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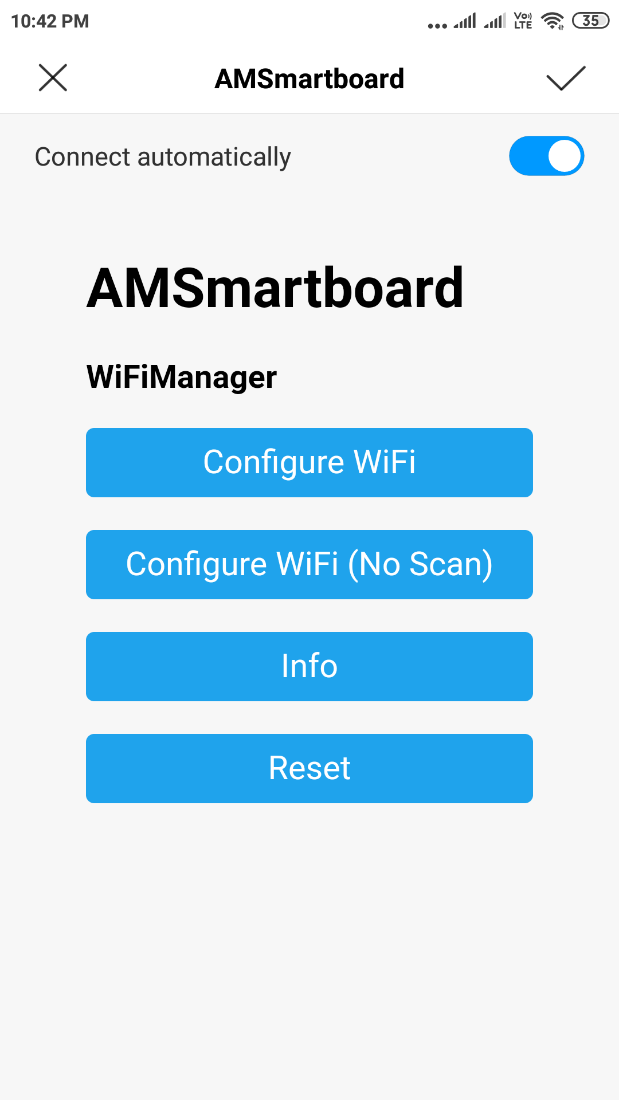
**8.5 Working Module**

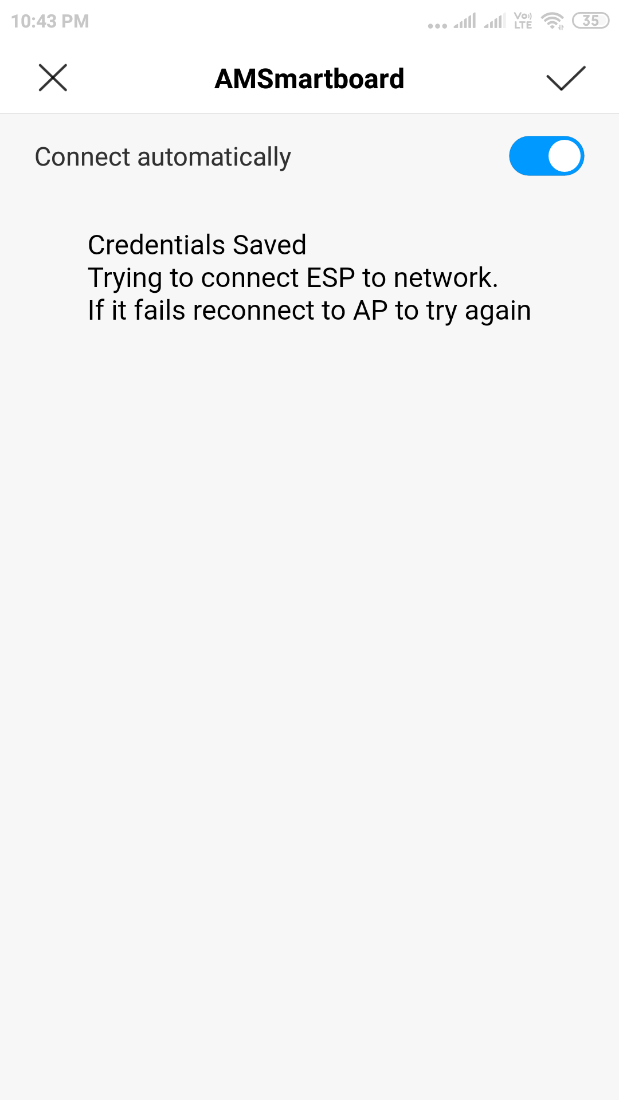
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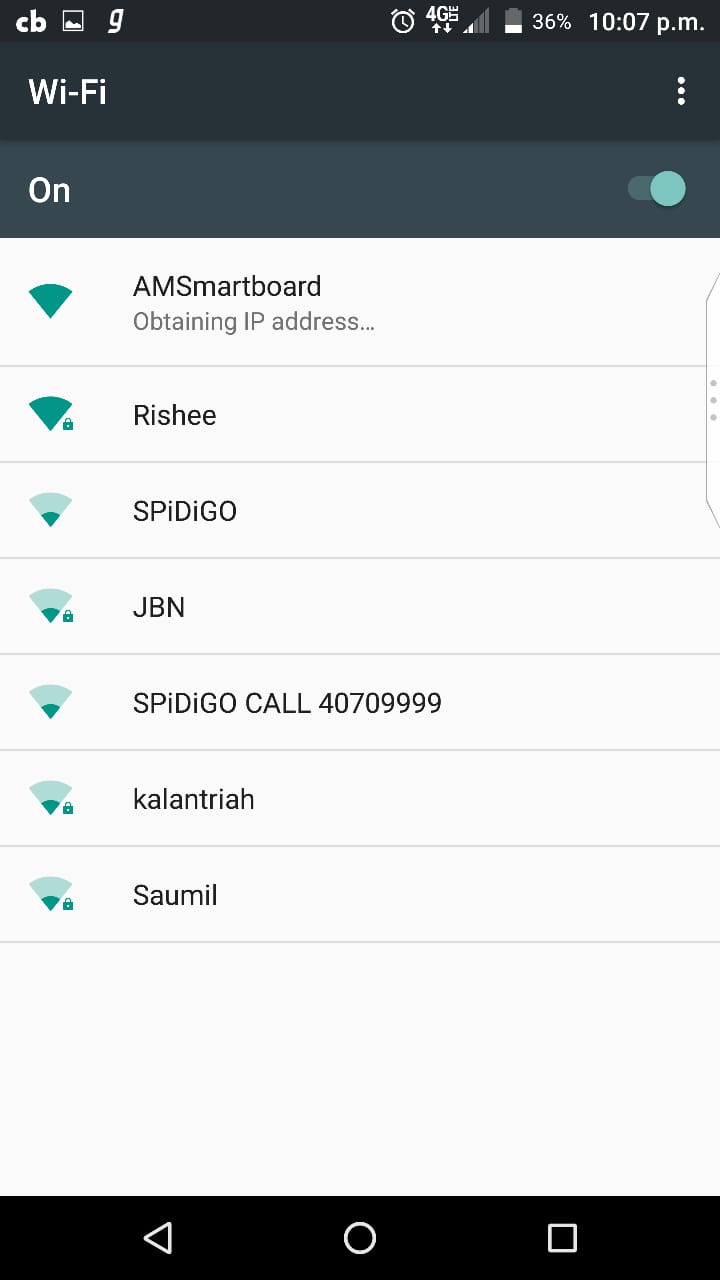
**8.6 Application Side**

**8.6.1 Go to setting for the WiFi Connection**

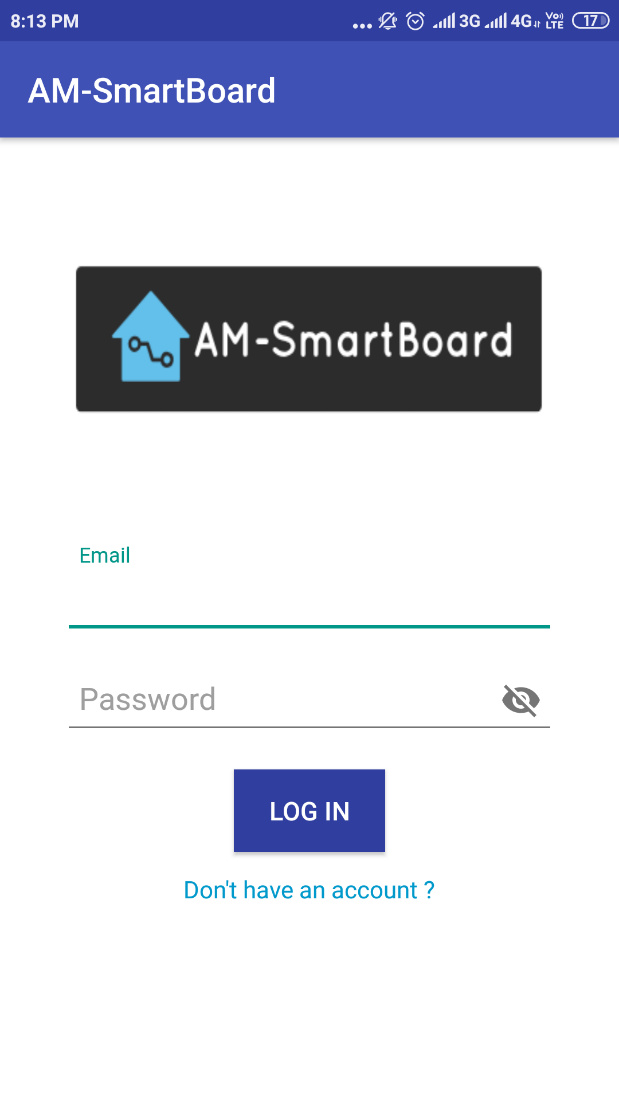
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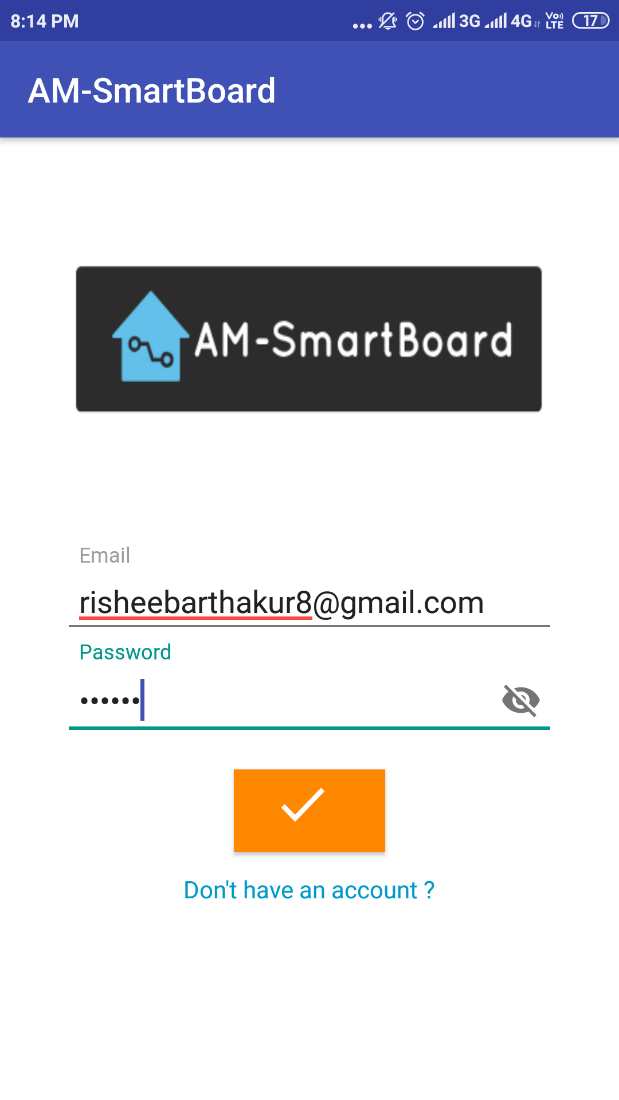
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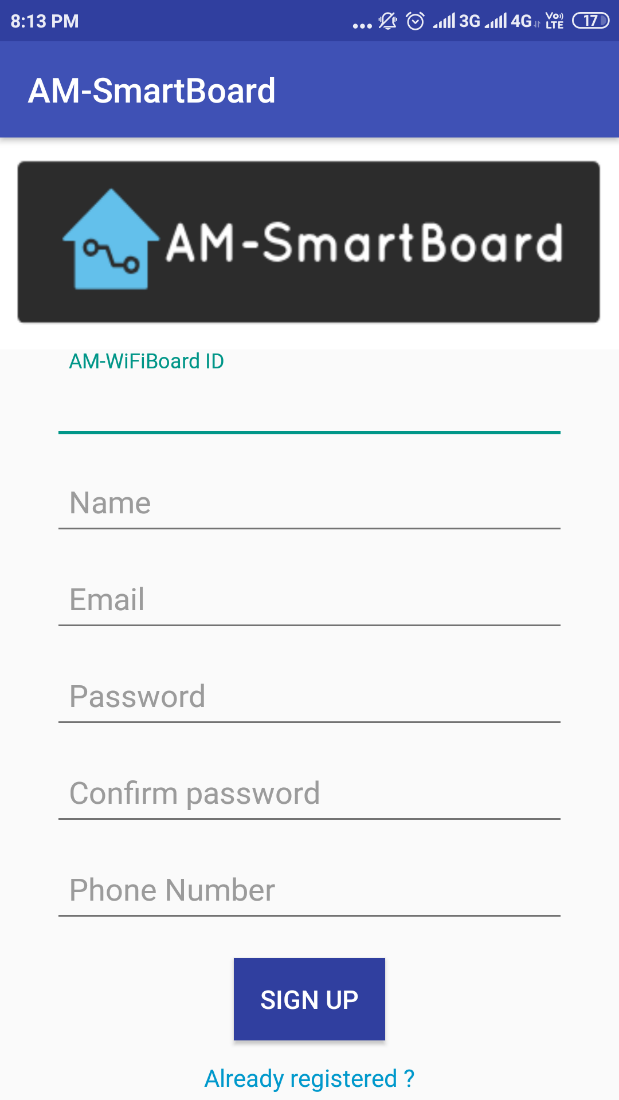
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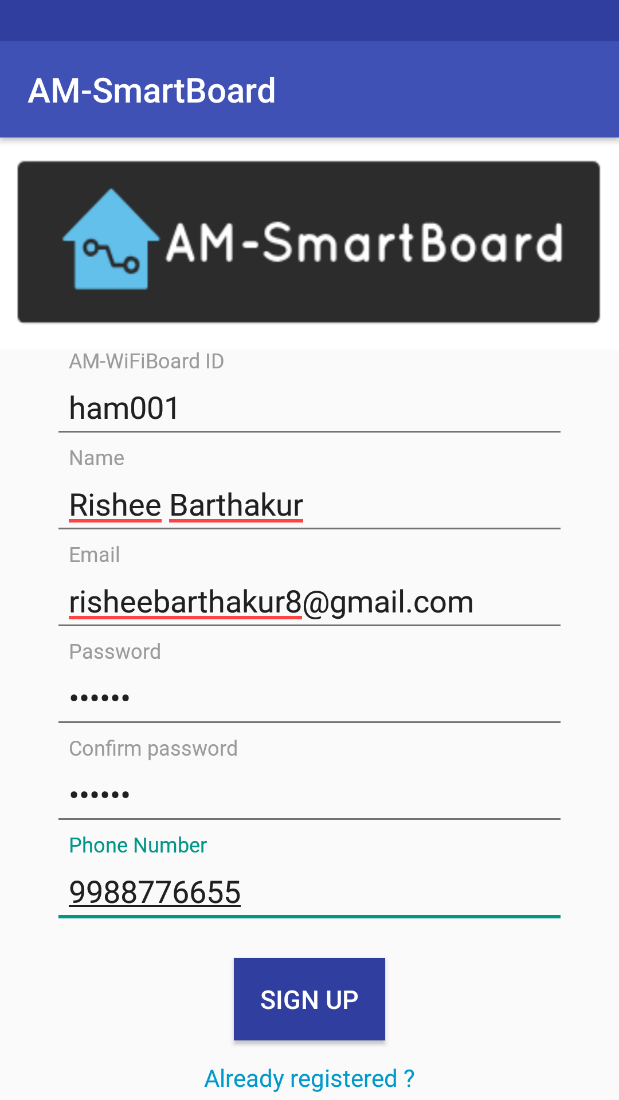
**8.6.2 (Open AM-SmartBoard App) Login**

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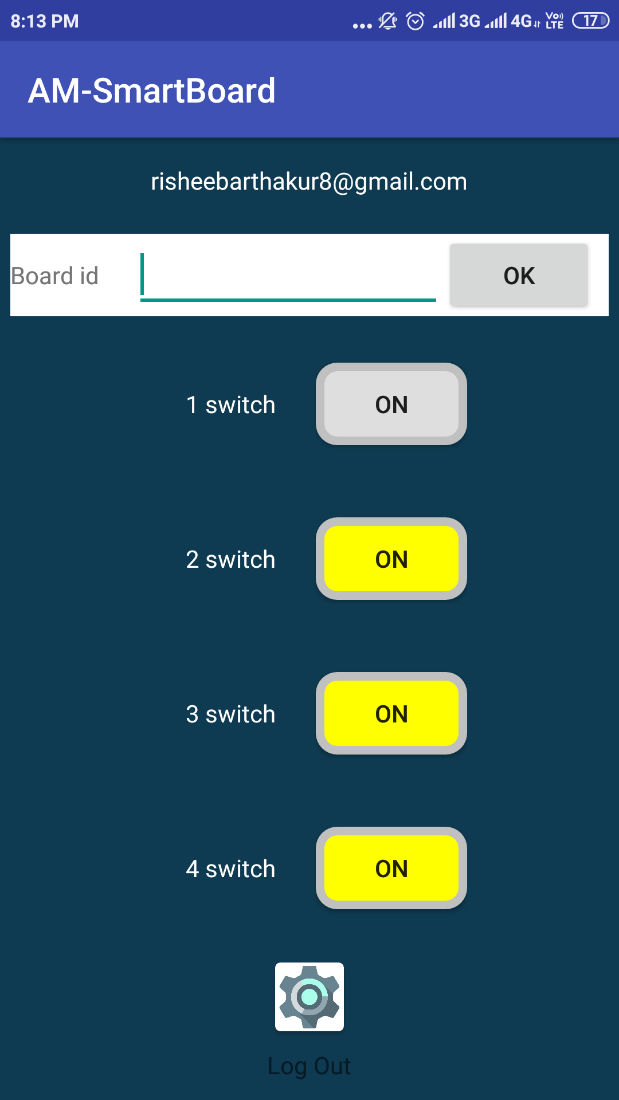
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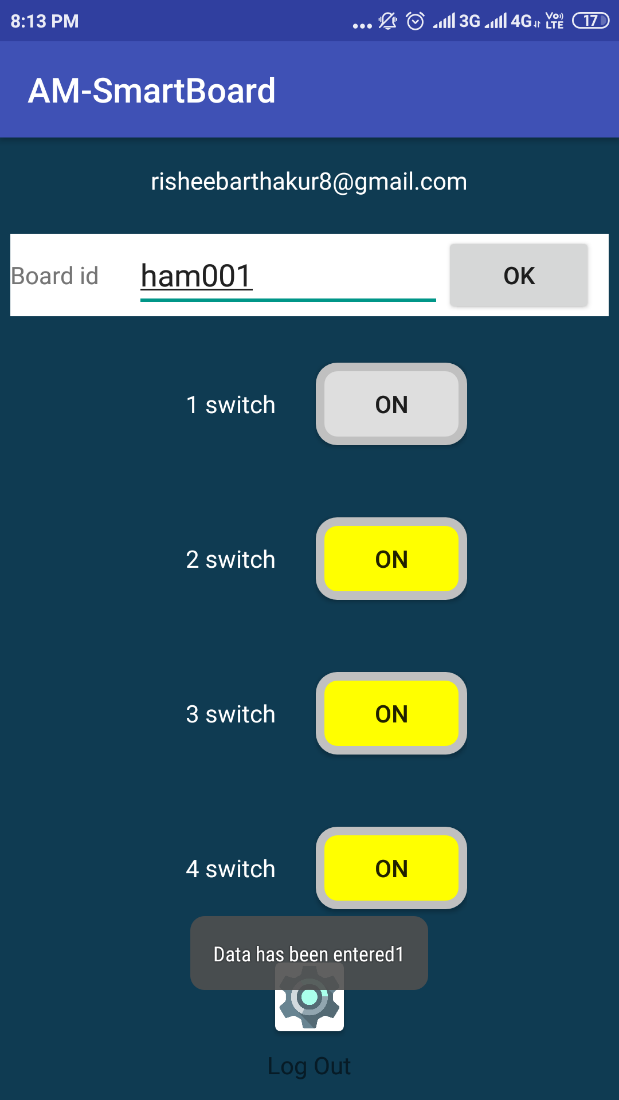
**8.6.3 Registration**

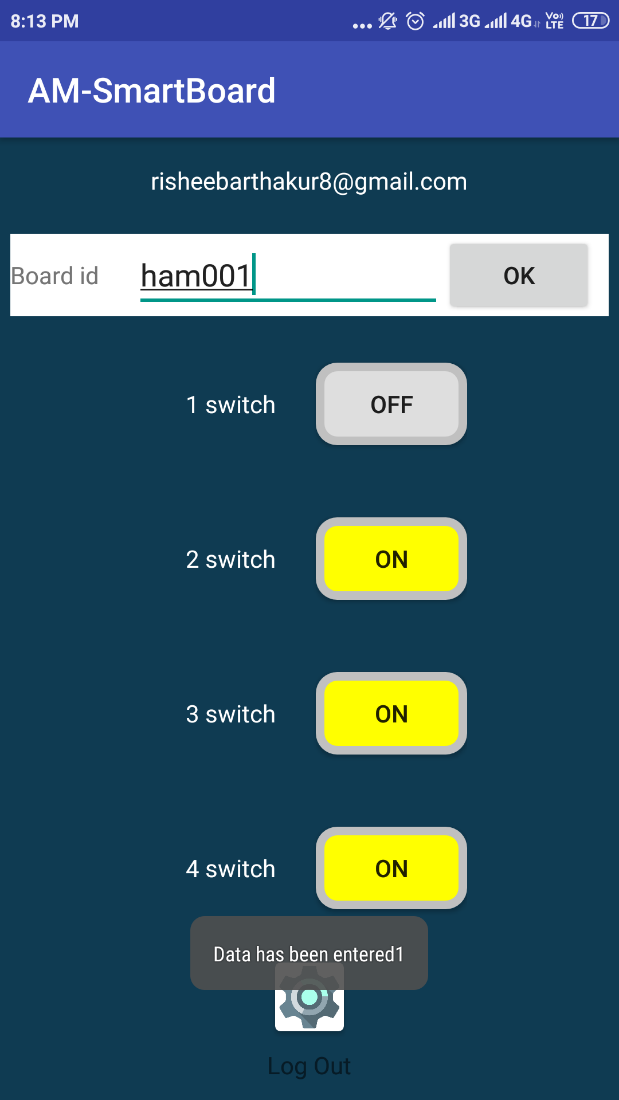
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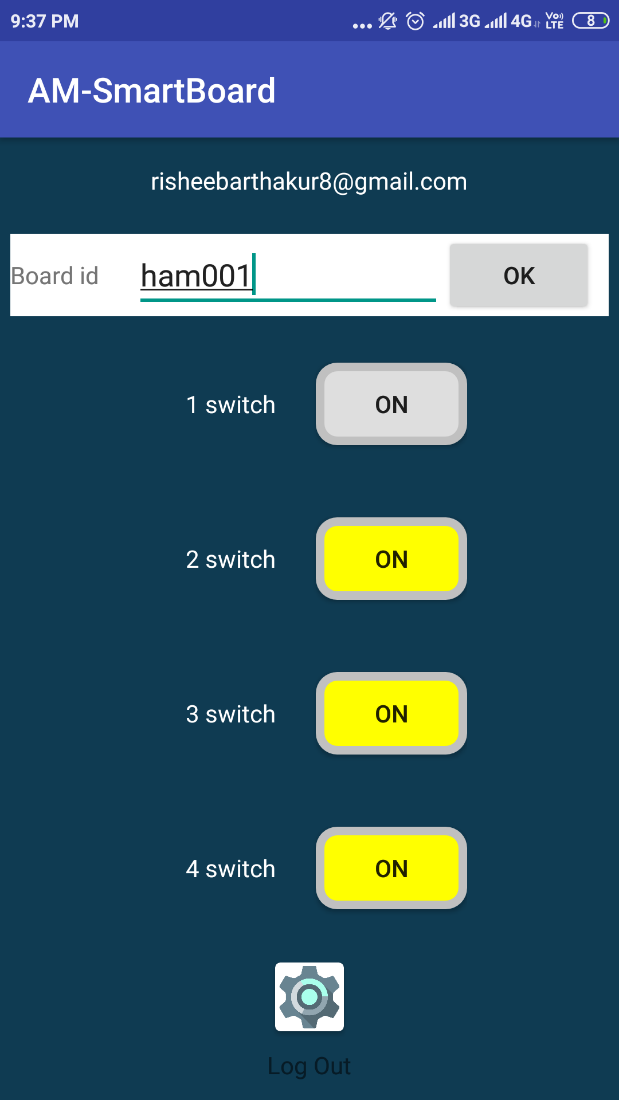
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**8.6.4 Dashboard**

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**9.Test Cases**

**9.1For LogIn**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_001 | To check log in functionality with valid Email & password | App should be installed | Open the app | AM HomeAutomation | User should see the app | Same as expected result |
| 2 |  |  | User should be registered | Enter login credential | EmailId: [risheebarthakur8@gmail.com](mailto:risheebarthakur8@gmail.com)  Password :\*\*\*\*\* | User should be able to click on login | Same as expected result |
| 3 |  |  |  | Click on login |  | User should be able to login & redirected to the Dashboard | Same as expected result |
| 4 |  | If the user is not  registered |  | Click on “Don’t have an account” | Page redirect | User should move to the registration page | Same as expected result |

**9.2For Registration**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_002 | To check log in functionality of registration | App should be installed | Open the app | AM HomeAutomation | User should see the app | Same as expected result |
| 2 |  |  |  | Fill the registration form with Board ID & user detail | AM-WIfiBoard ID,Name,Email,Password,Confirm  Password,Phone Number &  the password should match | User should be able to click on login | Same as expected result |
| 3 |  |  |  | Click on Registered |  | User should be able to register & redirected to the Login page | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3For Dashboard**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sr No | Test Case ID | Objective | Precautions | Steps | Test Data | Expected Result | Actual result |
| 1 | TC\_003 | User’s Email ID should be | User must be logged in |  | Showing Email ID | User’s Email ID should be | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3.1. For Select Board ID**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_003\_01 | Selecting the Switch board | User must be logged in | Enter the Board ID | Board ID | Switch board should be selected | Same as expected result |
| 2 |  |  | User must be logged in | Click OK | Board ID | Switch board will be selected and the ID will be shown in toast at the bottom | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3.2. For Switch 1**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_003\_02 | The light should be turned on | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the ON button | Light and the ON button | The light should turn on and the ON should  be converted to OFF | Same as expected result |
| 2 |  | The light should be turned off | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the OFF button | Light and the OFF button | The light should turn off and the OFF should be converted to ON | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3.3. For Switch 2**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_003\_03 | The light should be turned on | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the ON button | Light and the ON button | The light should turn on and the ON should  be converted to OFF | Same as expected result |
| 2 |  | The light should be turned off | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the OFF button | Light and the OFF button | The light should turn off and the OFF should be converted to ON | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3.4 For Switch 3**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_003\_04 | The light should be turned on | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the ON button | Light and the ON button | The light should turn on and the ON should  be converted to OFF | Same as expected result |
| 2 |  | The light should be turned off | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the OFF button | Light and the OFF button | The light should turn off and the OFF should be converted to ON | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3.5. For Switch 4**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_003\_05 | The light should be turned on | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the ON button | Light and the ON button | The light should turn on and the ON should  be converted to OFF | Same as expected result |
| 2 |  | The light should be turned off | User must be logged in, Switch board should be connected to the AC current and the WIFI should be connected to the switch board | Press the OFF button | Light and the OFF button | The light should turn off and the OFF should be converted to ON | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3.6. For Settings**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_003\_06 | Go to the setting page | User must be logged in | Press the Settings button | Settings | Routed to settings page | Same as expected result |
| 2 | TC\_003\_06\_1 | Change password | User should be in the Settings page | Enter the new password | Setting new password | Password is changed | Same as expected result |
|  |  |  |  |  |  |  |  |

**9.3.7. For Log Out**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr No** | **Test Case ID** | **Objective** | **Precautions** | **Steps** | **Test Data** | **Expected Result** | **Actual result** |
| 1 | TC\_003\_07 | User must logged out and redirected to the home page i.e. Login page | User must be logged in | Press the Logout button | Logging out | User is logged out and redirected to the home page i.e. Login page | Same as expected result |
|  |  |  |  |  |  |  |  |

**10.Conclusion:**

This device is an innovative tool which can be access by everyone. The future is going to be more advance at that time the product like this will have a need for people.

**11.Future Enhancement :**

Technology has become need for people these days. And this product is something which reduces human effort and helps in securing electronic appliances. So this project shows a wide scope in coming days though such devices are being used by people these days

**12.Bibliography :**

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