ज्ञानेन प्रकाशते जगत्
INDUS UNIVERSITY

AM Home Automation

Team Member:-

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Internal Guide :-

Prof. Jalpa Poriya

Synopsis

Existing system & problem areas

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

Need for the system

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

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.

Preambles

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.

System Modules

- **Hardware side:**
  - Arduino board
  - ESP8266
  - Relay module
  - DC voltage converter
  - Male-Female connecting wires
  - One switch board
- **Application side:**
  - Register
  - Log In
  - Dashboard
    - Select board
    - On (For any four appliances)
    - Off (For any four appliances)
    - Settings
    - Log Out

Technical description

- **Hardware Requirements:**

  - Arduino board (IC)
  - ESP8266
  - Four relay module
  - One switch board
  - Four one way switches
  - One two way switch
  - Android phone

- **Software Requirements:**

  - NoSQL for the database
  - Android as in Operating System
    - At least Marshmallow
    - RAM 200 MB Min

- **Technology which we are going to use :**

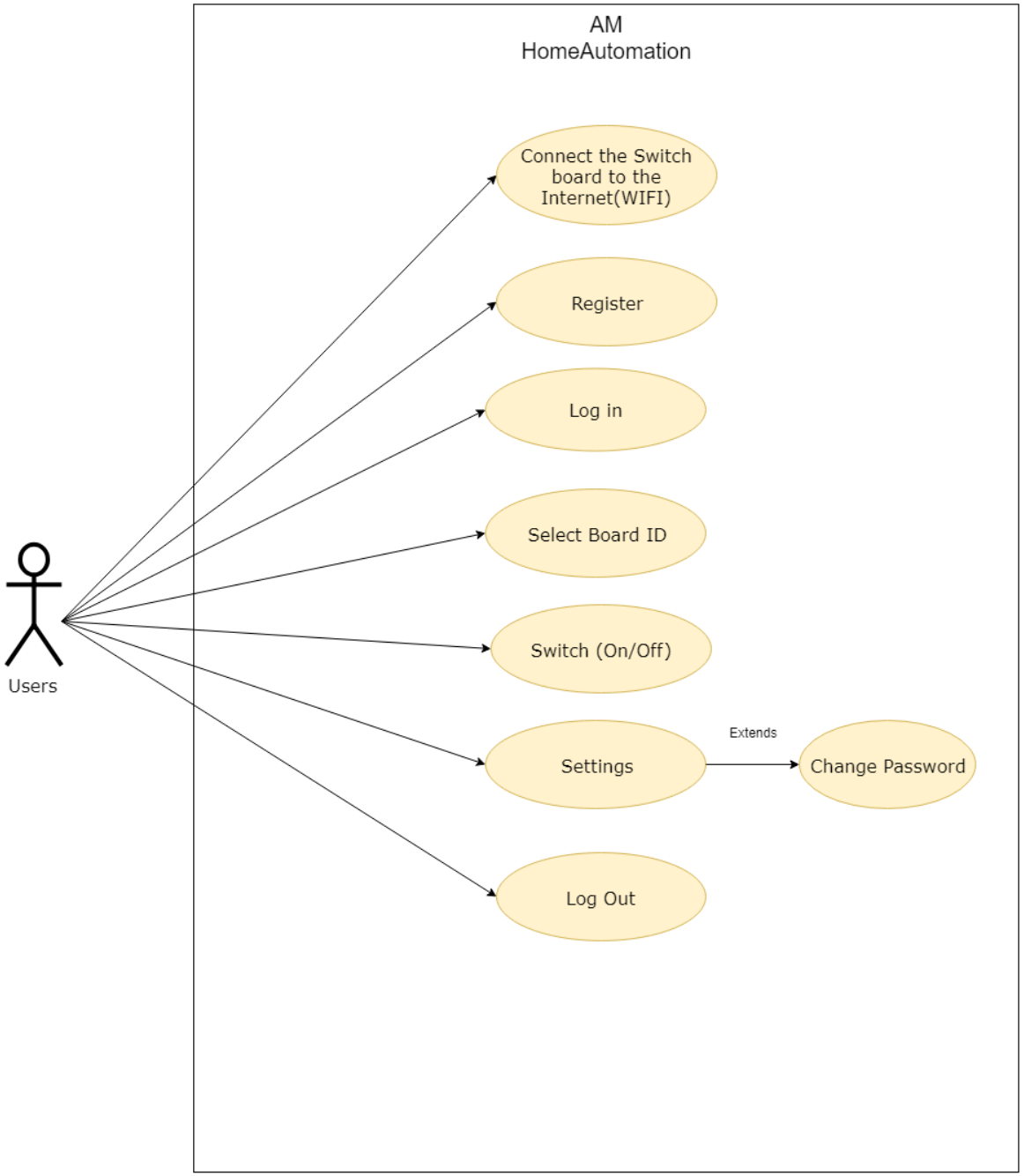
  - Internet of Things
  - Mobile technology

- **Programming Language:**

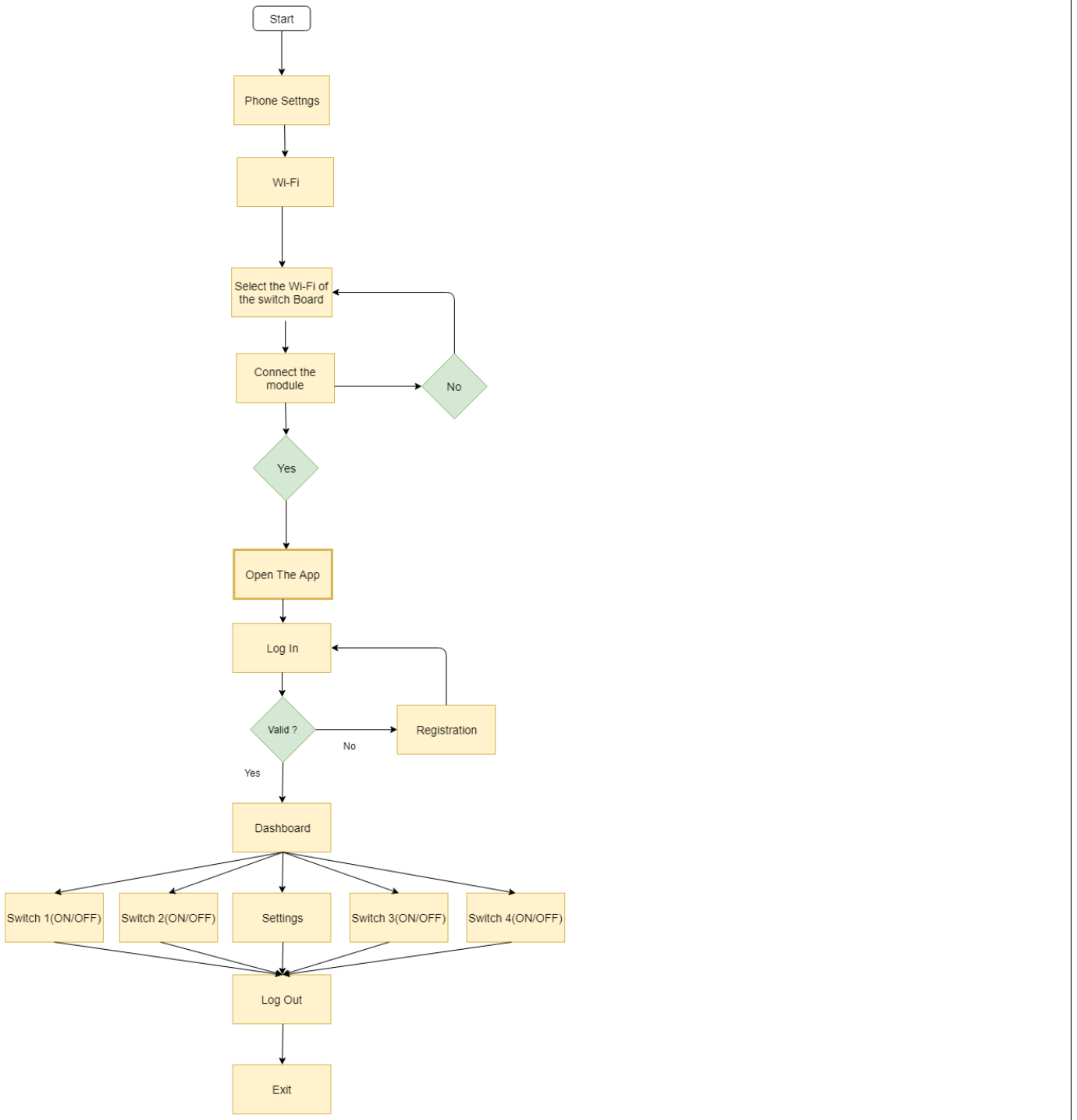
  - C++
  - Java

Diagrams

USE CASE diagram

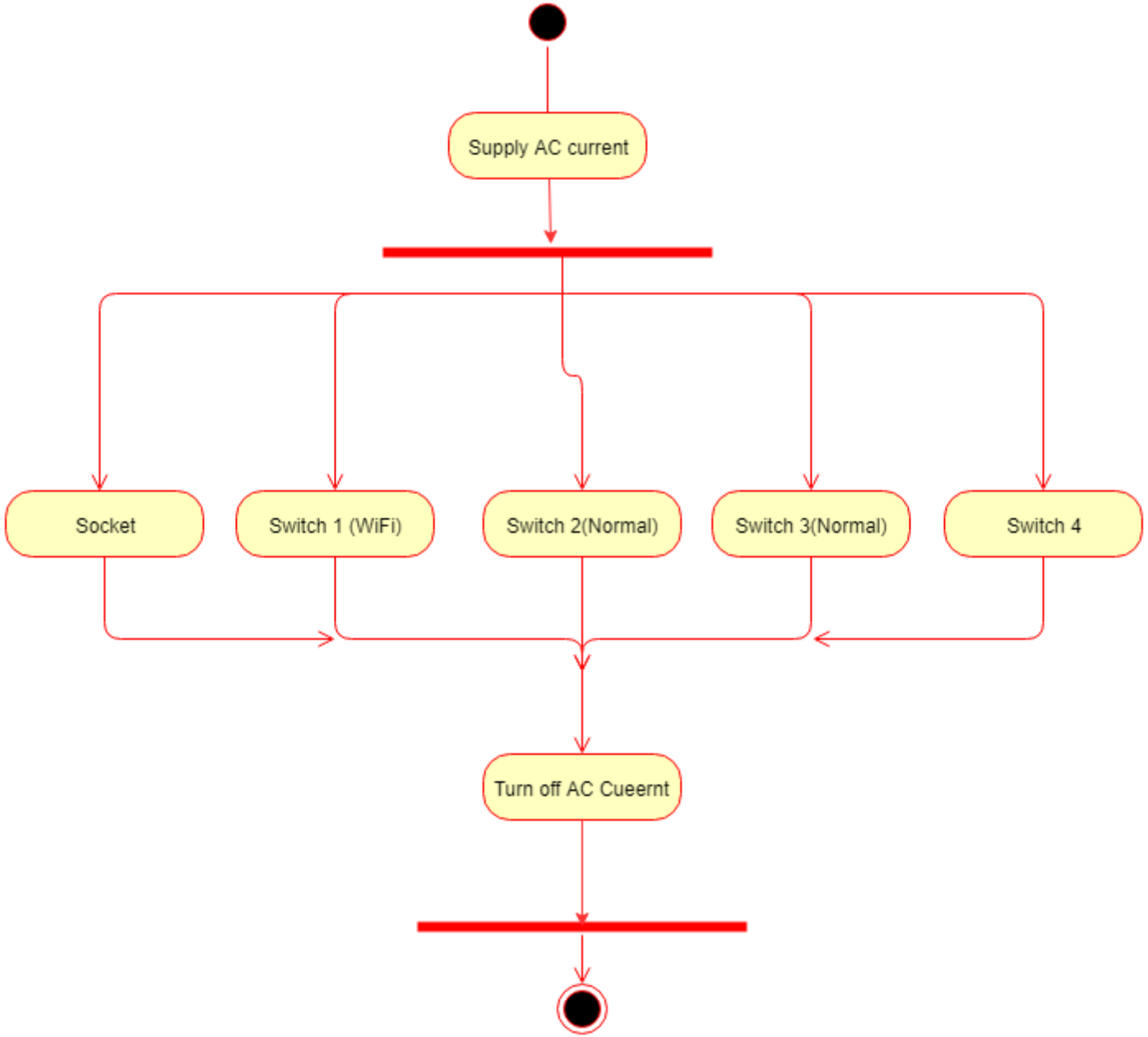

AM
HomeAutomation
Connect the Switch board to the Internet(WIFI)
Register
Log in
Select Board ID
Switch (On/Off)
Settings
Extends
Change Password
Log Out
Users

System Flow Chart


Start
Phone Settngs
Wi-Fi
Select the Wi-Fi of the switch Board
Connect the module
No
Yes
Open The App
Log In
Valid ?
Registration
No
Yes
Dashboard
Switch 1(ON/OFF)
Switch 2(ON/OFF)
Settings
Switch 3(ON/OFF)
Switch 4(ON/OFF)
Log Out
Exit

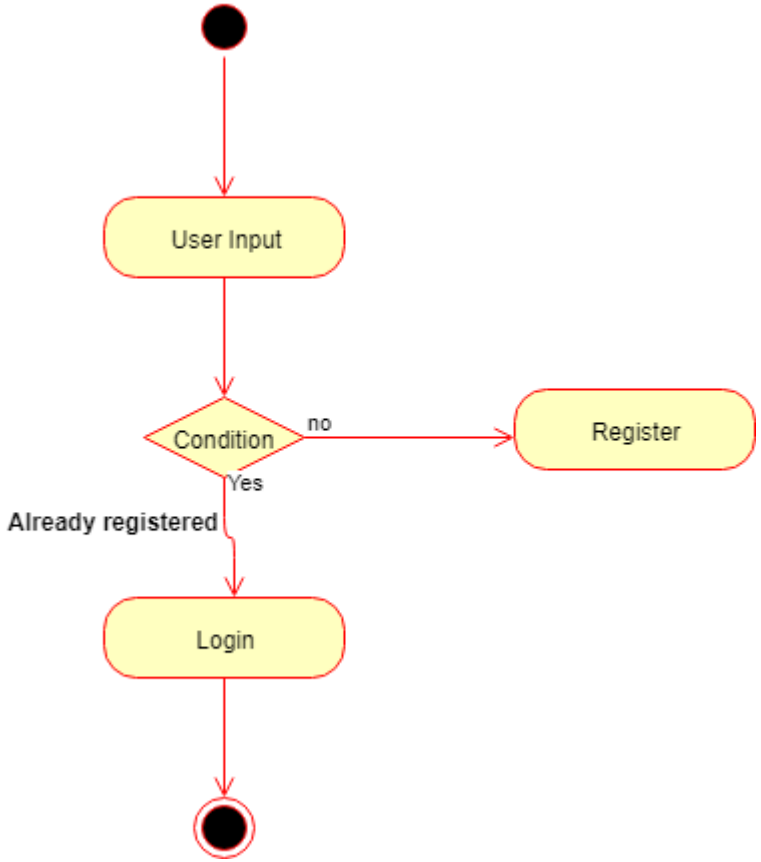
Activity Diagrams

Hardware side :

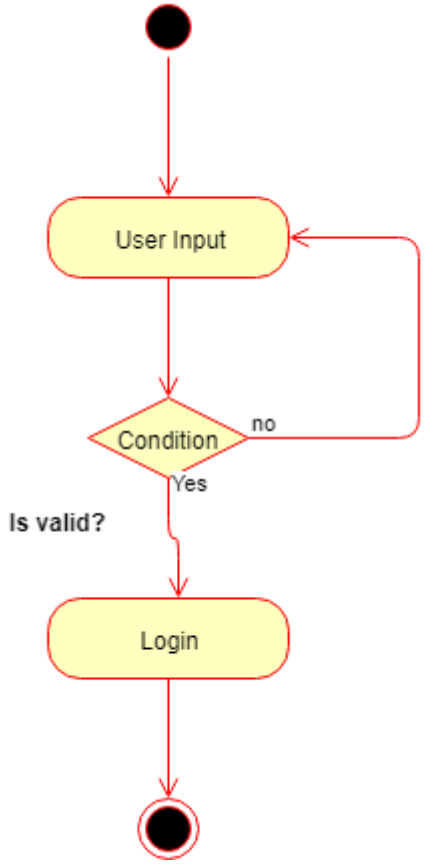


Application side:

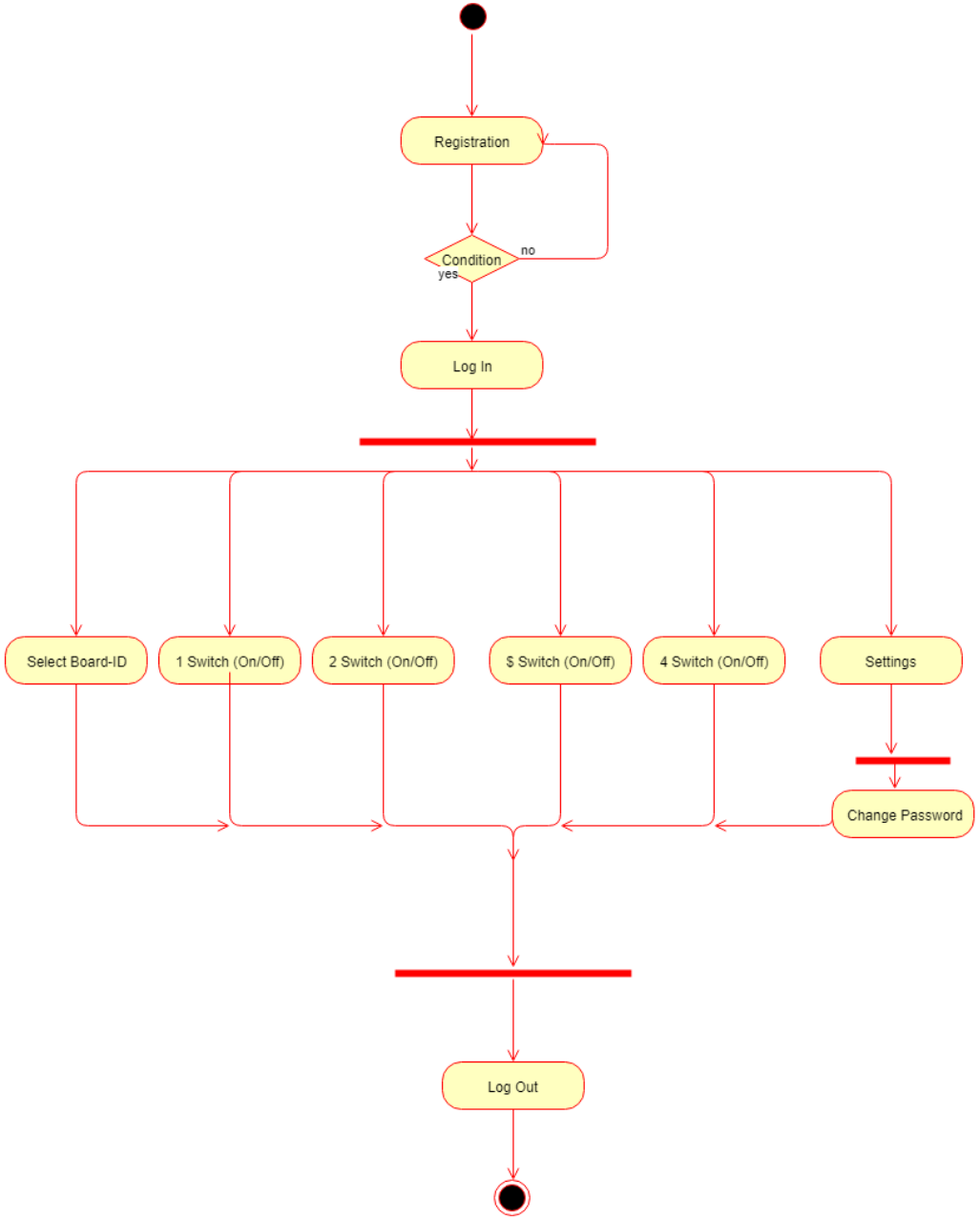
Registration



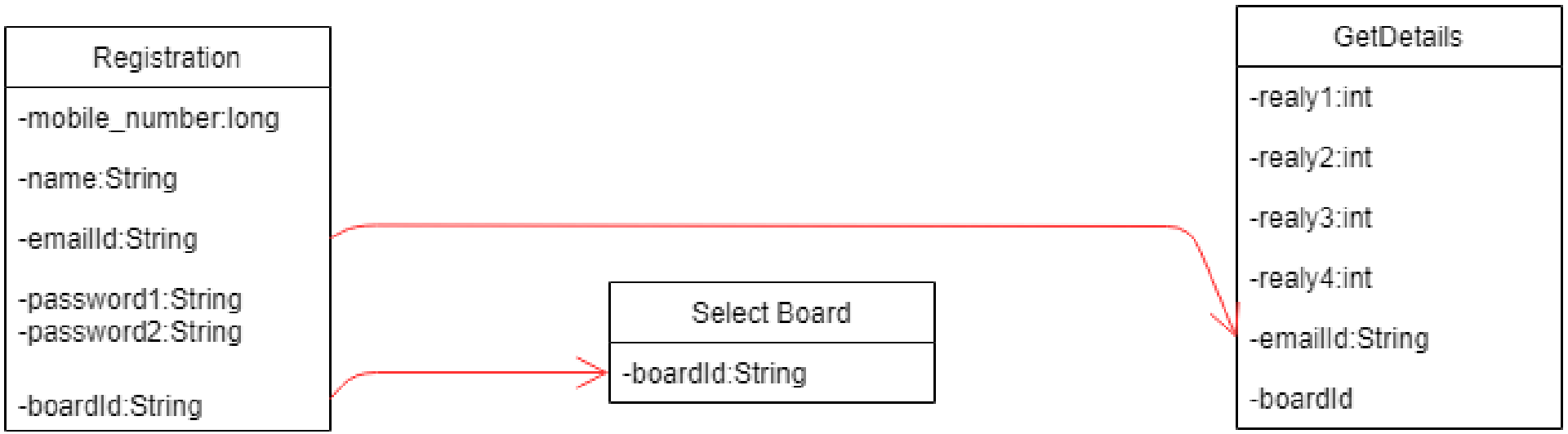
Login



AM Home Automation



Class Diagrams

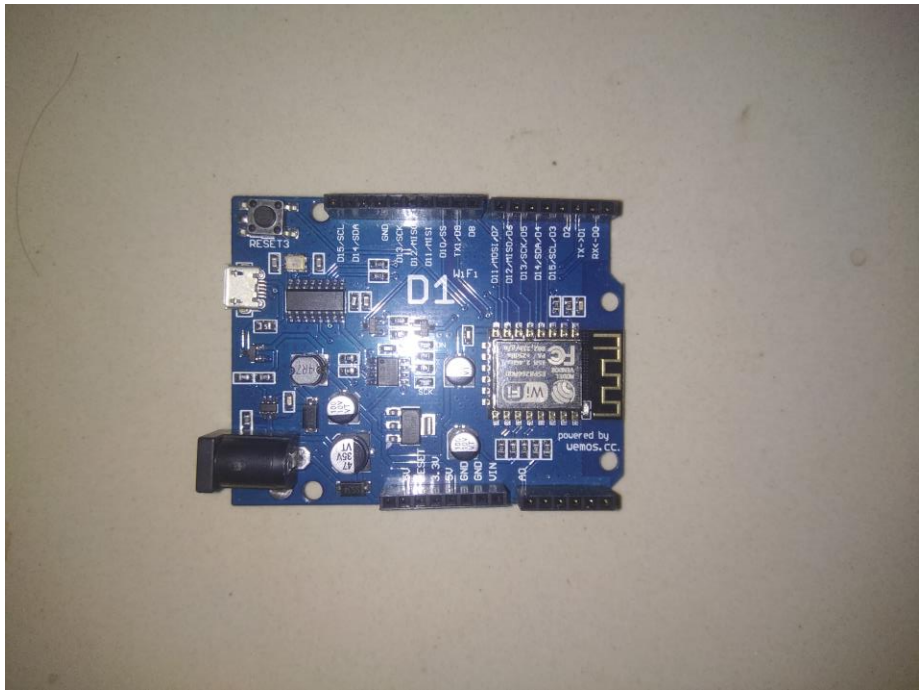

Registration
-mobile_number:long
-name:String
-emailId:String
-password1:String
-password2:String
-boardId:String
Select Board
-boardId:String
GetDetails
-realy1:int
-realy2:int
-realy3:int
-realy4:int
-emailId:String
-boardId

Data Dictionary

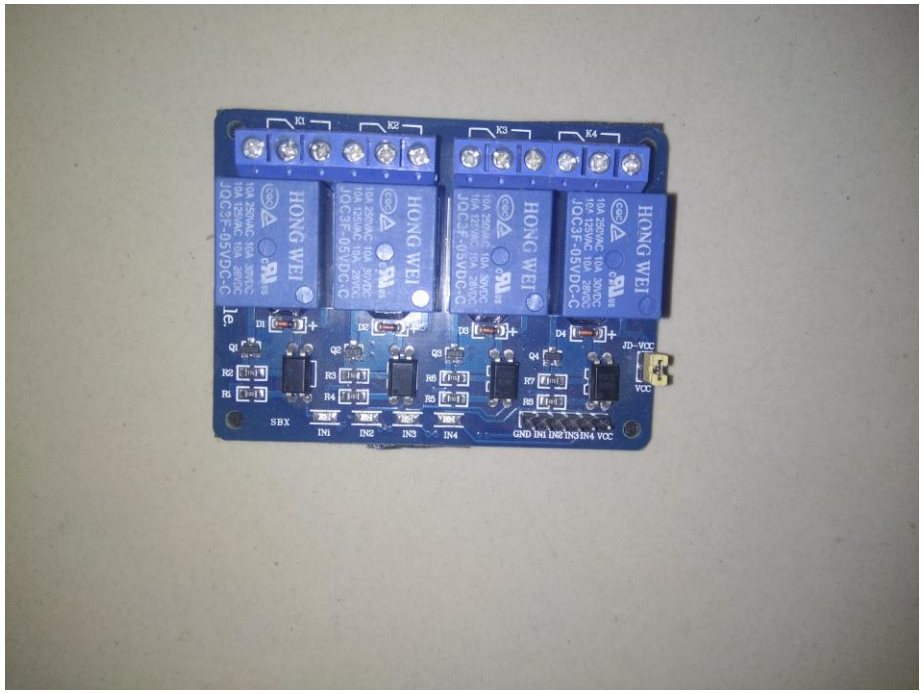
FieldName	DataType	FieldSize	Description	Example
Relay 1	Integer	1	Input/Output Relay 1	1
Relay 2	Integer	1	Input/Output Relay 2	1
Relay 3	Integer	1	Input/Output Relay 3	1
Relay 4	Integer	1	Input/Output Relay 4	1
EmailID	Varchar	20	Email Address of User	user@gmail.com
Name	Varchar	20	Name of User	Jones
PhoneNumber	Varchar	13	Phone Number of User	+91 9988776655

Representation of Modules
Hardware

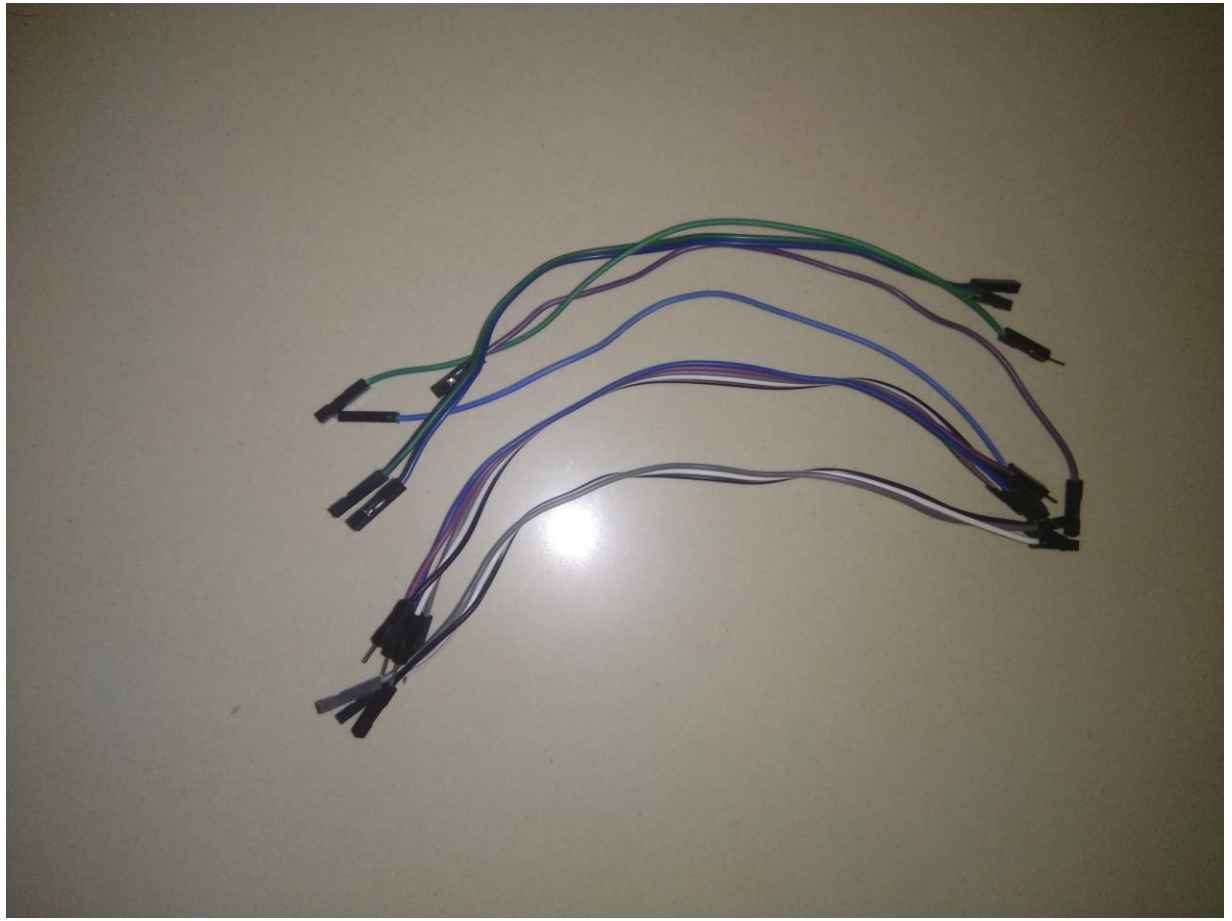
Arduino D1



4 Component Relay



Connecting wires

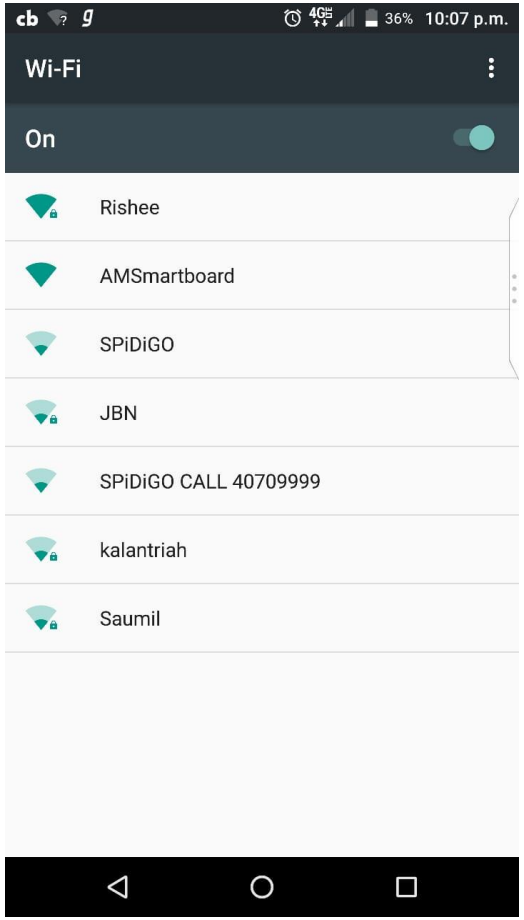


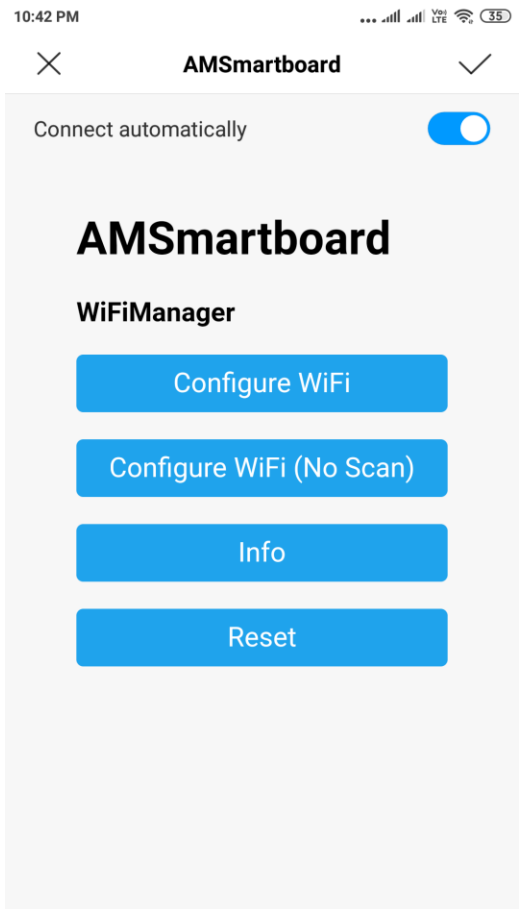
One Switch Board

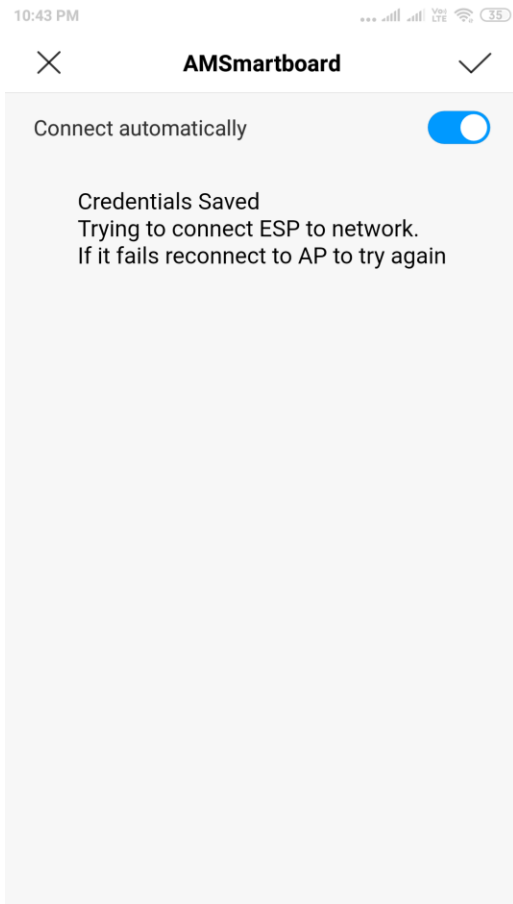
The final working model

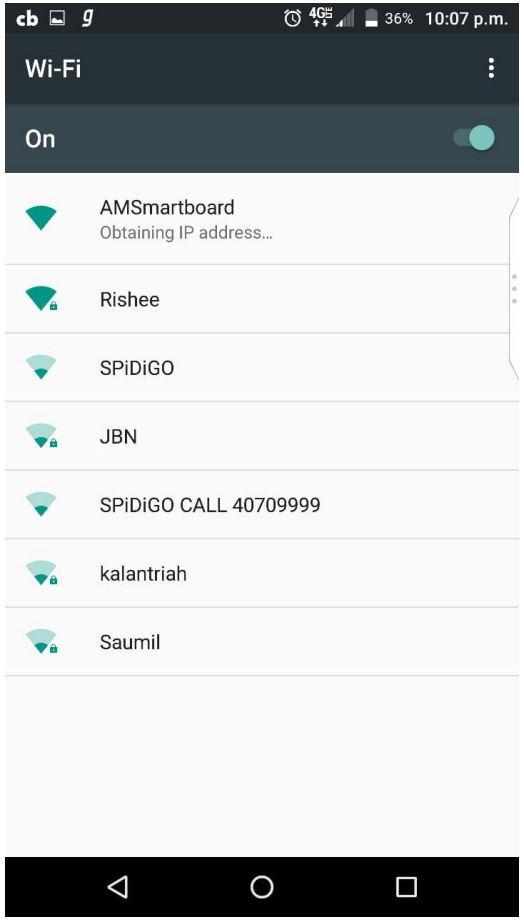
Representation of Modules
The Mobile App & WiFi

WiFi connection for the switch board



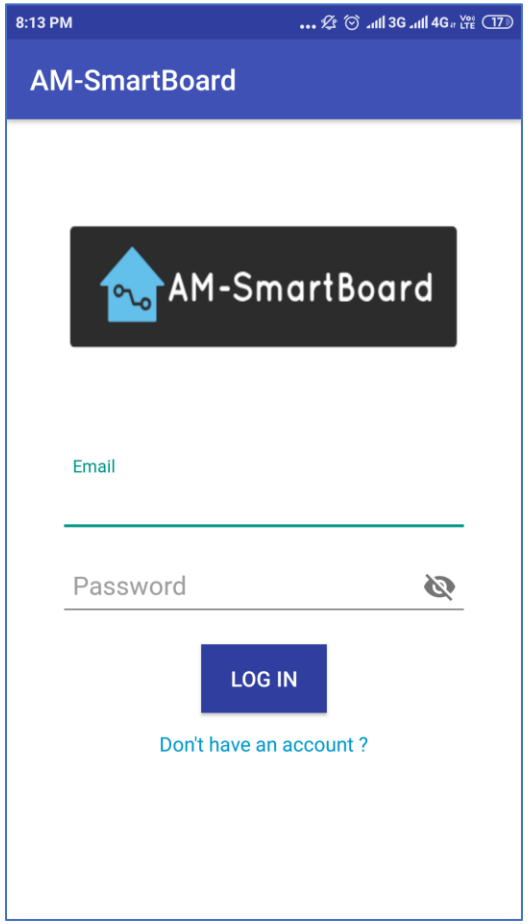

10:42 PM
AMSmartboard
Connect automatically
AMSmartboard
WiFiManager
Configure WiFi
Configure WiFi (No Scan)
Info
Reset


10:43 PM
AMSmartboard
Connect automatically
Credentials Saved
Trying to connect ESP to network.
If it fails reconnect to AP to try again

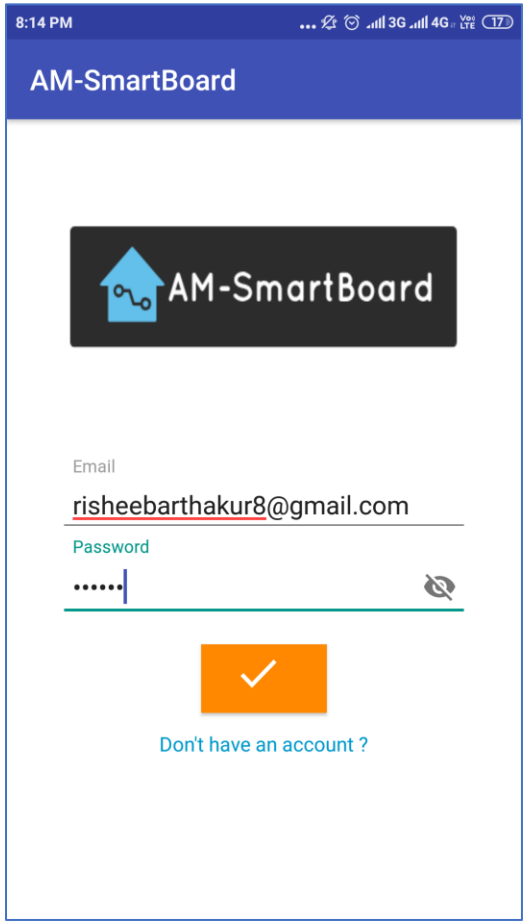

36% 10:07 p.m.
Wi-Fi
On
AMSmartboard
Obtaining IP address...
Rishee
SPiDiGO
JBN
SPiDiGO CALL 40709999
kalantriah
Saumil

Open the AM SmartBoard

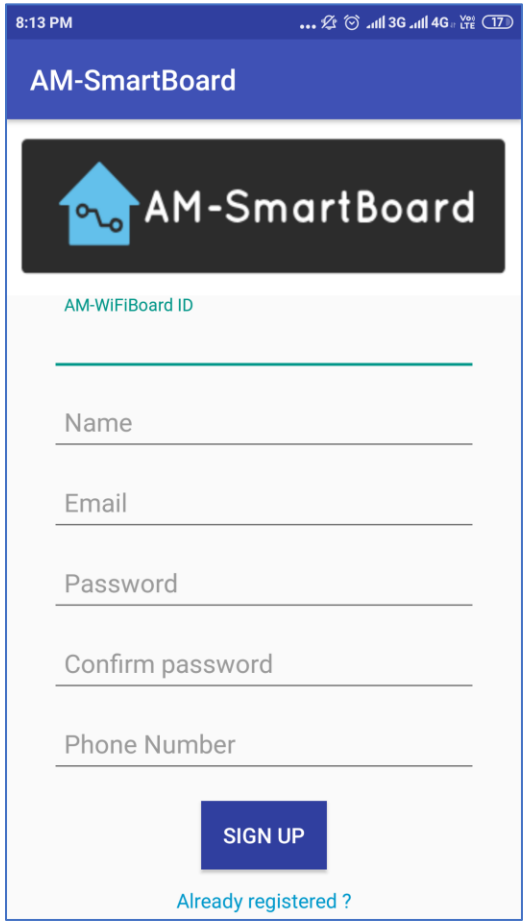
Login


8:13 PM
AM-SmartBoard
AM-SmartBoard
Email
Password
LOG IN
Don't have an account ?

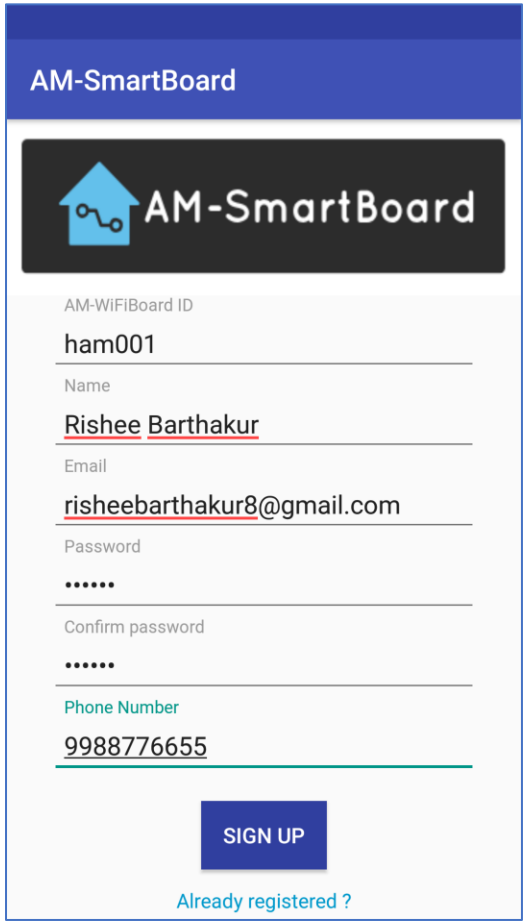
Login


8:14 PM
AM-SmartBoard
AM-SmartBoard
Email
risheebarthakur8@gmail.com
Password
Don't have an account ?

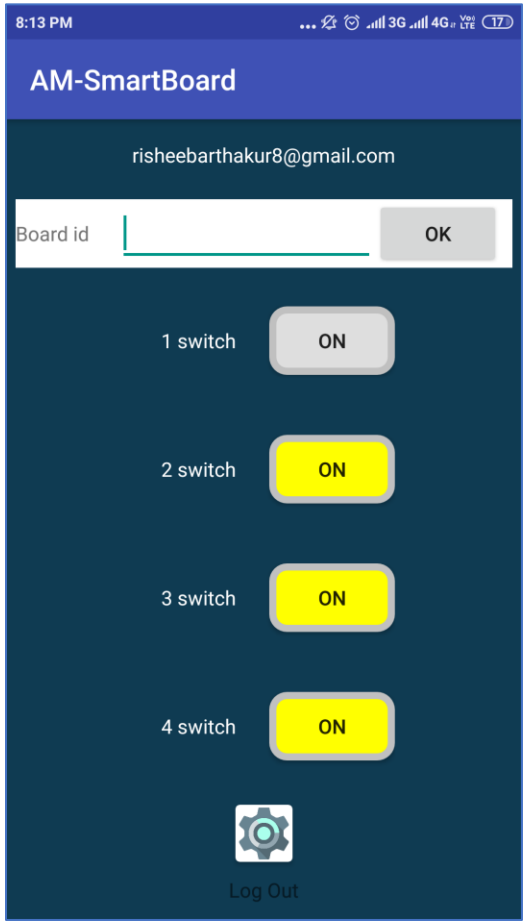
Registration



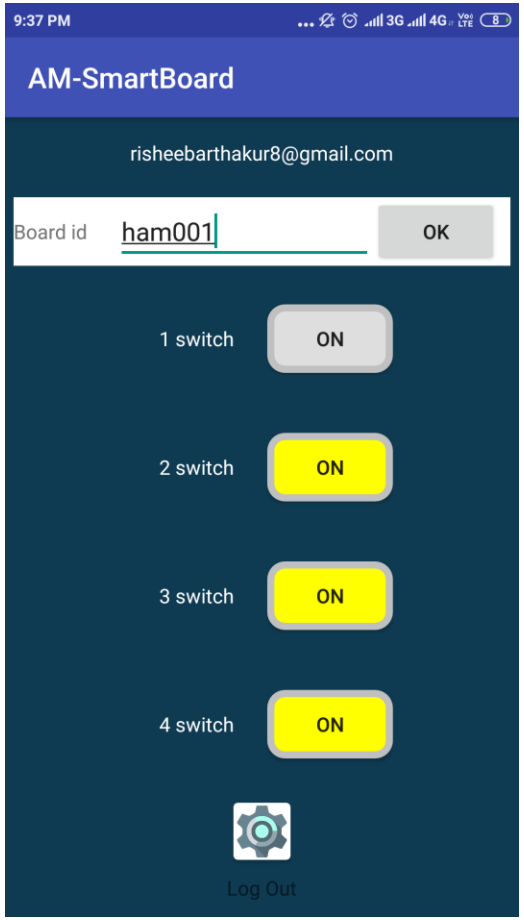
Registration



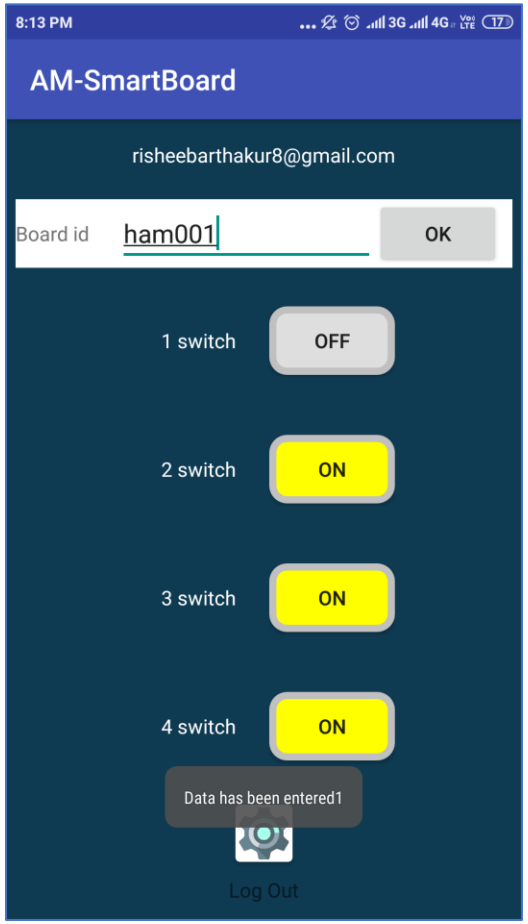
Dashboard


8:13 PM
AM-SmartBoard
risheebarthakur8@gmail.com
Board id
OK
1 switch
ON
2 switch
ON
3 switch
ON
4 switch
ON
Log Out

Dashboard


9:37 PM
AM-SmartBoard
risheebarthakur8@gmail.com
Board id
ham001
OK
1 switch
ON
2 switch
ON
3 switch
ON
4 switch
ON
Log Out

Dashboard


8:13 PM
AM-SmartBoard
risheebarthakur8@gmail.com
Board id
ham001
OK
1 switch
OFF
2 switch
ON
3 switch
ON
4 switch
ON
Data has been entered1
Log Out

Test Cases

For 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 Password :*****	User should be able to click on login	Same as expected result
3			User should be registered	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

For 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

For 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

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

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

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

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

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

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

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

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.

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.

Bibliography

- www.google.com
- www.stackoverflow.com
- www.arduino.cc
- www.developer.android.com