Project Title: Home Security System

Project Work-I

Subject Code: 18LEE509

Final Review

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Guide : Dr. A.Charles, AP/ECE

Year : ECE- 3rd year – 5th Sem

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Abstract:

Aim of the Project is to give the consumers, a 2nd layer of the security system for there home to safeguard there valuable things. This project provide us a two-factor authentication for our Home.

In this project we use the ESP8266 microcontroller to get the signal from phone through Wi-Fi and based on that instruction microcontroller decide to give instruction to the Servo Motor. The Servo motor is connected to the door lock. To Open the door, user need to install the app that we designed using MIT app inventor, then they need to connect to internet. Then they need to verify the fingerprint or Enter the password in the app, if the password entered is correct the app will send open() signal to the Microcontroller via Wi-Fi then ESP8266 give open signal to the servo motor to open the door.

The door opened or closed information is get by the button mechanism and the information is stored in MIT app inventor CLOUDDB with the time. Vibration Sensor connected to ESP8266 to sense, is some one break the door and send the information to app. User can able to get when door opened information from cloudDB in app.

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INTRODUCTION

Home is the place where we live, kept our valuable things, it has our loved ones and it is the part of us in our daily life. But the security for the home is less now a days. We need a security system for our Home to safe our things. To avoid this, we are introducing a project called Home Security System

This Home Security System is compact box which will be attached to the door and connected to the door lock. If the someone wants to open the door lock to get into the home, they first need to verify their identity by scanning their finger on their phone under the app that we created.

Suppose if the phone does not have the finger print sensor, then they need to enter the password to open the door lock. If the identity is matched then the app will send open signal with RFID to the home security system. Then the system checks the RFID and it will open the door lock. This acts as a two-factor authentication for our home.

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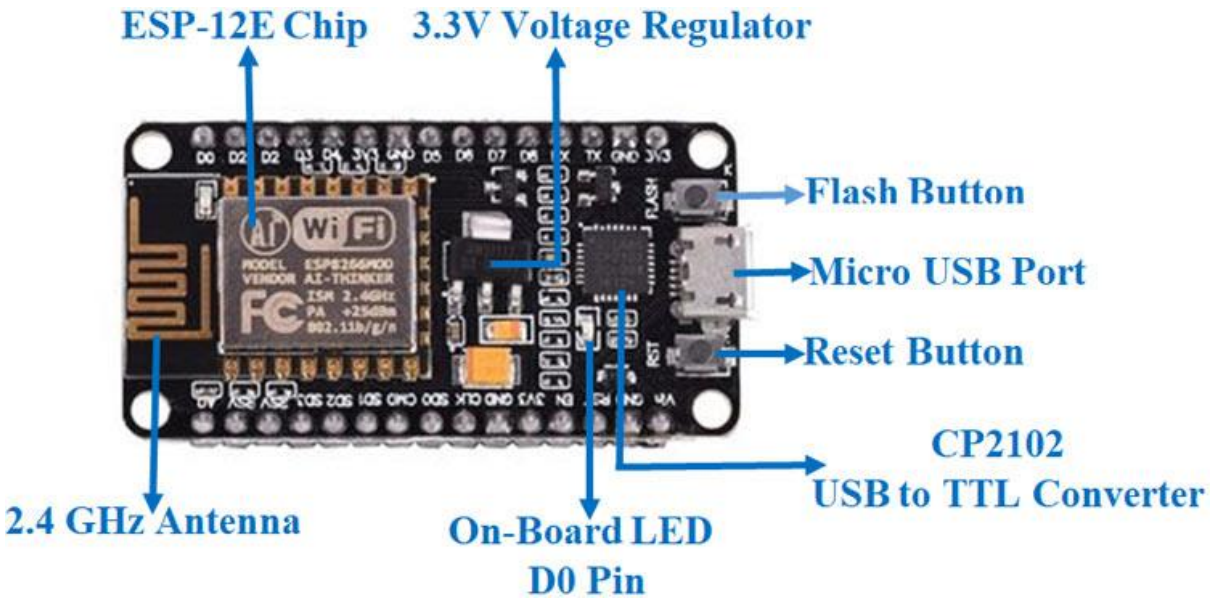
Components & Tools:

- ✓ ESP8266 Microcontroller(NodeMCU) + Wi-Fi Module
- ✓ Switch
- ✓ Servo Motor
- ✓ Door lock
- ✓ Vibrating Sensor SW-420
- ✓ ThingSpeak.com
- ✓ MIT App Inventor
- ✓ Power Source
- ✓ Android Phone

NodeMCU

NodeMCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.



Servo Motor

A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.

Servomotors are not a specific class of motor, although the term *servomotor* is often used to refer to a motor suitable for use in a closed-loop control system.

Servomotors are used in applications such as robotics, CNC machinery or automated manufacturing

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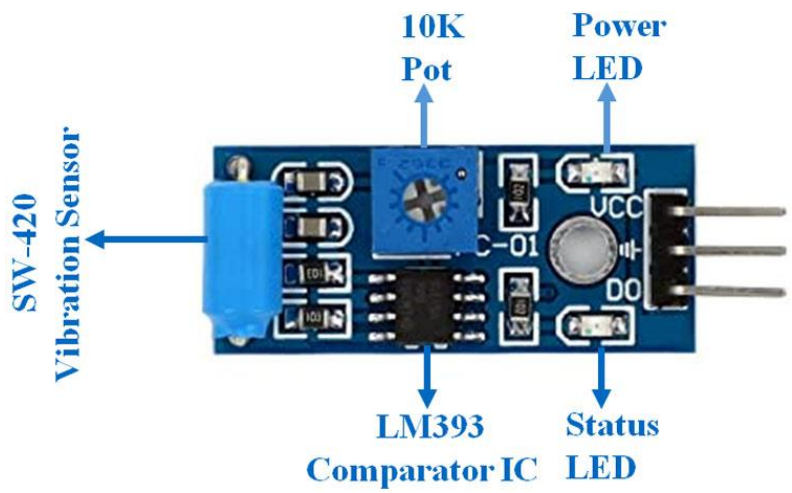
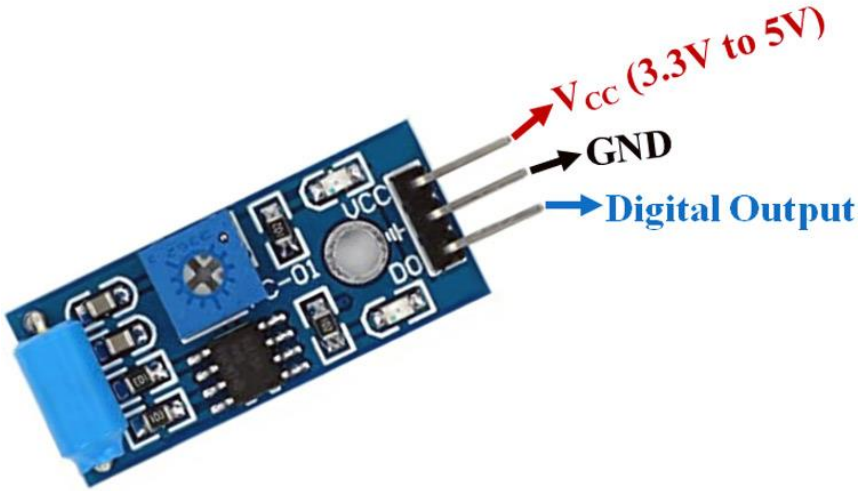
Door Lock Mechanism

Door lock is used to lock the door by the use of the servo motor. NodeMCU sends the signal to the servo if the identity is verified. Servo motor can also be used to close the door lock.

Vibration Sensor

The vibration sensor module based on the vibration sensor SW-420 and Comparator LM393 is used to detect vibrations. The threshold can adjust using an on-board potentiometer. During no vibration, the sensor provides Logic Low and when the vibration is detected, the sensor provides Logic High.





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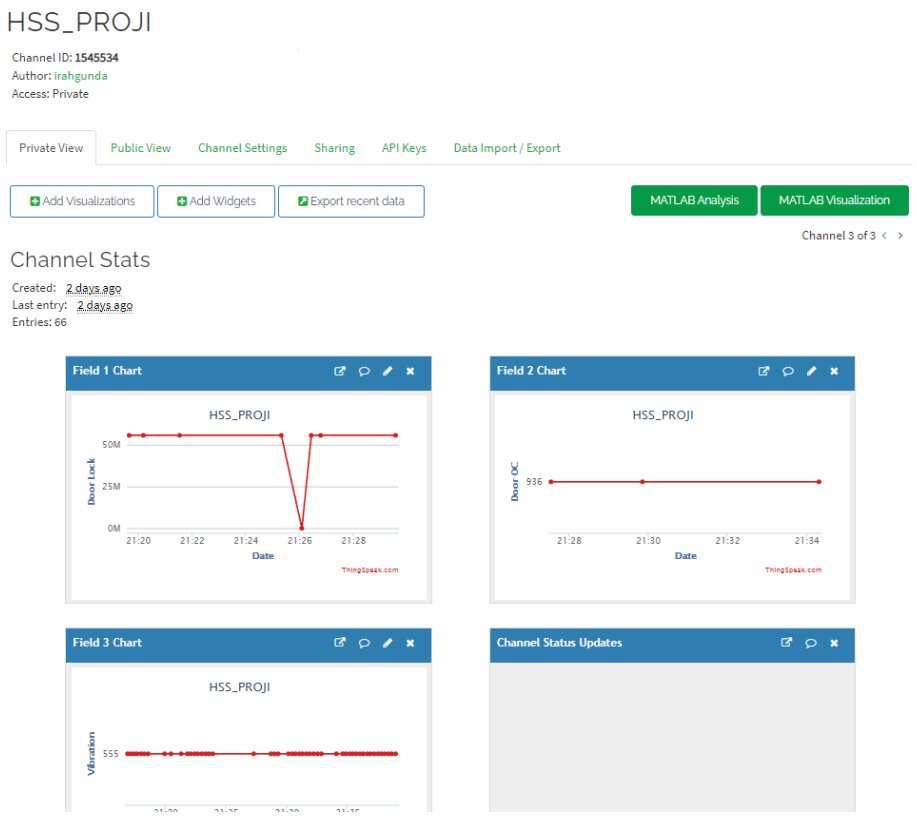
ThingSpeak

ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud. You can send data to ThingSpeak from your devices, create instant visualization of live data, and send alerts.



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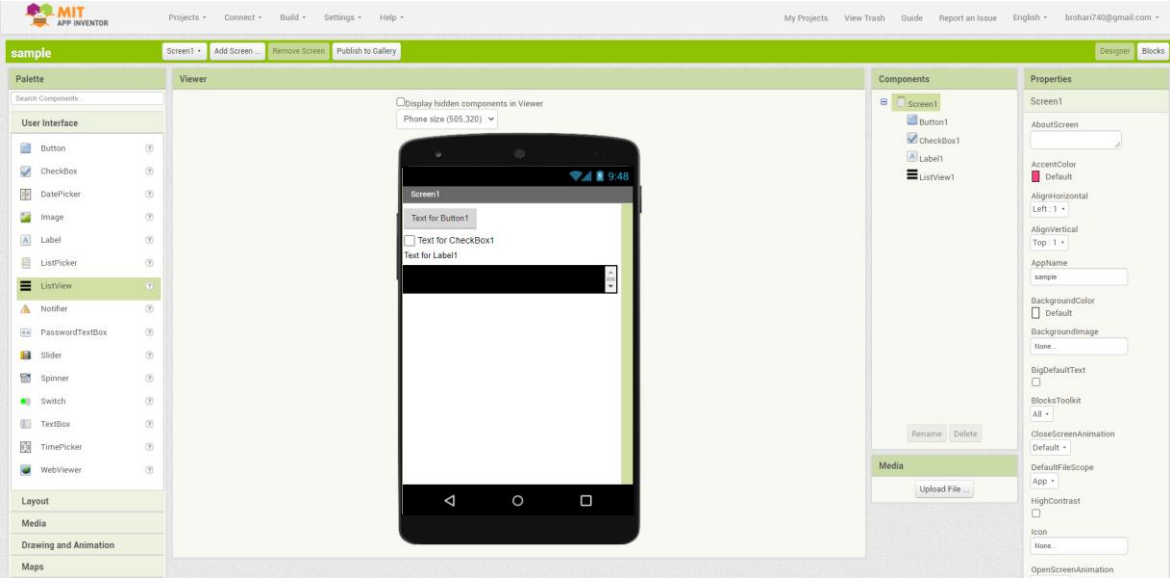
MIT app Inventor

MIT App Inventor is a web application integrated development environment originally provided by Google, and now maintained by the Massachusetts Institute of Technology (MIT). It allows newcomers to computer programming to create application software(apps) for two operating systems (OS): Android, and iOS, which, as of 8 July 2019, is in final beta testing. It is free and open-source software released under dual licensing: a Creative Commons Attribution ShareAlike 3.0 Unported license, and an Apache License 2.0 for the source code.



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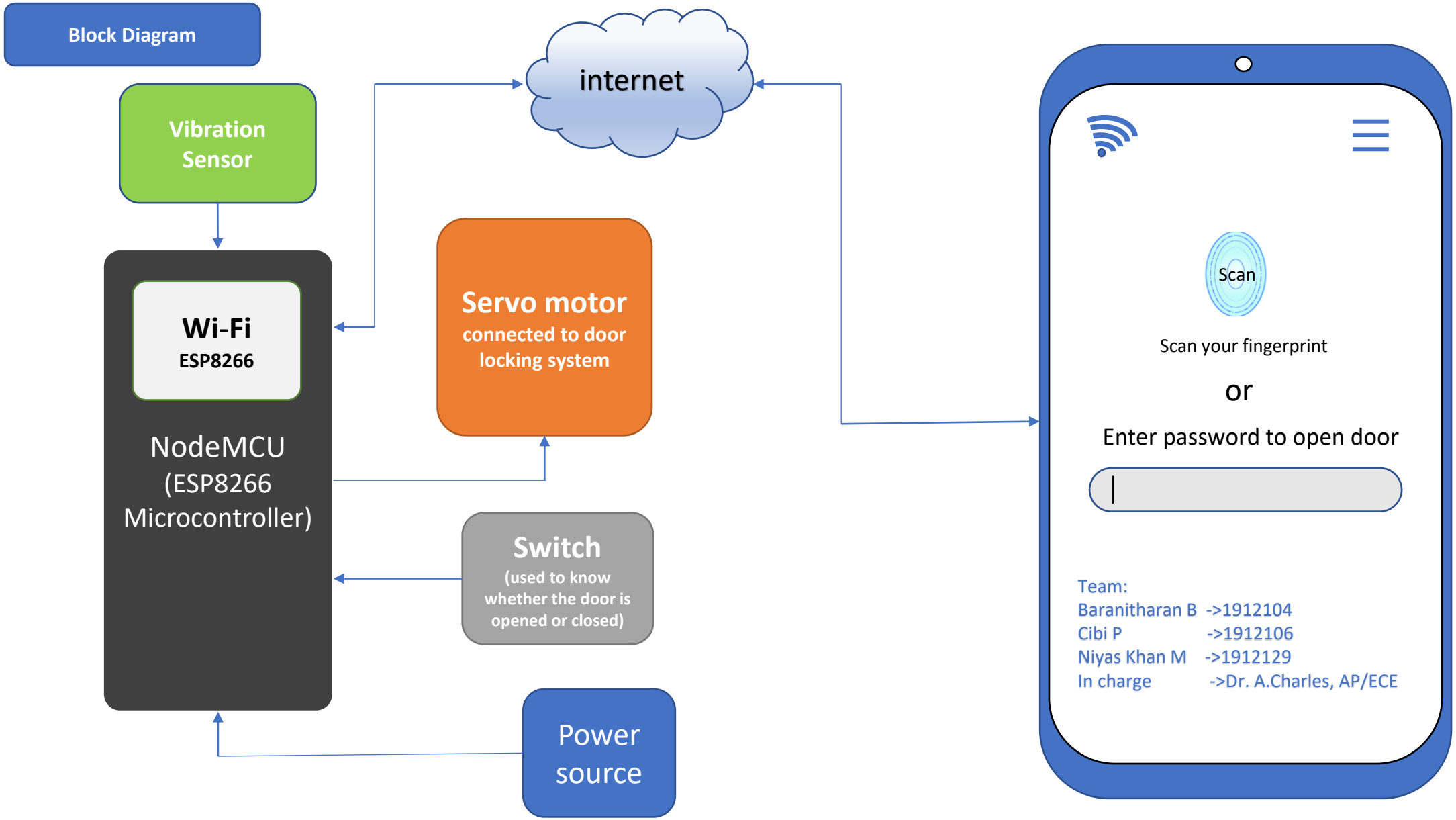

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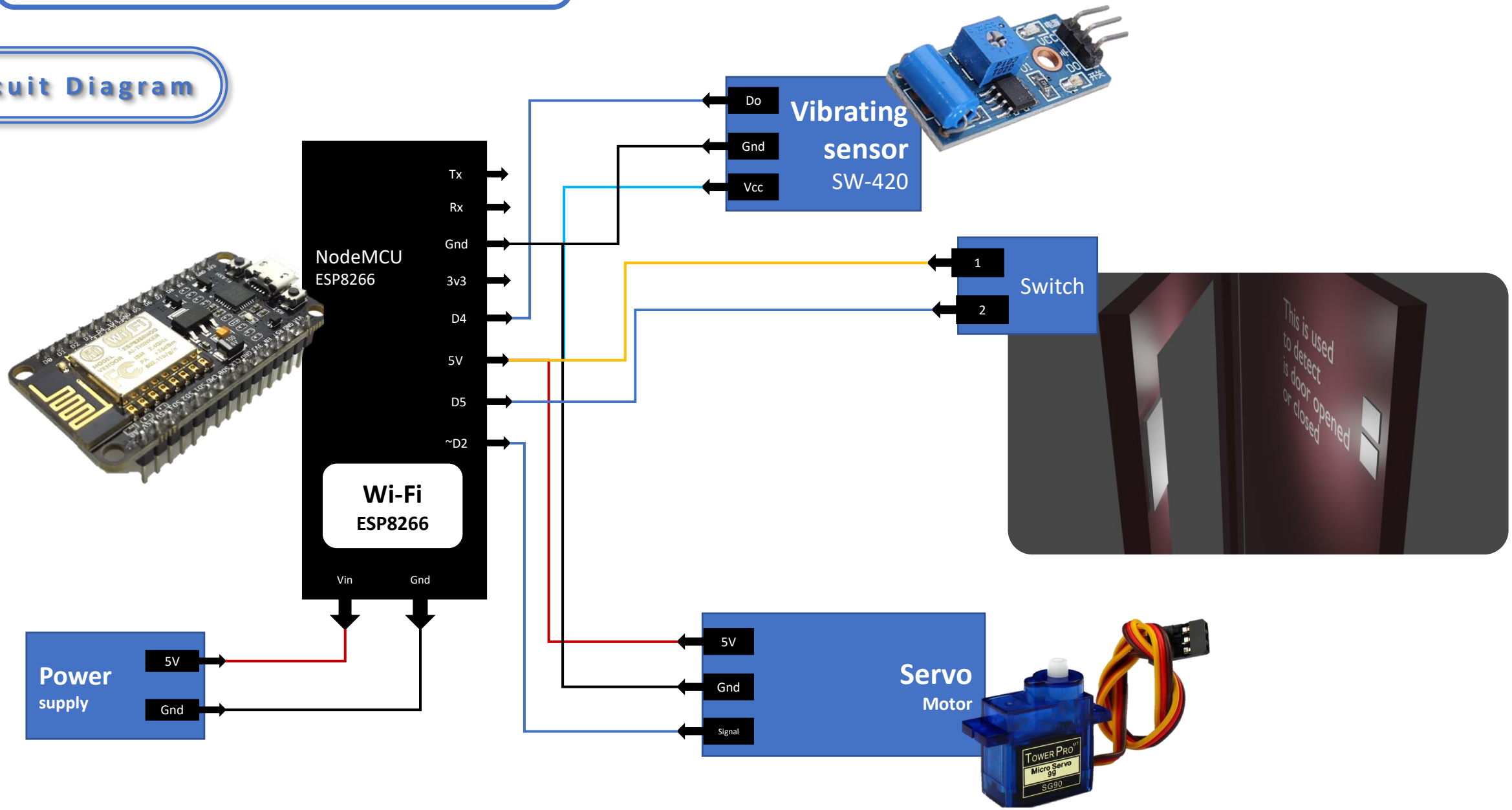
Circuit Diagram



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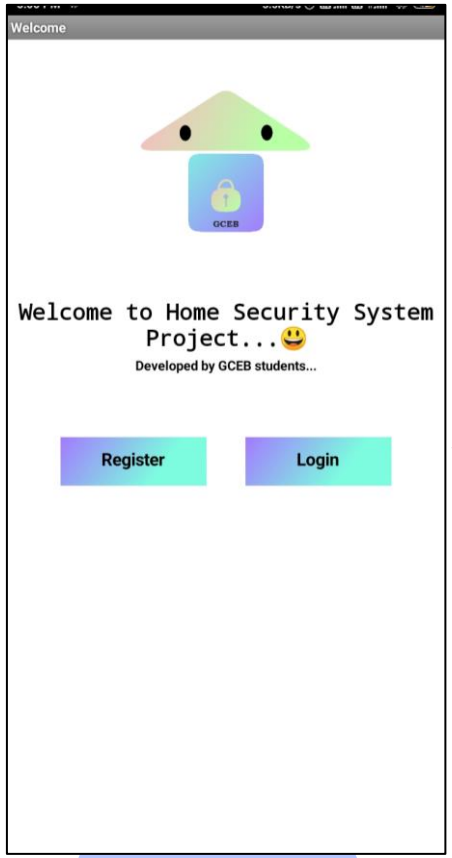
APP made with MIT app inventor



Welcome Page

It is the Welcome Page With give the Register of Login Option to user. User can Perform the Respective action by Pressing the Respective Button

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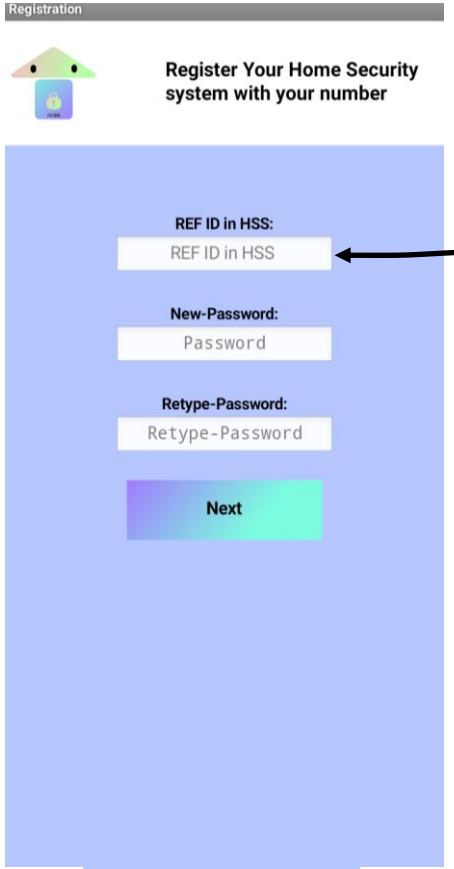
APP made with MIT app inventor



Registration Page

Need to enter the unique RFID and password to register

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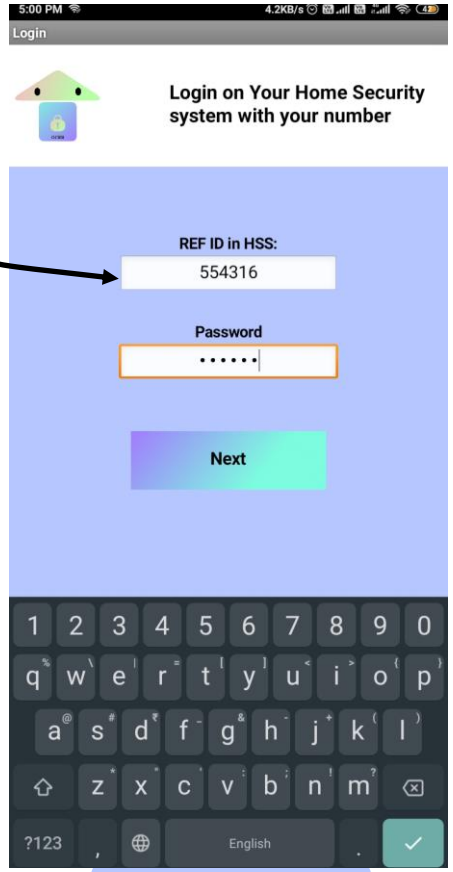
Need to enter the unique RFID and password to login



Login Page

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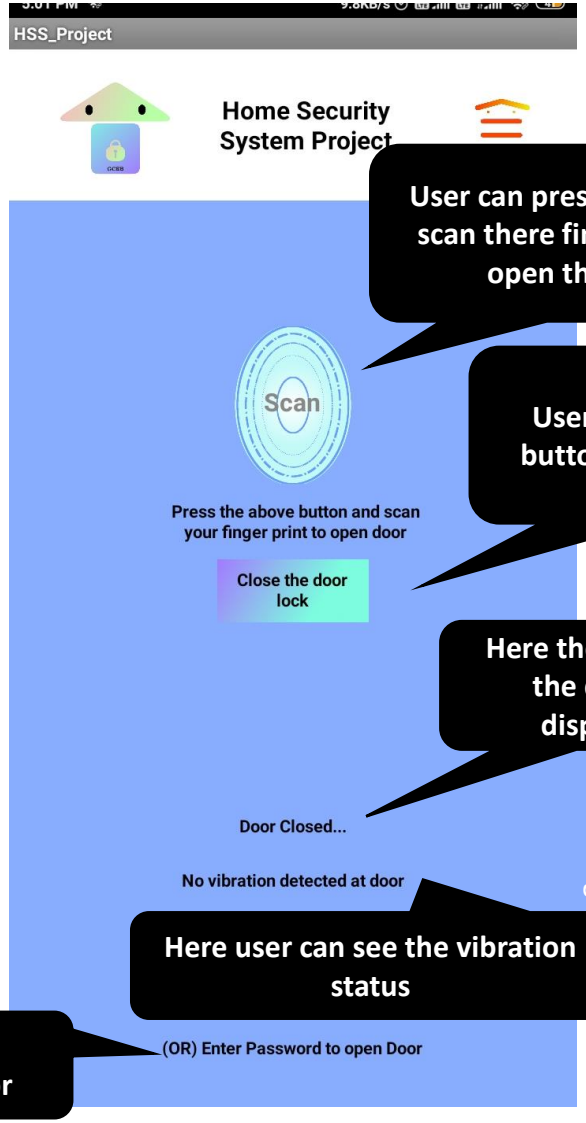

User can press this button scan there finger print to open the door

User need to press the button to close the door

Here the status of the door is displayed

Here user can see the vibration status

Here user can also use password to open the door

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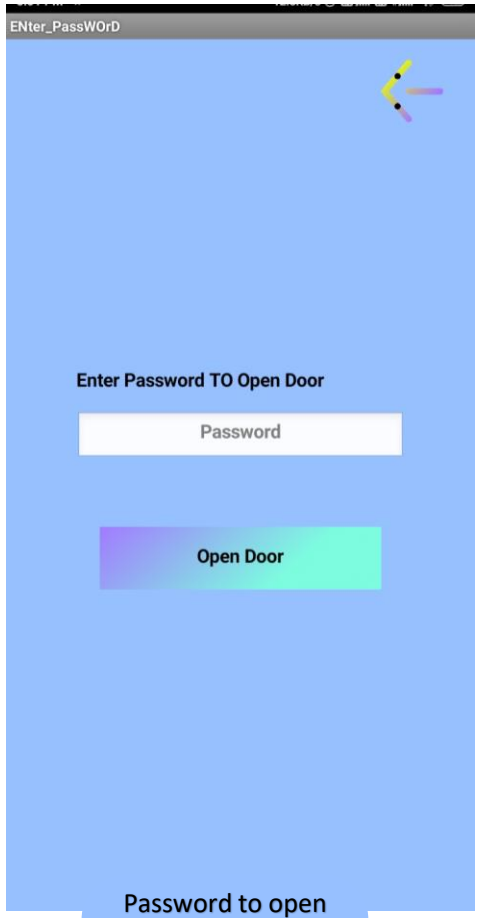
APP made with MIT app inventor

User need to Enter the password and press the Open Door button to open the door



Password to open Door page

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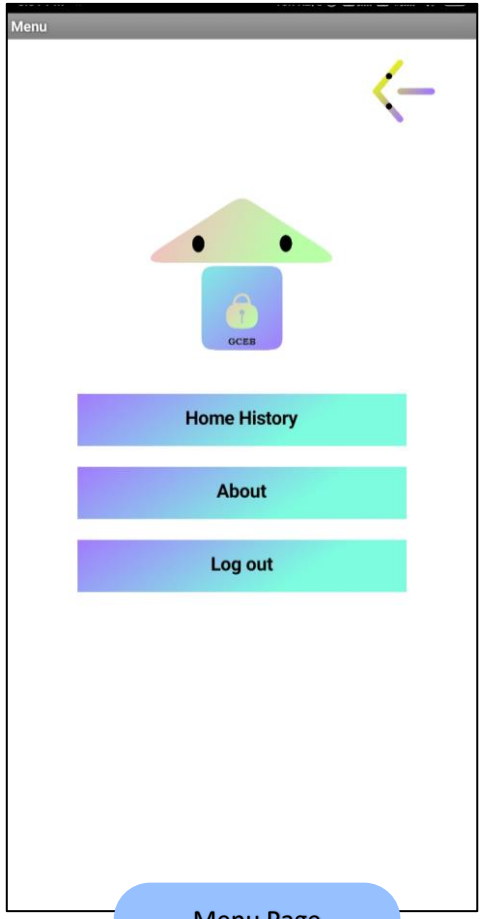
APP made with MIT app inventor



Menu Page

Menu Page, it Consist of option of Home History, About, Logout (to Logout from the app)

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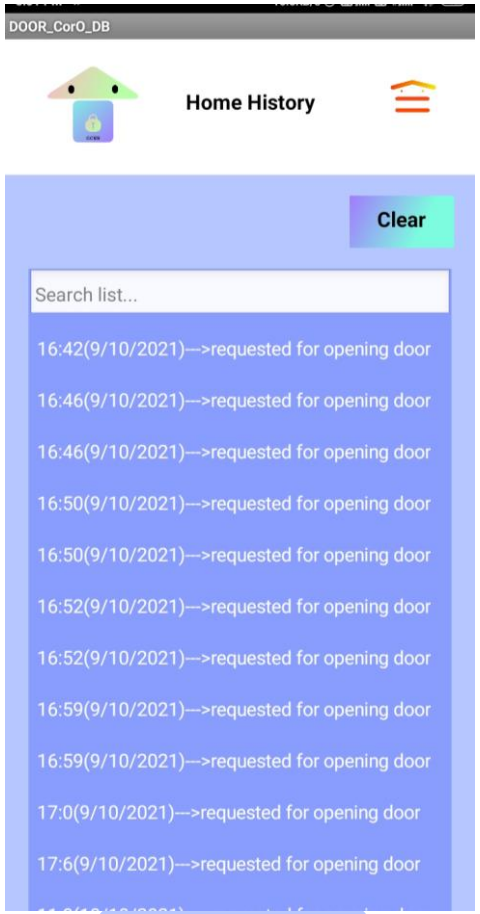
Here User can able to know when the door is closed or opened, when vibration detected



Door open close timing Page

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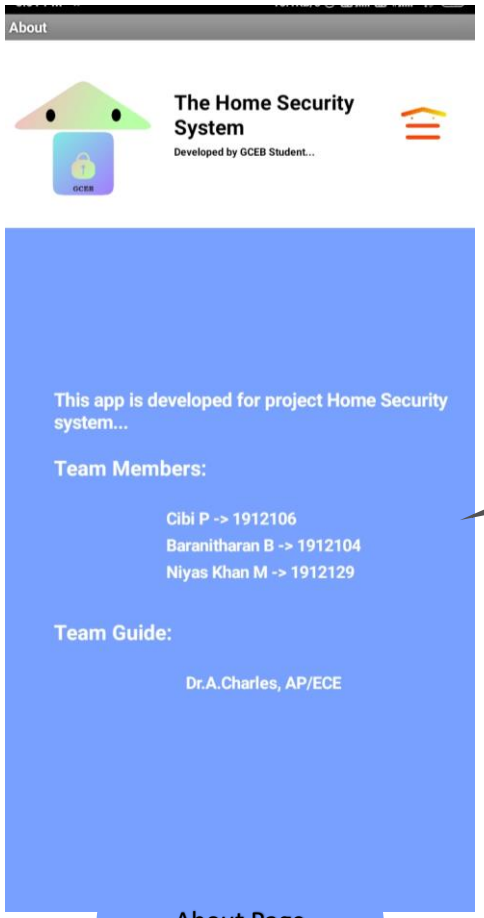

About Page

This is the about Page.

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Application

1) It is used to secure our home from thief.
2) It provide us the second layer of the security.
3) If someone try to destroy the door, the system will send vibration detected message to the app so the user can the necessary action wherever the user in the internet.
4) From the app we know that the door is closed or open.

It can also be used in lockers.

Limitation

1) It is hard to change the ssid and password which is programed inside the NodeMCU.

2) We need to maintain the API key Safe, using the API key other person can able to open the door lock.

3) To receive those notification the app needs to be open on the android phone.

Future Scope

1) We can use the EEPROM in NodeMCU to store the ssid, password, and we can use the ESP8266WebServer.h library to create the local server webpage from that page user can easily change the ssid and password

2) In app we can add change password page.

3) We can add camera and mic to see and hear what happening on the door at any time.

Conclusion

The Home Security System does not allow unauthorised person to open the door and it also measure the vibration at the door when someone tries to destroy the door. It stores when the door is opened and closed in the app which can be viewed later in app. So, it can be used to save our home, valuable things. If someone tries to destroy the door the app will notify us we can take the necessary action such as inform police or to inform neighbours to save our home. So, this provides security to our Home.

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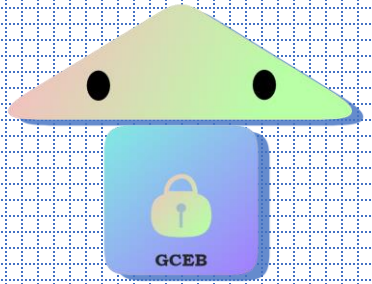
https://youtu.be/yfJINygZmM



Thanking You