Mini Project CS225/CS226 Part 2:-
Android Controlled Door Latch System

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Aim:-

To make a door latch system that can be controlled with the help of an Android Application and firebase realtime database.

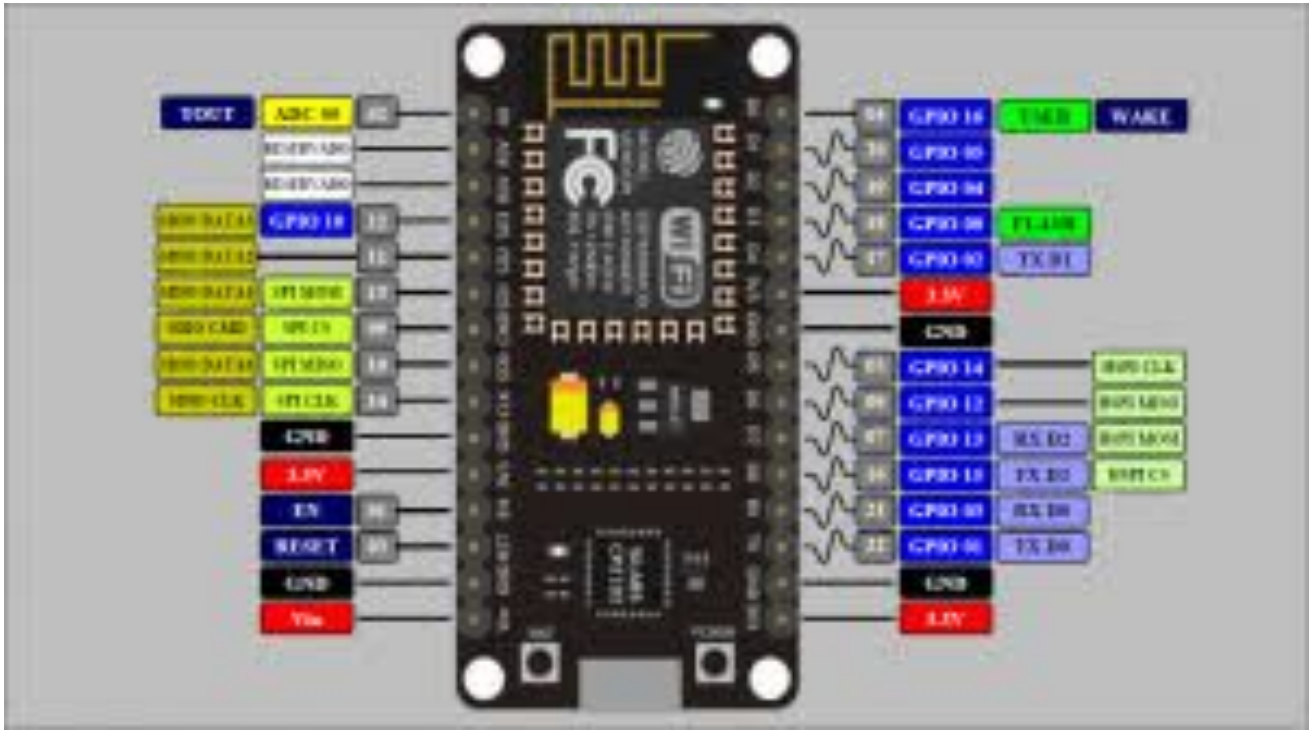
Technological Stack Used

- Android Development (Java and XML)
- C++ for NodeMCU programming
- Firebase Database Management
- Hardware Knowledge for using solenoid, reed switch, realy, etc
- Basic knowledge of networking protocols, HTTP and HTTPS for interfacing the Wifi Module of NodeMCU

Materials Required

1. NodeMCU
2. Jumpers
3. Breadboard
4. Power Supply 12V and 5V both
5. Reed Switch
6. Magnets (we used Neodymium Magnets)
7. Solenoid Latch
8. Relay Module
9. USB to Micro USB cable
10. Multimeter (not necessary but it was handy to quickly check some connections)

NodeMCU


GPIO 16
GPIO 14
GPIO 12
GPIO 13
GPIO 15
GND
3.3V
EN
RESET
GND
WAKE

Reed Switch

Relay

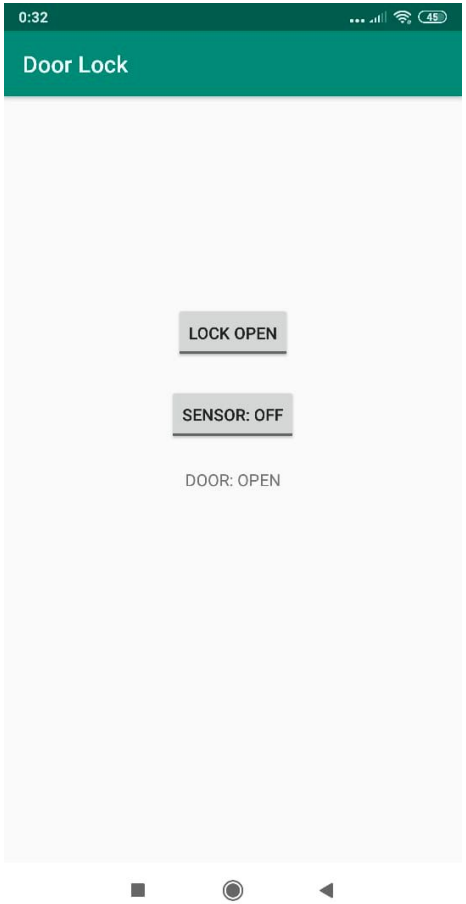
Solenoid Latch

Features

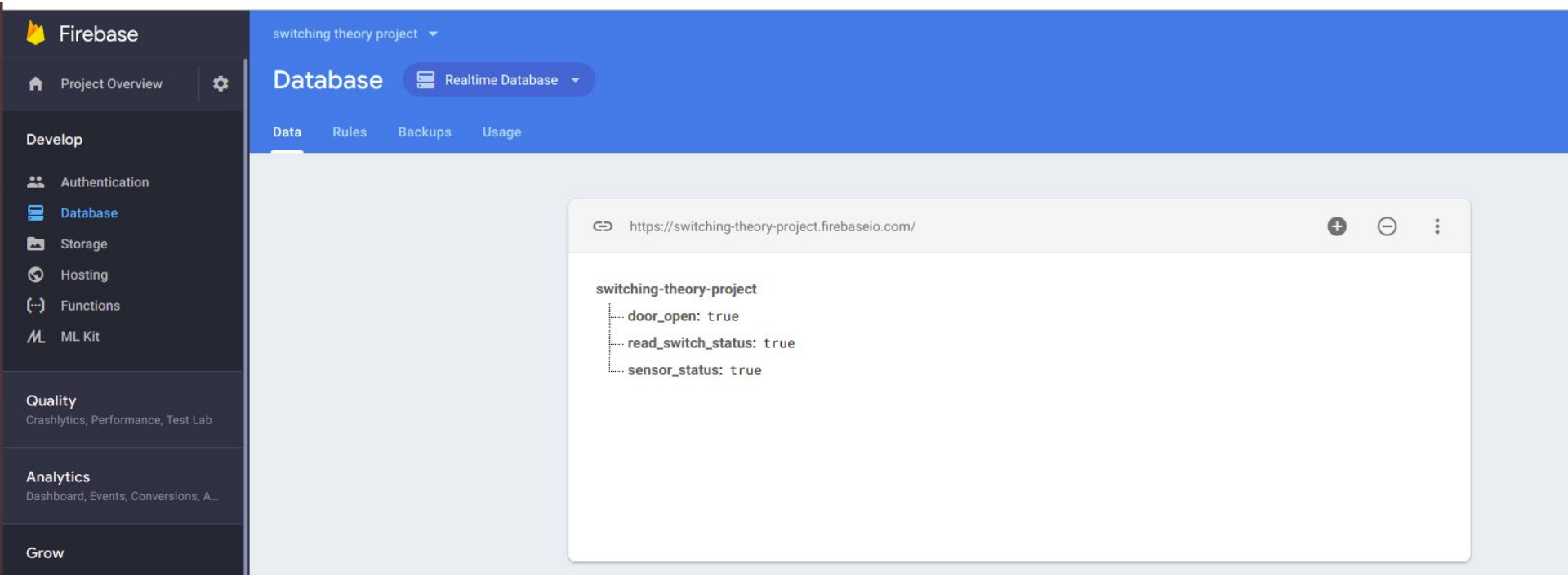
- Sends real time notification whenever door is opened in form of a door alert.
- Can automatically open or close a solenoid latch just by click of a button in android app.
- Fast response due to realtime firebase database.
- User gets real time status of the door from anywhere using the android application.

Android App

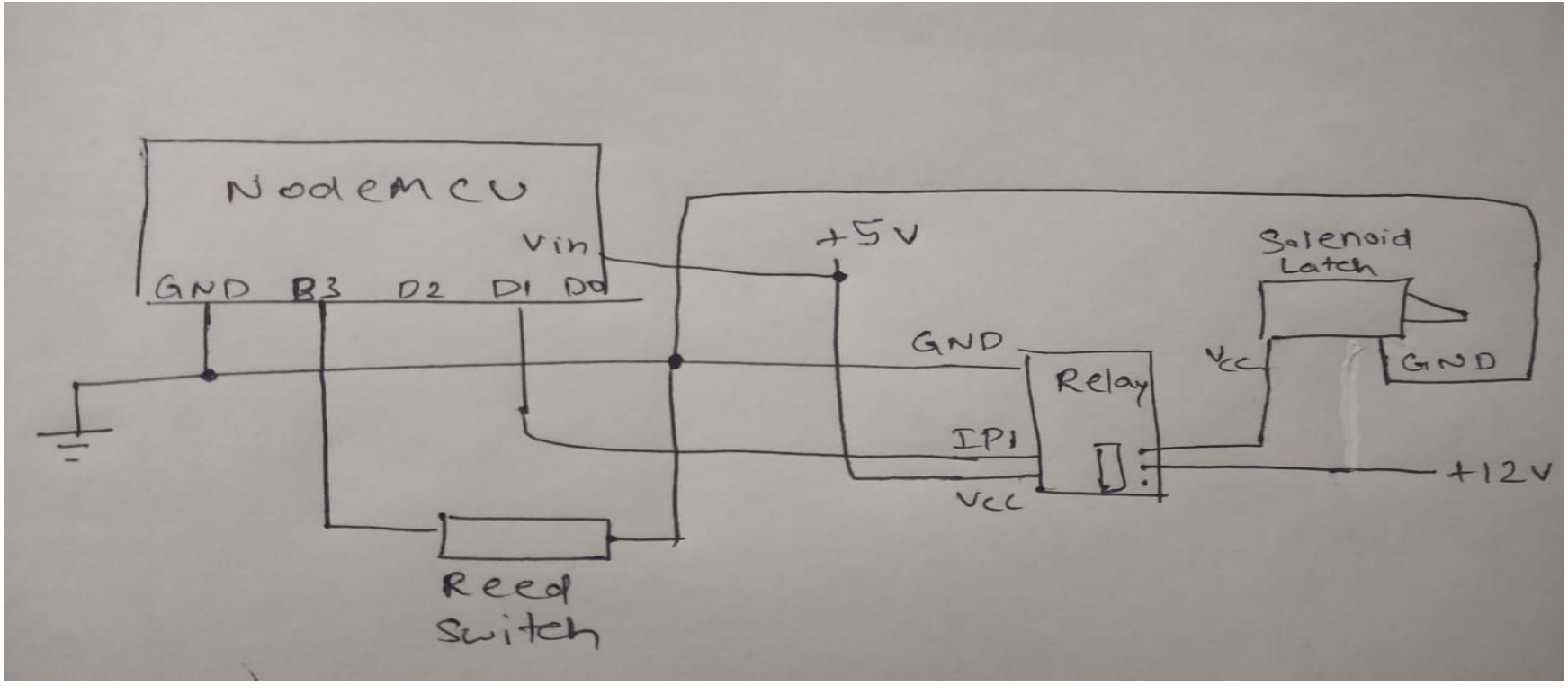
- Made in Java and XML.
- Uses Firebase Backend.
- Supports real time notification system.
- Acts as control panel as well as notification panel for the hardware system.



Realtime Firebase Database



Circuit


NodeMCU
Vin
GND
D3
D2
D1
D0
+5V
Solenoid
Latch
GND
Relay
Vcc
GND
IP1
+12V
Vcc
Reed
Switch

Learnings

- Working of NodeMCU and ESP8266 WiFi Module
- How to connect Firebase Realtime Database with any device that doesn’t have a inbuilt firebase support.
- Basic difference between HTTP and HTTPS.
- Security vulnerabilities of Firebase.
- Working of relay and some minor differences between the old and the new relay.
- Working of reed switch.
- Working of solenoid latch and valves.

Video Demonstration

https://photos.app.goo.gl/hEPyhypCswqNZAh7A