CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

CMPICA
SMT. CHANDABEN MOHANBHAI PATEL INSTITUTE OF COMPUTER APPLICATIONS

Smart Door Lock System

Guide By
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Proposed System

Defination:

- Though the rate of success is less in terms of functionalities and people are still in hope that there will be door lock with all functionalities in a single lock. In our door lock, we simply tried to control it with Wifi via device (Cell Phone).

COUNTINUE...

Objective:

- The aim is to develop a secure IoT-based smart door lock system using RFID, fingerprint recognition, and a Flutter app with MQTT for remote access. The system ensures enhanced security through multi-factor authentication, real-time monitoring, and remote control. It provides a user-friendly interface for managing access permissions and tracking activity logs. The design emphasizes scalability, low power consumption, and secure data handling for reliable performance.

COUNTINUE...

Scope:

- To be frank with the scope of our system, it is a door lock that has a functionality that is, it can be connected with Wifi and easily controlled. This project can help in several unique way and dealing several day-to-day tasks.

Technologies used

FRONT END: Flutter, Embedded C

BACK END: Dart, MQTT

TOOLS USED: Arduino IDE, Android Studio

DATABASE: Firebase

FRONT END: FLUTTER

- Flutter is a mobile app development platform created by Google .
- It is used to develop cross-platform applications for Android, iOS, Linux, macOS, Windows, and the web from a single codebase .
- One of the benefits of using Flutter is that you can modify or customize widgets with ease.

BACK END: DART , FIREBASE

Dart is an open-source, client-optimized programming language developed by Google, primarily used with Flutter for building cross-platform apps. It supports both ahead-of-time (AOT) and just-in-time (JIT) compilation for high performance and quick development cycles. With a syntax similar to Java and JavaScript, Dart is easy to learn and features null safety for reliable code. It includes robust libraries and tools for UI, networking, and file handling. Dart is versatile, running on web browsers, mobile devices, and command-line interfaces.

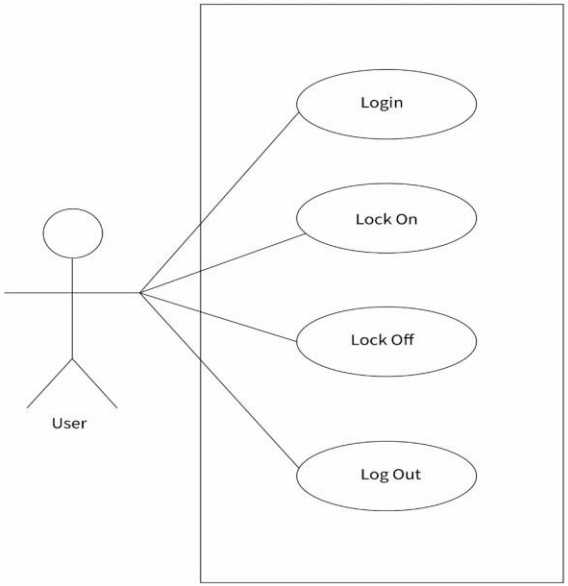
FIREBASE

- Firebase is a backend-as-a-service platform by Google that provides tools for building and managing web and mobile apps. It includes real-time databases (Realtime Database and Firestore), authentication services, and cloud storage. Firebase simplifies app development with cross-platform support and integration with tools like Flutter. It ensures data synchronization in real time, even offline, and offers robust security through customizable rules. Its scalability and ease of use make it ideal for modern applications.

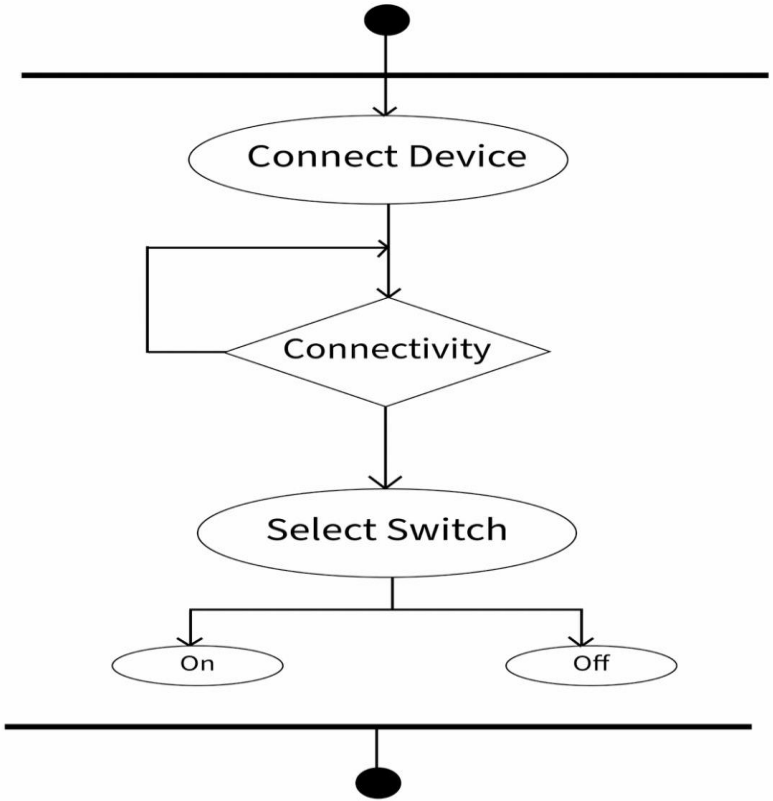
MQTT

- MQTT (Message Queuing Telemetry Transport) is a lightweight messaging protocol designed for IoT applications and low-bandwidth networks. It uses a publish-subscribe model where devices communicate through a central broker, enabling efficient and decoupled communication. MQTT supports three Quality of Service (QoS) levels, ensuring reliable message delivery. Its lightweight design minimizes resource usage, making it ideal for microcontrollers and real-time IoT devices. Security is ensured with TLS/SSL encryption and authentication mechanisms.

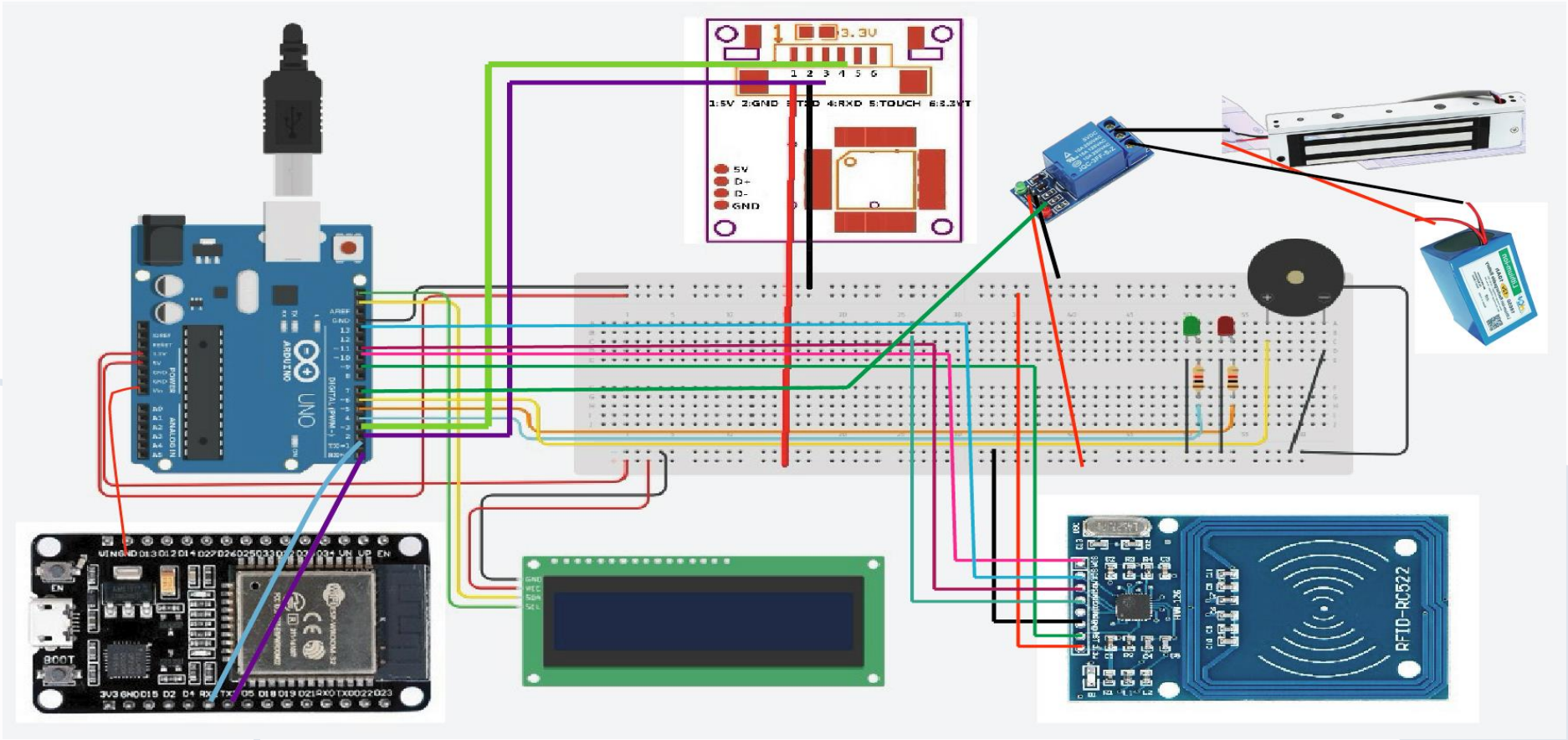
Use-case



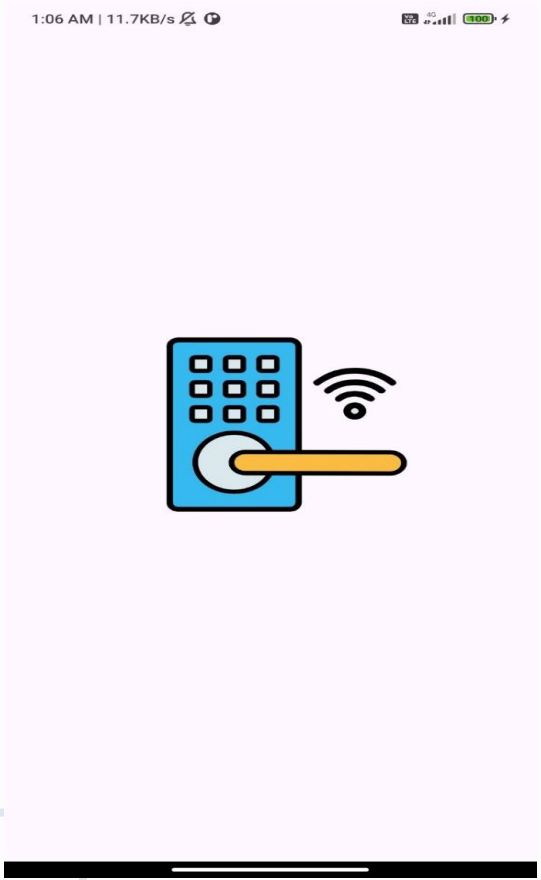
Activity Diagram

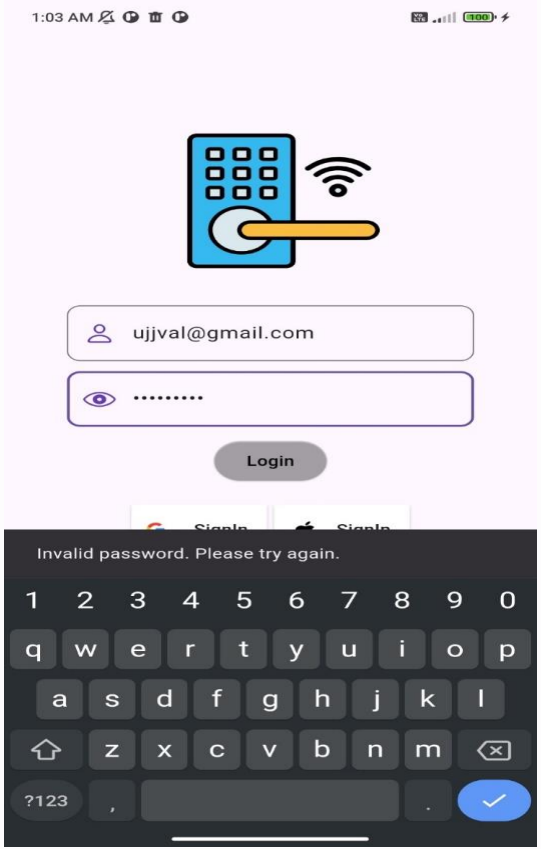


Circuit Diagram

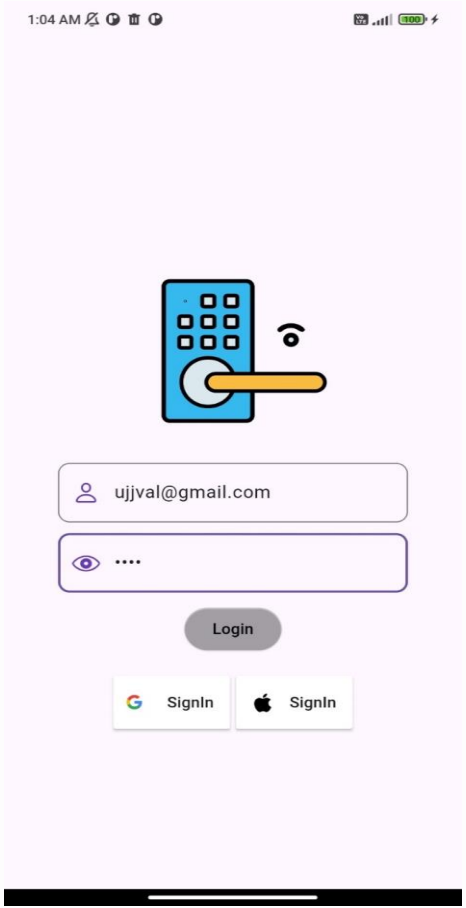


Screen Layouts / Screenshots





COUNTINUE...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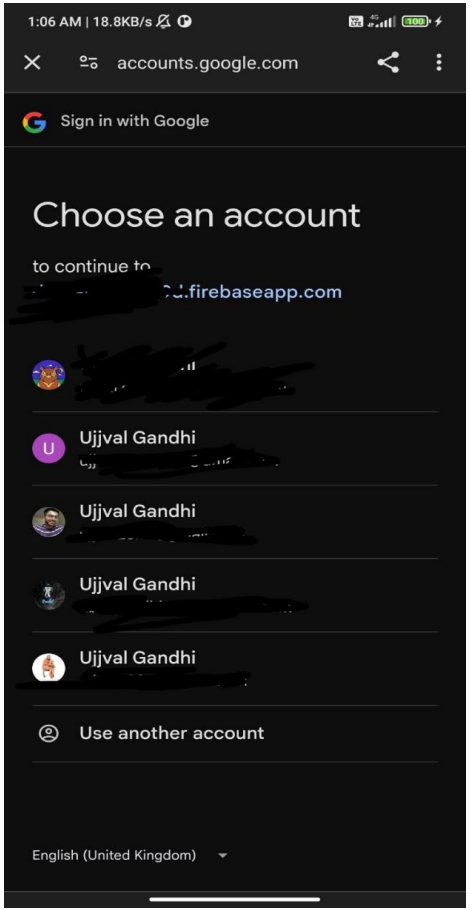
ujjval@gmail.com
••••
Login
SignIn
SignIn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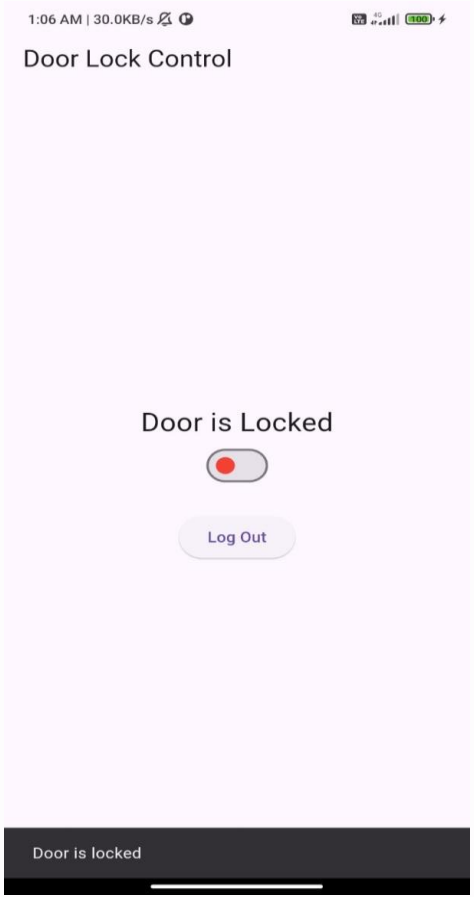
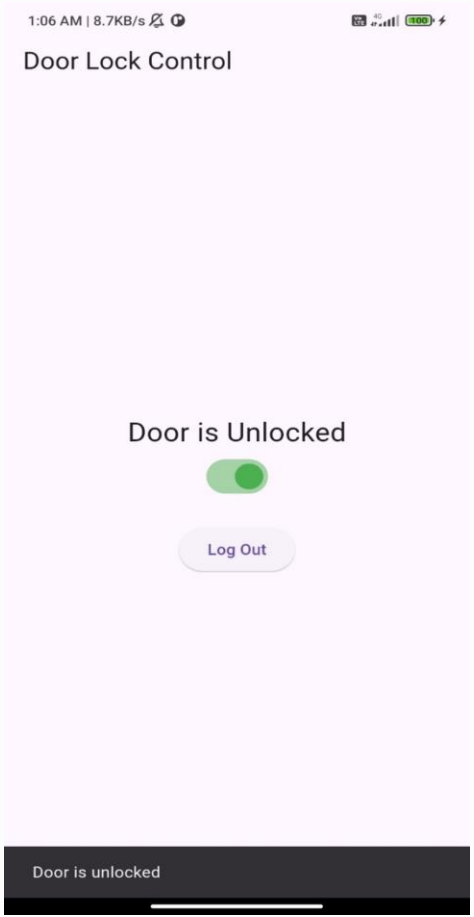
accounts.google.com
Sign in with Google
Choose an account
to continue to
.firebaseapp.com
Ujjval Gandhi
Ujjval Gandhi
Ujjval Gandhi
Ujjval Gandhi
Use another account
English (United Kingdom)

COUNTINUE...


1:06 AM | 30.0KB/s
Door Lock Control
Door is Locked
Log Out
Door is locked


1:06 AM | 8.7KB/s
Door Lock Control
Door is Unlocked
Log Out
Door is unlocked

Test Cases

Add User:

Case No.	Functions	Input Values	Expected o/p	Actual o/p	Remarks
1	Email	User@gamil.com	Email must be valid format	Email must be in valid Format	Pass
2	Email	User@com	Email must be valid format	Email is not in valid format	Fail
3	Email	User@gamil.com	Enter Email Id	User Exits	Pass
4	Email	User@gamil.com	Enter Email Id	User Does Not Exits	Fail

Future Enhancement

- Integrate voice assistant compatibility (e.g., Alexa, Google Assistant) for hands-free control.
- Add facial recognition as an advanced authentication method.
- Implement geofencing for automatic locking/unlocking based on user location.
- Enable temporary access codes for guest or time-limited access.
- Include tamper alerts to notify users of unauthorized attempts.
- Provide cloud-based logs for real-time monitoring and access history.
- Ensure compatibility with smart home systems for seamless integration.
- Optimize energy efficiency for improved battery life and sustainability.

Referance

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Thank You