

North Western University

Final Lab Report

Course Title: Software Development Laboratory.

Course Code: CSE-2200

**Topic**: Project on “Wireless Authentication of Smart Doors using RFID”.

|  |  |
| --- | --- |
| **SUBMITTED BY** | **SUBMITTED TO** |
| Name: Kazi Atik Mezan  ID: 20222004010  Name: Chandon Roy  ID: 20222009010  Section: A  Semester: (2.2)  Department: CSE-4y (Bi) | M. Raihan  Assistant Professor  Department of Computer Science and Engineering.  North Western University  Khulna. |

Project Title: ‘Wireless Authentication of Smart Door Lock Using RFID’

Introduction: The Smart Door Lock project aimed to develop a secure and efficient access control system using RFID technology, Arduino Uno microcontroller, relay module, solenoid lock, 12V battery, and LEDs. The project involved hardware assembly, programming, and testing to ensure reliable functionality and security.

Materials Used:

1. Arduino Uno microcontroller

2. RFID RC522 reader module

3. Relay module

4. Solenoid lock

5. 12V battery

6. LEDs (for status indication)

7. Jumper wires

8. Breadboard

9. USB power supply (for Arduino Uno programming)

Methodology:

1. Hardware Assembly: The RFID RC522 reader module, relay module, solenoid lock, LEDs, and Arduino Uno were connected using jumper wires and a breadboard. The solenoid lock was connected to the relay module, which was controlled by the Arduino Uno.
2. Programming: Arduino IDE was used to write the code for the microcontroller. The code included instructions to read RFID card IDs, trigger the relay module to activate the solenoid lock, and control the LEDs for status indication.
3. Testing: The system was tested by presenting authorized RFID cards to the reader and verifying that the solenoid lock activated, granting access. Unauthorized cards were effectively denied access. The LEDs indicated the status of the system, such as "locked," "unlocked," or "error."

Main coading:

Results: The Smart Door Lock successfully recognized authorized RFID cards and activated the solenoid lock, providing secure access control. Unauthorized cards were effectively denied access, demonstrating the reliability of the system in preventing unauthorized entry. The status LEDs provided clear visual feedback, indicating the current state of the lock (locked, unlocked, or error).

Conclusion: The Smart Door Lock project demonstrated the feasibility of creating a secure access control system using RFID technology, Arduino Uno, relay module, solenoid lock, and LEDs. By combining hardware assembly, programming, and testing, the project achieved its objectives of providing reliable and secure door access. Further enhancements, such as remote access capabilities or integration with home automation systems, could be explored to extend the functionality of the Smart Door Lock.

Recommendations: Consider adding additional features such as remote access capabilities via Wi-Fi or Bluetooth for added convenience. Explore options for integrating the Smart Door Lock with existing home automation systems to enhance functionality and compatibility. Continuously monitor and update the system to address any security vulnerabilities and ensure optimal performance.

Overall, the Smart Door Lock project showcased the potential of RFID technology and Arduino Uno in creating efficient and secure access control solutions for various applications, including residential and commercial environments.