GROUP 15 - SmartLock System – README file

he SmartLock System is an Arduino-based project that combines several components, including an LCD display, RFID module, PIR motion sensor, LED, buzzer, and servo motor, to create a smart door lock system. The system allows authorized access through RFID tags, detects visitors using the PIR motion sensor, and provides visual and audio feedback using the LCD display, LED, and buzzer.

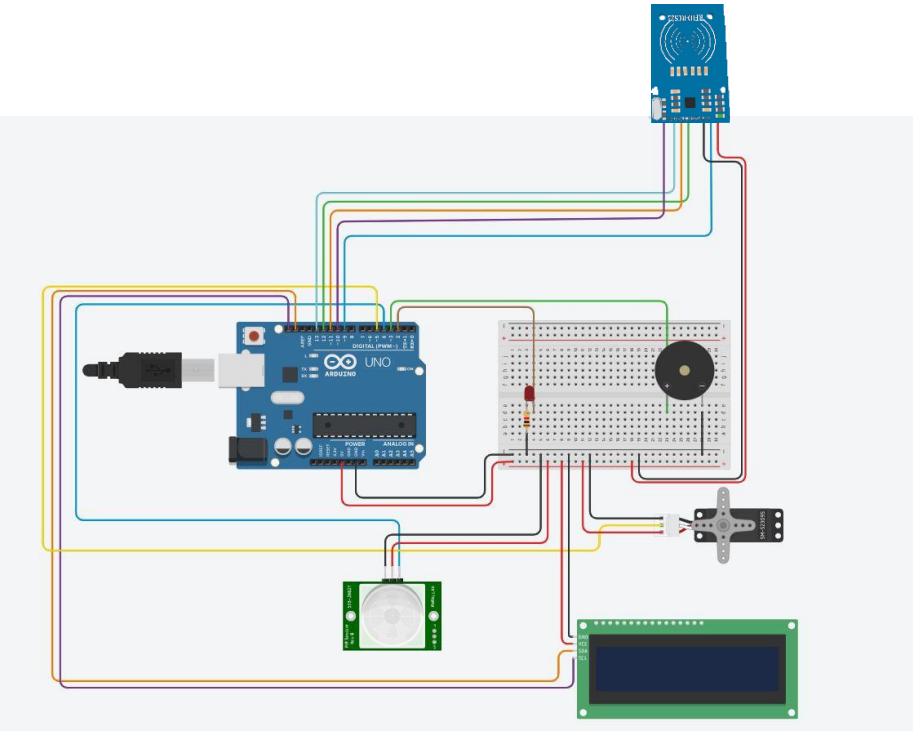
Components Used:

- Arduino board
- 16x2 LCD display (compatible with I2C)
- MFRC522 RFID module
- PIR motion sensor
- LED
- Buzzer
- Servo motor

Libraries Required:

- SPI Library
- MFRC522 Library
- Wire Library
- LiquidCrystal_I2C Library
- Servo Library

Circuit Diagram:



Installation:

1. Open the main Arduino file (systemGroup15.ino).
2. Open the Arduino IDE and connect the Arduino board to your computer.
3. Connect the Arduino board to your computer.
4. Install the required libraries (mentioned above) if not already installed.
5. Verify and upload the code to the Arduino board.

Usage

1. Connect the components according to the circuit diagram.
2. Power on the Arduino board.
3. The LCD display will show a system warm-up message, and then a welcome message.
4. Scan an authorized RFID tag to unlock the door. If authorized, the LCD display will show a welcome message, and the door will be unlocked.
   If unauthorized, an access denied message will be displayed, and an alarm will be activated.
5. If no RFID tag is detected but a visitor is detected by the PIR motion sensor, a visitor message will be displayed a please wait for the homeowner to open the door. If the homeowner arrives within a certain time, the door will be unlocked. Otherwise, a "No response" message will be displayed, and an alarm will be activated.

Customization

- Authorized RFID tags: Modify the master_key constant to match your authorized RFID tag ID.
- Pin assignments: If you want to change the pin assignments, update the respective constant variables in the code.
- Timing and duration: You can adjust the timing and duration values in the code to suit your requirements.