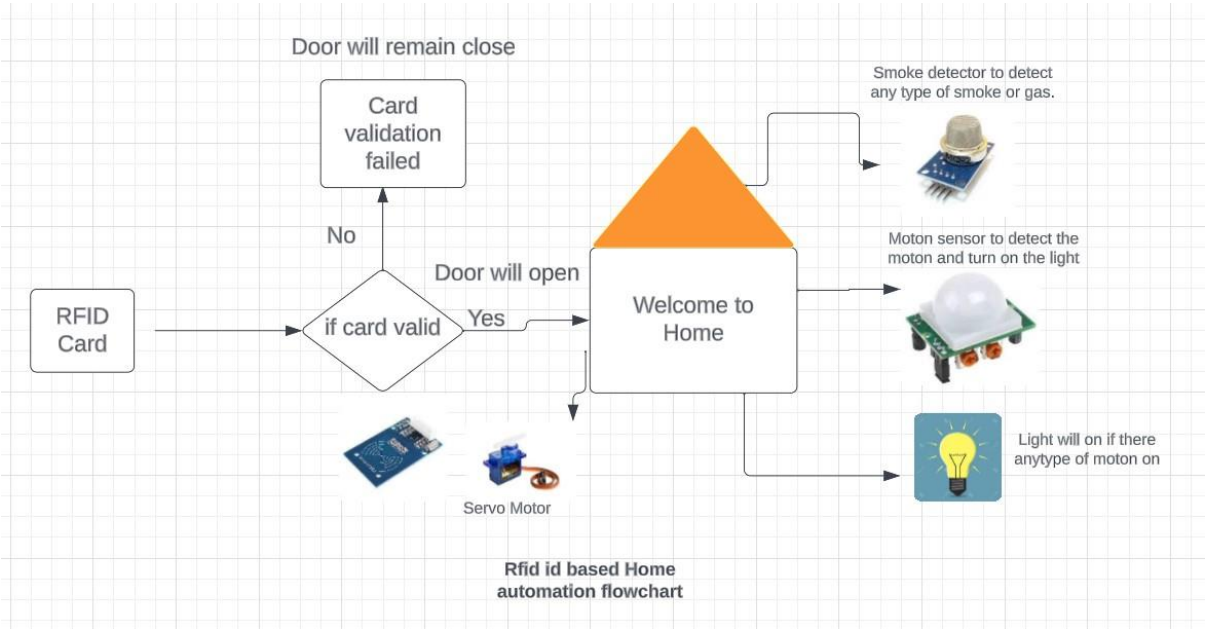
# RFID based home automation system

## Project description:

In this project, we'll use the RC5222 Module and Arduino to construct an RFID-based door lock security system. RFID (Radio Frequency Identification) technology has become the go-to option for many security applications as the globe moves toward more complex security measures. RFID security systems use electromagnetic fields to detect and track tags attached to things, which makes them less prone to duplication and more efficient than traditional lock and key systems.

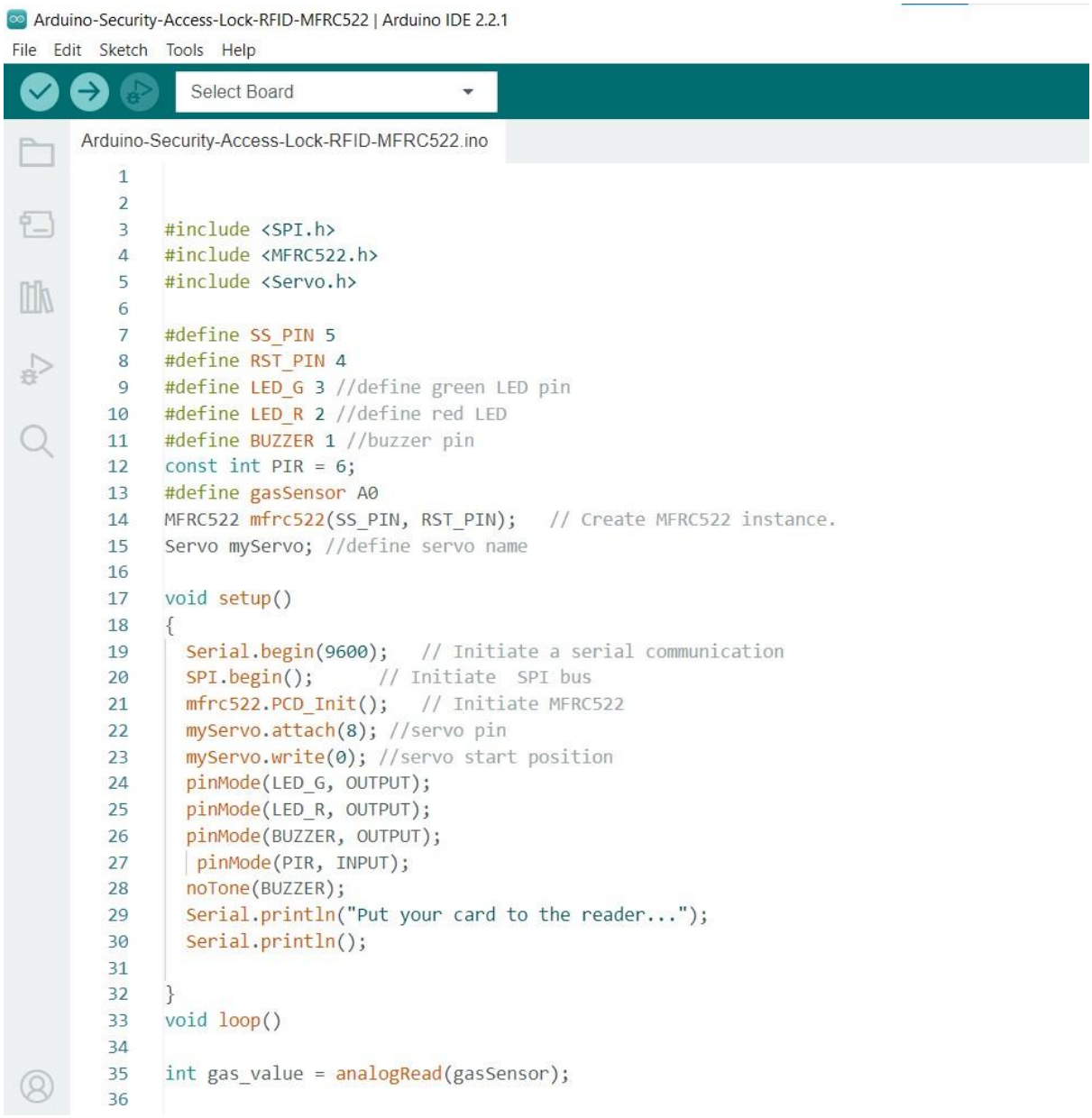
## Martials:

- ✓ Rfid card
- ✓ Arduino
- ✓ Breadboard
- ✓ Gas sensor
- ✓ Servo Motor
- ✓ Motion Sensor Detector Module HC-SR501



## Working Procedure of each component:

1. **RFID Authentication:**
    - When an RFID card is presented, the RFID module reads the card information.
    - Validate the card against a pre-defined list of authorized cards.
    - If the card is authorized, proceed to the next steps; otherwise, deny access.
2. **Gas Sensor Monitoring:**
    - Continuously monitor the gas sensor readings.
    - If the gas level exceeds a predefined threshold, trigger an alert
3. **Motion Detection:**
    - Continuously monitor the motion sensor.
    - If motion is detected, trigger actions based on the context (e.g., turn on lights, activate surveillance cameras).
4. **Servo Motor Control:**
    - Based on RFID authentication and other sensor inputs, control the servo motor to perform specific tasks.
    - For example, if an authorized RFID card is presented and motion is detected inside the house, the servo motor might unlock the door.


Arduino-Security-Access-Lock-RFID-MFRC522 | Arduino IDE 2.2.1
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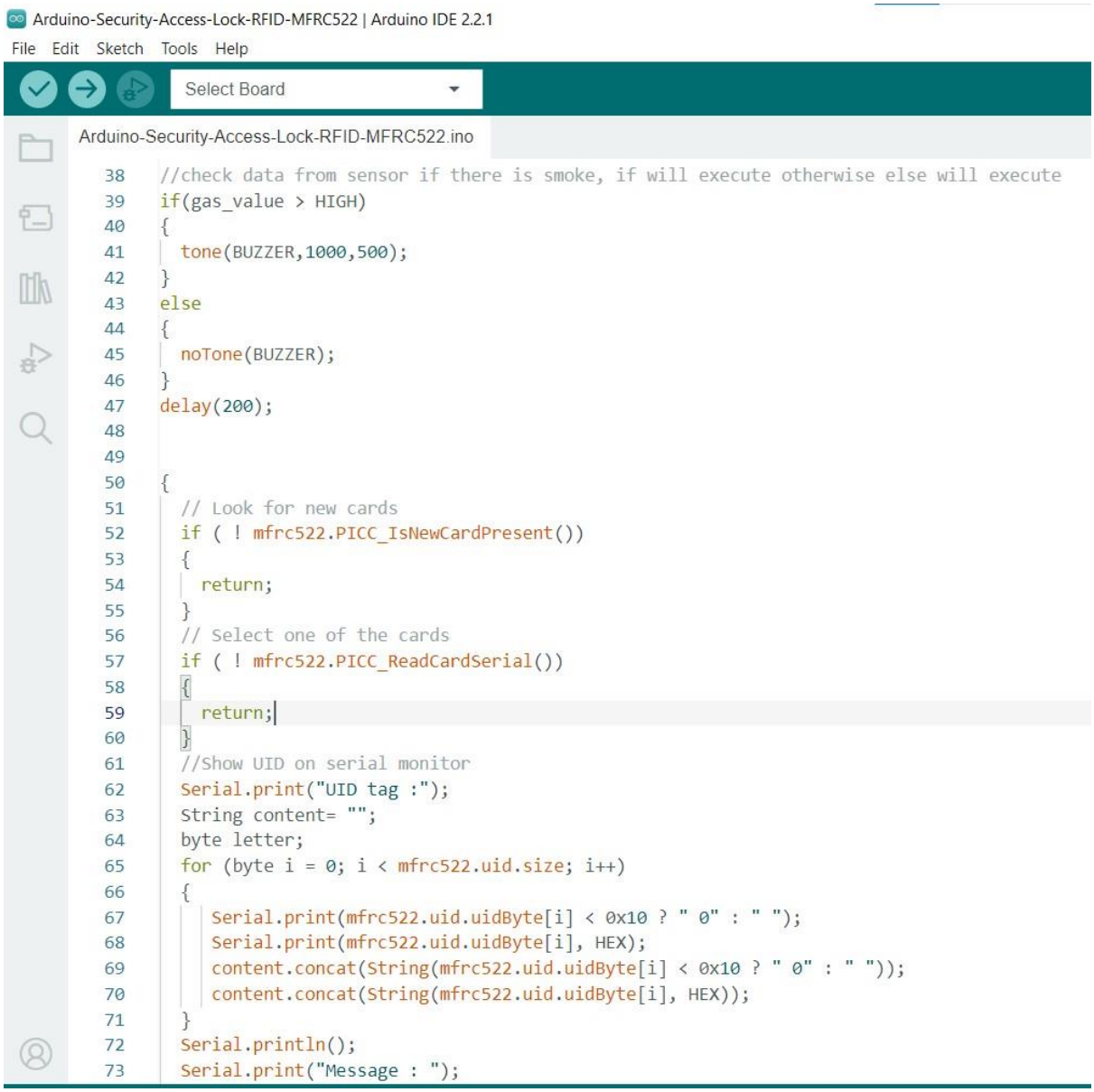
Arduino-Security-Access-Lock-RFID-MFRC522.ino
#include <SPI.h>
#include <MFRC522.h>
#include <Servo.h>
#define SS_PIN 5
#define RST_PIN 4
#define LED_G 3 //define green LED pin
#define LED_R 2 //define red LED
#define BUZZER 1 //buzzer pin
const int PIR = 6;
#define gasSensor A0
MFRC522 mfrc522(SS_PIN, RST_PIN); // Create MFRC522 instance.
Servo myServo; //define servo name
void setup()
{
Serial.begin(9600); // Initiate a serial communication
SPI.begin(); // Initiate SPI bus
mfrc522.PCD_Init(); // Initiate MFRC522
myServo.attach(8); //servo pin
myServo.write(0); //servo start position
pinMode(LED_G, OUTPUT);
pinMode(LED_R, OUTPUT);
pinMode(BUZZER, OUTPUT);
pinMode(PIR, INPUT);
noTone(BUZZER);
Serial.println("Put your card to the reader...");
Serial.println();
}
void loop()
int gas_value = analogRead(gasSensor);


Arduino-Security-Access-Lock-RFID-MFRC522 | Arduino IDE 2.2.1
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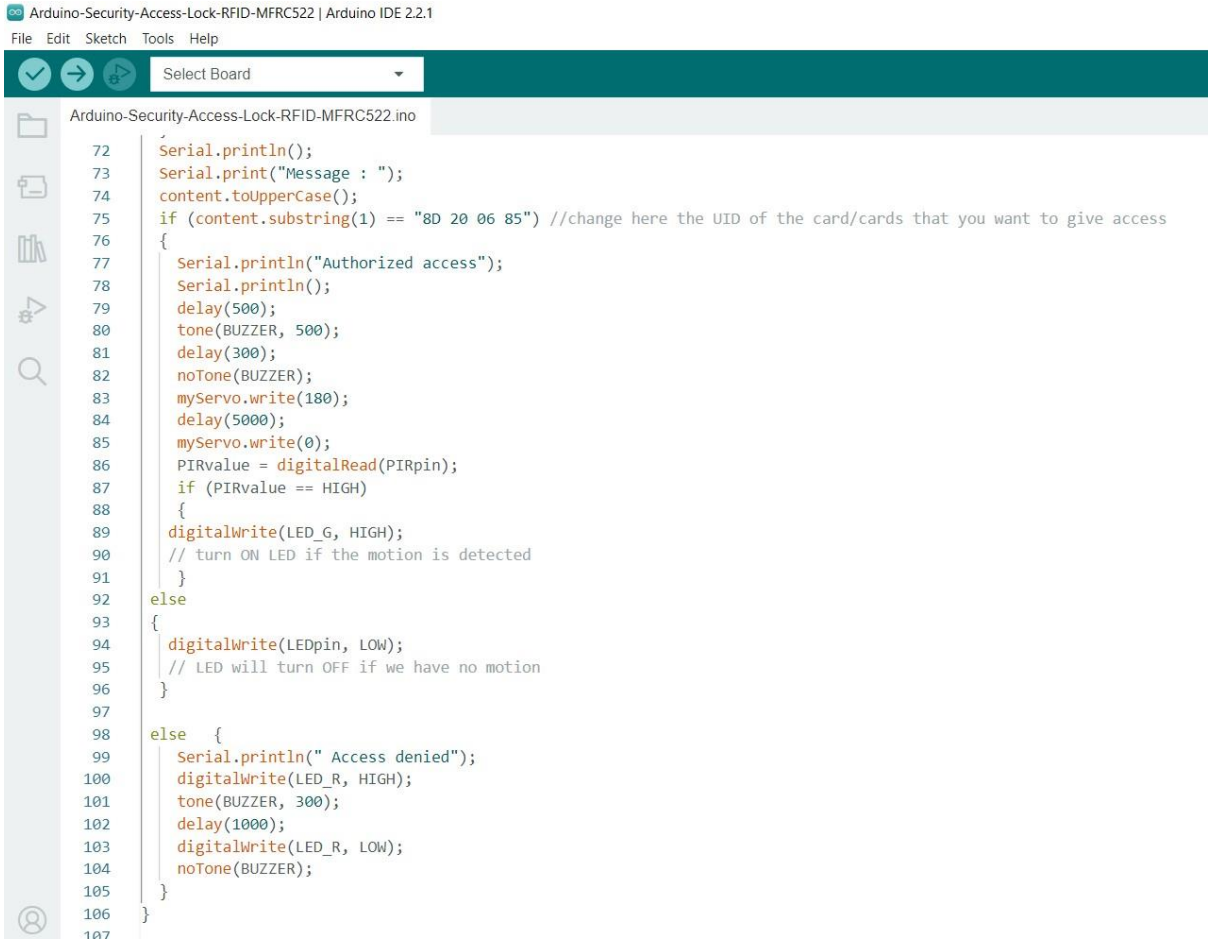
Arduino-Security-Access-Lock-RFID-MFRC522.ino
38 //check data from sensor if there is smoke, if will execute otherwise else will execute
39 if(gas_value > HIGH)
40 {
41 tone(BUZZER,1000,500);
42 }
43 else
44 {
45 noTone(BUZZER);
46 }
47 delay(200);
48
49
50 {
51 // Look for new cards
52 if ( ! mfrc522.PICC_IsNewCardPresent())
53 {
54 return;
55 }
56 // Select one of the cards
57 if ( ! mfrc522.PICC_ReadCardSerial())
58 {
59 return;
60 }
61 //Show UID on serial monitor
62 Serial.print("UID tag :");
63 String content= "";
64 byte letter;
65 for (byte i = 0; i < mfrc522.uid.size; i++)
66 {
67 Serial.print(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " ");
68 Serial.print(mfrc522.uid.uidByte[i], HEX);
69 content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " "));
70 content.concat(String(mfrc522.uid.uidByte[i], HEX));
71 }
72 Serial.println();
73 Serial.print("Message : ");

# Code:




```
  Serial.println();
  Serial.print("Message : ");
  content.toUpperCase();
  if (content.substring(1) == "8D 20 06 85") //change here the UID of the card/cards that you want to give access
  {
    Serial.println("Authorized access");
    Serial.println();
    delay(500);
    tone(BUZZER, 500);
    delay(300);
    noTone(BUZZER);
    myServo.write(180);
    delay(5000);
    myServo.write(0);
    PIRvalue = digitalRead(PIRpin);
    if (PIRvalue == HIGH)
    {
   digitalWrite(LED_G, HIGH);
   // turn ON LED if the motion is detected
    }
  else
  {
   digitalWrite(LEDpin, LOW);
   // LED will turn OFF if we have no motion
  }

  else   {
    Serial.println(" Access denied");
    digitalWrite(LED_R, HIGH);
    tone(BUZZER, 300);
    delay(1000);
    digitalWrite(LED_R, LOW);
    noTone(BUZZER);
  }
}
```