

Arduino Project Report

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Temperature and Humidity Sensor Detector

```
#include <DHT.h>

#define DHTPIN 2    // What digital pin the DHT11 is connected to
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);

void setup() {
  Serial.begin(9600);
  dht.begin();
}

void loop() {

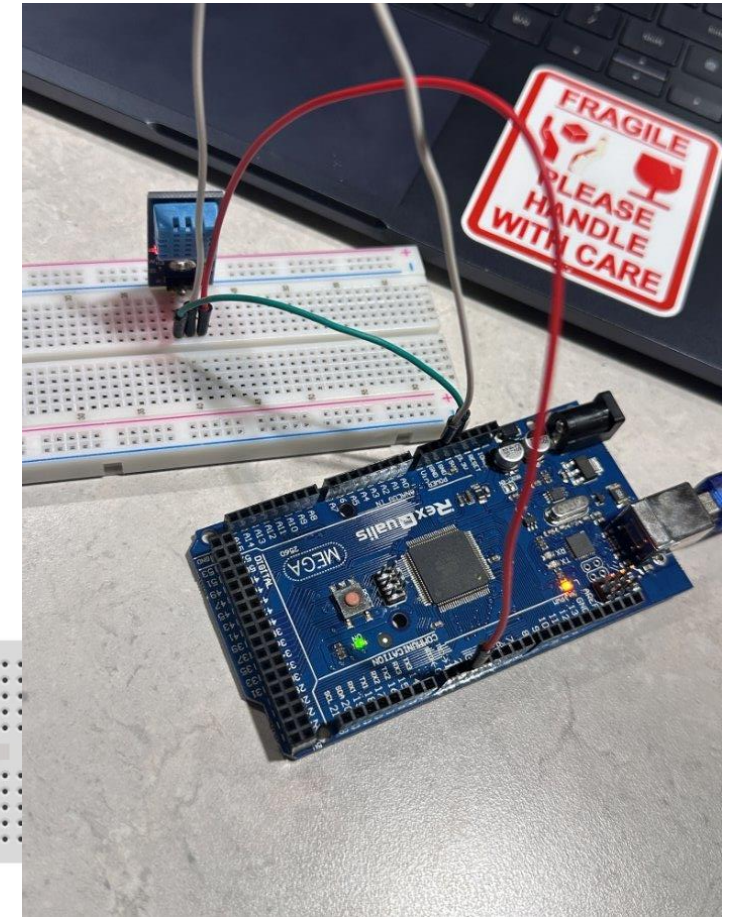
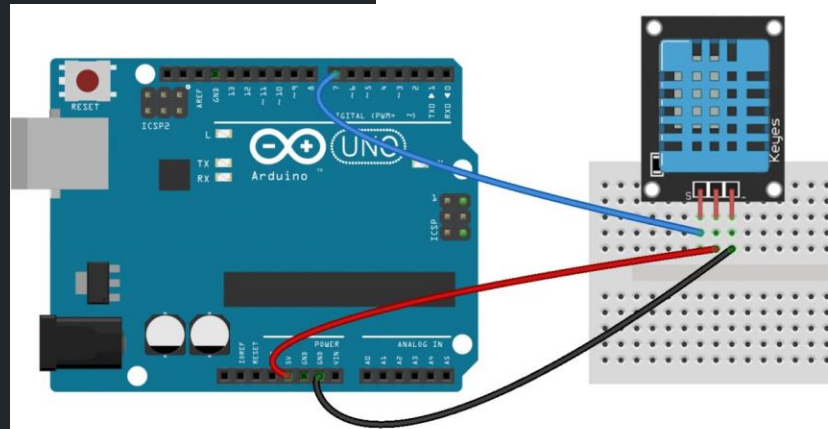
  delay(1000);

  float humi = dht.readHumidity();
  float temp = dht.readTemperature();

  Serial.print("Humidity: ");
  Serial.print(humi);

  Serial.print("Temperature: ");
  Serial.print(temp);

}
```

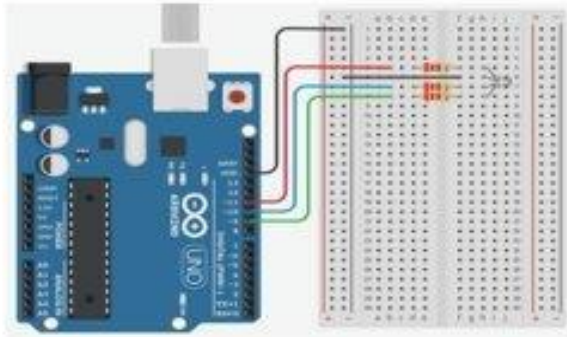


2. Mood lamp with Arduino kit

This project aims to implement a mood lamp which we can see around everyday life using an Arduino kit. We will use RGB multicolor to show diverse color set for user.

By implementing basic lantern program, we can understand how Arduino works and how to code the Arduino programming for the stuff in real life.

- **Set up Arduino**
 - Download Arduino program and set environment for window 64.
- **Compose PCB (Printed Circuit Board)**



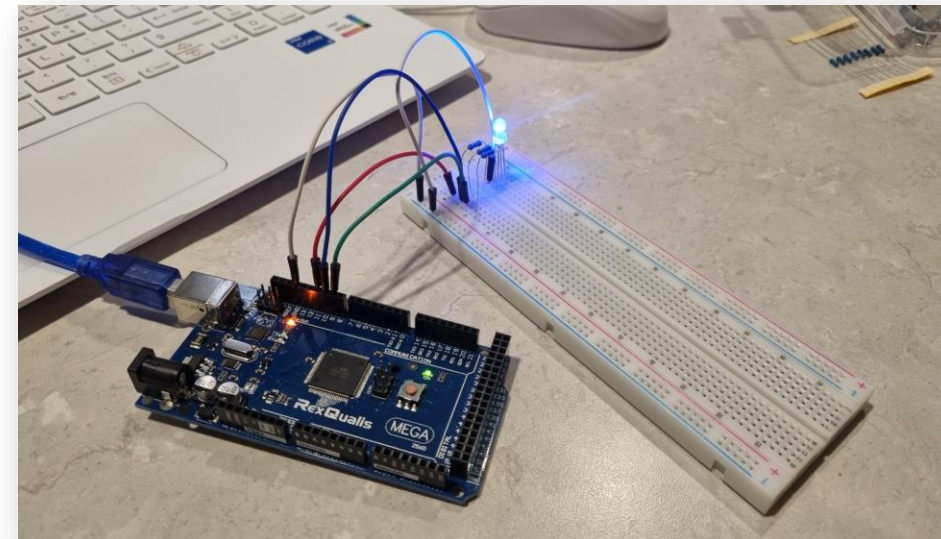
- Compose the PCB (printed circuit board) as above.
- Use one led lantern and three resistors to control RGB colors
- **Programming**
 - Program Arduino system
 - Use random function to implement diverse color visually
 - Check the color set and search how many colors Arduino can make.
 - Arduino will show random variables which it used for parameters
- **Test and review**
 - Test Arduino program and check the colors

Code

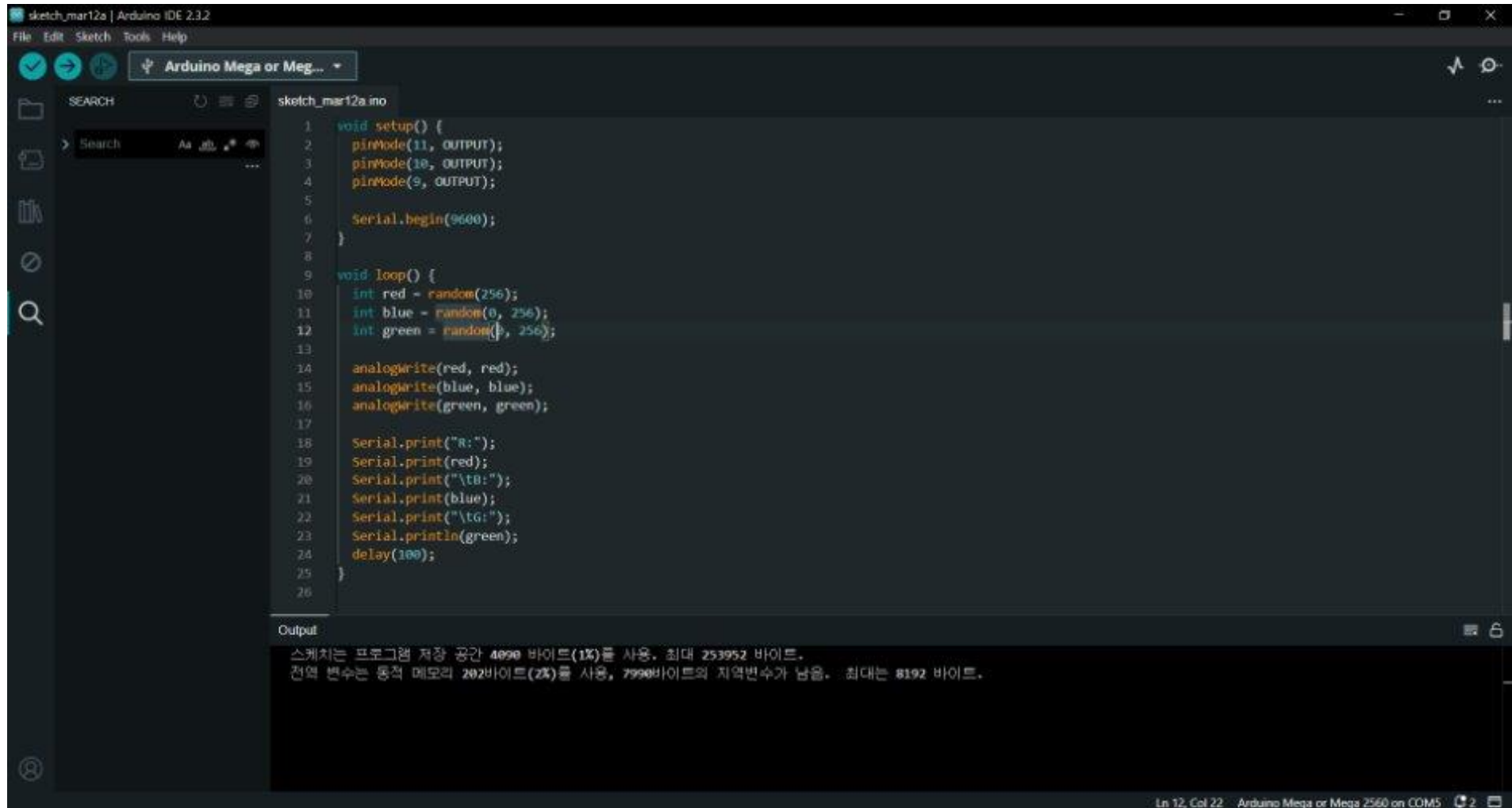
```

1 void setup() {
2   pinMode(11, OUTPUT);
3   pinMode(10, OUTPUT);
4   pinMode(9, OUTPUT);
5   Serial.begin(9600);
6 }
7
8 void loop() {
9   int red = random(255);
10  int blue = random(0, 255);
11  int green = random(0, 255);
12
13  analogWrite(red, red);
14  analogWrite(blue, blue);
15  analogWrite(green, green);
16
17  Serial.print("r:");
18  Serial.print(red);
19  Serial.print("\t");
20  Serial.print("b:");
21  Serial.print(blue);
22  Serial.print("\t");
23  Serial.print("g:");
24  Serial.print(green);
25  delay(100);
26 }
  
```

Implementation



Mood lamp with Arduino kit - Code



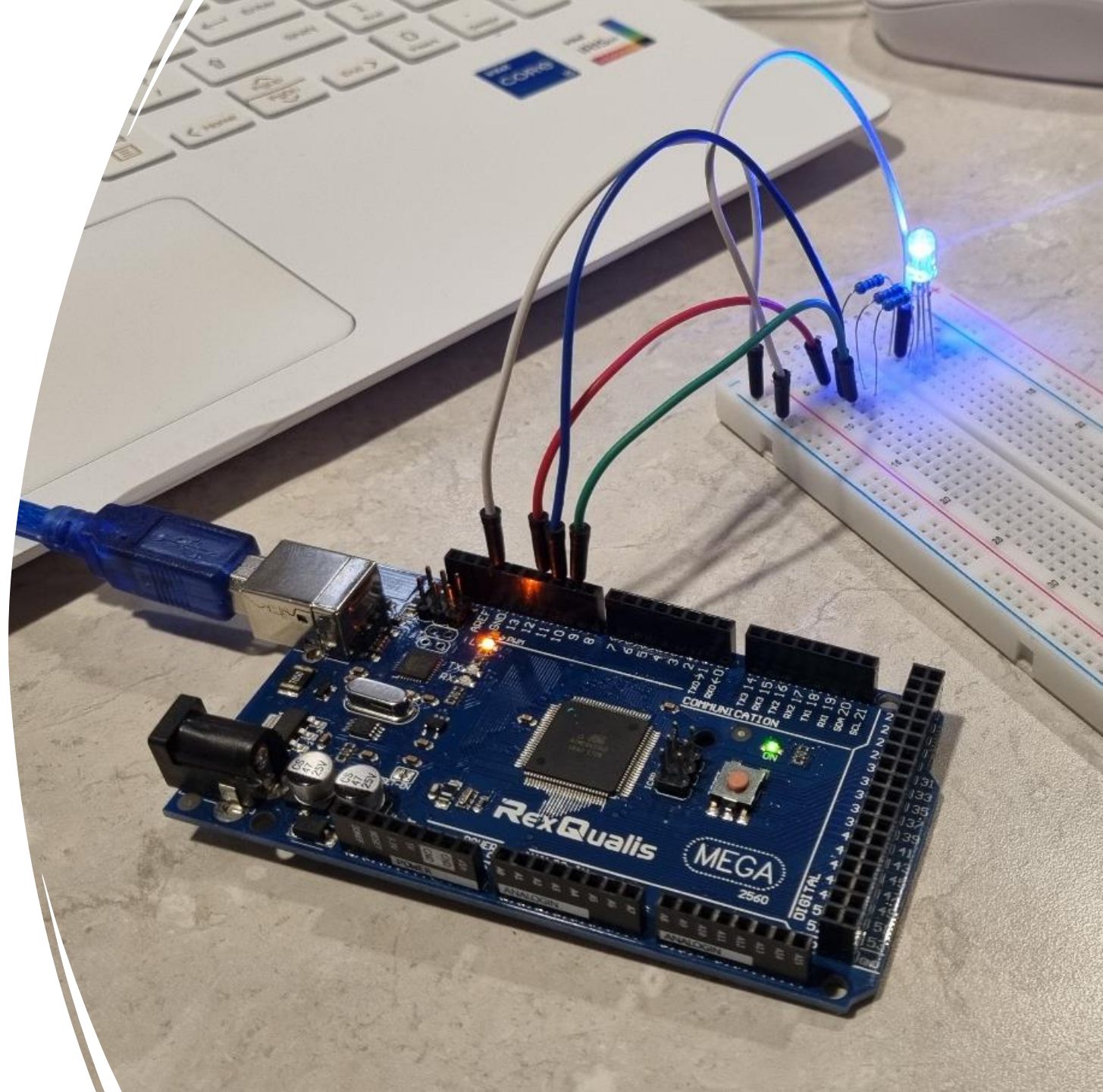
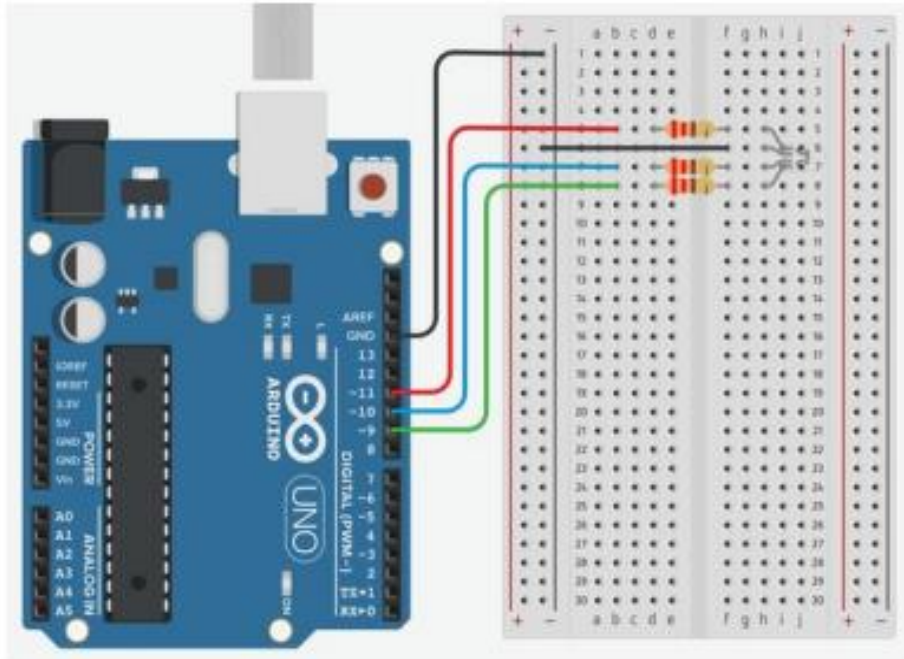
```
sketch_mar12a | Arduino IDE 2.3.2
File Edit Sketch Tools Help
Arduino Mega or Meg...
SEARCH
Sketch Mar 12, 2022
sketch_mar12a.ino
1 void setup() {
2   pinMode(11, OUTPUT);
3   pinMode(10, OUTPUT);
4   pinMode(9, OUTPUT);
5
6   Serial.begin(9600);
7 }
8
9 void loop() {
10  int red = random(256);
11  int blue = random(0, 256);
12  int green = random(0, 256);
13
14  analogWrite(red, red);
15  analogWrite(blue, blue);
16  analogWrite(green, green);
17
18  Serial.print("R:");
19  Serial.print(red);
20  Serial.print("\tB:");
21  Serial.print(blue);
22  Serial.print("\tG:");
23  Serial.println(green);
24  delay(100);
25 }
26

Output
스케치는 프로그램 저장 공간 4096 바이트(1%)를 사용. 최대 253952 바이트.
변수 변수는 동적 메모리 202바이트(2%)를 사용, 7998바이트의 지역변수가 남음. 최대는 8192 바이트.

Ln 12, Col 22 Arduino Mega or Mega 2560 on COM5 2
```

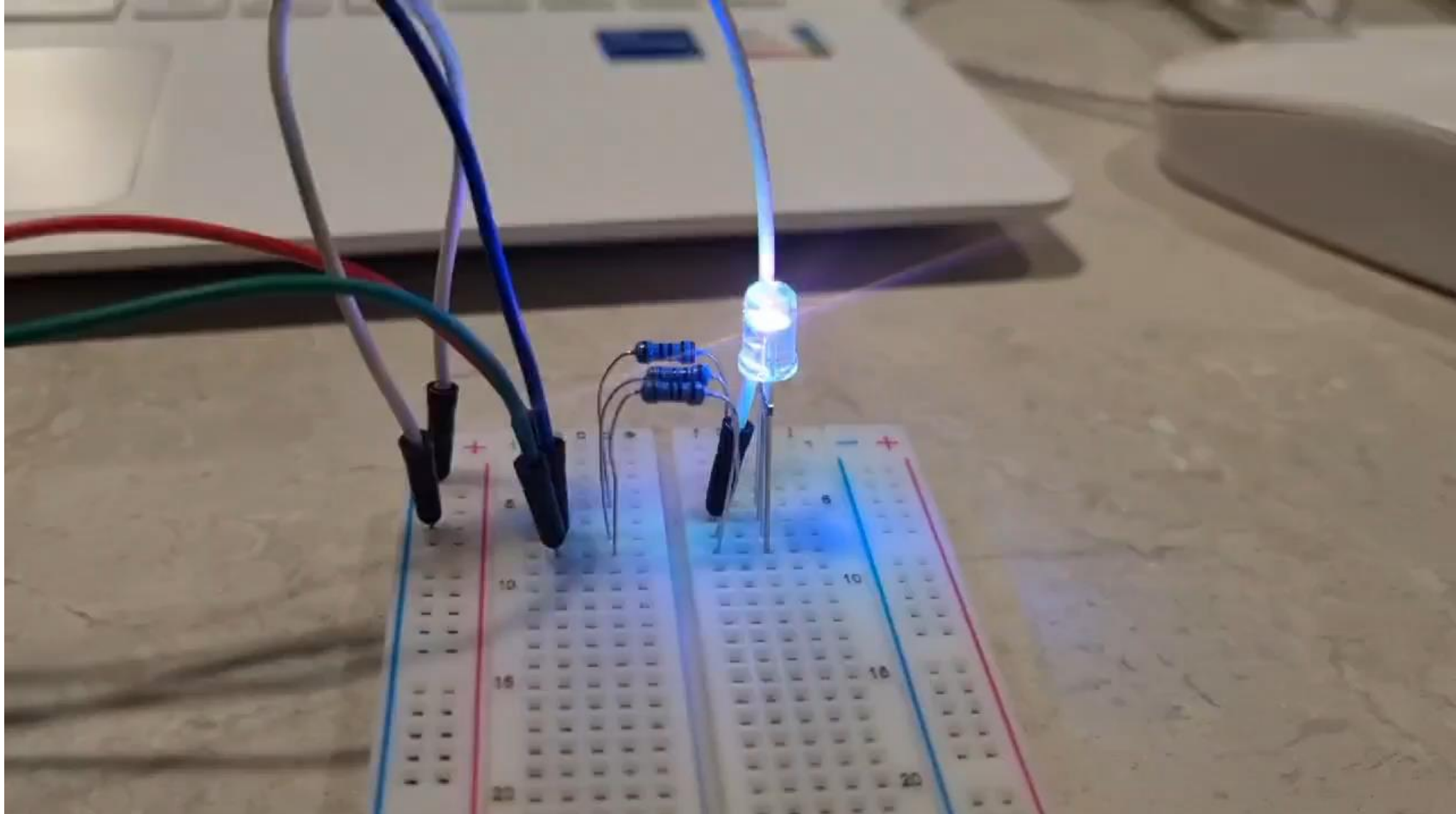

JaeJun Lee

Mood lamp with Arduino kit - motherboard



JaeJun Lee

Mood lamp with Arduino kit - video

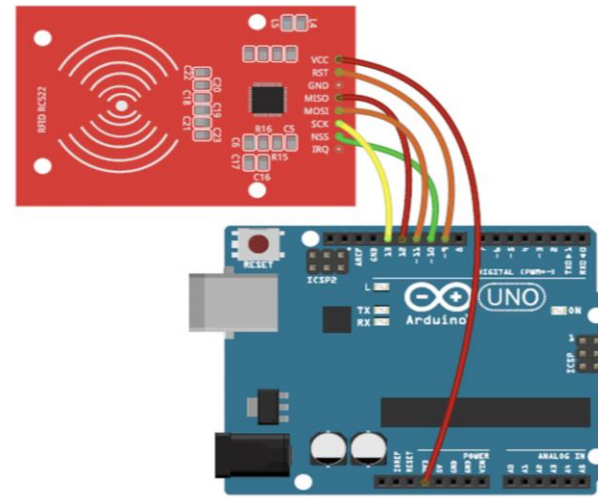


Windows log in using Arduino RFID

- In this project, we are going to demonstrate how to login to Windows computer without typing in password manually by using Arduino RFID.
- First step is to set up Arduino and RFID reader.
 - Connect the RFID reader module to Arduino according to circuit diagram.
 - Install the necessary libraries in Arduino IDE to communicate with the RFID reader.
- Second step is to program Arduino.
 - Write a program for Arduino that listens for RFID tag scans.
 - When a tag is scanned, Arduino reads its unique identifier.
 - Store the RFID tag identifiers that correspond to authorized users in the Arduino code.

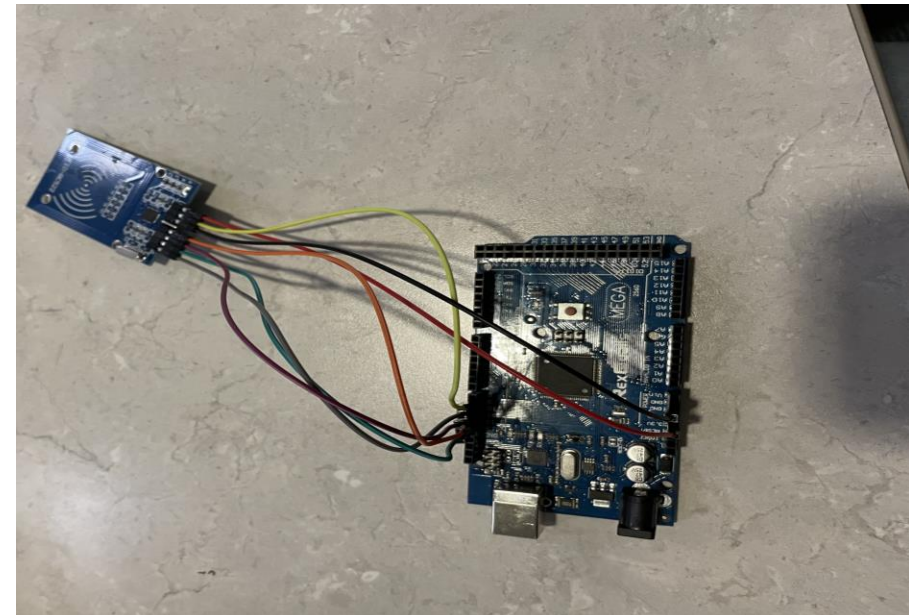


Setting up Arduino and RFID Reader



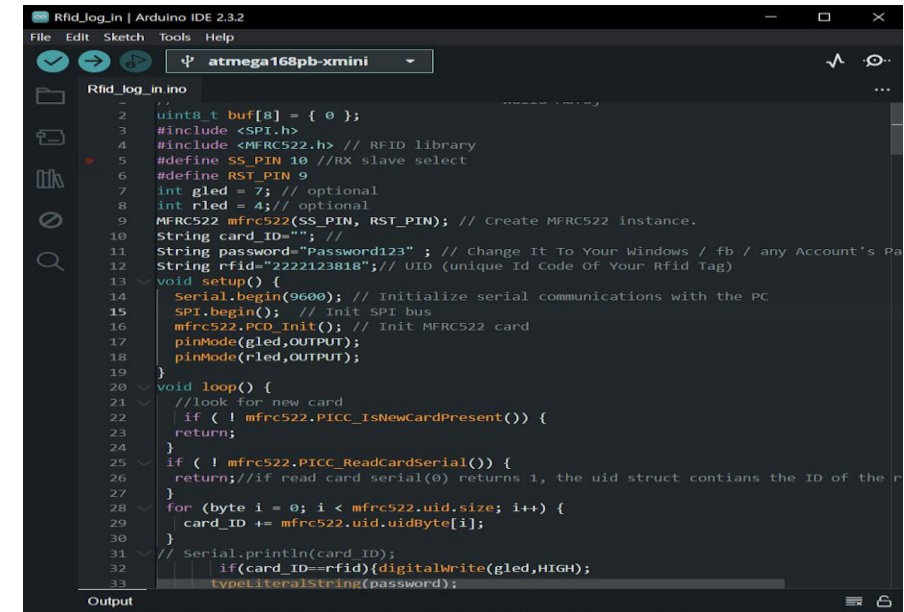
RFID RC522	ARDUINO
V _{CC}	3.3V
GND	GND
RST	D9
MISO	D12
MOSI	D11
SCK	D13

- To connect RFID reader and Arduino UNO, I referenced both the diagram and the connection details.
- I have connected MISO, MOSI, SCK and NSS pin to the SPI pins of the Arduino Uno board since RFID module use SPI communication.




Program Arduino

- For this step, I utilized pre-built RFID login library.
- If you opened the library, there are some changes you need to make such as card_id and password.
- The screenshot below shows that RFID reader module is ready to be scanned and conduct log-in to Windows device.



```
Rfid_log_in.ino
1 //
2 uint8_t buf[8] = { 0 };
3 #include <SPI.h>
4 #include <MFRC522.h> // RFID library
5 #define SS_PIN 10 //RX slave select
6 #define RST_PIN 9
7 int gled = 7; // optional
8 int rled = 4; // optional
9 MFRC522 mfrc522(SS_PIN, RST_PIN); // Create MFRC522 instance.
10 String card_ID = ""; //
11 String password = "Password123" ; // Change It To Your Windows / fb / any Account's Pa
12 String rfid = "2222123818" ; // UID (unique id Code Of Your Rfid Tag)
13 void setup() {
14   Serial.begin(9600); // Initialize serial communications with the PC
15   SPI.begin(); // Init SPI bus
16   mfrc522.PCD_Init(); // Init MFRC522 card
17   pinMode(gled, OUTPUT);
18   pinMode(rled, OUTPUT);
19 }
20 void loop() {
21   //look for new card
22   if ( ! mfrc522.PICC_IsNewCardPresent() ) {
23     return;
24   }
25   if ( ! mfrc522.PICC_ReadCardSerial() ) {
26     return; //if read card serial(0) returns 1, the uid struct contains the ID of the r
27   }
28   for (byte i = 0; i < mfrc522.uid.size; i++) {
29     card_ID += mfrc522.uid.uidbyte[i];
30   }
31   // Serial.println(card_ID);
32   if (card_ID == rfid) {digitalWrite(gled, HIGH);
33     typeLiteralString(password);
34   }
```



```
ATMEGA16U2 - USB - USB/DFU

Device selection..... PASS
Hardware selection..... PASS
Opening port..... PASS
Reading Bootloader version..... PASS 1.2.0
Erasing..... PASS
Selecting FLASH..... PASS
Blank checking..... PASS 0x00000 0x02fff
Parsing HEX file..... PASS Arduino-keyboard-0.3.hex
Programming memory..... PASS 0x00000 0x00fbb
Verifying memory..... PASS 0x00000 0x00fbb
Starting Application..... PASS RESET 0

Summary: Total 11 Passed 11 Failed 0
Now, you need to unplug the Arduino and plug it back in,
and it'll show back up as an Arduino. Press any key to exit....
```