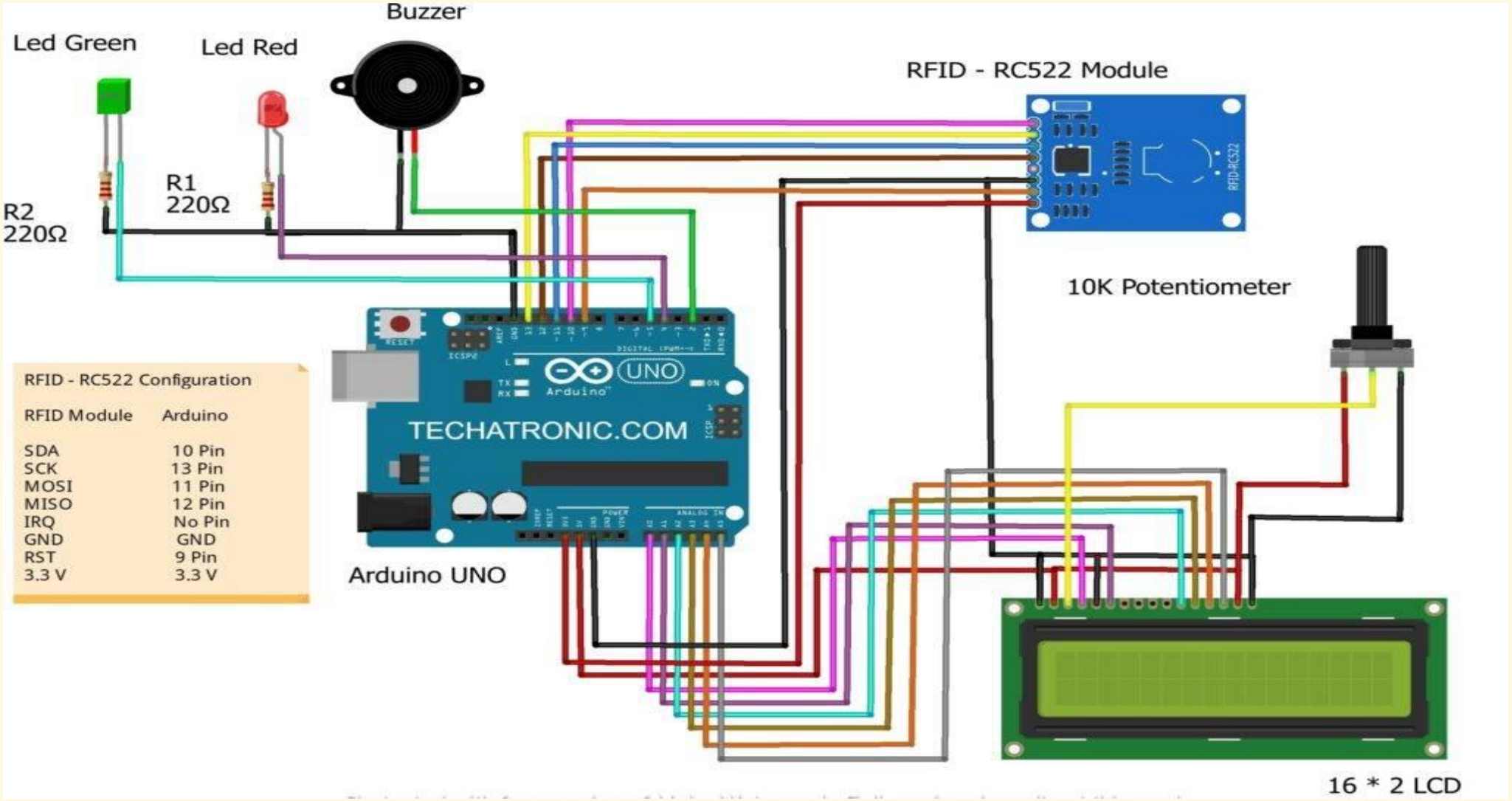
TOP-G presents

Attendance System using RFID

Introduction

Have you ever wondered how you scan your ID cards and information gets processed?
So keeping this in mind we are writing this article to make an RFID-based attendance system using Arduino UNO board. The students can enroll themself by just placing the smart card on the reader module. For doing this we are using an RC522 RFID reader and writer module.

Circuit Diagram



Components

	Component Name	Count	Cost (Rs)
1	Arduino UNO	1	750
2	RC522 RFID module	1	255
3	Buzzer module	1	99
4	LCD Display (16x2)	1	355

Total Cost: (Approximate) Rs. 1700/-

Arduino UNO

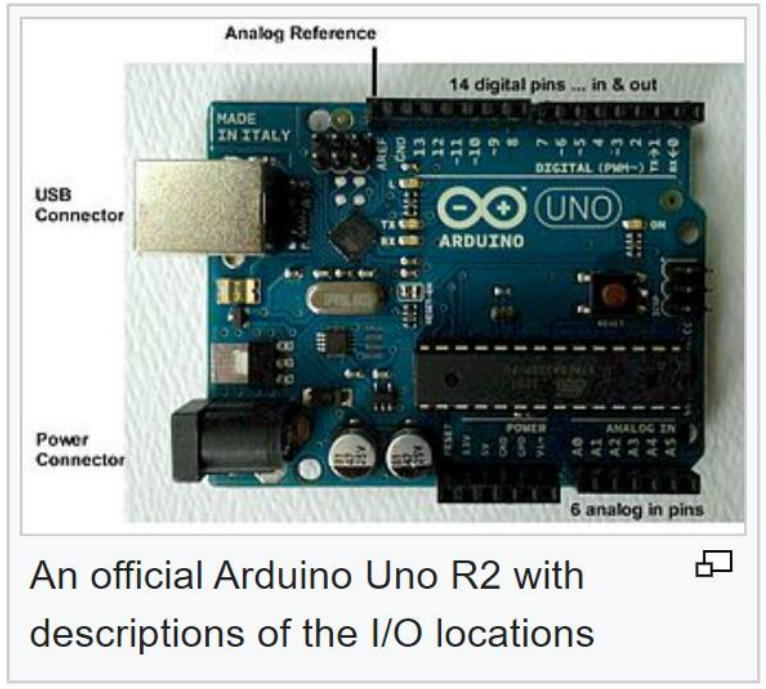
What is an Arduino?

- Arduino is an open-source hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices.

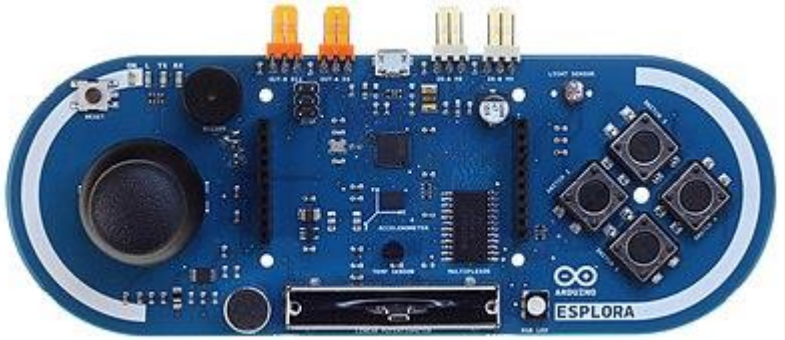
Applications:

- Arduboy, a handheld game console based on Arduino
- Arduinome, a MIDI controller device that mimics the Monome
- Ardupilot, drone software and hardware
- ArduSat, a cubesat based on Arduino

Different Types of Arduino



An official Arduino Uno R2 with descriptions of the I/O locations



RFID Module

What is RFID? How does it work?

An RFID or radio frequency identification system consists of two main components, a tag attached to the object to be identified, and a reader that reads the tag.

A reader consists of a radio frequency module and an antenna that generates a high frequency electromagnetic field. Whereas the tag is usually a passive device (it does not have a battery). It consists of a microchip that stores and processes information, and an antenna for receiving and transmitting a signal.

Buzzer

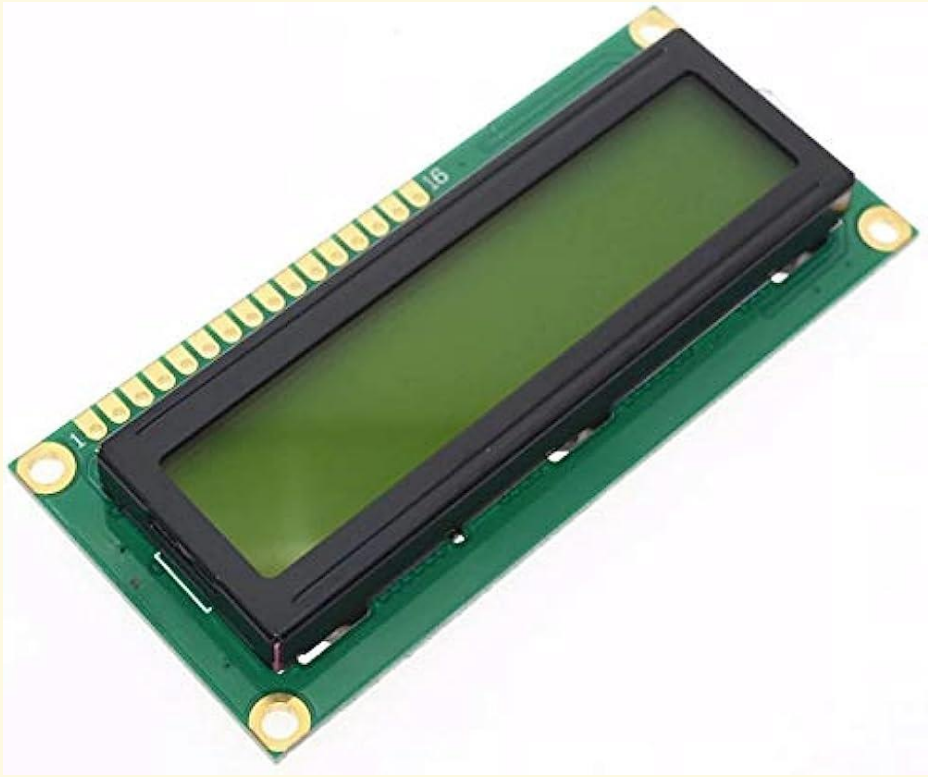
What is a buzzer? How does it work?

- A buzzer is an audio signaling device
- As a type of electronic buzzer with integrated structure, buzzers, which are supplied by DC power, are widely used in computers, printers, photocopiers, alarms, electronic toys, automotive electronic devices, telephones, timers and other electronic products for voice devices.
- The module is usually used to make sounds via setting under some specific circumstance

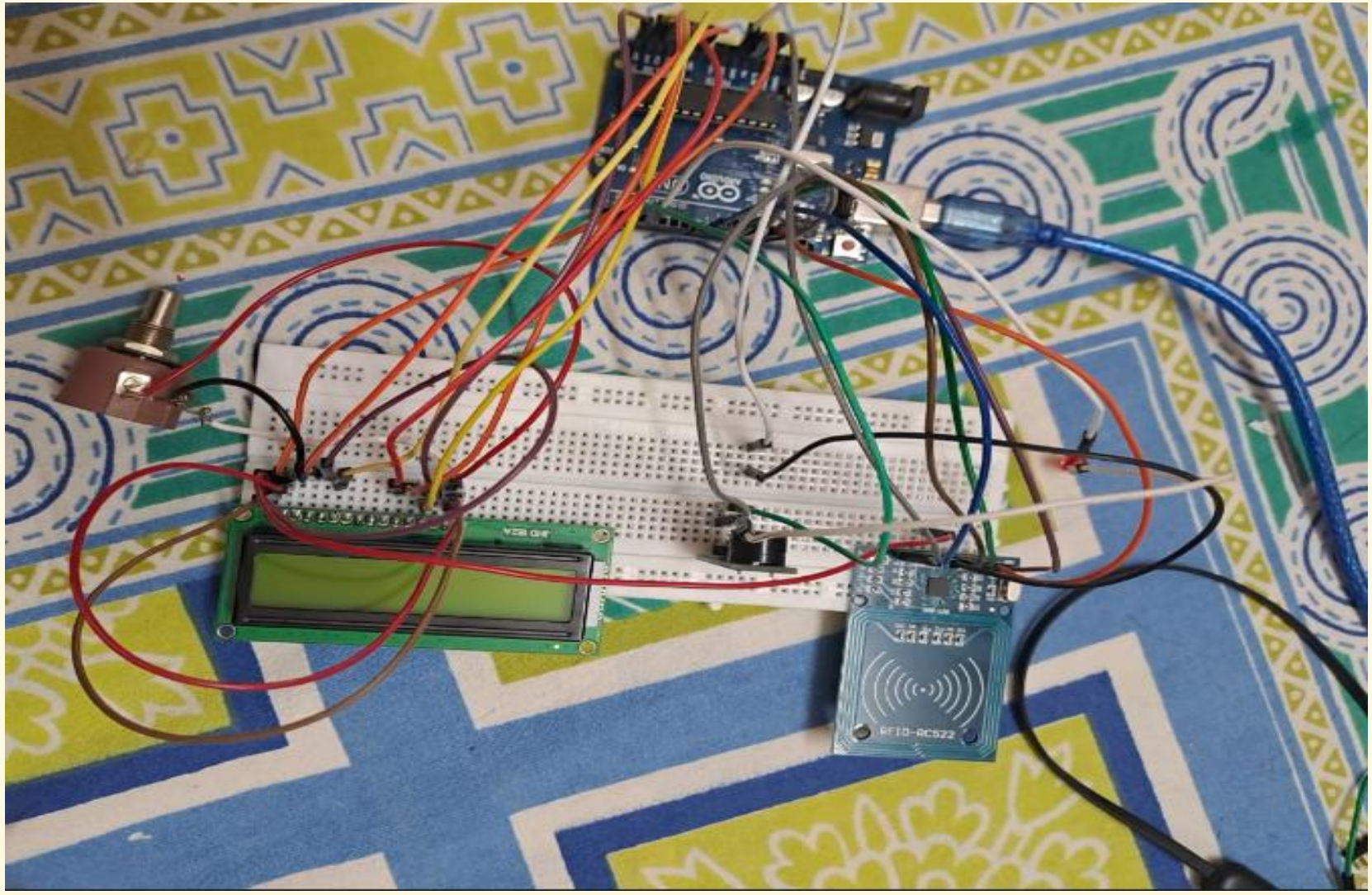
LCD Display

About LCD Display

Liquid Crystal Display (LCD) is widely used in various electronics applications. It is commonly used in various systems to show different status and parameters. LCD16x2 has 2 lines with 16 characters in each line. Each character is made up of a 5x8 (column x row) pixel matrix.



Working Project



Source Code

```
#include <SPI.h>
#include <MFRC522.h>

#define RST_PIN         9           // Configurable, see typical pin layout above
#define SS_PIN          10    // Configurable, see typical pin layout above


#include "LiquidCrystal.h"
 LiquidCrystal lcd(A0, A1, A2, A3, A4, A5);
 #define SS_PIN 10
 #define RST_PIN 9
 //#define LED_G 5 //define green LED pin
 #define LED_R 4 //define red LED pin
 #define BUZZER 2

MFRC522 mfrc522(SS_PIN, RST_PIN);  // Create MFRC522 instance

void setup() {
  Serial.begin(9600);    // Initialize serial communications with the PC
  while (!Serial);     // Do nothing if no serial port is opened (added for Arduinos bas
  SPI.begin();        // Init SPI bus
  mfrc522.PCD_Init();    // Init MFRC522

  lcd.begin(16,2); // Turn on the blacklight and print a message.
```

Source Code

```
  //pinMode(LED_G, OUTPUT);
  pinMode(LED_R, OUTPUT);
  pinMode(BUZZER, OUTPUT);
  noTone(BUZZER);

  delay(4);          // Optional delay. Some board do ne
  mfrc522.PCD_DumpVersionToSerial();  // Show details
//lcd.println(F("Scan your ID card..."));
}

void loop() {
  // Reset the loop if no new card present on the sen
  if ( ! mfrc522.PICC_IsNewCardPresent()) {
    return;
  }

  // Select one of the cards
  if ( ! mfrc522.PICC_ReadCardSerial()) {
    return;
  }
```

Source Code

```
Serial.print("UID tag :");
String content= "";
byte letter;
for (byte i = 0; i < mfrc522.uid.size; i++)
{
  Serial.print(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " ");
  Serial.print(mfrc522.uid.uidByte[i], HEX);
  content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " "));
  content.concat(String(mfrc522.uid.uidByte[i], HEX));
}
Serial.println();
content.toUpperCase();
```

Source Code

```
if (content.substring(1) == "94 42 4D 64")
{
 Serial.print("hello");
 lcd.print("22ECB0F19");
 lcd.setCursor(0,1);
 lcd.print("PRESENT");
/   digitalWrite(LED_G, HIGH);
 digitalWrite(LED_R, LOW);
 tone(BUZZER, 500);
 delay(300);
 noTone(BUZZER);
 delay(3000);
/   digitalWrite(LED_G, LOW);
 lcd.clear();
}
```

```
else if (content.substring(1) == "81 93 40 43")
{
 lcd.print("STUDENT 02");
 lcd.setCursor(0,1);
 lcd.print("PRESENT");
 //digitalWrite(LED_G, HIGH);
 tone(BUZZER, 500);
 delay(300);
 noTone(BUZZER);
 delay(3000);
/   digitalWrite(LED_G, LOW);
 lcd.clear();
}
```

Source Code

```
else {
 lcd.print("UNAUTHORIZE");
 lcd.setCursor(0,1);
 lcd.print("ACCESS");
 digitalWrite(LED_R, HIGH);
 digitalWrite(BUZZER, 10000);
 delay(2000);
 digitalWrite(LED_R, HIGH);
 //noTone(BUZZER);
 digitalWrite(BUZZER, LOW);
 lcd.clear();
}

}
```

Our team

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