RFID Based Attendance System Using Arduino

Dinesh Karthik Yashwant Gowtham

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Introduction

Attendance management plays a crucial role in schools, colleges, and offices. Manual systems are time-consuming and error-prone. To overcome these limitations, we developed an automated **RFID Based Attendance System using Arduino**. This system scans RFID cards and automatically records attendance, reducing manual effort and increasing accuracy.

Abstract

The RFID Based Attendance System uses RFID tags and a reader module connected to an Arduino microcontroller. Each RFID card has a unique ID, and when scanned, the system validates and marks attendance. The recorded data can be displayed on an LCD screen or transferred to a database for further use. This project ensures transparency, saves time, and improves efficiency in managing attendance.

Requirements

The hardware and software requirements are as follows:

Hardware Components

- Arduino UNO
- RFID Module (RC522)
- RFID Tags/Cards
- LCD Display (16x2)
- Breadboard
- Jumper Wires
- Buzzer

Software Tools

- Arduino IDE
- C/C++ programming for Arduino
- Libraries: `SPI.h`, `MFRC522.h`, `LiquidCrystal.h`

Code

```
// RFID Based Attendance System

#include <Keypad.h>
#include <LiquidCrystal.h>
LiquidCrystal lcd(5, 4, 3, 2, A4, A5);
struct student_detail{
  String name;
  String regno;
  int status;
};
student_detail student_registered[30];
void student_registered_database()
{
  student_registered[0]={"A0","18BLC0000",0};
  student_registered[1]={"A1","18BLC0001",0};
  student_registered[2]={"A2","18BLC0002",0};
  student_registered[3]={"A3","18BLC0003",0};
  student_registered[4]={"A4","18BLC0004",0};
  student_registered[5]={"A5","18BLC0005",0};
  student_registered[6]={"A6","18BLC0006",0};
  student_registered[7]={"A7","18BLC0007",0};
  student_registered[8]={"A8","18BLC0008",0};
  student_registered[9]={"A9","18BLC0009",0};
  student_registered[10]={"A10","18BLC0010",0};
  student_registered[11]={"A11","18BLC0011",0};
  student_registered[12]={"A12","18BLC0012",0};
  student_registered[13]={"A13","18BLC0013",0};
  student_registered[14]={"A14","18BLC0014",0};
  student_registered[15]={"A15","18BLC0015",0};
  student_registered[16]={"A16","18BLC0016",0};
  student_registered[17]={"A17","18BLC0017",0};
  student_registered[18]={"A18","18BLC0018",0};
  student_registered[19]={"A19","18BLC0019",0};
  student_registered[20]={"A20","18BLC0020",0};
  student_registered[21]={"A21","18BLC0021",0};
  student_registered[22]={"A22","18BLC0022",0};
  student_registered[23]={"A23","18BLC0023",0};
  student_registered[24]={"A24","18BLC0024",0};
  student_registered[25]={"A25","18BLC0025",0};
  student_registered[26]={"A26","18BLC0026",0};
  student_registered[27]={"A27","18BLC0027",0};
  student_registered[28]={"A28","18BLC0028",0};
  student_registered[29]={"A29","18BLC0029",0};
}
int find(String regno){
  int status=-1;
  for(int i=0;i<20;i++)
  {
```

```
49      if(regno==student_registered[i].regno)
50      {
51        status=i;
52      }
53    }
54    return status;
55  }
56  void setup(){
57     Serial.begin(9600);
58     lcd.begin(16, 2);
59     lcd.setCursor(0,0);
60    student_registered_database();
61  }
62  void loop()
63  {
64    int status=-1;
65    if(Serial.available()>0)
66    {
67      String reg_no=Serial.readString();
68      status=find(reg_no);
69      if(status>=0 && status<=29)
70      {
71        lcd.clear();
72        lcd.setCursor(0,0);
73        lcd.print(student_registered[status].name);
74        lcd.setCursor(0,1);
75        lcd.print(student_registered[status].regno);
76        delay(5000);
77        student_registered[status].status=1;
78      }
79      else{
80        lcd.clear();
81        lcd.setCursor(0,0);
82        lcd.print("not␣found");
83        delay(5000);
84      }
85    }
86    else{
87      lcd.clear();
88      lcd.setCursor(0,0);
89      lcd.print("Give␣your␣regno");
90      delay(5000);
91    }
92  }
93
94  }
```

Output

- When an authorized RFID card is placed near the reader, the LCD displays a welcome message with the person's name.
- The serial monitor also shows the UID and confirmation of access.
- If an unauthorized card is scanned, it displays "Access Denied".

Conclusion

This project successfully demonstrates the use of RFID technology to automate attendance management. It provides an efficient, user-friendly, and secure way of recording attendance, reducing human effort and minimizing errors. The system can be extended with database integration and IoT features for remote monitoring.

Project Image