```
#include<LiquidCrystal.h>
#include "MFRC522.h"
#include "SPI.h"
#include <DS1307RTC.h>
#define SS_PIN 10
#define RST_PIN 9
#define LED_PIN A0
#define LED_PIN2 A1

LiquidCrystal lcd(7,6,5,4,3,2); //RS, En, D4, D5, D6, D7
unsigned long startClassTime;
unsigned long classDuration;
unsigned long  student1EnterTime;
unsigned long  student2EnterTime;
unsigned long  student3EnterTime;
unsigned long  student1Time;
unsigned long  student2Time;
unsigned long student3Time;
unsigned long minTime;
unsigned long  student1totalTime=0;
unsigned long  student2totalTime=0;
unsigned long student3totalTime=0;
String student1 = "BC:32:D4:DB";
String student2 = "72:C7:DD:DB";
String student3 = "3B:35:80:29";
String ids[3] = {"","",""};
String words;
int startClass=0;
int student1inclass=0;
int student2inclass=0;
int student3inclass=0;
int numberOfStudents = 0;
int greenLed = A1;
int buzzer = 8;
int smokeA0 = A5;
int sensorThres = 200;
int redLed = A0;

MFRC522 rfid(SS_PIN, RST_PIN);
MFRC522::MIFARE_Key key;


void setup() {
  Serial.begin(9600);
  lcd.begin(16,2);
  SPI.begin();
  rfid.PCD_Init();
  pinMode(LED_PIN, OUTPUT);
  pinMode(LED_PIN2, OUTPUT);
  digitalWrite(LED_PIN2, HIGH);
```

```
  pinMode(redLed, OUTPUT);
  pinMode(greenLed, OUTPUT);
  pinMode(buzzer, OUTPUT);
  pinMode(smokeA0, INPUT);

}


void loop() {
 int analogSensor = analogRead(smokeA0);

if (analogSensor > sensorThres)
{
  digitalWrite(redLed, HIGH);
  digitalWrite(greenLed, LOW);
  tone(buzzer, 1000, 200);
}
else
{
  digitalWrite(redLed, LOW);
  digitalWrite(greenLed, HIGH);
  noTone(buzzer);
}
delay(100);
int card = 1;

 if (!rfid.PICC_IsNewCardPresent() || !rfid.PICC_ReadCardSerial())
   card = 0;

if(card == 1){
 MFRC522::PICC_Type piccType = rfid.PICC_GetType(rfid.uid.sak);

 if (piccType != MFRC522::PICC_TYPE_MIFARE_MINI &&
   piccType != MFRC522::PICC_TYPE_MIFARE_1K &&
   piccType != MFRC522::PICC_TYPE_MIFARE_4K) {
   //Serial.println(F("Your tag is not of type MIFARE Classic."));
   return;
 }

 String strID = "";
 for (byte i = 0; i < 4; i++) {
   strID +=
   (rfid.uid.uidByte[i] < 0x10 ? "0" : "") +
   String(rfid.uid.uidByte[i], HEX) +
   (i!=3 ? ":" : "");
 }
 strID.toUpperCase();

if((strID.equals("24:D9:80:63"))){
 if(startClass == 0){
```

```
  startClass=1;
  startClassTime = millis();
  //Serial.print(startClassTime);
  lcd.clear();
  lcd.print("Instructor in");
  //start class timer
 }

 else{
  startClass=0;
  lcd.clear();
  lcd.print("Instructor out");
  classDuration = millis() - startClassTime;
  if(student1inclass==1)
  student1totalTime += (millis()- student1Time);
  if(student2inclass==1)
  student2totalTime += (millis()- student2Time);
  if(student3inclass==1)
  student3totalTime += (millis()- student3Time);

   minTime = 0.75 * classDuration;

  if(student1totalTime >= minTime){
    Serial.println("Student 1 has attended");
   }
   else{
    Serial.println("Student 1 has not attended");
   }
   if(student2totalTime >= minTime){
    Serial.println("Student 2 has attended");
   }
   else{
    Serial.println("Student 2 has not attended") ;
   }
   if(student3totalTime >= minTime){
    Serial.println("Student 3 has attended");
   }
   else{
    Serial.print("Student 3 has not attended") ;
   }

}}

if(startClass == 1){
  int inClass = 0;
 if(!(strID.equals("24:D9:80:63"))){


  for(int i = 0 ; i < 3 ; i++){
```

```
if(ids[i].equals(strID)){
   inClass = 1;
    if(ids[i].equals(student1)){
     student1inclass=0;
    student1totalTime += (millis()- student1Time);
    }
    if(ids[i].equals(student2)){
       student2inclass=0;
    student2totalTime += (millis()- student2Time);
    }
    if(ids[i].equals(student3)){
       student3inclass=0;
     student3totalTime += (millis()- student3Time);
    }
  ids[i] = "";

  numberOfStudents--;
  lcd.clear();
  lcd.print(numberOfStudents,DEC);
  lcd.print(" student(s)");
  break;
  }

}

 if(inClass == 0){
  for(int i = 0 ; i < 3 ; i++){
      if(ids[i].equals("")){
        ids[i] = strID;
        numberOfStudents++ ;
         if(ids[i].equals(student1)){
          lcd.clear();
           lcd.print("Student 1 in");
          student1inclass=1;
          student1Time=millis();
         }
         if(ids[i].equals(student2)){
          lcd.clear();
           lcd.print("Student 2 in");
           student2inclass=1;
          student2Time=millis();
          }
          if(ids[i].equals(student3)){
            lcd.clear();
           lcd.print("Student 3 in");
          student3inclass=1;
         student3Time=millis();
          }
          delay(2000);
        lcd.clear();
```

```
            lcd.print(numberOfStudents,DEC);
            lcd.print(" student(s)");
            break;
            }
          }

      }
   }
  }

   digitalWrite(LED_PIN, HIGH);
   digitalWrite(LED_PIN2, LOW);
   delay(3000);
   digitalWrite(LED_PIN, LOW);
   digitalWrite(LED_PIN2, HIGH);


 rfid.PICC_HaltA();
 rfid.PCD_StopCrypto1();
 }

}
```