A Smart Student's Attendance System Using QR Code

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Abstract—Smart phones are becoming more preferred companions to users than desktops or notebooks. Knowing that smart phones are most popular with users at the age around 26, using smart phones to speed up the process of taking attendance by university instructors would save lecturing time and hence enhance the educational process. This paper proposes a system that is based on a QR code, which is being displayed for students during or at the beginning of each lecture. The students will need to scan the code in order to confirm their attendance. The paper explains the high level implementation details of the proposed system. It also discusses how the system verifies student identity to eliminate false registrations

Keywords— QR codes, ARDUINO IDE, ARDUINO MEGA, DS 3231 RTC module , GSM module ,Bluetooth, LCD display.

INTRODUCTION

In this paper we are providing an accurate attendance system using QR codes .In this attendance system we are also using some online applications to scan the respective QR codes and also an interfacing application for Bluetooth between mobile and the ARDUINO UNO. A GSM module is used to send an message alert to the respective person after the attendance has been taken. An RTC module is also been used produce real time clock .an LCD display is used to display the time and the information of the scanned student.

Components used in this proposed method are:
  a. QR Codes
  b. ARDUINO IDE software
  c. ARDUINO UNO
  d. DS 3231 RTC module
  e. Barcode scanner
  f. GPS-BLE

LITERATURE SURVEY

In the previous attendance system the existing technology was RFID readers and RFID tags. In this paper we are proposing about the QR code based attendance system .which is more reliable and efficient these days and an apt to now-a-days technology. The accuracy of the attendance system increases

with this technology. The operation of the hardware is also user friendly compared to other technology. Complexity is also less when we consider other existing technologies.

I. ARDIUNO UNO

ARDUINO UNO is a microcontroller board based on the ATMEGA 328P.It has 14 digital input/output pins of which 6 can be used as PWM outputs,6 analog inputs ,a 16MHz quartz crystal ,a USB connection ,a power jack, an ICSP header and a

reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The ARDUINO Uno can be programmed with the (ARDUINO SOFTWARE (IDE)). Select "Arduino/Genuino Uno from the Tools > Board menu. The Arduino Uno board can be powered via the USB connection or with an external power supply. The power source is selected automatically. The board can operate on an external supply from 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may become unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

*Fig: ARDUINO UNO*

II. DS 3231 RTC MODULE

The DS3231 is a low-cost, Real Time Clock Module which can maintain hours, minutes and seconds, as well as, day, month and year information. The module can work on either 3.3 or 5V. The battery input is 3V and a typical CR2032 3V battery can power the module and maintain the information for more than a year. The module uses the I2C communication protocol which makes the connection to the Arduino Board very easy.
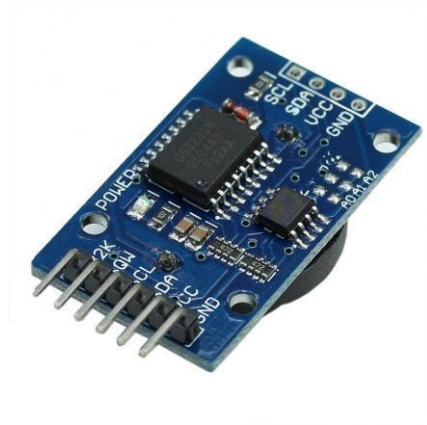
III. ARDUINO SOFTWARE

The Arduino Integrated Development Environment or Arduino software(IDE) contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuino hardware to upload programs and communicate with them. Programs written using arduino software are called Sketches. These sketches are written in the text editor and are saved with the file extension (.ino). the editor has features for cutting/pasting and for searching/replacing text. the message area gives feedback while saving and exporting and also display errors. the console displays text output by the Arduino software, including complete error messages and other information .

To upload new code to the arduino , either you will need to have access to code you can paste into the programmer, or you will have to write it yourself, using the arduino programming language to create your own sketch. An arduino sketch usually has five parts :a header describing the sketch and its author ;a section defining variables; a setup routine that sets the initial conditions of variables and runs preliminary code ; a loop routine, which is where you add the main code that will execute repeatedly until you stop running the sketch ; and a section where you can list other functions that activate during the setup and loop routines. All sketches must invlude the setup and loop routines.
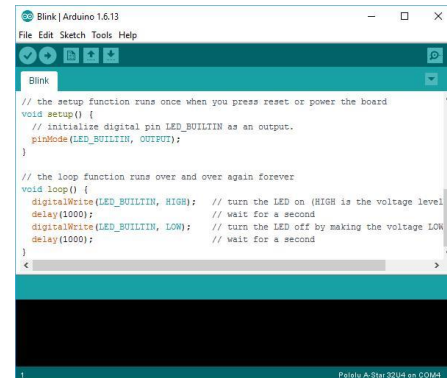
Serial monitor

This displays serial sent from the Arduino or Genuino board over USB or serial connector. To send data to the board ,enter text and click on the send button or press enter.

IV. QR CODE

QR code (abbreviated from Quick Response Code) is the trademark for a type of matrix barcode (or two-dimensional bar code) first designed for the automotive industry in Japan. Bar codes are optical machine-readable labels attached to items that record information related to the item. . The code consists of black modules (square dots) arranged in a square grid on a white background. The information encoded may be made up of four standardized types ("modes") of data (numeric, alphanumeric, byte / binary, Kanji) or, through supported extensions, virtually any type of data.


V. BARCODE AND GPS-BLE

To scan a QR code we need a bar code scanner ,this can be available in internet .to interface the Bluetooth with mobile and the kit we are using an GPS-BLE application.

PROPOSED METHODOLOGY

Each individual is given a unique QR code. This code is scanned using a barcode scanner, which is a mobile application. Whenever the code is scanned the information of scanned code is displayed on the LCD display and also in GPS-BLE application. The complete information can be seen in server monitor using serial monitoring page. The ARDUINO software plays a key role in this proposed methodology. The program written in this platform is written in language C. This program is dumped into the ARDUINO UNO using an USB cable from laptop . Then the code is uploaded and performs as we have designed. A Bluetooth is used to communicate between the hardware and mobile application. The block diagram of proposed methodology is below:
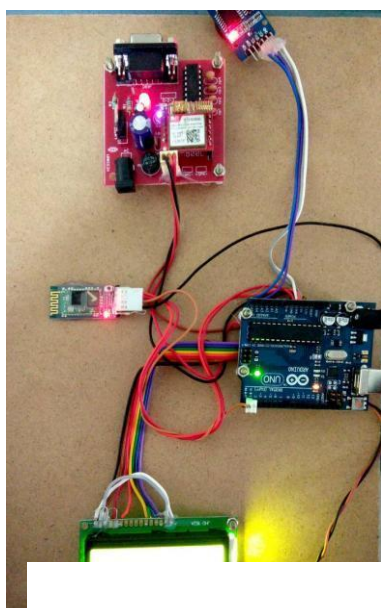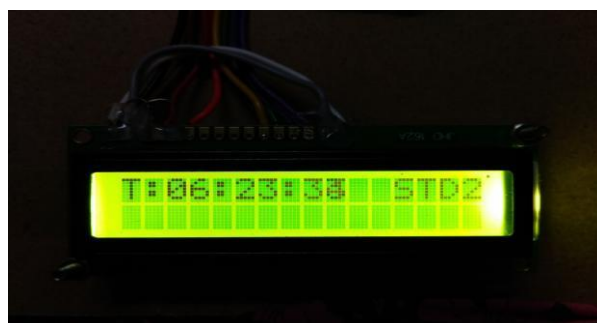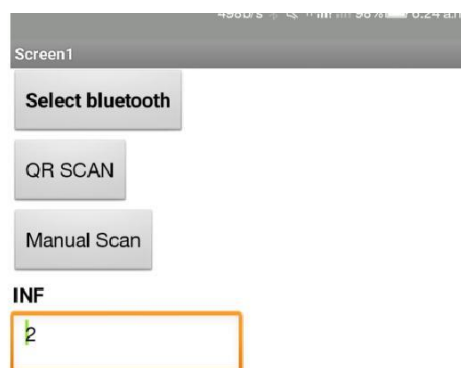

Fig:Block diagram

RESULTS

The results of our proposed project are like this whenever a code is scanned the corresponding student details can be seen. Here we have scanned the code of student-2,so it shows the time and student number on LCD , also on GPS-BLE application and also on server monitor.
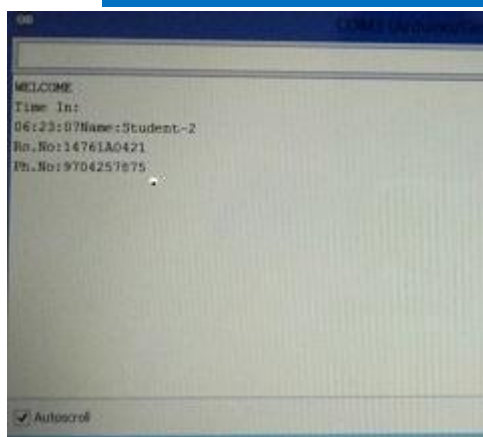

Fig : QR CODE OF STUDENT-2

Fig: LCD DISPLAY

FIG : GPS-BLE APPLICATION

FIG: SERVER MONITOR

The above represents the serial monitoring of the scanned QR codes of the student with their details like:

- Roll number
- mobile number
- In-time

CONCLUSION

Due to this the accuracy of the attendance system increases. The process of taking attendance becomes easy and the security of data increases.

FUTURE SCOPE

Due to advancement in technology ,the future scope of the attendance System will be a FACE RECOGNISATION ATTENDANCE SYSTEM.

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