Rfid based attendance system using microcontroller pdf

In this article, we implemented two different RFID-based participation system projects using 8051 Microcontroller and AVR (ATmega 8) Mirocontroller. Attendance at colleges is generally paper-based, which can sometimes cause errors. Manual participation takes longer. Thus, the proposed attendance

system uses RFID technology to take participation. In this system, each student is issued an RFID tag. The control unit is in the institution. Whenever the card is placed near the reader, there will be participation. This article explains the same. But, before you go to read this post, once you have an idea of how to interface LCD with AVR Microcontroller as it is also included in this circuit. The RFID-based participation system for construction and output consists of RFID reader, RFID tags, LCD display and microcontroller unit. RFID can be interfaced to the microcontroller via USART. The data is transferred from the RFID cards to the reader and from there to the microcontroller. Radio frequency technology is used in many applications. RFID tags are of two types: 1) Passive tags and 2) Active tags. Passive tags contain a 13-digit numeric tag built into it, where as an active tag is the read/write tag, that is, you can read from the tag and write to the tag. This project uses passive tags. In real time, you can release active tags to students, with their roll numbers as tags. The RFID reader contains a copper winding. This winding acts as an antenna. When the tag is placed near the reader, due to the induced mutual inductance energy, the data is transferred to the reader. The reader then transfers the data to the microntroller. Microcontroller continuously checks the data, if data is received, microcontroller compares the data in the database. If the tag is authenticated, the microcontroller accepts presence. You can also control the output video of the rfid-based participation system. Circuit 1 RFID Based Attendance System Circuit Diagram using AVR Circuit Diagram of RFID Based Attendance System – Electronics Hub Circuit Components ATMEGA8 Microcontroller. RFID tag of the RFID reader. LCD Circuit Design display of the participation system based on RFID RFID participation system has a very simple circuit design. The RFID reader has transmission and reception pins. These pins are connected to the microcontroller's transmission and reception pins, such as pd0 pins and microcontroller PD1. VCC is connected to 5v and GND is connected to the ground. If the pins are not available for the form, connect it using the DB9 connector. The PD0 pin is receiver and the PD1 pin is transmitter. Related post: Biometric participation system using AVR microcontroller. The RFID module communicates with the controller USART, where USART is a communication protocol. USART stands for Universal Synchronous and Asynchronous Receive and Transmit. Serial data can be transmitted from the RFID module to the microcontroller using UART. The ATmega8 microcontroller has USART registers internally. These registers should be declared to transmit or receive data in series. The LCD display is connected to the microcontroller's B port. Lcd interfacing in 4-bit mode is in the microcontroller, as shown in the circuit diagram. D4 – D7 data pins are connected to the microcontroller's PB0 - PB3 pins. The RS pin is connected to PB4, the RW pin is connected to PB5, and the enablement pin is connected to the microcontroller's PB6. To display data on LCD, initially set the LCD to 4-bit mode. Then make the Rw perno low, the RS high, enable the high perno. Send data to the data pins and make the enable pin low. DOWNLOAD THE PROJECT CODE RFID-based frequency circuit simulation video How to use the RFID-based participation system circuit? After making all the above connections, turn on the circuit. On LCD you will see PLEASE SCROLL THROUGH THE CARD. Place the RFID tag near the reader. The reader then reads the data in the tag and transmits it to the controller. Microcontroller compares the tag to the database. If the tag is paired, the LCD is displayed authenticated and takes your presence Now place another tab that is not in the database and check authentication. The LCD now displays Unauthorized and will never require participation. In this way, we can use implement this circuit. Video Output (RFID Attendance System using AVR) Circuit 2 RFID based Attendance System using 8051 The previous circuit shows the RFID-based attendance system using AVR. Here is the same project but using the 8051 microcontroller. Let's see the circuit and the operation of this circuit. The principle of circuit operation is the same as the above circuit. Required circuit diagram components AT89C51 Microcontroller AT89C51 Programming board 11.0592 MHz Quartz crystal 2 x 33pF Ceramic capacitors 2 x 10KΩ Resistor 10μF Electrolytes 2 x Capacitor 16 x 2 LCD Display 3 x 1KΩ Resistor 10KΩ POT EM-18 RFID Reader Module RFID Tag or Wires Circuit Design Link Cards The main components of the project are the 8051-based microcontroller , 16×2 LCD and RFID reader module. First we will see the basic connections with respect to the microcontroller. Here, we will have to connect a crystal, a reset circuit and external access. To use the oscillator on chip, an 11.0592 MHz quartz crystal is connected to pins 18 (XTAL2) and 19 (XTAL1) of the microcontroller. Two 33pF ceramic capacitors are connected by the crystal to the ground. The reset on the 8051 microcontroller is active at high, i.e. when applying a high pulse to the RTD pin, the microcontroller will reset. A 10 KΩ resistor is connected by the RST (Pin 9) of the microcontroller on the ground. A 10μF electrolyte capacitor is connected between the positive feed and the RTD. A button is connected through the capacitor. The (Pin 31) is connected to a positive power supply using a 10 KΩ resistor. This completes the basic connections with respect to the microcontroller. Now we're going to connect the LCD to the microcontroller. To adjust the contrast of the display, a plate is connected to adjust the contrast of the pin, for example, pin 3 of the LCD. First Before the three LCD control points, e.g. RS, RW and E at P3.6, GND and P3.7. Then connect the 8 data pins of the LCD display to the PORT1 pins of the microcontroller. After connecting the display, we will now connect the RFID reader module. Connect the RFID reader's TX pin to the RXD pin, such as the microcontroller's P3.0. Similarly, connect the RFID reader RX pin to the TXD pin, such as the microcontroller's P3.1. Finally, a button is connected to P3.3 (IN) to view the details of the participation. Working The goal of this project is to design a frequency system based on RFID technology using the 8051 microcontroller, in which the attendance of students or employees is automatically recorded with the scrolling of a card. The operation of the project is explained here. When this circuit is turned on, the microcontroller will initially show the message as Swipe the board on the LCD display. When the RFID reader detects the ID card, it will send the unique card to the microcontroller via serial terminal. With the help of proper programming, we have to compare the card received no. with numbers that are already stored in the microcontroller or any database. Once, if one of these numbers matches the no. of the card received, the corresponding name stored in that no. appears on the LCD display and also marks the presence of the name stored in the corresponding number. Pressing the button will close the attendance recording and the details will be displayed repeatedly on the LCD until the microcontroller has been restored. DOWNLOAD PROJECT CODE Applications of the RFID-based frequency system Rfid frequency system can be used in educational institutions, industries and anywhere. RFID is an emerging technology and is used in applications where authentication is required. The limitations of the RFID based frequency system participation system are protected, but there is the possibility to misuse the cards. A person can give the presence of another person if he or she had an RFID card. If the card has been passed for more than once, there is a possibility to give participation for the next few days even if the code is not written correctly. SHOWING 1-6 OF 6 REFERENCESA New design of the low-cost integrated intelligent security system for industrial surveillanceAsener's international engineering and technology journal2010Kamaraju , A new design of low-cost integrated intelligent security system for industrial surveillance, Environmental effects on antennas tags RFID 2010M.(2013),Student participation based on RFID Management System , InternationalJournal of Scientific & Engineering Research Volume 4,2013 An RFID-based frequency system is a very interesting project that can be used in different places, such as schools to record the attendance of students and teachers, private organizations to tabulate employees' monthly working hours and automatically calculate salary based on the number of hours recorded in the office and other similar types of questions. A presence management system based on RFID RFID Be designed using different types of microcontrollers, such as an 8051 series controller, an AVR, an PIC, or an ARM controller. The same RFID participation system can also be developed using popular development boards such as Arduino, Raspberry Pi etc. Choosing a microcontroller or development board is based solely on the additional features and features you plan to incorporate into your system. For example: – If you plan to export all data recorded on the system to a web platform (such as a cloud host) at the end of each week, it is good not to use the 8051 series controller to design such a system. Such a type of system that communicates with the Internet can be efficiently (and easily) designed using atmega AVR series controllers. If you are designing as a hobby, such a system can be easily designed using Arduino. RFID-based participation system using Arduino In this project, we will build an RFID-based participation system using Arduino. An RFID-based attendance management system is based on a few simple concepts. We store a set of RFID card data in our system, such as RFID 3 or 10 card data. When the person with the right RFID card (compatible with preloaded data in our program/system) arrives and scrolls through their RFID tag, their arrival time will be stored on the system. When the same person scrolls through their RFID tag again, the system will save it as exit time and add it to their total working hours. Before you start, please go through our tutorial on how to interface RFID reader to Arduino and also read our tutorial on the rfid-based access control system using Arduino. Designed Displays the current time and date on the LCD screen along with an option for the menu button. Saves details of a user's arrival and exit time to arduino's EEPPROM. Calculate and store each user's total working hours and provide options in the menu to retrieve it. Provide an option to erase data that can only be accessed by the administrator using his ID. Circuit diagram -Arduino RFID Presence Circuit Diagram - RFID-Based Participation System Project Description The complete circuit diagram to interface the RFID module to Arduino is shown above. The unique ID code in the RFID card is read by the circuit and the corresponding person's name will be displayed on the 20 x 4 LCD display. The TX pin of the RFID module is connected to the 0th pin (RX) of arduino. Arduino receives data from the RFID module through this channel. The 1,2,3,4 button is used to select the menu and several options within the menu. The Arduino pins to which the buttons are attached are configured as within the program. This will eliminate the use of external tensile resistors by allowing Arduino's internal pull-ups. A buzzer and two LED indicators are connected to the 5th, 4th and 3rd pins of the Arduino respectively. The buzzer rings when it receives an id code when a card is read from the circuit. Our system uses a 20 x 4 LCD module for displaying purposes. Work and of lcd module 20×4 is similar to that of LCD 16 x2 expects it to consist of a few more rows and columns. The RTC module we use here is DS1307 IC. The RTC module is connected to the Arduino using the I2C protocol. SCL and SDA pins are used to establish I2C communication. Program/Code Download the Arduino program The libraries we are using here are LiquidCrystal.h, EEPROM.h, wire.h. LiquidCrystal is for interfacing the LCD module. EEPROM writing and reading is done using the functions provided by the EEPROM.h library. The wire.h library allows you to communicate with I2C /TWI devices (RTC module). The address of the I2C device is mentioned at the beginning of the program. Both 7- and 8-bit versions of I2C addresses exist. 7 bits identify the device, and the eighth bit determines whether it is written or read by. The Wire library, used for I2C bus communication, followed by the bus address definition for RTC as 0x68. These are followed by two functions that convert decimal numbers to BCD (decimal with binary code) and vice versa. These are necessary because IC RTCs work in non-decimal BCDs. The setTime() function is used to set the clock. Using it is very simple to enter values from year down to second, and the RTC will start from that moment. Once the function is performed once it is advisable to set it with // and load the code again, so that it does not reset the time once the power has been recycled or the microcontroller is restored. Reading time from your RTC IC is just as simple, in fac, the process can be followed neatly within the displayTime() function. At first, two arrays of pointers are declared that contain RFID codes and people names. The name and ID code of each staff must be enrolled in this array over programming time. When a person scrolls through their RFID card, the controller will receive a unique ID code on their RX pin. The controller will compare the received ID with the codes previously stored in the array mentioned above. If the ID received is equal to any of the ID stored in the program, the person's name will be displayed on the LCD and the arrival time will be stored on the controller's EEPROM. A flag is then hosted within the program to signal that person's presence. When the same person scrolls through their ID again, the controller will assume that the person is leaving (checking the corresponding flag bit) and will save that time as an exit time. The working time is then calculated using the arrival and departure time. It is then added to the total working time and stored in the EEPROM. The controller will automatically clear yesterday's data in the everyday morning (8.30am). Details of the timetable total staff can only be deleted by the administrator. The menu includes an option called view everything that shows each staff's total working hours since they were last restored. The view participation option will give the arrival and departure time of the staff on that day. The program includes details of 10 employees. You can reduce the program by reducing the number of employees. So we finished learning the RFID-based frequency system using Arduino. The outgoing photographs follow! Follows!