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RFID based Attendance Monitoring System using 8051 Microcontroller

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Abstract: ***Attendance marking in a Classroom is typically a guide manner that consumes greater time and once in a while erroneous. The proposed attendance gadget addresses this trouble the usage of RFID to take attendance in easy way. in our work our attendee is allotted with a RFID tag and controlling unit which is given to the organization. Whenever the card is positioned close to the reader, the attendance will be recorded. In general attendance is taken manually and reports are maintained in file format for future use. Our proposed work is thinking in a way to reduce guide work and to make this work automatic. Through embedded process we are going to implement this because embedded is defined to be hardware controlled by software. Here microcontroller is utilized which controls all the hardware components. Microcontroller plays a major role in our system. The foremost goal of the machine is to uniquely perceive and to make attendance for a person. This requires a special product, which has the functionality of distinguishing distinctive person. This can be achieved through RFID (Radio Frequency Identification). The most important components of an RFID machine are RFID tag (with special ID number) and RFID reader (for analyzing the RFID tag). In this system, RFID tag and RFID reader used are running at a hundred twenty five kHz. The EEPROM used for storing the important points has the functionality of storing small print of 256 man or woman at a time. The PC can be used for restoring all the important points of attendance recorded earlier. This record affords a describes about the hardware and software program used in the proposed system.***

Keywords: EEPROM, RFID, Transceiver, Transponder.

I. INTRODUCTION

Embedded system is by and large an equipment intended for a particular reason upheld by a product. The microcontroller assumes a significant part in the framework. The principle objective of the framework is to interestingly recognize and to check the participation for an individual. This requires a one of a kind item, which has the ability of recognizing diverse individual. This is conceivable by receiving the new arising innovation RFID (Radio Frequency Identification). The primary pieces of a RFID framework are RFID tag and RFID reader. This RFID tag has extraordinary ID number for every person and RFID peruser for perusing the number from RFID tag. In this framework, RFID tag and RFID peruser are worked at 125kHz. The EEPROM utilized for putting away the subtleties has the capacity of putting away 256 man subtleties all at once. The PC can be utilized for reestablishing every one of the subtleties of the recorded participation.

II. LITERATURE SURVEY

It is predicted that RFID use can in any case increment. it's probably not going to at any point be as cost successful as barcoding, anyway it'll get predominant in territories any place barcoding and elective optically check advances aren't viable. RFID Tag classes the fundamental assortments of RFID labels are regularly delegated perused/compose and peruse exclusively. the data hang on read/compose labels are regularly improved, added to, or totally changed, anyway given that the tag is among the shift of the peruser. the data hang on a sweep exclusively tag are frequently check, anyway can't be improved in any methodology. Peruse/compose labels ar way more high-ticket than examine exclusively labels, with the goal that they aren't utilized for following most antiquity things. RFID labels ar extra classified as: Active labels, that contain electric battery that controls the semiconductor gadget and licenses it to communicate a proof to the peruser. Semi¬active (or semi¬passive) labels, that contain electric battery to run the electronic hardware of the chip, anyway should draw power from the attractive motion made by the peruser in order to talk with the peruser. Latent labels, that swear only on the attractive transition made by the radio waves conveyed by the peruser to shape a current which will be gotten by the recieving wire among the aloof tag.

A. RFID Construction RFID Technology Overview

A RFID reader sends out a radio frequency wave to the 'Tag' and the 'Tag' broadcasts back its stored data to the reader. The system works basically as two separate antennas, one on the 'Tag' and the other on the reader.

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III. METHODOLOGY AND ALGORITHMS

The description of each algorithm used in this project is explained below TRANSPONDERS
RFID tag is formed of semiconductor that contains characteristic info and an antenna that transmits the info wireless to a reader. There are 3 choices which will be encoded on the tags.

A. Antenna

The antenna emits radio signals to activate the tag and browse and write knowledge thereto. Antennas ar on the market in kind of shapes and sizes, they'll be designed into a door frames to receive tag knowledge from persons or things or mounted on associate interstate tollhouse to observe traffic passing by on a state highway. RFID tag passes through the magnetic force zone it detects the reader's activation signal. The reader decodes {the knowledge the info the information encoded} within the tags computer circuit and also the data is passed to the host laptop for process. Read-only tags contain information sort of a serialized trailing vary that's on to them by the tag manufacturer or distributor. "Write once "tags alter a user to put in writing down information to the tag just the once in production or distribution methodology. Full "read-write" tags change new information to be written to the tags as needed and even written over original the data.

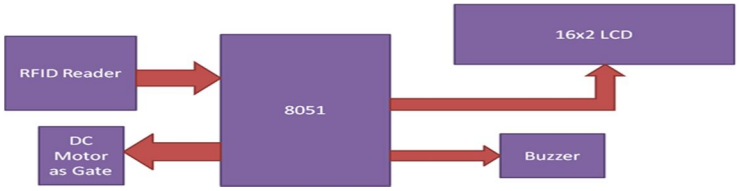

Figure 1: Block diagram of the proposed system

We divide the complete attendance system into different sections:

B. Reader Section

This section contains a RFID, that is associate degree electronic devices that has 2 elements one is RFID Reader and another one is RFID card or reader. once we place RFID tag with regards to the RFID reader, it reads the tag information serially. RFID tag has twelve digit character code in a very coil. This RFID is functioning at a baud of 9600 bits per second. RFID uses magnet to transfer information from reader to tag or tag or reader.

C. Control Section

8051 microcontroller is employed for dominant the whole method of the project. Here by victimisation 8051 we tend to area unit receiving RFID information and causation standing or messages to digital display.

D. Display Section

A 16*2 digital display is employed during this project for displaying messages thereon.

E. Driver Section

This section incorporates a motor driver L293D for gap gate and a buzzer with a BC547 NPN electronic transistor for indications.

F. Oscillator

To use the On-chip generator associate degree eleven.0592 megahertz quartz is connected to pins 18(XTAL 2) and 19(XTAL 1) of small controller. 2 33pf ceramic capacitors area unit connected from the crystal to ground.

G. Resistors

A ten kg ohm resistance is connected from the RST (pin 9) to small controller to ground.External pin (pin 31) to microcontroller and therefore the ground.

H. Reset Pin

Reset on the 8051 microcontroller is active high that's applying high pulse to the reset pin, to the microcontroller can Reset.

I. Capacitors

A 10 tiny F capacitance is connected between the positive provide and RST pin. A electrical switch is connected across the capacitors.

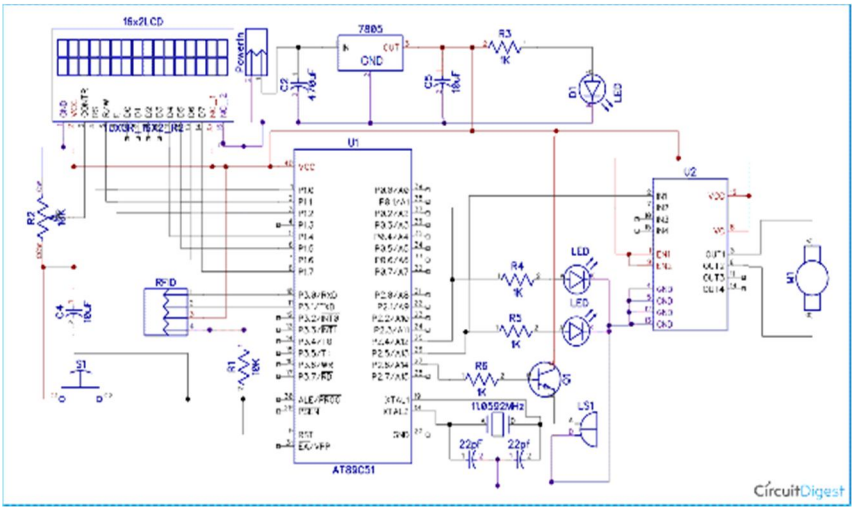

Figure 2: Circuit diagram

J. LCD to Microcontroller

Connect LCD to microcontroller to adjust the contrast of the display, a pot is connected to contrast adjust pin (pin 3 of LCD).

K. LCD Connection

Connect 3 pins of LCD that is RS, RW and E to P3.6, Ground, P3.7 then connect 8 pins of LCD to port pins of the microcontroller.

L. RFID Connection

Connect TX pin of RFID reader to RXD pin (p3.0) of Micro controller. Connect RX pin (p3.1) of Micro controller. Finally button is connected to p3.3 (IN) to view the attendance details.

IV. WORKING OF THE CIRCUIT

When the circuit is high-powered ON, the microcontroller can show the message as “swipe the card” on the {lcd liquid crystal show| LCDdigital display alphanumeric display} display. With the assistance of the programming compare the received card range with the numbers already hold on in microcontroller. If {the range|the amount|the quantity} is matched the name hold on within the number is displayed on the liquid crystal display and attending is marked. By printing the button attending recording are closed and therefore the details square measure displayed on liquid crystal display till small controller has been reset.

V. SIMULATION RESULTS

Initially we have to design the schematic diagram in proteus software and then upload the keil program to 8051 microcontroller. Finally we have to simulate it. once the simulation gets over a virtual terminal will appear on the screen. we have to copy and paste the register number of the student. And then it will show the result like attended.

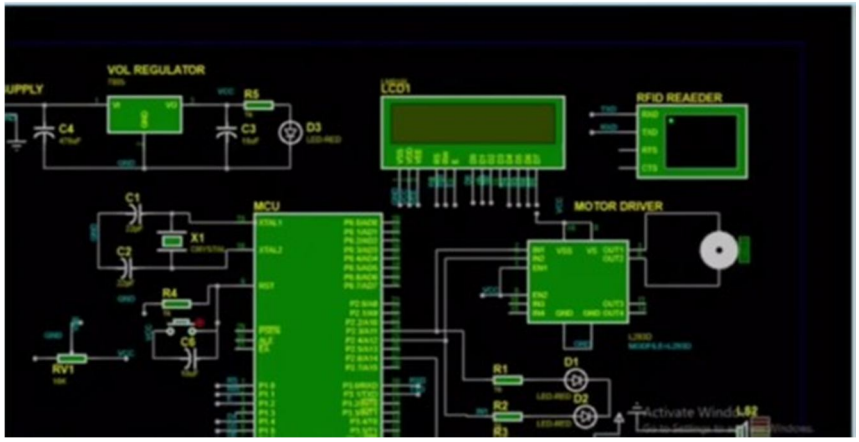

Figure 3: Schematic Diagram

A. Simulation Result 1

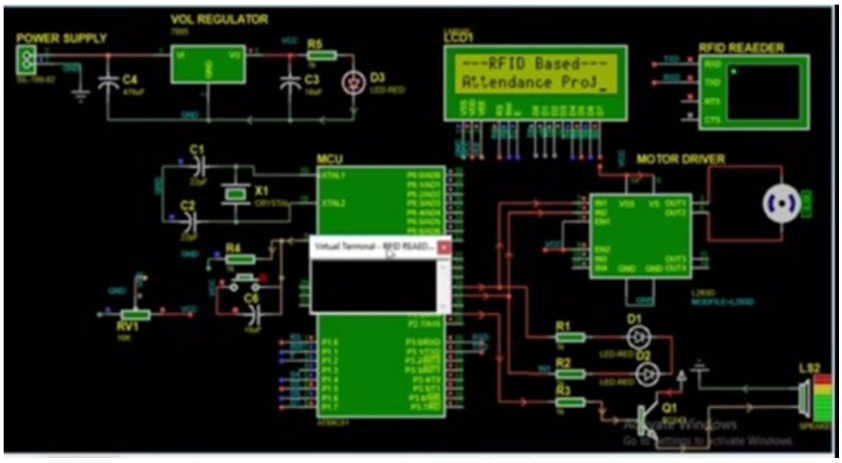

Figure 4: SIMULATION RESULT 1

After designing the schematic, we have to simulate it . And then the RFID reader will appear.

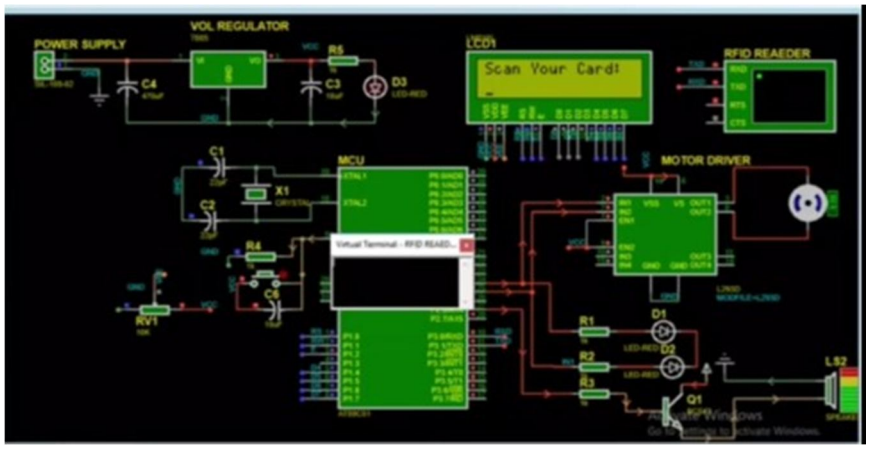

Figure 5: INPUT 1

Now the LCD screen will show the instruction “SCAN YOUR CARD”

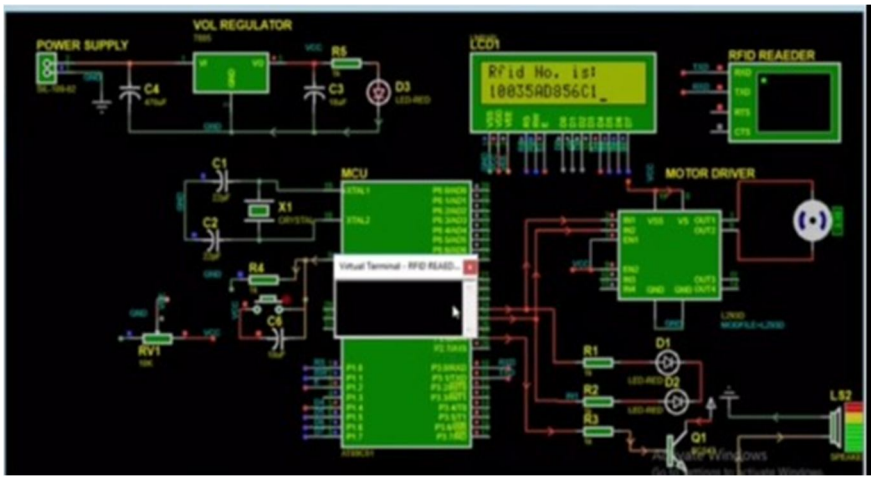

Figure 6: OUTPUT 1

Now it will show the person name

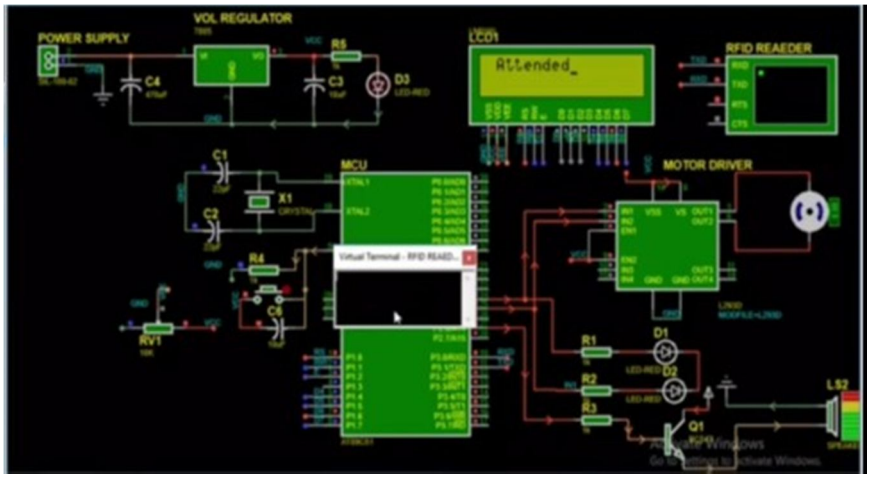

Figure 7: OUTPUT 1

Finally it will show the result as “attended”

VI. CONCLUSION

Our task used to be to attain automation in an instance form. At the receiver facet the complete circuit is constructed in such a way that our messages are obtained to electricity on / off the extension board. Scope of RFID primarily based attendance device is that it can be used at houses to adjust electricity, domestic appliances, to reveal and furnish protection of the office, enterprise etc. The chances are infinite in RFID primarily based attendance device . We tried to decorate the extension board by way of in reality including a digital vacationer counter to our extension board. RFID based totally attendance device can be built with the assist of Bluetooth, GSM, or imparting RTC and DTMF. As we stated the probabilities are endless. Different applied sciences can be used to reap automation however every technological know-how has its very own mark of presence. Bluetooth and DTMF are easier to put in force that is why we employed GSM modem in our model. Automation is a family time period presently and can be used in homes, hospitals, workplace environments, industries, excessive protection zones, malls, restaurants, hotels, universities, campuses, schools, workshops, manufacturing sectors, roadway law etc. RFID primarily based attendance machine is the demand of the hour. We have constructed a prototype. A lot extra can be viewed in the future if we make use of automation in the direction of automation protocol. Great hobby will be considered when mechanical, civil, IT, computers, electronics and many others will merge toward constructing HAP i.e. Home Automation Protocol. From our mobile telephones we will be capable to view our residence or workplace surroundings on the screen, extra protection will be supplied through HAP. The evolution of HAP is close to and brighter than ever.

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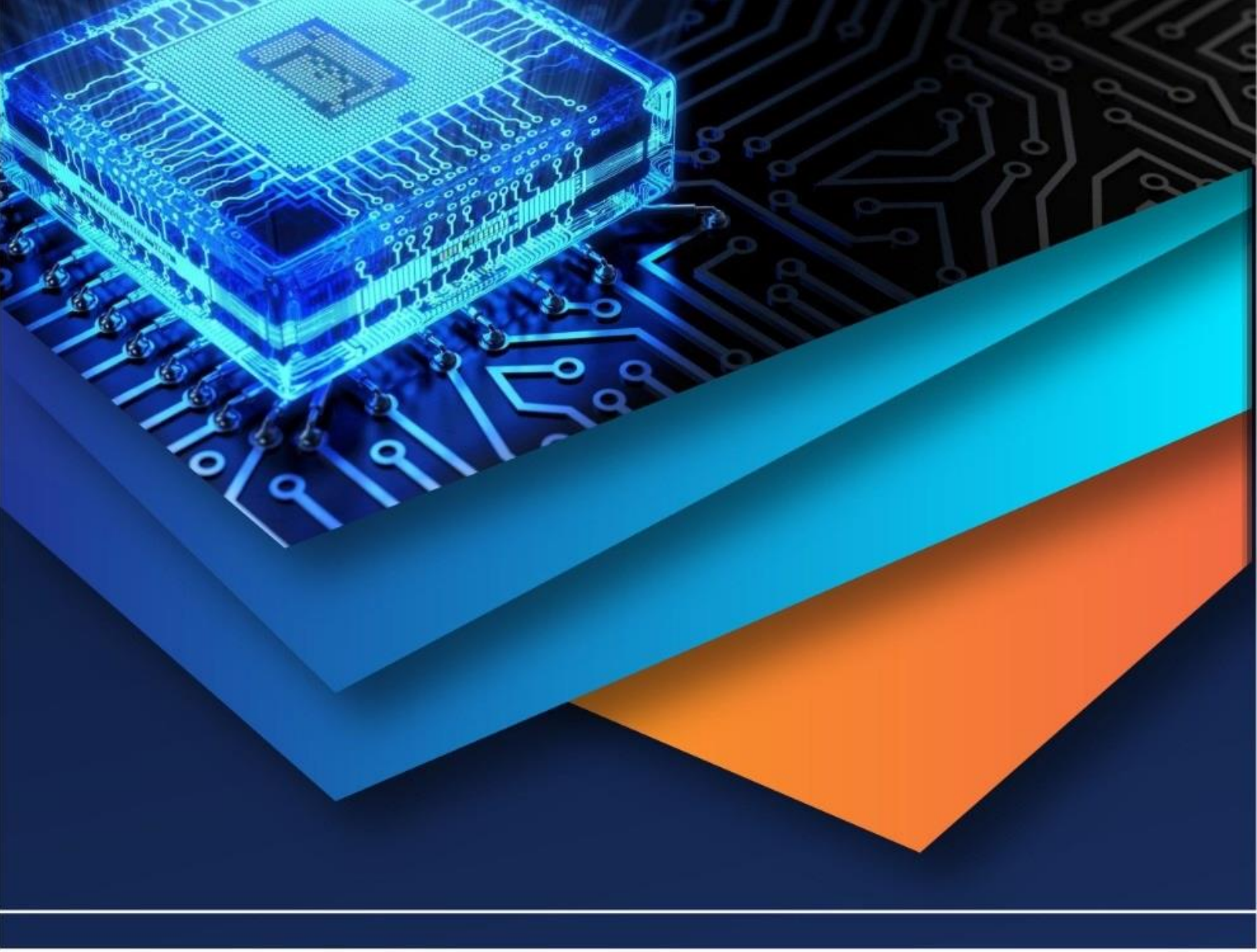

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