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Sustainable and No Contact Attendance System

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***Abstract:** This initiative makes use of RFID technology to keep track of every student who enters the classroomand to determine how long they will spend there. Every student is given an RFID tag under the suggested system. Taking attendance is a procedure. can be carried out by putting the card close to the RFID Reader, which will record all the necessary information about the pupil in the Excel Spreadsheet. A form of electronic device with a small antenna and a chip is known as an RFID (Radio Frequency Identification) device. Barcode scanners are no longer necessary thanks to RFID (Radio Frequency Identification). It generates a special identification number for that item, which must be scanned to obtain the information, just like a bar code or magnetic strip.*

I. INTRODUCTION

RFID is the technology that alters the way we communicate with other electronic devices and objects in our surroundings is RFID. It is utilised in every industry, from security to retail, where a distinct identifier is necessary. It is also paving the way for several cutting-edge developments, including human implants based on RFID technology. With such a broad range of uses, RFID is appealing and advantageous for many Arduino projects. Our teachers designate us present after we respond to the roll call in our schools and colleges. Ever consider the possibilities of using a smart device to track attendance? The RFID-based Attendance System we created using Arduino accomplishes this. Students may register on their own by simply putting their smart cards.

II. METHODOLOGY

Methodology of making this project

- Hardware & Software.
- PLX-DAX (To Store collected attendence data)

A. Hardware

Arduino UNO , RFID tags & reader, LED, LCD, Bread board, Potentiometer ,Resister, USB cable & Connecting wires. Initially we drew a circuit diagram for the system and we assembled all the components in their respective places as shown in circuit diagram, after all connection of components we verified and executed.

B. Software

Cross-platform integrated development environment (IDE) for Arduino application created in the Javaprogramming language (for Windows, macOS, and Linux). It came from the IDE for the Processing languages. also wiring. It has a code editor with tools for text copying and pasting, text replacement, automated indenting, brace matching, and syntax highlighting. It also offers straightforward one-click compiling and uploading tools for Arduino programmes. A hierarchy of operating menus, a message area, a text terminal, a toolbar with buttons for standard functions, and more are also included. The GNU General Public License, version 2 governs the publication of the IDE's source code. The Arduino IDE has specific code organisation guidelines to support the languages C and C++. A software library from the Wiring project, which offers numerous standard input and output operations,is provided by the Arduino IDE. For the sketch to start and the main programme loop, user-written code only needs two fundamental functions, which are combined with a programme stub main() to create an executable cyclic executive programme using the GNU toolchain, which is also distributed with the IDE. The executable code is transformed via the Arduino IDE's use of avrdude into a text filewith hexadecimal encoding, which is then loaded into the Arduino board by a loader programme in the firmware.
IDE 2.0: The Arduino Pro IDE (alpha preview) was published on October 18, 2019.21
Later, on March 1, 2021, the beta preview—now known as IDE 2.0—was made available. Despite advancements including a more professional development environment, auto completion support, and Git integration, the system continues to use the Arduino CLI (Command Line Interface). The Eclipse Theia Open Source IDE serves as the foundation for the application frontend.

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C. PLX-DAX

When used with any Parallax microcontroller, the Parallax Data Acquisition Tool (PLX-DAQ) software add-in for Microsoft Excel can collect data from up to 26 channels and put it into columns asit comes in. PLX-DAQ offers simple spreadsheet analysis of field data, sensor analysis in the lab, and real-time equipment monitoring. A Microsoft Excel add-on tool for Parallax microcontroller data acquisition is called PLX-DAQ. Now, data can be sent directly into Excel from any of our microcontrollers attached to any sensor and the serial port of PC

III. MODELING AND ANALYSIS

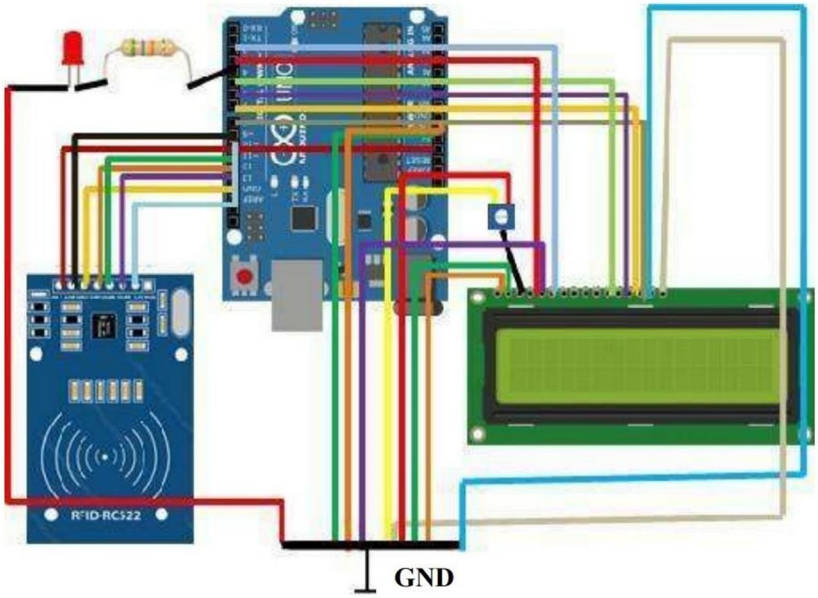


Figure 1 : Basic Circuite diagram



Figure 2 : RFID Tags

Smart barcodes are used in RFID tags, a sort of tracking device, to identify objects. Radio frequencytechnology is used by RFID tags, which stand for "radio frequency identification."

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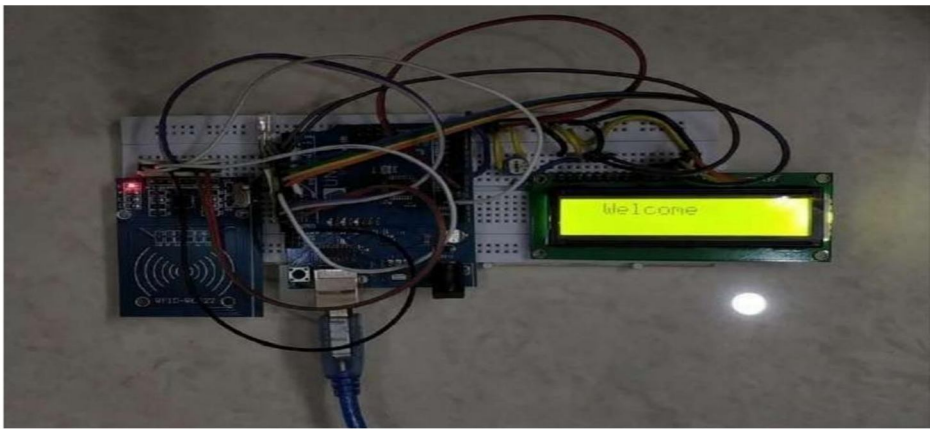


Figure 3: Prototype connection

The Arduino Uno is an open source microcontroller that was created by Arduino. Its board is the AT mega 328p microprocessor. This board offers several shield and other circuits with sets of analogue and digital input and output that can be used. The term "Radio Frequency Identification" (RFID) refers to the use of radio waves for data transfer that is non-contact and wireless.

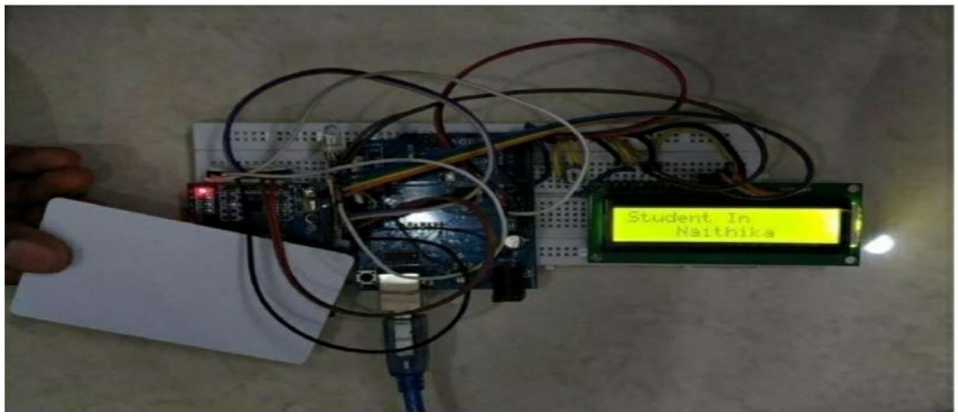


Figure 4: Attendance output

After the RFID tags were scanned by the RFID reader, as seen in Figure 4, the output of theattendance was presented in LCD along with the name of the student.

IV. RESULTS AND DISCUSSION

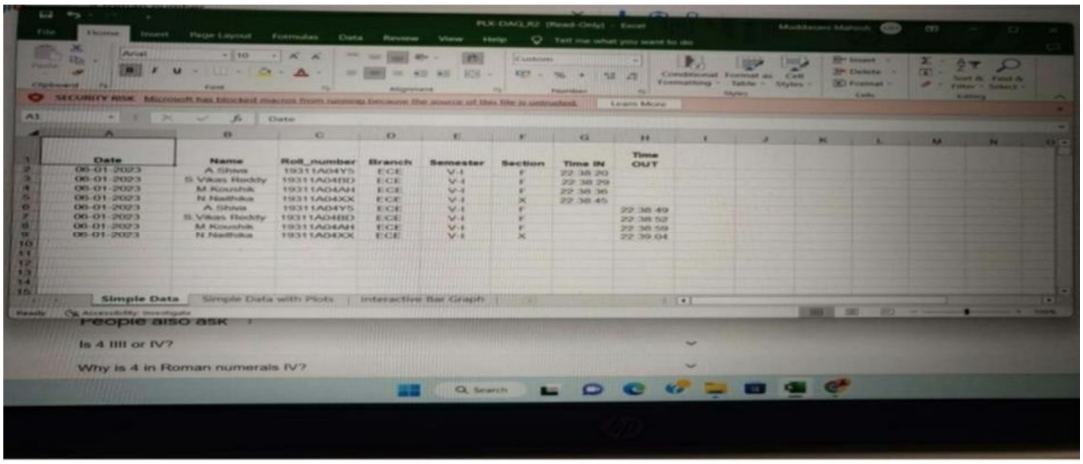


Figure 5: Recorded attendance in Excel-spread sheet

When RFID tags enter the RFID reader's radio frequency range, the RFID attendance system activates, as we learned. When the tags and distinct ID number match, an Excel spread sheetautomatically records attendance.

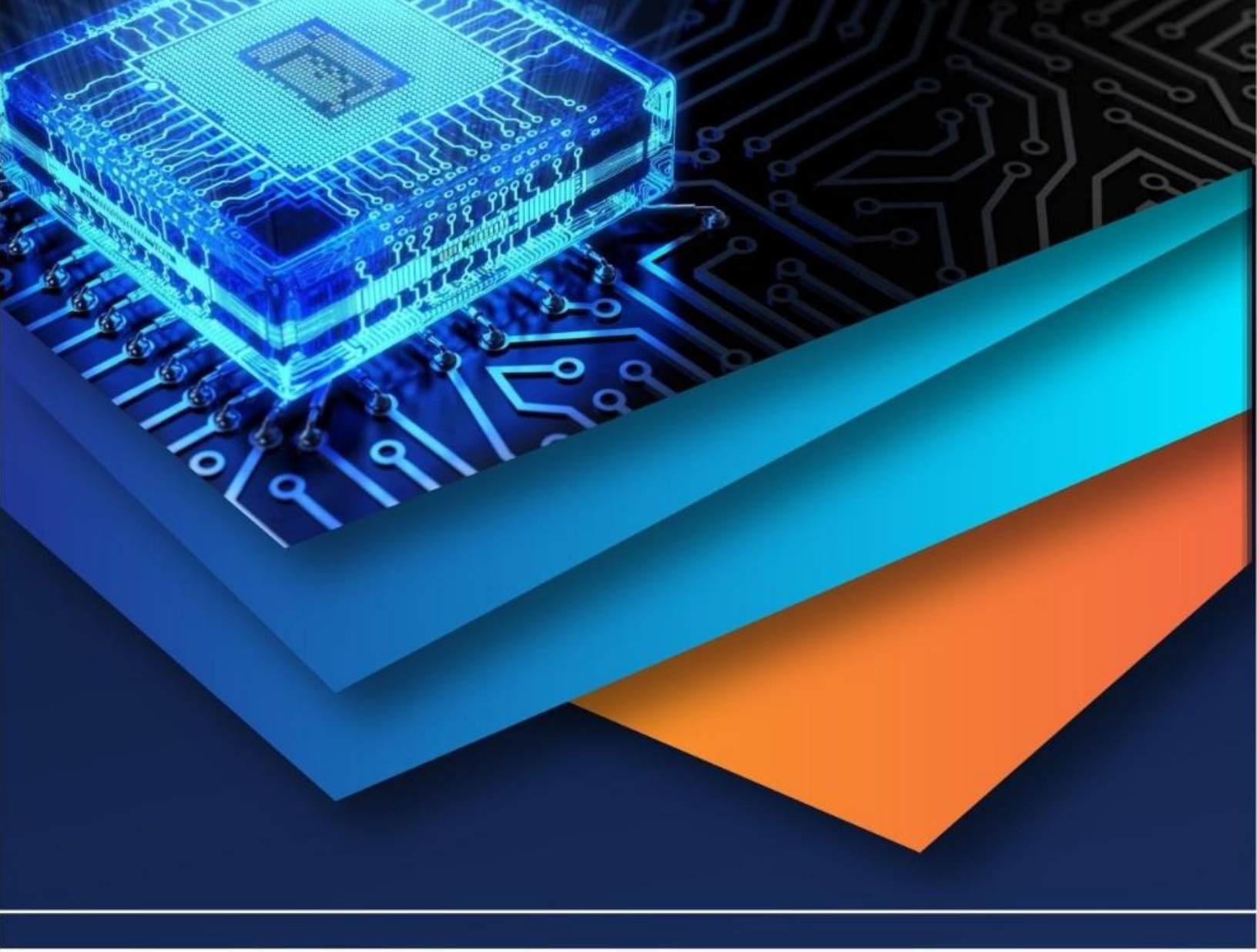
V. CONCLUSION

Finally, the goal of creating an RFID-based attendance system was accomplished. Compared to the conventional technique of attendance system, this project has offered a convenient method of attendance marking in terms of performance and efficiency. Data is better organised thanks to databases. But there are still certain things that can be done to this RFID to make it more dependable and efficient. To show when any unregistered cards are scanned, the device can include an LCD panel. This system can incorporate an IP camera to detect behaviours like buddy punching, in which one cheats by looking for another person. Adding a feature that allows the attendance system to inform when a student is absent will also help this attendance system.

The system is a low-cost one that is made to resist any terrain and environment while offering superior comfort and tactical and surveillance capabilities. Positively, RFID technology promises to boost operational and administrative procedures' efficacy and efficiency. Through the use of this article, the successful design and deployment of an automatic attendance system based on RFID technology has been successfully shown. The system created efficiently transforms the paradigm towards a digital and contactless environment and offers an accurate, convenient, and affordable way to track attendance in educational institutions. Additionally, the system's portability and compactness make it even more convenient to deploy as and when necessary.

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