ACE-SQUAD

presents

CheckInMate

ABSTRACT

Our product aims to develop a comprehensive attendance and performance monitoring system for college staff and students. Utilizing RFID technology, students can conveniently scan their cards to log attendance, which is then recorded in a spreadsheet connected to the CheckInMate app. Key features include grade and internal mark display, an achievements tab for staff, and an attendance percentage tab. The student login provides individual attendance tracking and a Goal Setter tool to calculate required marks for desired grades. This integrated system is designed to enhance convenience for both staff and students in college settings.

Detailed Description of Product

RFID for Identification

- RFID (Radio Frequency Identification) technology works by using electromagnetic fields to identify and track tags attached to objects or individuals. RFID systems include tags, readers, and a backend system for data management.
- Each student will be given an RFID card/tag which will have a unique frequency. This tag will be scanned on the RFID Scanner which will be at the entrance of each class. The second the card is scanned the student’s information will be sent to the connected ESP8266 microcontroller.

ESP8266 microcontroller for seamless integration

- An ESP8266 microcontroller is used to connect the RFID to the google sheet. Since the ESP8266 also has a inbuilt WIFI module built-in , we can use wireless connection in-between the ESP8266 and another system.

Detailed Description of Product

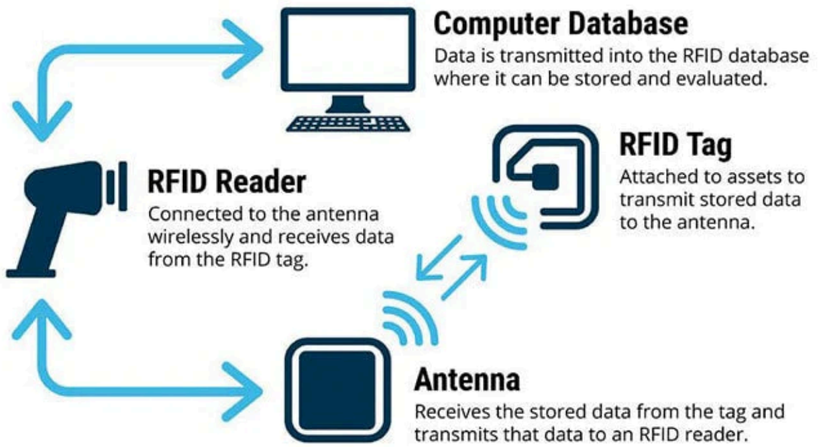


Fig 1. Diagram of How RFID system works

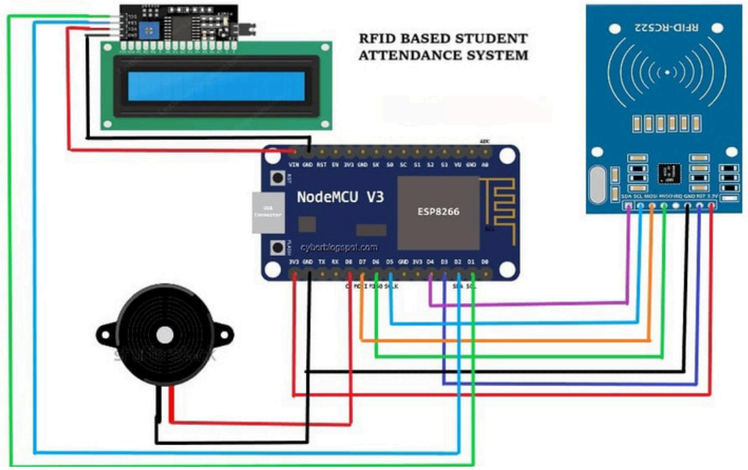


Fig 2. Circuit Diagram of RFID and ESP8266 system

As previously mentioned this system is connected to a google sheet via WIFI or wired connection. In which , when the RFID tag is scanned , attendance will be entered for the student in the google sheet.

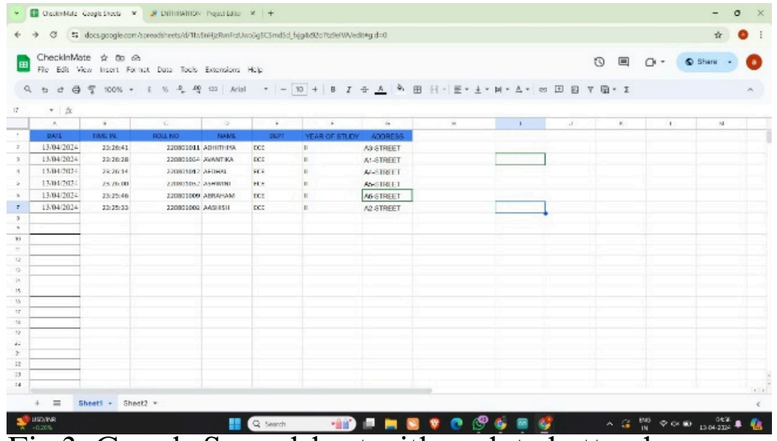


Fig 3. Google Spreadsheet with updated attendance

Detailed Description of Product

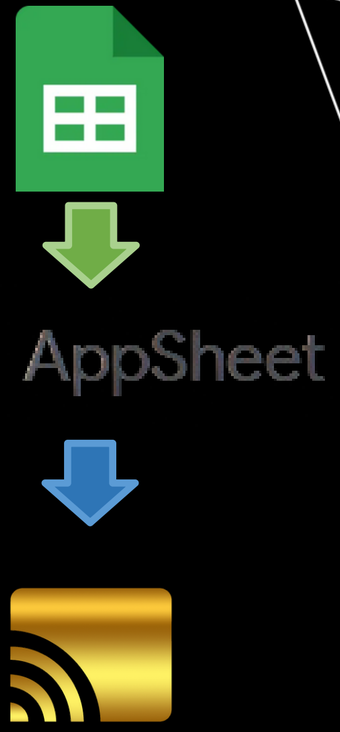
CheckInMate App

The Google Sheet is connected to our app which is called CheckInMate. AppSheet is a google owned software platform which is a no-code platform to create websites and apps. Using this platform we can seamlessly integrate the google sheet with our app making the whole system complete.

The attendance will be updated in real-time and will specify the time in which we clocked in. This way the staffs can easily check the attendance of their students more easily.

The main feature of this product is our app. It is not only for checking attendance but also for monitoring the performance of each student and offers a lot of hallmarks.

The app will have logins for both student and staffs.

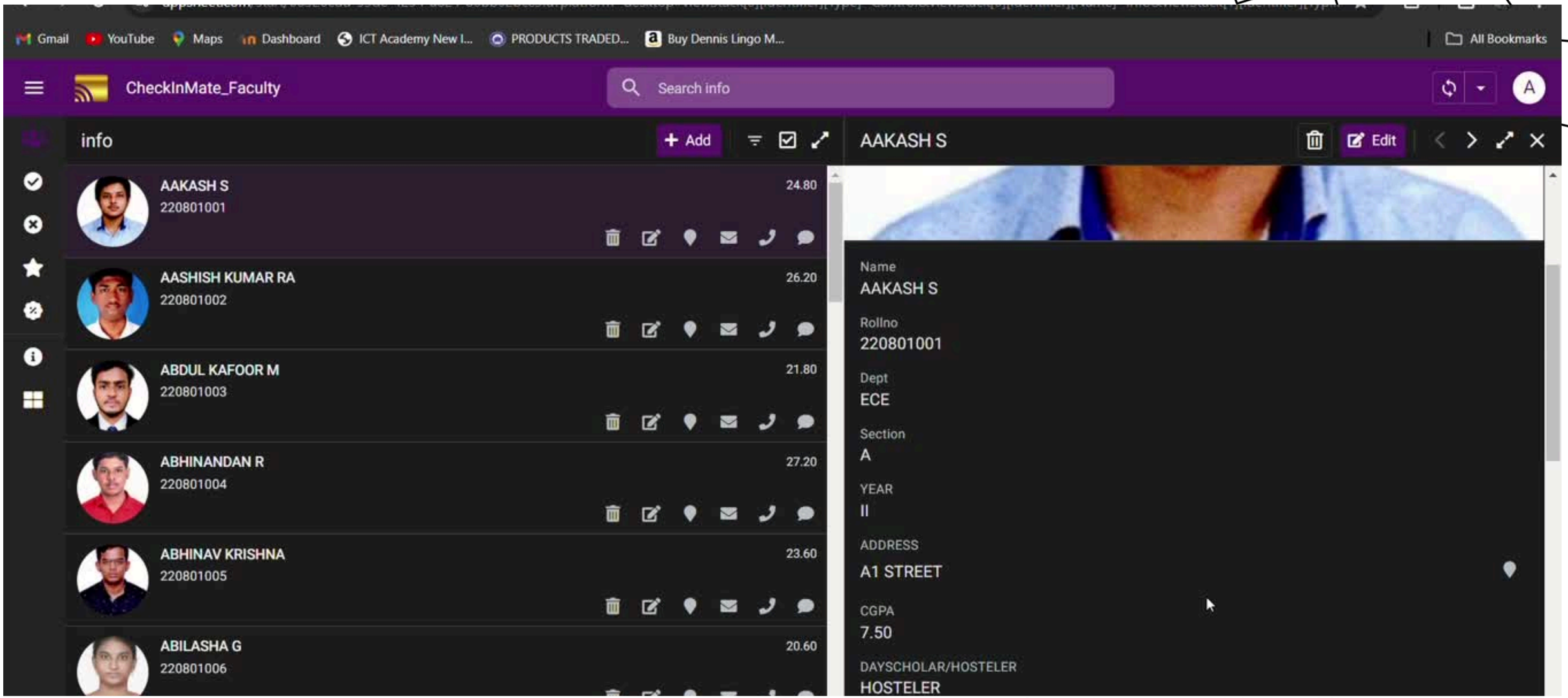


Staff Login

The staff login will offers information on the students who are present and absent for a particular day but beyond that , there will tabs for checking the information of students. The Info tab will offer the information of each student like previous semester grades and internal marks. Another tab is the overall attendance tab which will show the overall attendance for each student.

In addition to that there will also be an achievements tab which will showcase each achievement of students.
This is so that the staff can know each student’s achievement and get to know the student s more personally.

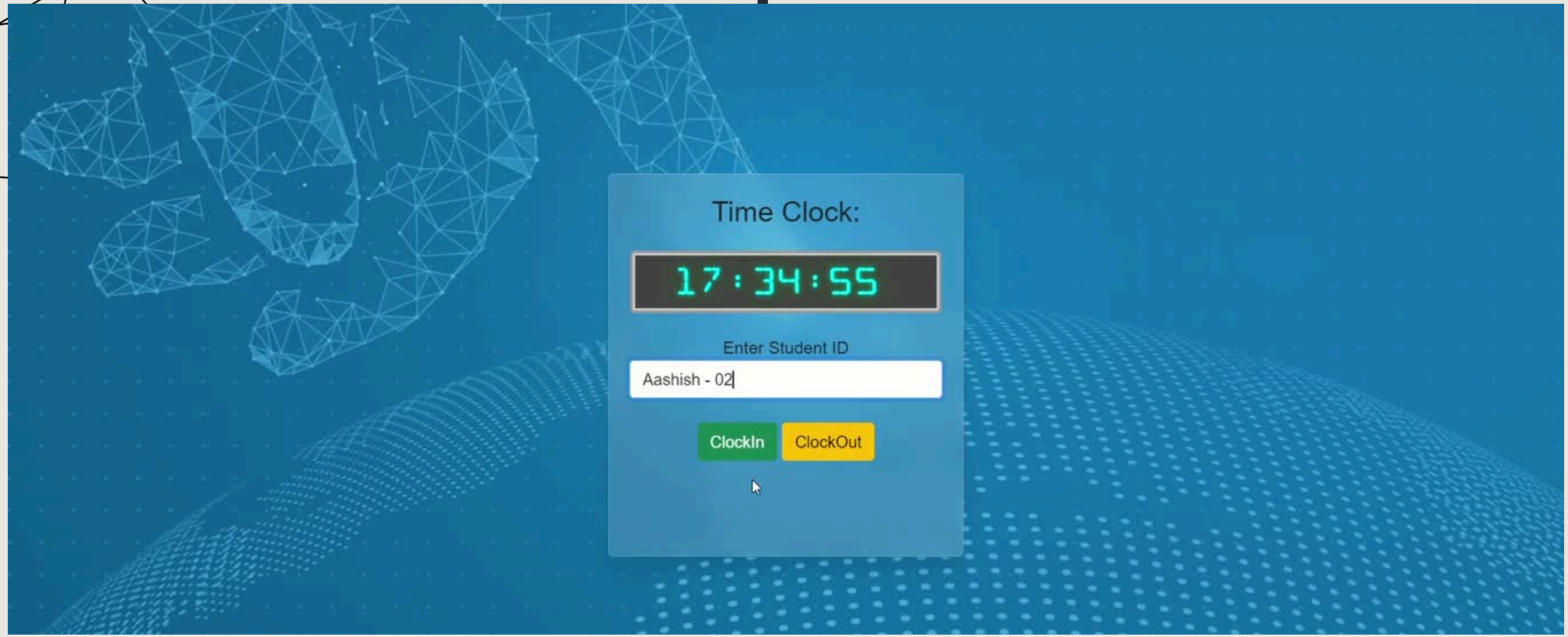
Detailed Description of Product



Note:
All students are marked absent unless otherwise they scan their RFID card and clock-in.

We will implement a function to add certificates and course completion proofs together with these extra-curricular achievements

Detailed Description of Product



we have thought of is by implementing a sort of 2-step verification where the student has to both scan the card and also enter their login in another website which also takes their attendance but more importantly stores their GPS location and IP address. If the address where the card is scanned is the same address as the address of the login , then the student will be marked present. Each student have their unique login based on IP address so therefore, the student's accomplice cannot login and scan the card for him unless he wishes to be booked for malpractice.

NOVELTY:

Thought many have implemented student attendance system based on RFID , none have taken it as far as to make it into a ease of use app.

The use of ESP8266 allows real-time updating via wireless or wired means. This means that unlike the other systems which use “end of the day” based attendance taking, ours’ is much more responsive.

The app we have developed hold not only basic information like marks and attendance but also contains a achievement’s tab in which the staff can learn more about a student’s strengths and encourage and get to know more about him/her.

The student login section of the app also contains the Goal Setter Tab which uses internal marks and wanted grade to find how much marks is needed for Semester examination

We have also discussed plenty of way to combat malpractice in attendance taking in the conclusion part, which many papers have yet to showcase.

Conclusion and Extra Features

In conclusion , our product can trivialise attendance taking and performance monitoring in class and save a lot of time while being a useful aid to both staff and student's as informative app.

Now let us look at few methods by which we can improve our product to overcome some potential malpractice:

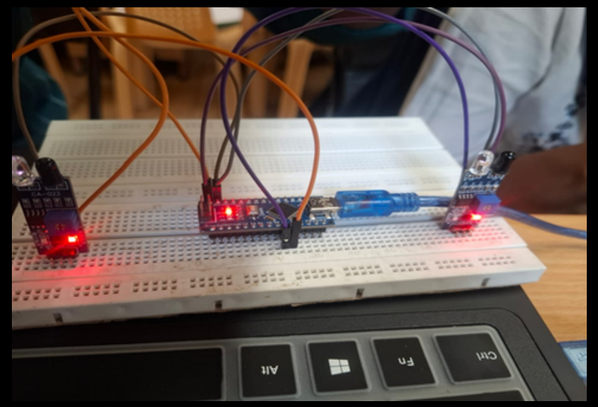


Fig 13. Circuit of Proximity Scanner

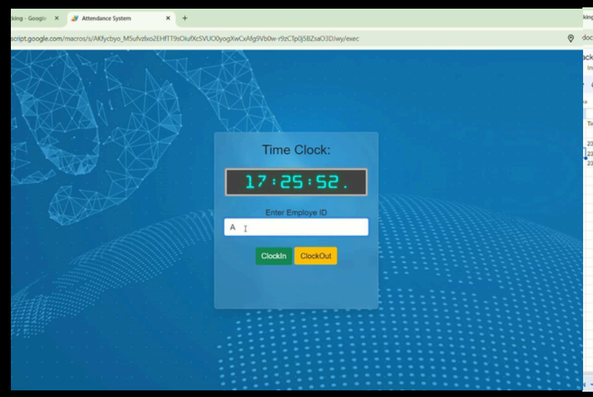


Fig 14. Login & Scanning at same time

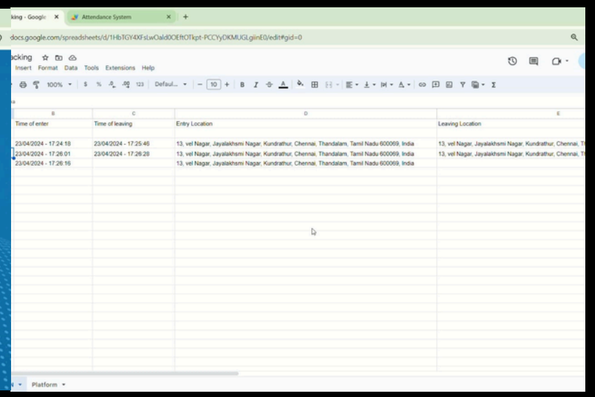


Fig 15. Checking if address matches for login and scanning

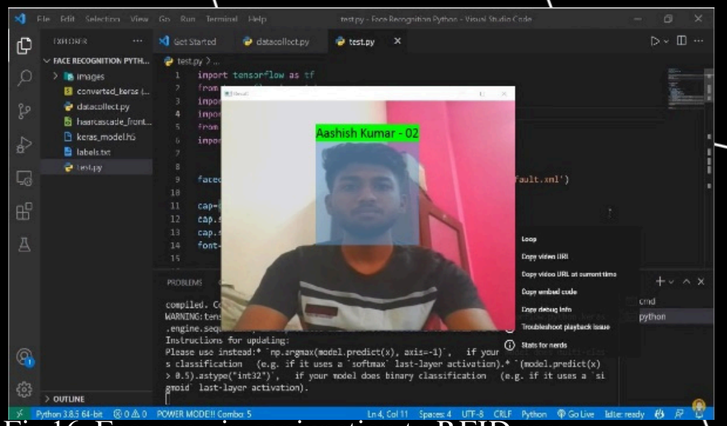


Fig 16. Face scan in conjunction to RFID scan

By implementing a headcount detector placed before and after the RFID scanner , we can make sure anyone person does not scan multiple cards. This will require students to leave and enter one by one to avoid not detecting someone who is overlapped with another person from sensor's Point of view.

Another solution we have thought of is by implementing a sort of 2-step verification where the student has to both scan the card and also enter their login in another website which also takes their attendance but more importantly stores their GPS location and IP address. If the address where the card is scanned is the same address as the address of the login , then the student will be marked present. Each student have their unique login based on IP address so therefore, the student's accomplice cannot login and scan the card for him unless he wishes to be booked for malpractice.

Finally we can add webcam with a (OpenCV) face detector which will cross reference the face of the RFID holder with that of the face captured. This method will be better with higher end microcontrollers and system used.

References:

Google Drive Link:
https://drive.google.com/drive/folders/1I_ISg7HInyoXoahn_sBcYMDba2YVSLKP

Project Links:

Staff Login: https://www.appsheet.com/start/08320cdd-59de-4294-a824-86bb02bcc3fa?platform=desktop#viewStack[0][identifier][Type]=Control&viewStack[0][identifier][Name]=info&appName=CheckInMate-532893517

Student Login: https://www.appsheet.com/start/6b3727ae-89f6-4fa1-94f5-ba7380c05c20?platform=desktop#viewStack[0][identifier][Type]=Control&viewStack[0][identifier][Name]=New

Student Login Page to get Student Location for Attendance taking:
https://script.google.com/macros/s/AKfycbzHpUWvc8lIaUC7_8LbNRLlTnBZEn6A4kM4Laj8serGRRKhi13V0iEmSm8W76-N4yy6/exec

THANK YOU