Student Safety and Tracking System

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Abstract: In this work, we present an android based application- Student Safety and Tracking System which provides an easy way for the class to connect and collaborate, keeping record of student attendance and to track location of the student in any institute or college . It help educators harness the strength of social media to personalize the lecture room for each and each scholar. This utility is an attempt to deal with the report of a big number of college students and their present, absent or depart popularity. To complete our study we used Android app modules, library modules and GPS module. This software is an strive of ours to preserve a document of a massive range of college students and their present, absent or leave status. This is totally a user friendly application teachers can smoothly operate it with none special training. Our analysis on the study disclosed that the application supports many type of different-different criteria for user so that student problem is solved and the person user with precise interface, via which the depart management issues are solved inside given time and it indicates performance in the internal messaging gadget and effects in accurate assignment scheduling gadget and this will be run with the minimum administration.

Keywords- GPS, attendance, student tracking.

I.   INTRODUCTION:

In colleges, it is very difficult to collect and collaborate, keep record of attendance of students and to track location of the students inside the college. It is very difficult to analyse student's attendance performance and so many other problems. Taking these issues into consideration, we have decided to make an application on Student Safety and Tracking which facilitates interaction between teachers and students. With the help of

this application educators harness the strength of social media to customise the lecture room for each and every scholar. This application is very straightforward to analyses student attendance performance. There are multiple factors contributing to its success. Firstly, the college admin can email attendance performance record to parents. Secondly, Students can also send their current locations in case of any emergency. In our study, we came with the idea that there is a need of reformation of the system with more advantages and flexibility. This is a very user friendly application which teacher can easily operate without any special training. Adding or enhancing of any report in this software made by us may be very smooth. This machine generates all of the vital reports required by the control. All repetitive data is stored as master record. It saves customers time in getting

into statistics. The Student Safety and Tracking System can be entered the usage of a username and password. it's miles handy by way of an administrator. The information can be fetched without difficulty. The interface is made very user-friendly. The records are properly protected for personal use and makes the statistics processing very rapid. Hence, there is an urgency of reformation of the system with more advantages and flexibility.

II.   EXISTING SYSTEM:

We have examined and visited the various sites and the writings. According to the writing audit, the different associations and people have endeavoured to conquered the issues in the conventional attendance system. The conventional system was that the admin enters the attendance to the cell phone using keypad. It is a manual procedure. He/she will mark the attendance of the students that are present in the class. Then using the GPRS service the attendance list will be the computer. It was created considering the necessities of that time and has an almost no future degree. The framework has a constrained limits. It falls behind a great deal. As when contrasted with advanced innovation, for example, Windows, Android, iphone. It doesn't have GPS so attendance can be marked from anywhere.

III.   PROPOSED SYSTEM:

Studies show over and over, if guardians are worried in the training method and teachers can quantify the student's development inside the classroom, they will be extra successful inside the academic system. Student Safety and Tracking System helps in simplifying attendance system**.** Taking attendance and grades absolutely would not do that tons correct if you can't report on it and learn classes from what has worked and what hasn't. Our application presents customizable reports and at first sight you always recognize exactly what you want and need to do. Starting up the lines of communication between professors and parents/guardians is important to an improved academic technique. We have constructed a parent and student platform to assist them to communicate fluently without complications. We built this application to keep the student attendance monitoring process easy and unified. Simply the user can add his details and criteria and can easily track attendance from anywhere. Our application is so easy and convenient to use that educator of classes of any size or coordinator of any groups or events can put in more time with their students and participants and can use our application to record, view and report on the attendance of his/her classes online.

IV. Global Positioning System:

Global Positioning System (GPS) is a Global Navigation Satellite System (GNSS) created by the United States Department of Defense. It is the main completely practical GNSS on the planet. It utilizes a constellation of somewhere in the range of 24 and 32 Medium Earth Orbit satellites that transmit exact microwave signals, which empower GPS recipients to decide their present area, the time, and their speed. Its official name is NAVSTARGPS. GPS is regularly utilized by regular citizens as a route framework. A GPS recipient ascertains its situation by definitely timing the sign sent by the GPS satellites high over the Earth. Each satellite persistently transmits messages containing the time the message was sent, exact orbital data, and the general framework wellbeing and harsh circles of all GPS satellites. As a rule, a GPS beneficiary uses data from the GPS satellites circling the earth to compute its present area.


GPS satellite

The GPS framework contains 27 satellites that constantly circle the earth, transmitting data to would-be collectors. Each satellite pursues a characterized way, guaranteeing that in any event four satellites are "unmistakable" from any point on earth at any given time. Having the option to have an "observable pathway" to in any event four satellites is important to decide area utilizing GPS. Every GPS satellite in the star grouping consistently transmits its present position and chronological registry information. The chronicle information incorporates information about each satellite in the group of stars, including circling information just as data about the general condition of the framework all in all. To state it another way, ephemeris information will be data about a solitary satellite, and chronological registry information will be data about each satellite. Each satellite transmits both. Despite the fact that both the ephemeris information and chronological registry information give area information to a given satellite, the ephemeris information gives exactness to area count. To ascertain its area, a GPS recipient must almost certainly decide its separation from different satellites. It does this utilizing the ephemeris information. Incorporated into the information that is transmitted from the satellite, alongside the position information, is the time at which the transmission began. Every GPS satellite contains profoundly exact timekeeping system that permits the satellite to keep its time in a state of harmony with the remainder of the satellites. To deliver a precise area count, the GPS satellites and GPS recipients must have their timekeepers profoundly synchronized. Indeed, even the smallest distinction in time can cause huge mistakes when processing area. Utilizing the transmission begin time, the GPS beneficiary can ascertain the time it took for the transmission to be gotten (the beneficiary knows when the transmission finished). This count is made with the presumption that the radio waves that transmit the information travel at the speed of light in a vacuum (which isn't generally the situation). Utilizing the begin time, end time, and a consistent for the speed of light, a GPS beneficiary can compute the separation of the satellite from the recipient.

V. APPLICATION MODULES:

A. User module

The primary reason for the client module is to give security. This module is exceptionally intended for staffs, which utilize smart phone to mark attendance. Each staff enter username and password word before enter in to students list. On the off chance that username and password don't match, he/she cannot enter in to attendance page.
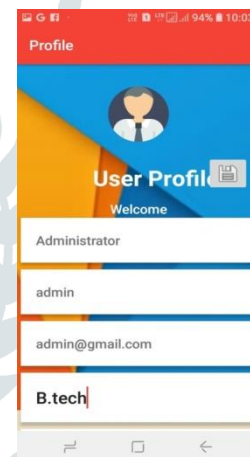

After the administrator has logged in successfully he/she will have a list of all the students in their respective classes and they can track the attendance of the students.


B. Registration module

This module is designed for the students, the students can register here by providing their roll number, name, e-mail address, password and phone number. These details will be saved in the application and later any registered user can simply log in by entering their roll number and password or by simply using the finger print sensor of the smart phone if supported.
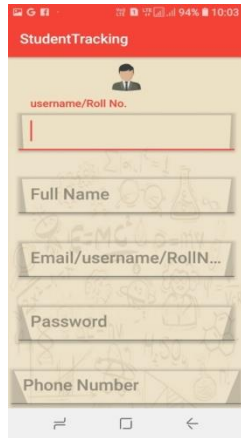
C. Location detection module

This module helps in detecting the real location of the student so that they do not mark their from anywhere. For this module GPS is used and if the student is within the range only then his/her attendance will be marked and a confirmation message will be send to the user. If the user is not in the range then no confirmation message will be send.
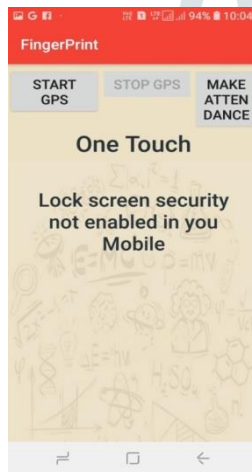
VI. LOCATION PROCESSING:

This is the centre piece of usage of this application. The application needs to produce ready message and send them to the enrolled versatile number. This must be done eventually interim. The message is sent to educate the parent about the area of the child for example regardless of whether the student is protected or he has broken the sheltered zone. The majority of this is done in area handling. For this application to keep running in foundation, we are utilizing administrations in android. Out of sight the application will use the present area of the kid from the area following module which is acquired from the GPS and the fixed focal

point of the geo-fence from the database. Along these lines, the separation of the youngster from the fixed point say, school or educational cost focus will be determined and that separation will be contrasted and the range of the zones. For ascertaining this separation we use the Great circle Algorithm. The extraordinary circle or orthodromic remove is the most brief separation between any two points on the outside of a circle estimated along a way on the outside of the circle. Since round geometry is not the same as customary Euclidean geometry, the conditions for separation take on an alternate structure. The separation between two points in Euclidean space is the length of a straight line from one point to the next. On the circle, in any case, there are no straight lines. In non-Euclidean geometry, straight lines are supplanted with geodesics. Geodesics on the circle are the extraordinary circles. A line on a circle that cuts all meridians at a similar point; the way taken by a ship or plane that keeps up a consistent compass bearing is called as rhumb line.

This method calculates the great circle distance, and is based on spherical trigonometry, and assumes that:

- 1 minute of arc is 1 nautical mile
- 1 nautical mile is 1.852 km.
- $D = 1.852 * 60 * ARCOS (SIN(L1) * SIN(L2) + COS(L1) * COS(L2) * COS(DG))$

Where, L1- latitude at the first point (degrees)

L2- latitude at the second point (degrees)

G1- longitude at the first point (degrees)

G2-longitude at the second point (degrees)

DG- longitude of the second point minus longitude of the first point (degrees) = G2-G1

D- Computed distance (km)

On the off chance that the tyke is in the protected zone, the separation determined ought to be in every case not exactly the sweep of the sheltered zone. In the event that the scholar breaks safe zone, the thought about separation will increment and after that the ready age procedure will begin. The message will be sent in some time interims for example, like clockwork or like clockwork. Similarly, for the hazardous furthermore, exceedingly hazardous zones, the alarm messages will be created and the parent will probably know the area of the scholars on breaking the wall. Further the student can always send his location through the emergency button, by doing so his location will be forwarded to the administrator.

VII. OBJECTIVES:

The study was carried out in order to determine the following objectives:

- The main objective of the project is to provide the mentors a proper past record and an area for proper update of the student's leave reason or any other issues.

- Teacher should be able to view Student's profile

- Teacher can view the student location during the attendance process.

- Student should be able to create/edit/view there profile.

- Student can submit their attendance when the teacher allows them.

- Student can send their location in case of any emergency

- Student can view their overall attendance

- The Student Safety and Tracking System are meant to keep the security of the admin and between the users.

- A student can easily view his attendance.

- The main interest of the project is to enhance the efficiency and effectiveness of the attendance system.

VIII.   CONCLUSION:

Our motivation behind the study was to build an application which provide teachers a platform to track the attendance and student's profile easily and they have more time to emphasize on more important issues. In our attempt to create this application we have done our level best to create it interactive and user friendly by adding so many features. This application can lead to so many experimental work within the college. It will help in saving the time of our teachers and mentors as they can easily access the student's information whenever they want by using our application system and they need not create a manual report to access the data. Our application supports many type of criteria for user so that student problem and leave management issues are solved inside given time easily.

IX.   FUTURE SCOPE:

The application can have multiple uses:

- Messaging platforms alert parents about the attendance of students which provides a transparency between the students and parents.

- The application provides an excellent tool in case of emergencies to track the presence of a student within the college premises.

- It will give more time to teachers and mentors to focus on qualitative issues which in turn will increase their efficiency.

Our application can have further enhancements to be more beneficial in future:

- A help menu can be provided with a special function key and help command in the main page itself.

- The system can use typed commands, as they were once the most common mode of communication with the system.

- A training module can be included in the system. This module can be used to train the users of the system about the systems usage.

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