**CHECKING CLASS ATTENDANCE SYSTEM USING WIFI**

BY

**MD. MAHADI HASAN**
**ID: 152-15-5650**

**DIPTO SAHA**
**ID: 152-15-5867**

**JANNATUL FERDOSH**
**ID: 152-15-5554**

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

**DR. FERNAZ NARIN NUR**
Assistant Professor
Department of CSE
Daffodil International University

Co-Supervised By

**MS. NAZMUN NESSA MOON**
Assistant Professor
Department of CSE
Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

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# APPROVAL

This Project titled **" Checking class attendance system using WiFi "**, submitted by **Md. Mahadi Hasan, ID No: 152-15-5650, Jannatul Ferdosh ID: 152-15-5554, Dipto Saha ID: 152-15-5867** to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 2nd May, 2019.

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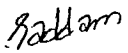Daffodil International University

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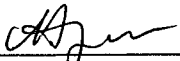Department of Computer Science and Engineering
United International University

# DECLARATION

We hereby declare that, this project has been done by us under the supervision of **DR. FERNAZ NARIN NUR, Assistant Professor, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.
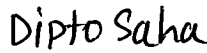
**Supervised by:**

**DR. FERNAZ NARIN NUR**
Assistant Professor
Department of CSE
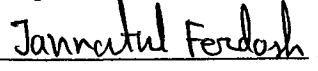Daffodil International University

**Co-Supervised by:**

**MS. NAZMUN NESSA MOON**
Assistant Professor
Department of CSE
Daffodil International University

**Submitted by:**

**MD. MAHADI HASAN**
ID: 152-15-5650
Department of CSE

**DIPTO SAHA**
ID: 152-15-5867
Department of CSE

**JANNATUL FERDOSH**
ID: 152-15-5554
Department of CSE

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Finally, we must acknowledge with due respect the constant support and patients of our parents.

# ABSTRACT

Recent advancements in wireless technologies have evolved the growth of smart systems in day to day life. Nowadays, people are using WiFi connectivity for accessing the Internet or local hub inside home or office. Localization mechanism over a WiFi network can cover a specific area so that any user connected to this a WiFi terminal can be identified. Covering this particular area is called geofencing as the connected devices to this specific WiFi terminal are workable if they exist within this covered range. Keeping this geofencing mechanism in our mind, we have developed a design and implemented a smart phone based checking system for monitoring class attendance through WiFi signal. Our system consists of three types of dedicated participants i.e. admin, teacher, and students. This system can identify a registered student whenever the student enters into the covered area and matching the BSSID or geofence and send a notification to server, At that current time student get notification and submit this then the attendance is marked. The teacher is responsible for controlling the system while conducting a class.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

In every educational institution checking student's attendance is very essential also compulsory part and rule to maintain that institution properly. Attendance checking is essential for knowing and ensuring every student's average attendance, study condition, other problems like illness or vacation etc. Basically it shows a graphical representation of how many students are active in a class or in whole institution. In the past teachers or authorities used to call the name of students for the purpose of attendance. This is a time consuming process because the teacher has call each person by name but when the number of student huge it is a great problem, just a waste of time and energy. It is a bad distraction from concentration. Several types of smart attendance system invented before. As example: Beacon based attendance system, Bluetooth based attendance, using QR for code scan for attendance etc. But this all system have some shortage for use. We are focusing on developing a system using mobile application. Both students and teachers students and teachers will use this application for consuming class time and their own purpose. When class time will be arrived students will give their attendance by using this app. Student's attendance will store in database. Thus student can get attendance mark automatically and teacher will monitor all this process and can easily know about total student's attendance and in how many class a student attended and how much mark he/she got.

## 1.2 Motivation

Our class time is fixed usually we got one hour or one and half hour. Our teachers take our attendance in manual system. In this process both teachers and students have too many troubles. It is time consuming, Students get distract concentration from their study. This is an energy wasting system for teachers also. This is an era of modern science and digital technology. With the advantage of this science and technology we have found a proper solution. In our project we are using mobile application on wifi based. Concept to make

attendance system automatic, more reliable and convincing. The Consequences we will get those are time saving, teachers can monitor students activity of class, saving energy etc.

## 1.3 Rationale of the Study

In this modern era every single stuffs are depending on science and technology. We cannot think human civilization without technology. Now-a-days everything is under control in our own hand by using our own hand. Bangladesh has crossed over from Least Developing Countries (LDCs) by achieving all the 3 conditions and about to be recognized as developing countries economically and socially [1]. The country is prospering through information and Communication .Technology, medical system, business purpose and mostly educational system. Government and personal organization are step by step developing with fashionable technology in educational system like smart classroom, online exam, smart ID card system, smart admit card and smart security system. We have a tendency to partaking fashionable technologies in each aspects of our life for a sensible and convenient life. In every sector we use technology then why shouldn't we use this technology in class attendance system. This is very necessary for time saving and follow discipline. This study in intended to make a smarter solution of this problem.

## 1.4 Research Questions

Current attendance system of our educational institution   provides discipline management facility in old way where time and energy waste. For attendance purpose both student and teacher has to waste a lot amount of energy and time. It also makes teachers and students distracted from concentration. As a result it turns into a cause of trouble. Our system will provide the most time energy saving way to the attendance system. Though our system is smart phone base and this an era of modern science and technology this would be very useful to very one. Using a smartphone is more reliable and user-friendly to get the navigation. In addition, there are other reasons also, Very user friendly, Apps also provide better personalization, Apps are very small and faster.

## 1.5 Expected Output

Our goal is to develop automatic class attendance system that will save time energy and following discipline properly and make it more reliable for both students and teacher. We will provide proper authentication in the system by android application to ensure the students presence in the class. It will help both student and teachers to save their valuable time and energy.

## 1.6 Report Layout

This report comprises of five parts, and this area gives knowledge of every one of the five sections.

1. Chapter one provides introduction, motivation and expected outcome of the study.

2. Related research work is talked about on section two. It likewise gives issue extents of the examination.

3. In section three, necessities of the proposed framework, framework design and framework stream chart is given.

4. Chapter four of this document describe our proposed system design, implementation and testing.

5. Lastly, chapter five is on conclusion, limitations, comparison and future study.

# CHAPTER 2
# BACKGROUND

## 2.1 Introduction

The headway of innovation today has drenched itself towards instruction. Now thinking about how much easy to take attendance. The technology are increasing day by day. Now attendance is very important in every students, an absent is big problem for a student, because a single absent is big difference in performance in an institute. Now a days every institutes are checking attendance in manually. It is loss of many more time in a class, so think how much time can be reduced. When students are reach the classroom, automatically get a notification, with subject and date in a specific time. Now student are working on submit, we need to develop the checking attendance system without wasting time. And using " Geofencing " that means automatically checking the users which is inside or outside the classroom [1].

## 2.2 Related Works

The recent year there have been many more work in student attendance system, as like as web based attendance system, finger print based attendance system, face recognition based attendance system, iris based attendance system, Radio Frequency Identification based attendance system, and Near Field Communication based attendance system [2]. In this web based application they are using SMS and send SMS to parents and store all detail, so they are lost many more paper and offices [3]. In this Radio Frequency Identification based attendance system as like as web based attendance, the framework advances a semi-mechanized methodology in catching the understudy participation, so there have many more cost [4-7]. In this proposed system that find out how to easy way to build up an application. Where there have been three app ones for admin, one for teacher and other students. This app only can run when WiFi is connected all application. At first admin set a specific time for a subject and that time when students come in this classroom all students get a notification and they submit this, That's automatically add to database. Using this application here use "Geofencing with Bluetooth technology" here detect the users who is

inside or outside the classroom [1]. When student enter the classroom that time they get this notification. So we said that do not waste the class time. And Student attendance will depend on Student's hand.

## 2.3 Research Summary

In this investigation, we are trying to solve this problem for attendance checking because it wastes many more time. In our country we have seen every school, college, University or every institute have manual attendance system. So it wastes many more time. There have many away to check attendance. But some problem are here, every Site are very costly. So we take a decision that make an application which is user friendly, and easy to access. This system use android and Bluetooth, mobile device, WiFi are also connected both of device. All information are enter the admin, and users when arrived this place and get a notification in current time then users just submit and viewing a tools which said your attendance is successful. Now Teachers can also check how much student present and absent.

## 2.4 Scope of the Problem

This study focuses on finding a way to develop an automatic class attendance to reduce overall risks, problems to taking class attendance properly for teachers and students saving time, energy purpose.

## Management

A major part of our system is depend on management. To managing this system properly management must be carefully and follow every rule and instruction of the system properly.

## Cost

Though we have tried our best to make this project as cheap as possible so it would be easy to use every institution. But it may be expensive for someone.

### Area select

Selecting classroom area is one of the tough problem because taking attendance of a class we must select an area that when student will enter into the area only then they can give attendance under that area's network.

### Router

Students can give attendance under the selected area's network. It is very hard to covering all students under a router.

### Proxy

For preventing proxy everyone must have to be honest. There is no other option. We have tried to prevent all possible option to give proxy. But if one carry multiple to give his or her friends attendance there is nothing we can do. One attendance can give only from one android phone. To Solving this problem authorities or management must be aware.

## 2.5 Challenges

When we considering this undertaking a lot more challenge is fetching, there have some problem here

### Process of sending notification:

Sending notification to the smart phone is one of the hard challenge. Because notification send via firebase to the smart phone.

### Area select

Selecting classroom area is one of the tough challenge because taking attendance of a class we must select an area that when student will enter into the area only then they can give attendance under that area's network.

### Time set

Set time is a big challenge. Because it depends on when class will start, when it will end and duration of a whole class time. So it is a tough situation.

## Make up class problem

Sometimes teachers got some problem or any unwanted circumstance happened that's why it is need to take make up class. So make class needed classroom, class time out of the schedule time. So cope up this situation will be a great challenge.

# CHAPTER 3

# REQUIREMENT SPECIFICATION FOR THE PROPOSED SYSTEM

## 3.1 Introduction

Requirement Specification is consist in this project, who is using this project they can be said this is user friendly. So requirement is android studio, Android mobile, Database. Which combination with hardware and software.

## 3.2 Block Diagram of Proposed System

Attendance checking system are working in this system teacher, student and admin. Admin are enter the student details and set class starting time and ending time and date. This time student are enter the classroom then get a notification with subject and date, Student just click the submit button, Then automatically attendance is complete are showing.

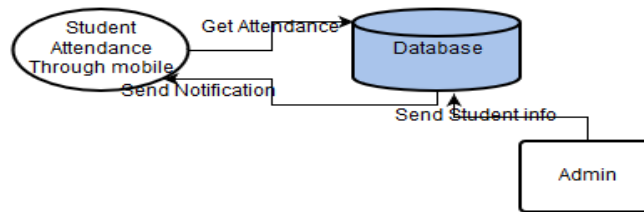Figure 3.1 describes the block diagram in attendance system



Figure 3.1: Proposed block diagram for checking attendance system

## 3.3 Flow Chart of Proposed System

Figure 3.2 in the flow chart of the proposed system. Firstly Admin student and teachers are login the system. Admin sets students with their Department, semester, name, id and section. Admin set a class in a room in a specific time, when student come to the class that specific time all student get a notification with subject and date from database just click the submit button then Successfully Attendance is complete then stop in this system.
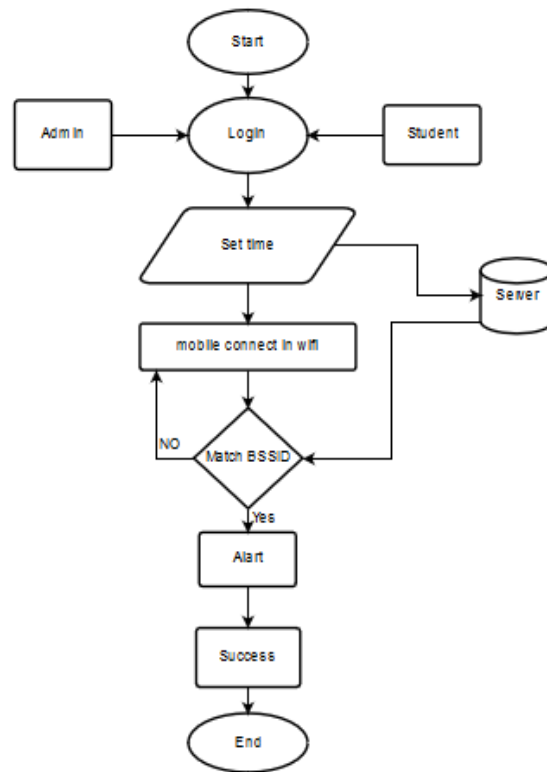


Figure 3.2: Flow chart are working in attendance system

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## 3.4 ER Diagram

Figure 3.3 shows ER diagram of our designed system
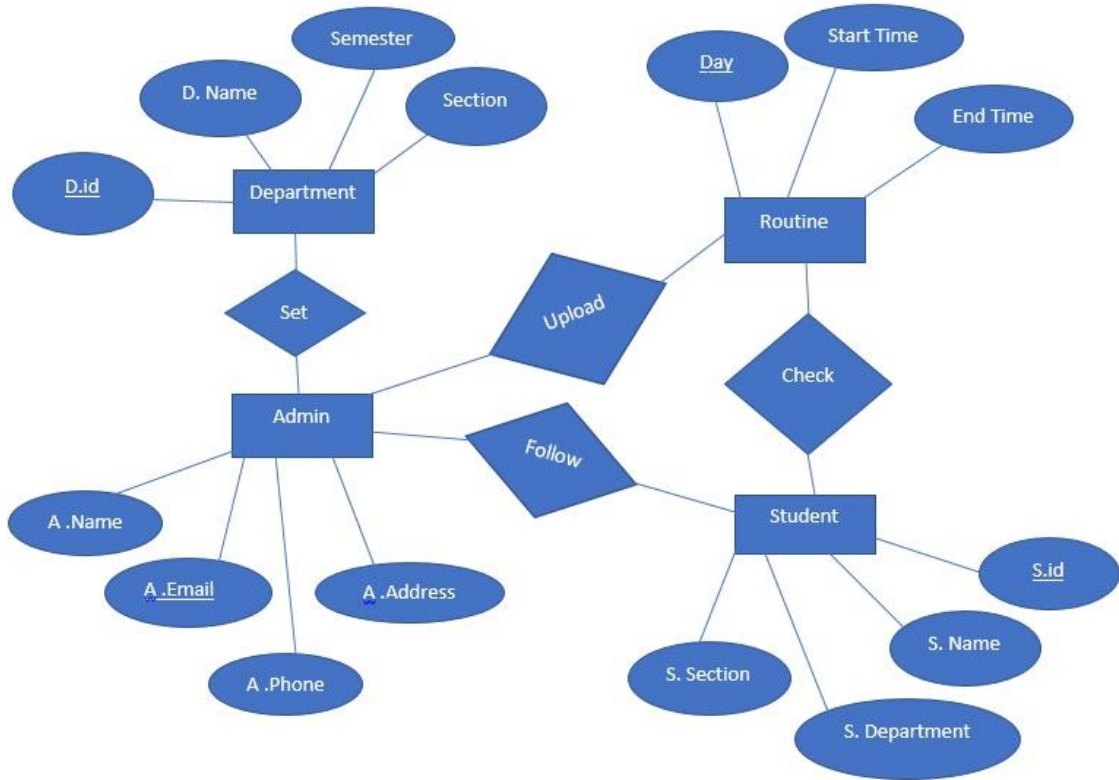
Figure 3.3: ER diagram of our proposed system

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## 3.5 Use Case Diagram

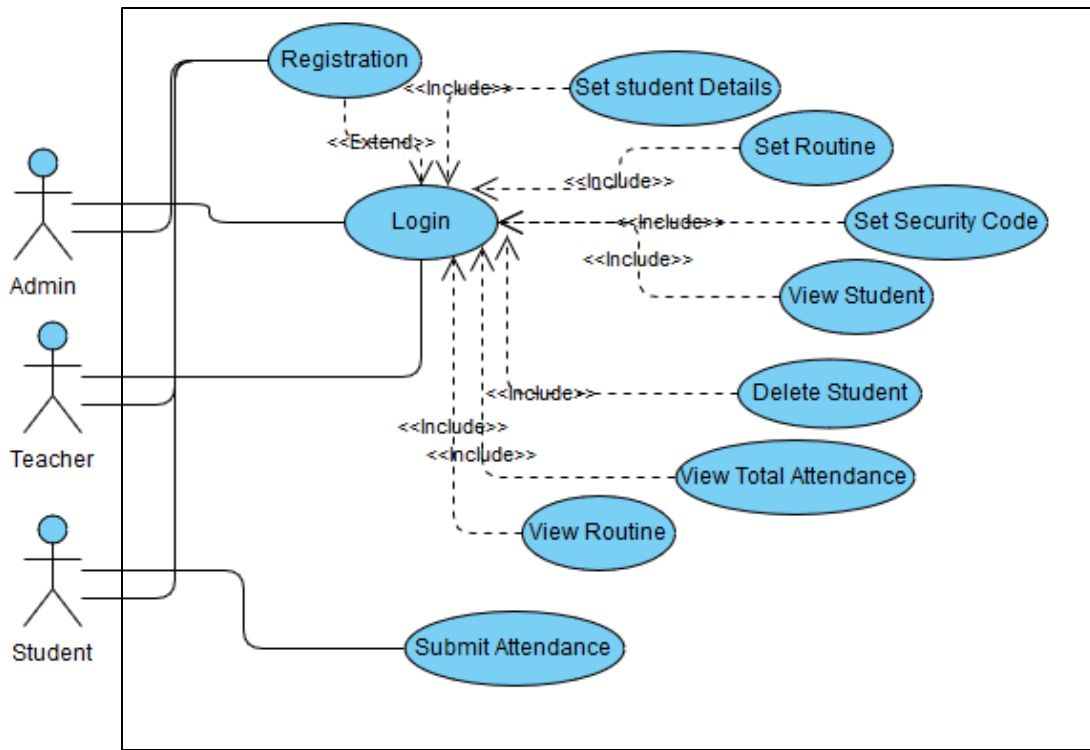Figure 3.4 shows Use Case diagram of our designed system



Figure 3.4: Use Case diagram of our proposed system

## 3.6 Use Case Description

**For Registration**

Table 3.1 shows use case description for data collection. If every person is register then all data are store in database. That data only use by admin.

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Table 3.1: Use Case Description for Registration

| UCID | 01M |
|---|---|
| Use Case Name | Registration |
| Actor | Admin, Teacher, Student |
| Pre-Condition | Null |
| Normal Flow | 1) Admin and Teacher enter Name, Email, Phone Number.<br>2) Students enter Name, Id, Department, Semester, Section |
| Post Condition | Successfully complete |

**For Login**

Table 3.2 shows use case description every person need to be use the system, there have pre-condition must be register For security measure, If any user input invalid name or password that can't be use system. If all right then inter the system.

Table 3.2: Use Case Description for Login

| UCID | 02M |
|---|---|
| Use Case Name | Login |
| Actor | Admin, Teacher |
| Pre-Condition | Complete Registration |
| Normal Flow | Enter their email and password and logs the Actors into the system |
| Alternative Flow | The actors enter an invalid name and password, The system display the error message |
| Post Condition | Successfully enter the system and working in this system |

**For View routine**

Table 3.3 shows use case description all the user view the routine. That is important for everyone. Teacher can follow the routine and attend the class and continue this, same as student.

Table 3.3: Use Case Description for View Routine

| UCID | 03M |
|---|---|
| Use Case Name | View Routine |
| Actor | Admin, Teacher, Student |
| Pre-Condition | Login |
| Normal Flow | 1) Admin and Teacher, Student select Department name, Semester, Section and date.<br>2) Click view button<br>3) Display detail routine |
| Alternative Flow | The actors enter an invalid Date or section |
| Post Condition | Successfully show Routine |

**For Set Routine**

Table 3.4 shows use case description Admin can set the total class routine which is followed by student and teacher. A they can be attend the class. All semester and section are only follow this schedule.

Table 3.4: Use Case Description for Set Routine

| UCID | 04M |
|---|---|
| Use Case Name | Set Routine |
| Actor | Admin |
| Pre-Condition | Login |
| Normal Flow | 1) Select Department name, Semester, Section, Date and Start time and End time<br>2) Click view button |
| Alternative Flow | The actors enter an invalid Date or section or time |
| Post Condition | Carefully set the routine and successfully updated |

**For Student details**

Table 3.5 shows use case description is store all the student details. That only can access the admin panel.

Table 3.5: Use Case Description for Set Student Details

| UCID | 05M |
|---|---|
| Use Case Name | Set Student Details |
| Actor | Admin |
| Pre-Condition | Login |
| Normal Flow | 1) Select Department name, Semester, Section, Subject and date<br>2) Click the button |
| Alternative Flow | The actors enter an invalid Date or section |
| Post Condition | Successfully Update the Student detail |

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**For Student details**

Table 3.6 shows use case description for viewing student participation in class. Admin and Teachers can be seen how many student present and absent. And see the present student name and id.

Table 3.6: Use Case Description for View Student

| UCID | 06M |
| --- | --- |
| Use Case Name | View Students |
| Actor | Admin and Teacher |
| Pre-Condition | 1)Login<br>2) Student must be present the class |
| Normal Flow | 1) Select Department name, Semester, Section, Subject and date<br>2) Click the present button then see how many student are here<br>3) Click the present student button then show the student name and id which are present the class. |
| Alternative Flow | The actors enter an invalid Department name, Semester, Subject, Date or Section. The system do not work |
| Post Condition | Successfully show Student present list, absent and total student |

**For Delete Student**

Table 3.7 Shows use case description for delete student in a semester. When student complete a specific semester after delete this semester. That can be free from database and space are increase.

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Table 3.7: Use Case Description for Delete Student

| UCID | 07M |
|---|---|
| Use Case Name | Delete Students |
| Actor | Admin |
| Pre-Condition | Login |
| Normal Flow | 1) if delete all the section then Select Department name, Semester, Section, Subject<br>2) Click Delete button. |
| Alternative Flow | The actors enter an invalid Department name, Semester, Subject, Section |
| Post Condition | Successfully Delete Student list |

**For Security code**

Table 3.8 shows use case description for security code. Security code need to use only for student, for security measure, that time a student downloads a student app and install this that time want a security that can provide authority. Every student have a specific security code. If anyone can uninstall this apps that time going to admin and get a security code and open this apps.

Table 3.8: Use Case Description for Set Security Code

| UCID | 08M |
|---|---|
| Use Case Name | Set Security Code |
| Actor | Admin |
| Pre-Condition | Login |
| Normal Flow | 1) Select random number. <br> 2) Provide the student |
| Post Condition | Successfully update the security code |

**For Submit Attendance**

Table 3.9 shows use case description for summit attendance for a class. Admin set the time in specific class in specific time. That time student inter the room and get a notification then only click the submit button. Then automatically attendance are successful. And student can see the total attendance in this particular subject.

Table 3.9: Use Case Description for Submit Attendance

| UCID | 09M |
|---|---|
| Use Case Name | Submit Attendance |
| Actor | Student |
| Pre-Condition | 1) Security code <br> 2) Registration |
| Normal Flow | 1) Student present the class and current time get a notification <br> 2) Click the submit button. |
| Post Condition | Successfully Attendance is complete |

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### 3.7 Equipment's for Proposed System

1. Smart Mobile Phone

2. Router

3. Bluetooth

Platform used for Android Application

Platform:  Android

Language: Java, Xml

Tools: Android Studio, Java SDK, Emulator

Storage: Shared Preference, Firebase

Design: Adobe XD

Component: Activity, Fragment

### Android Studio

Our project is android based project. We use android studio to develop our application. Android studio in authority IDE (Integrated Development Environment) given by Google to its working framework Android. It is a substitution of Eclipse Android Development Tool (ADT) as essential IDE for Android Development.

### Router

In our project router is one of the important equipment. We use router for net connection. We have to find out the student are here in classroom. We use BSSID of the router which are connected all the student device when student enter the classroom.

# CHAPTER 4

# SYSTEM DESIGN IMPLEMENTATION AND TESTING

## 4.1 Introduction

In this portion, we will discuss what kind of approach we have been taken to solve this problem and situation. Here our proposed system gives result of expected output. We have been made three app to execute the system. One App is for Admin. Admin sets students with their Department, semester, name, id and section. Admin can view students who are in the same section. Admin second work is to set the class routine. To select routine, Admin have to set subject name, teacher's name, Department, Semester, Section, date, starting time and ending time. Lastly Admin have to set Security code for the students when they first time install their app and have to change the code for Security code for more secured. Second App is for the students. To open the app in first time they have to enter the valid Security provided by Admin. Student have to set their name, id, Department, Semester, and Section for one time. According their class routine if they stay in the classroom and mobile connected same Wifi provided in the classroom, when they open the app, they get notification of the subject name and teacher name. They have to press on the button named "GIVE ATTENDANCE". After giving their attendance, they get a toast. Student can view their routine. To view routine, they have to select Day. After selecting all Day when they, press the button they can see the subject name, teacher name and class time. Third App is for the class teacher. By the app they can see the today attendance and total attendance of each student. They have to select Department, Semester, Subject name, and current date. After selecting teacher can see the total student of the class, total present student and total absent student. To see the total attendance of a student they have to select Department, Semester, subject name and id of the student.

## 4.2 System Design

The main target of this project to reduce time waste during class time by giving class attendance. Android app is used to give attendance connected by Wifi.

## 4.3 Implementation of the Proposed System

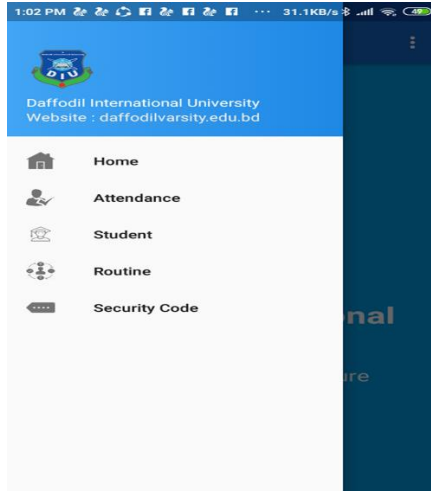Figure 4.1 shows admin panel front page



Figure 4.1: Admin panel home page

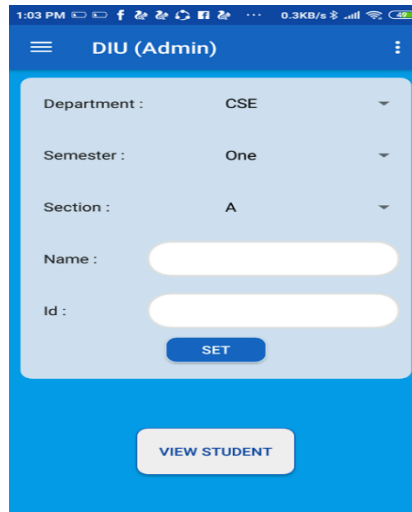Figure 4.2 shows admin set students semester and section



Figure 4.2: Admin setup student detail in semester

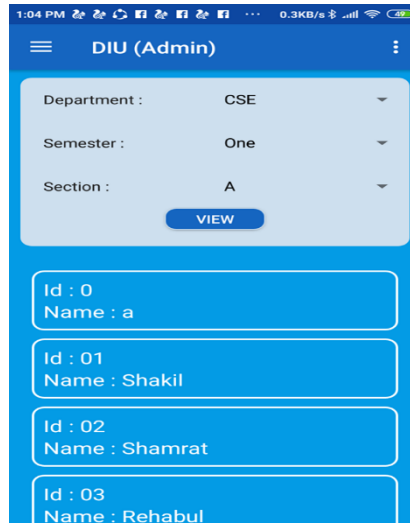Figure 4.3 shows admin view student in a section



Figure 4.3: admin view student list

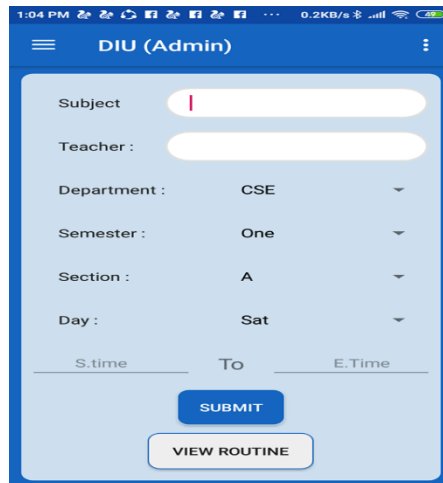Figure 4.4 shows admin set student class time



Figure 4.4: Student class time

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Figure 4.5 shows admin view the class routine



Figure 4.5: Admin view routine a specific section
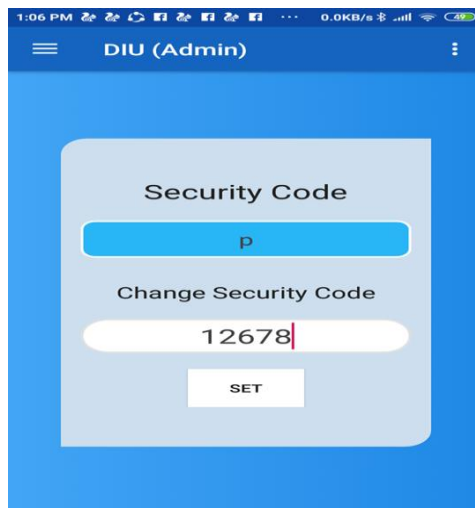
Figure 4.6 shows admin set security code for student



Figure 4.6: shows admin set security code

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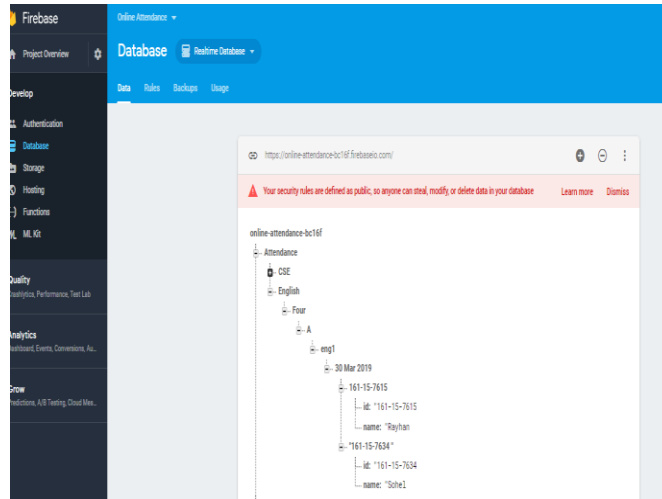Figure 4.7 shows database student attendance



Figure 4.7: Student attendance

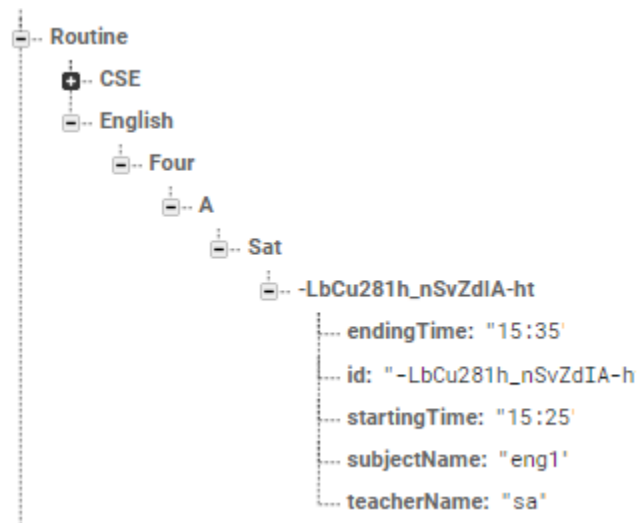Figure 4.8 shows database student class routine



Figure 4.8: Class routine time

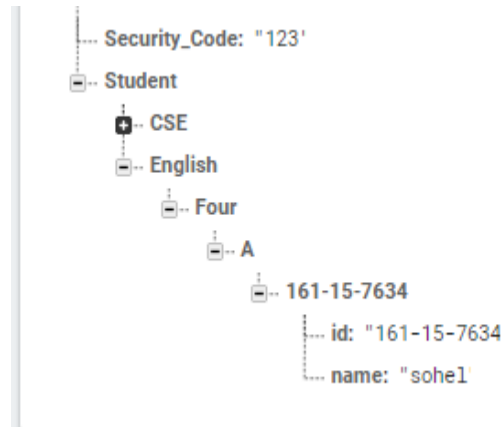Figure 4.9 shows database security code and student details



Figure 4.9: Security code and student details

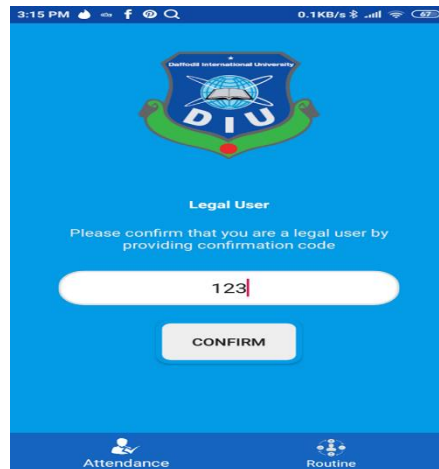Figure 4.10 shows security code needed



Figure 4.10: Registration for student
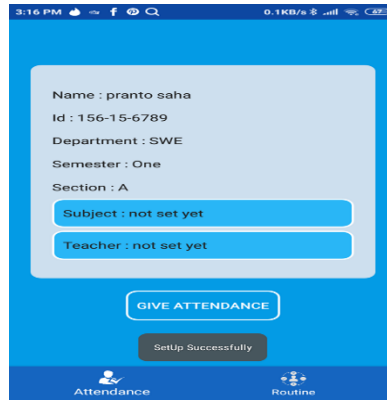
Figure 4.11 shows security code needed



Figure 4.11: Register for student and give attendance

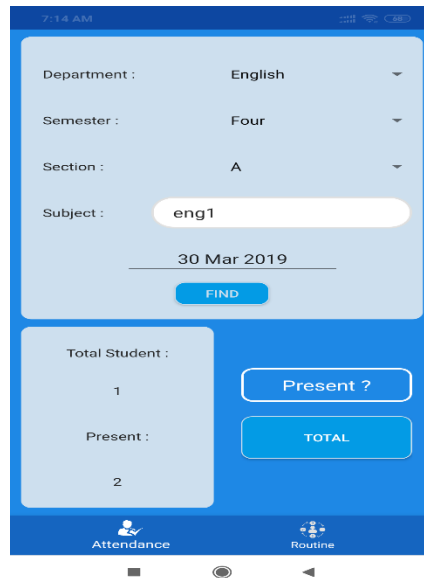Figure 4.12 shows teacher search total student in a section and present



Figure 4.12: Student attendance in a section

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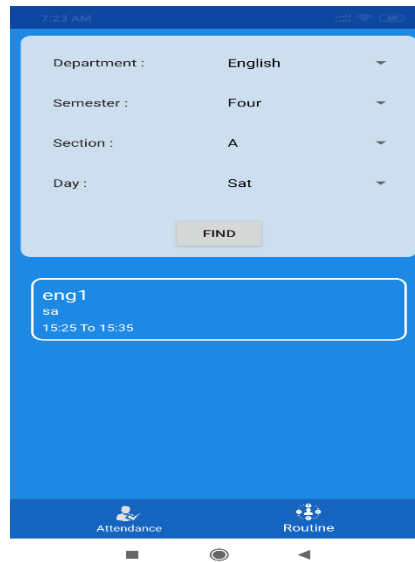Figure 4.13 shows teacher search the routine a specific section



Figure 4.13: Teacher view routine

## 4.4 Testing

**Integration testing**

Integration testing known as a methodology where individual modules are combined and tested as group. Usually it Coordination testing is a product testing strategy used to test singular programming parts or units of code to check connection between different programming segments and distinguish interface absconds. Parts are tried as a solitary gathering or composed in an iterative way. After the incorporation testing has been performed on the parts, they are readily available for system testing and it occurs after unit testing phase.

Table 4.1 shows test cases, expected result and observed result for individual module of the system.

Table 4.1: Integration Test

| Test Case | Expected Result | Observed Result | Test Result |
|---|---|---|---|
| Student should get notification from server in proper time | Student get notification in proper time | Get notification in proper time | Pass |
| Student's attendance should added in database properly | Student's attendance added in database properly | attendance should added in database properly | Pass |
| Outside of BSSID no one Should get attendance notification | Outside of BSSID no one can get attendance notification | Can't get attendance notification | Pass |
| Time and date should be set properly by Admin | Time and date can be set properly by Admin | Time and date should be set properly | Pass |

**System testing**

System testing of programming or equipment implies the testing of a total and coordinated system to quantify system's consistence with its predefined prerequisite. The fundamental intension of system testing is to discover principle immateriality between the units that are incorporated together.

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Table 4.2 shows test cases, expected result and observed result of system testing

Table 4.2: System Test

| Test Case | Expected Outcome | Observed Outcome | Test Result |
|---|---|---|---|
| Student should open app with security code | Student can open the app | Can open | Pass |
| Student should give their attendance in their class time | Student can give their attendance | Can give attendance | Pass |
| Student should view their class routine | Student can view their class routine | Can view routine | Pass |
| Admin Should add student and set class routine | Admin can add student and set class routine | Can add student and set routine | Pass |
| Admin should set security code and able to update the code | Admin can set security code and update the code | Can set security code and can update the code | Pass |
| Teacher should cheek the present attendance of the class and total attendance of a student | Teacher can cheek the present attendance and total attendance of a student | Can cheek present attendance and total attendance of a student | Pass |

# CHAPTER 5

# CONCLUSION, IMPLICATION FOR FUTURE RESEARCH

## 5.1 Conclusion

In this study, we proposed and implemented a smart and checking class attendance system using wifi for educational institution. This system will save time, energy and it will also help to obey discipline. It will also provide an easy way to give attendance system by providing notification. Students will get notifications through an app and they will give their attendance in fixed classroom and time under a fixed network's area. And their attendance will store in database. Teachers will get student's attendance from database via teacher's app. Our class attendance system is very reliable for both teachers and students. After all, we may hope for a better solution of class attendance system.

## 5.2 Limitations

There are some limitations. Without net connection our app doesn't work. Teacher can't give notice and upload file by the app. If admin input invalid id and name of the student in registration, there is no option to edit. Admin can't delete a section or department by their app. We use "BSSID" of router instead of " Geofencing". So Can't detect user inside or outside the class room clearly.

## 5.3 Comparison with Existing Systems

Table 5.1: comparison between existing systems and our proposed system.

| Subject | Existing Systems | Our Proposed System |
|---|---|---|
| Using system | In existing system student have to select his department, id, date, subject for per attendance. | In our system, student have to select their department, id, One time. Then they have only press the button to give their attendance |
| Total attendance of each student | Can't calculate total attendance of each student | Can calculate total attendance of each student |
| Data storage | MySql | Firebase, Shared Preference |
| Control By | Bluetooth | WiFi |
| Time consuming | Existing systems are less time consume than our system | Our system is more time consume than others |
| Cost effectiveness | Some are costly some are not costly | Lower costly |
| User friendly | Not user friendly | Very user friendly |

## 5.4 Future work

We want to be work admin teacher must be register. Mobile inside or outside in the classroom [1]. Teacher can upload file which is use student. And student can upload file that can be seen teacher. Make student accuracy panel that only use admin panel and inform the parents via mobile app. Parents get his/her children present accuracy in class.

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