Blueatt

Team 35 - Design Document

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Purpose

Attendance taking in a college lecture hall is no simple task, there is still the use of attendance sheets and even roll call. While some of the classes use I-clickers, there are two issues: first, it's confusing for non-technical instructors to use; second, some might only want to take attendance instead of quizzes. The Blueatt application will provide a bluetooth device-based software to take attendance based on the student's bluetooth devices.

Blueatt provides the software very intuitive and easy to use and not requiring extra hardware by the students. With the help of Blueatt, instructors can focus only on teaching as attendance will be taken within minutes via bluetooth without requiring any effort from the instructor.

Functional Requirements

Our project's functional requirements can be divided into following categories:

A. Instructor

1. Student Information
    a. I would like to store student's information in the software
    b. I would like to manually add/delete/modify student's attendance
    c. I would like to be able to add or remove a student from a class
    d. I would like to be able to edit student's information if necessary
2. Attendance Data
    a. I would like to get a quick reading of student attendance
    b. I would like to view the percentage of attendance of each lecture
    c. I would like to select the way to get the information, such as emails or instant report
    d. I would like to view the tendency of a student's attendance during the semester graphically
    e. I would like to only receive information on students in the class
3. Bluetooth
    a. I would like to select which class is in session
    b. I would like to connect the scanner to a computer quickly
    c. I would like to select the intervals to periodically check for bluetooth signals
    d. I would like to get notifications on if the scan is successful or not

    e. I would like to allow software to scan automatically at a given time everyday

B. Student

1. Student Information
    a. I would like to register my bluetooth device for my Purdue username via phone app
    b. I would like to register a new device to my same Purdue username if I get a new device
2. Attendance Data
    a. I would like to receive a notification that my attendance has been recorded
    b. I would like to, see my attendance trends and historical data
3. Bluetooth
    a. I would like to use general bluetooth devices to connect to the scanner
    b. I would like to have my attendance taken just by bringing bluetooth device

C. Developer

1. Feedback
    a. I would like to get user feedback
2. Student Information
    a. I would like to store student information securely
3. System
    a. I would like to handle troubleshooting

Non-Functional Requirements

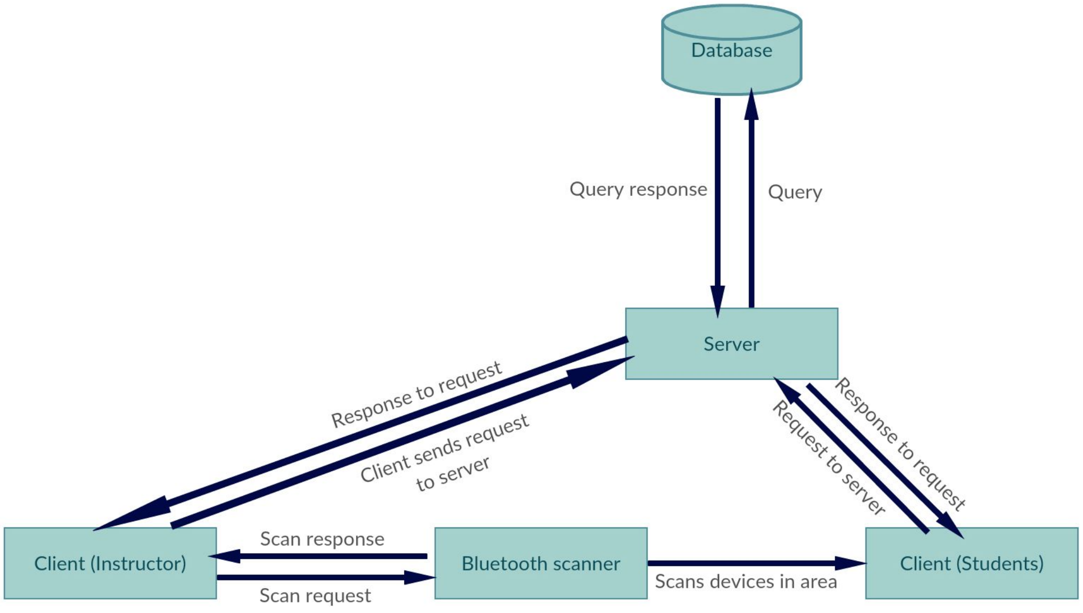
A program that..

- has a simple and intuitive design, easy to use yet functional
- Is compatible with any bluetooth device
- takes attendance within 3 minutes after starting to scan
- Is able to handle up to a 400 person lecture hall
- More secured authentication
    - I would like to use fingerprint as authentication of attendance
    - I would like to create app that turns on bluetooth based on time and location

Design Outline

Components of the system

1. Server
    a. Receives and handles client requests
    b. Queries the database to update/request information
2. Database
    a. Stores all system information (students, courses, attendance, etc)
3. Client (Instructor)
    a. Begins scanning process on bluetooth scanner
    b. Automatically sends scanner information to server to update database
    c. Requests class roster from database to take attendance
4. Client (Student)
    a. Sends user information to database
    b. Receives its own user information from database
5. Bluetooth Scanner
    a. Scans for bluetooth ID's that are in the database for the roster
    b. Relays scanned devices to Instructor which then updates attendance



Design Issues

Which database software to use?

- Option 1: SQLite
- Option 2: MySQL
- **Option 3:** Oracle

Decision: We chose to use Oracle as our database software since Oracle is the software that we have the most experience in.

Which platform to use?

- Option 1: Necessary to make an iPhone app
- Option 2: Make the application only in the Android version
- **Option 3**: Focus on Android application, and if time allows, make an iPhone application

We plan on implementing option 3, to start making an Android application first which is the main part of our project. As many students at Purdue own an iPhone, we thought that creating an iPhone application would benefit more students. Thus, we decided to make an iPhone application if time allows.

Issue: How should students receive notifications of their attendance each class?

- Option 1: Email notifications
- **Option 2**: Popup box/badge notifications from the app
- Option 3: Text message alerts

We decided to notify students of their attendance each class via popup message box. The Blueatt application will send notification popup to students whose attendance was checked successfully.

What programming language will suit our project best?

- **Option 1**: Java
- Option 2: C#
- Option 3: C++
- Option 4: Python

We chose to use Java as a programming language for the application. As we are creating an Android application, we concluded that using Java would be the most preferable and suitable language for our project.

How to initially acquire student information and device ID?

- **Option 1**: Prompt students for the information and device ID through input box when students initially login
- Option 2: Allow students to input information and device ID through the Learning Management System such as Blackboard

We are planning to implement option 1. Students can input the information and their device ID when they first register to the application and login.

Which platform to use for instructor

- Option 1: Mobile application
- **Option 2: Computer application**

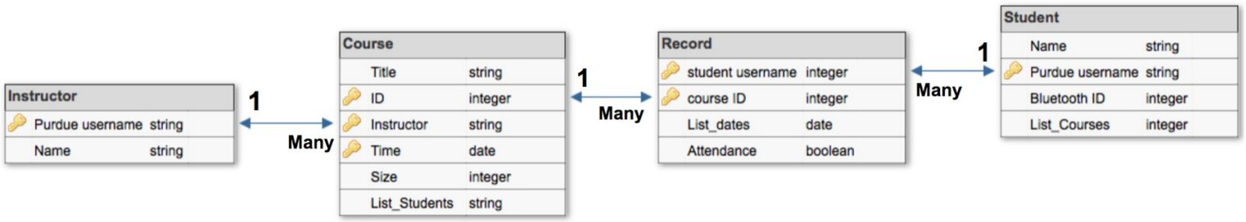
In order to be able to utilize the bluetooth scanner we decided it would be best to make the instructor only have a computer application and not a mobile one

How to handle large amounts of students in a class

- **Option 1: Record devices in area without having them connect to scanner**
- Option 2: Have each device connect to the scanner

The bluetooth scanner can only have a limited number of devices connected to it at once (~7) which would drastically slow down the scanning process. We decided to have it just scan for all devices that are in the area and record their ID and later match that with the student.

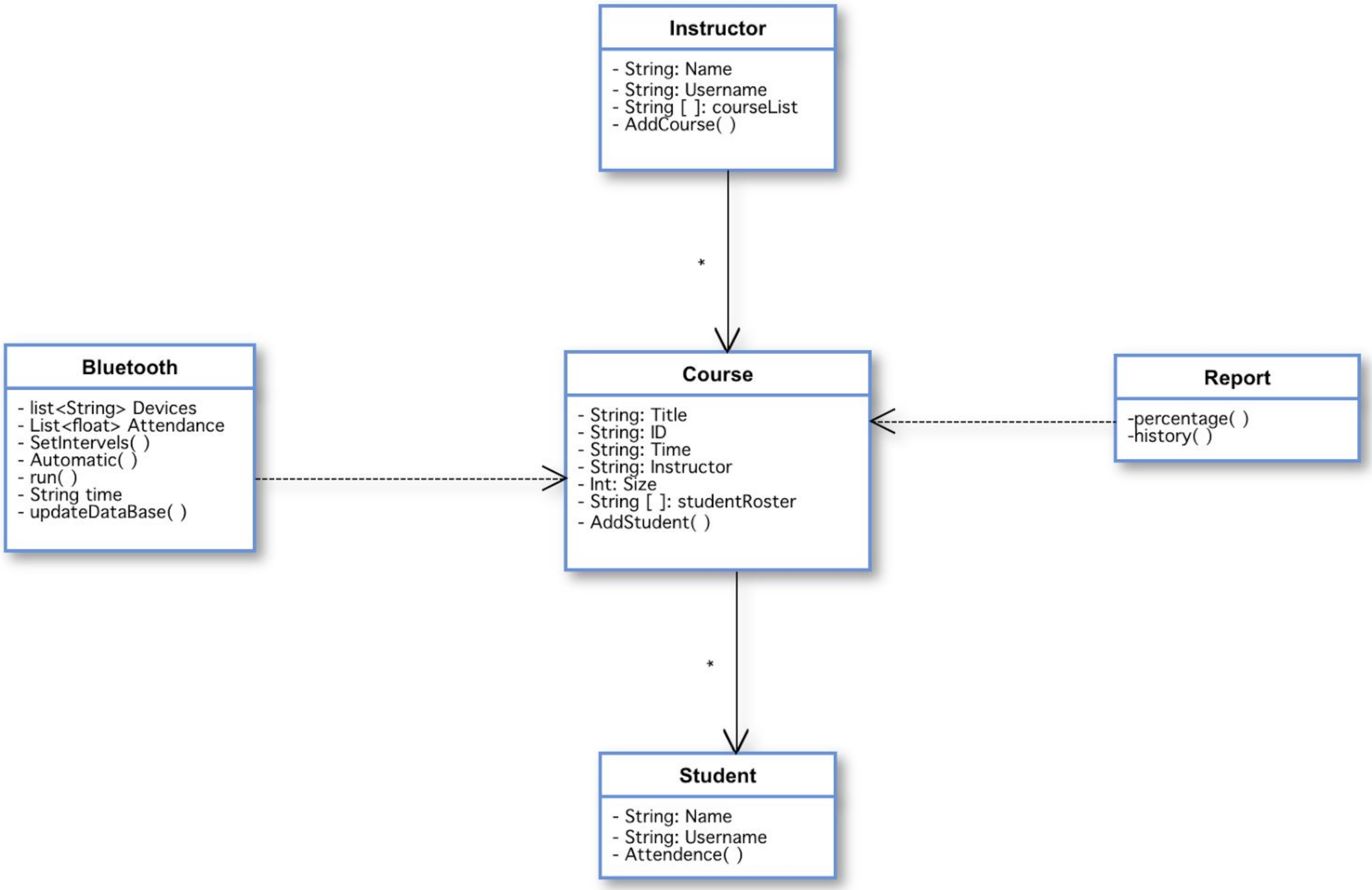
Design Details



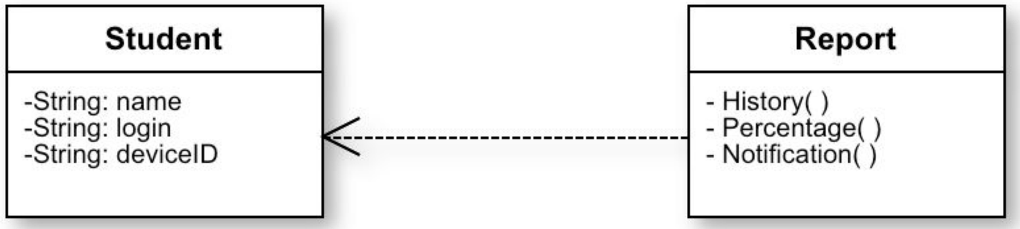
Description of Database

1. Instructor
    a. Each instructor has a name and purdue username
    b. Instructor's Purdue username is a unique primary key
2. Course
    a. Each course has a title, ID, time, instructor, size, and list of students enrolled
    b. Course ID, instructor, and time is the super key
3. Student
    a. Each student has a name, purdue username,, bluetooth ID, and list of courses they are enrolled in
    b. Student's Purdue username is the primary key
4. Record
    a. Each record has a student username, course ID, list of dates, and attendance for that day
    b. The student username and course ID is the super key
    c. For every course each student has an attendance record
    d. If a student is in multiple courses they will have multiple records

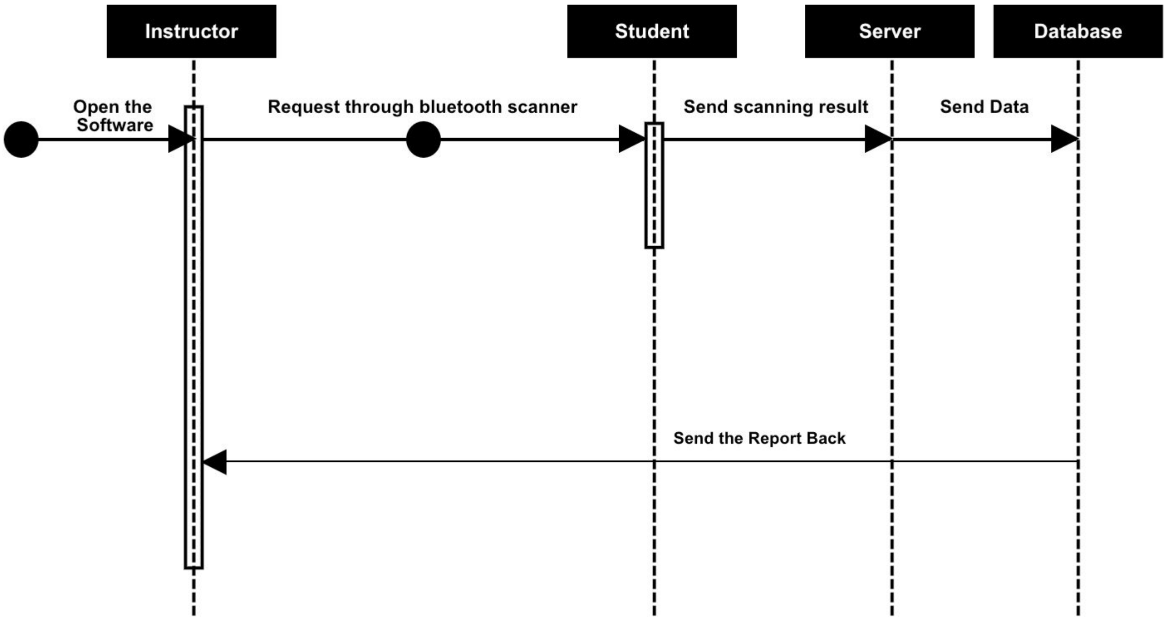
Client (Instructor): desktop software



Client (Student): mobile app

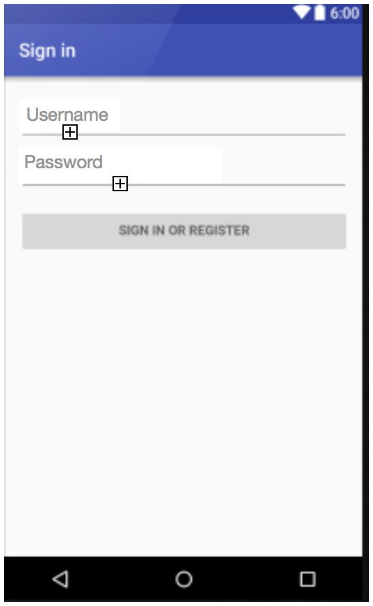


Sequence diagram:

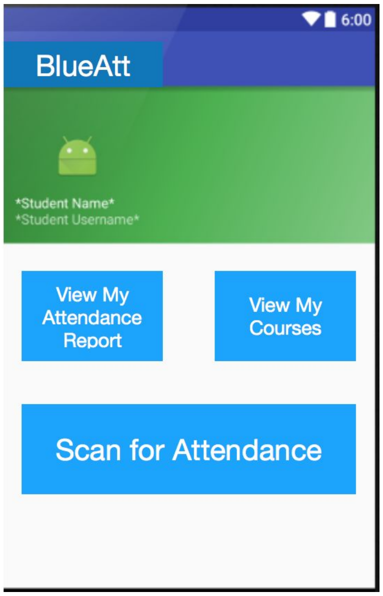


GUI - Instructor Version

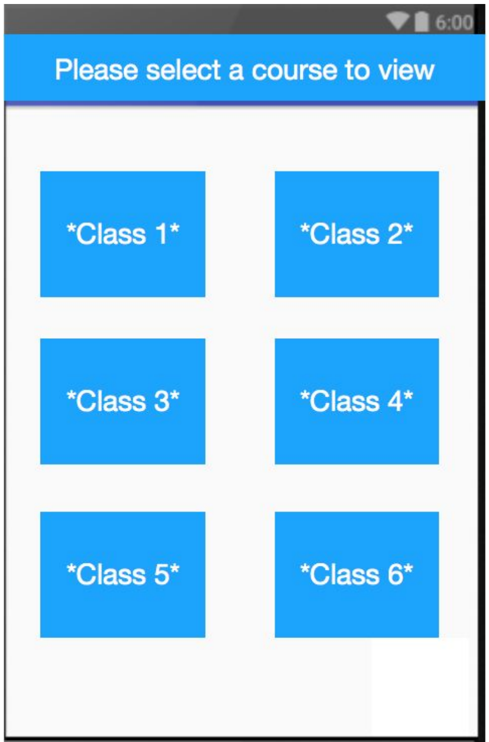
Opening Screen



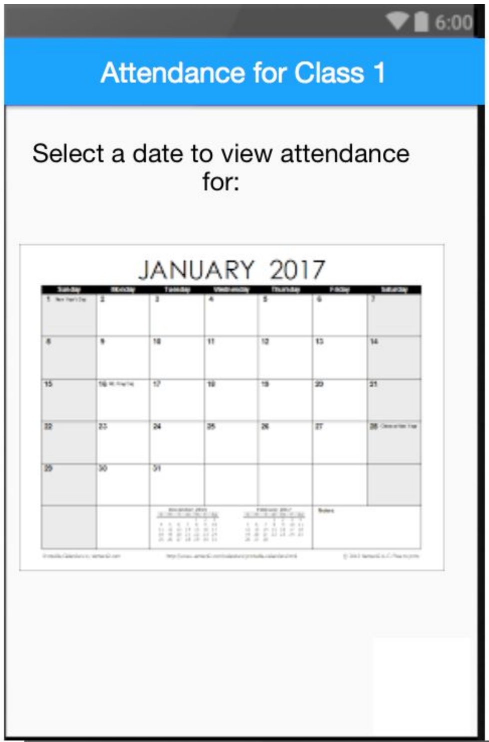
Home Screen after Log-in



View My Attendance Report Screen

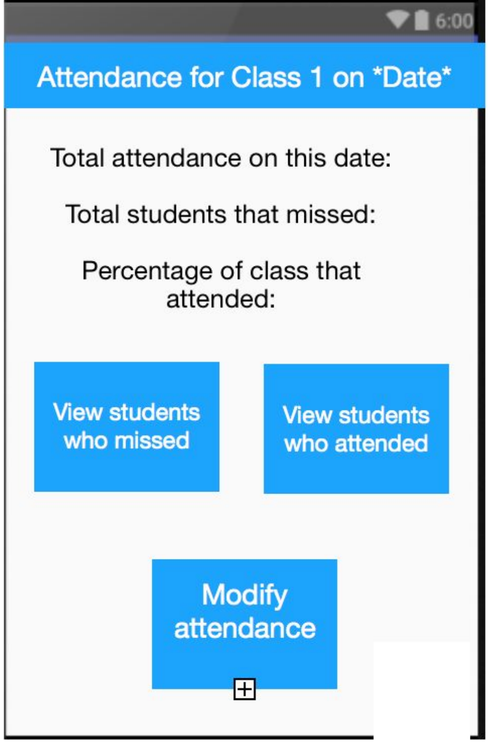


Please select a course to view



Attendance for Class 1

Select a date to view attendance for:

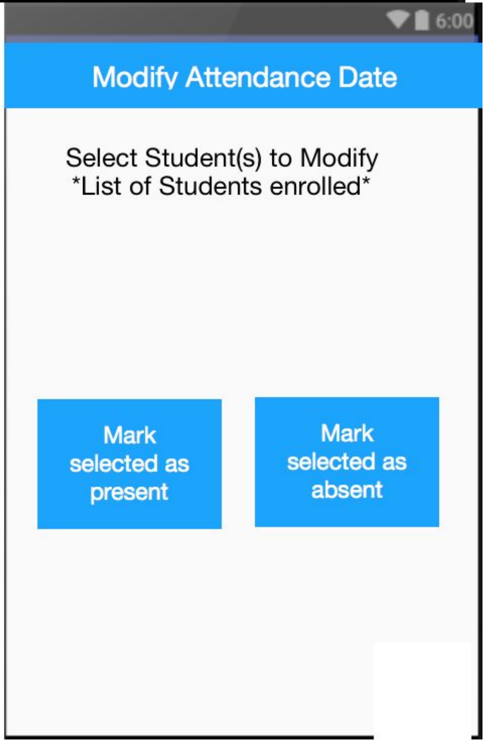


Attendance for Class 1 on *Date*

Total attendance on this date:

Total students that missed:

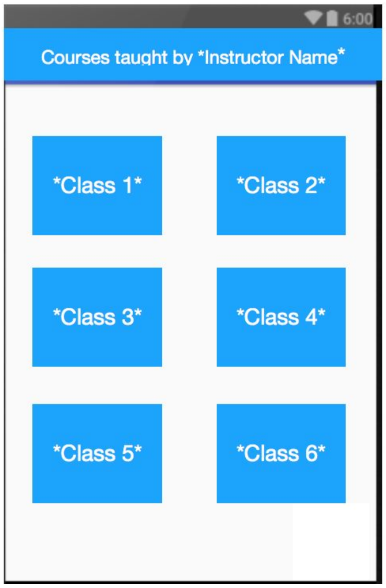
Percentage of class that attended:

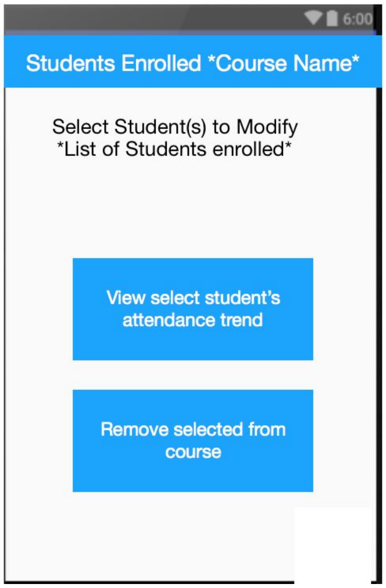


Modify Attendance Date

Select Student(s) to Modify
List of Students enrolled

View My Courses Screen

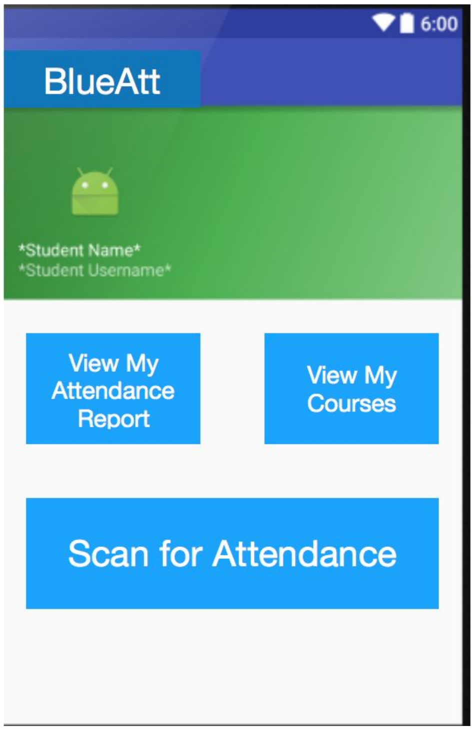


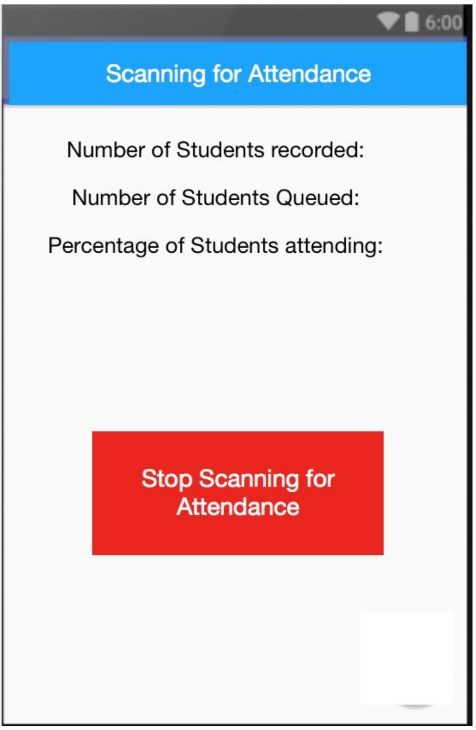

6:00
Students Enrolled *Course Name*

Select Student(s) to Modify
List of Students enrolled

View select student's attendance trend
Remove selected from course

Scan for Attendance Screen





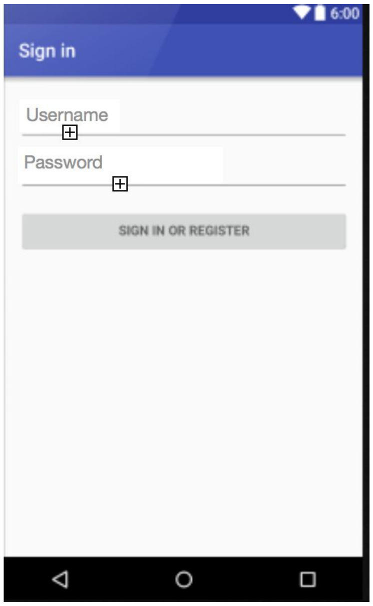
Number of Students recorded:

Number of Students Queued:

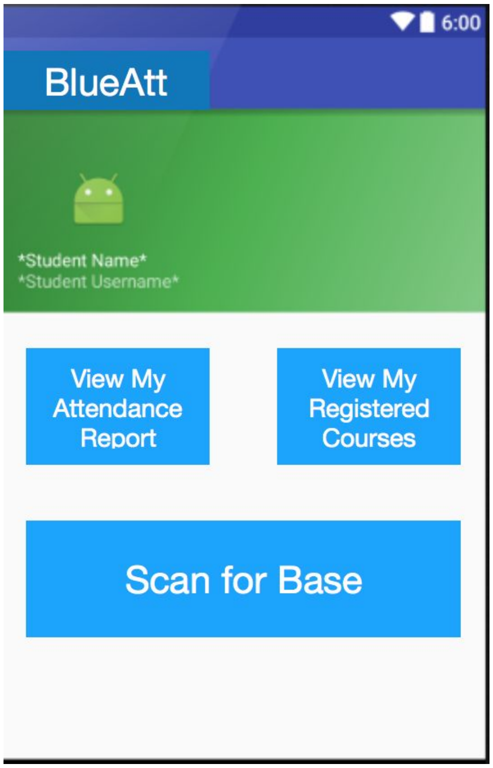
Percentage of Students attending:

GUI Student Version

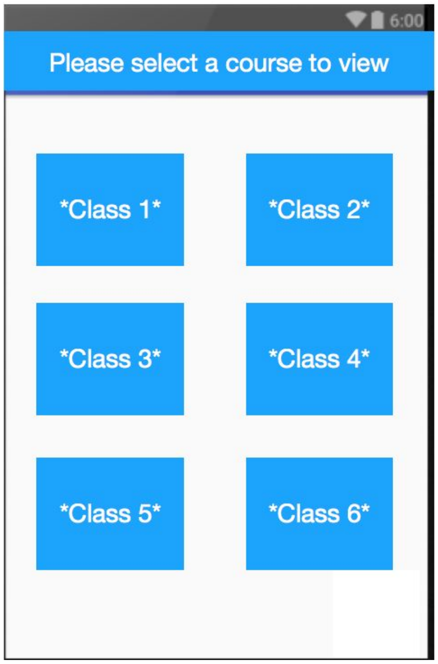
Opening Screen

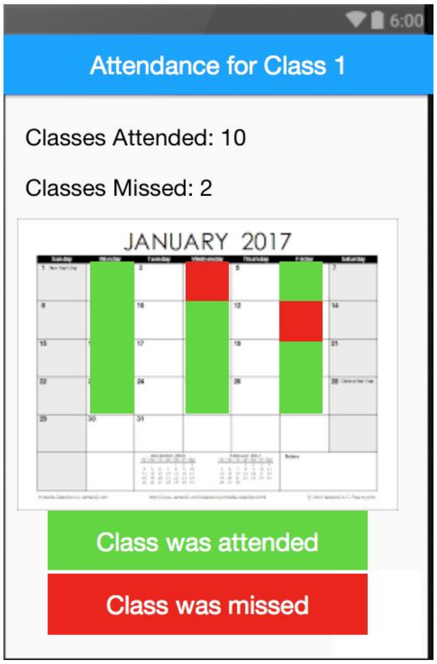


Home Screen after Log-In



View my Attendance Report

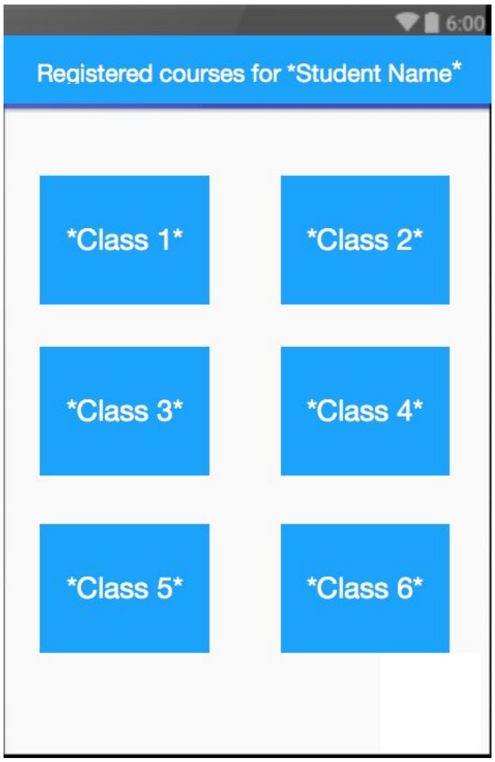




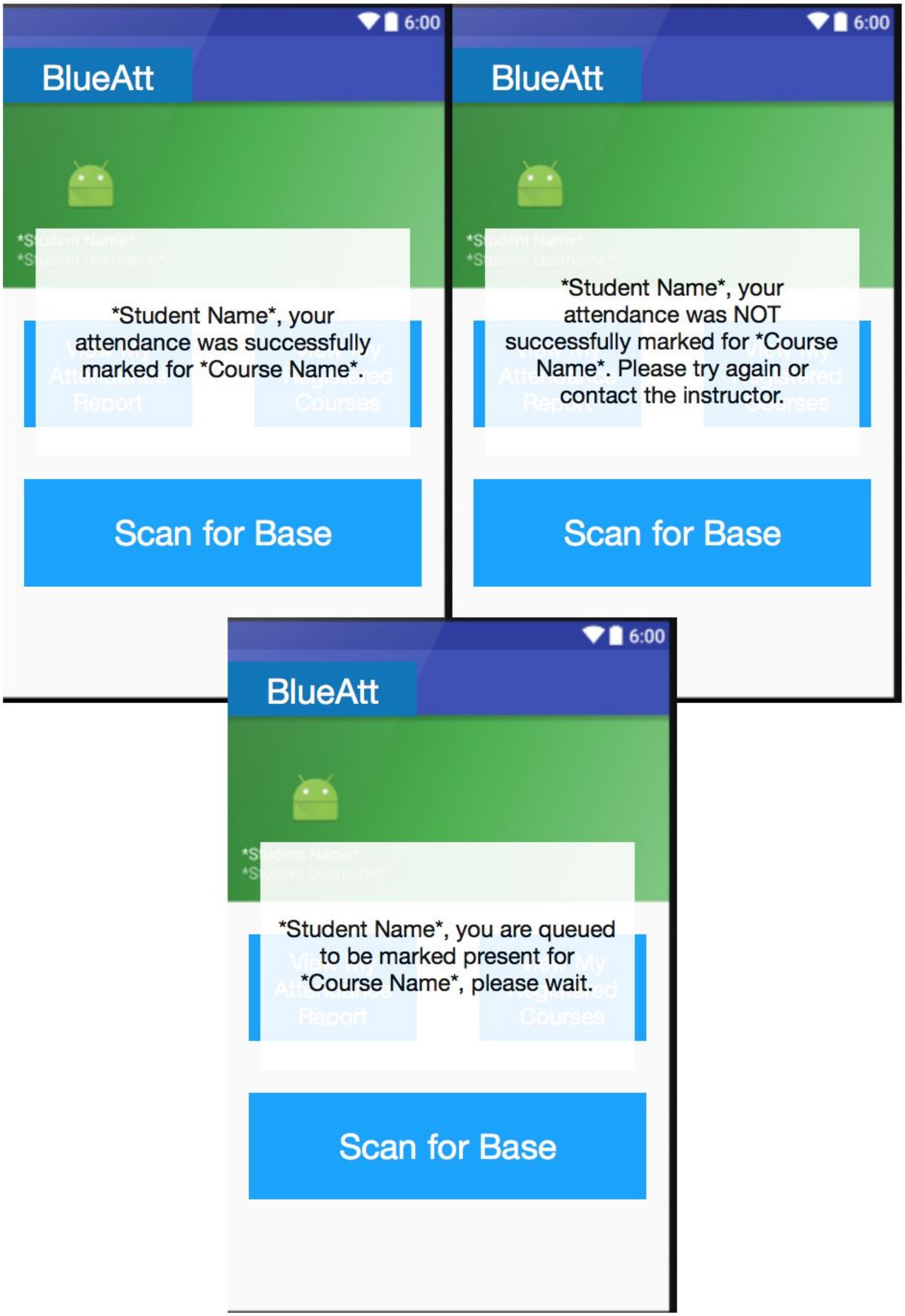
Classes Attended: 10

Classes Missed: 2

View Registered Courses Screen



Scan for Base Screen



Student Name, your attendance was successfully marked for *Course Name*.

Student Name, your attendance was NOT successfully marked for *Course Name*. Please try again or contact the instructor.

Student Name, you are queued to be marked present for *Course Name*, please wait.