No Proxy

Attendance Marking System

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Our aim

- To mark attendance of students in a way that is-
  - Simple.
  - Ensures no proxies.
  - Requires time lesser than that of lecture.

- In addition to these, we want to have a feature which can show today’s attendance of a course to the instructor before end of the lecture.

Why fingerprints?

- Why not use other unique features such as a barcode, QR code, or facial recognition etc.
- Barcode or QR code has to be given to students on some type of card, which can be exchanged by students, which fails the purpose of the project.
- So, we need to use some unique thing which students don’t have to carry with them to class, but just comes with them.

No Proxy

No Proxy has 3 components-

- Fingerprint scanner.
- Android device.
- A main server.

Fingerprint Scanner

- The fingerprint scanner we have used is Secugen Hamster Plus.

- The scanner reads fingerprint of the student and forwards it to the android device.

Android device

- The android device gets the roll number from student, and the fingerprint from the device.
- It then matches the fingerprint with that saved in the database corresponding to the roll number within a second.
- After matching, it sends roll number, course, date and attendance(Present/Dubious) to the main server.
- There is also a registration app, which allows you to add fingerprint of a student in the database.

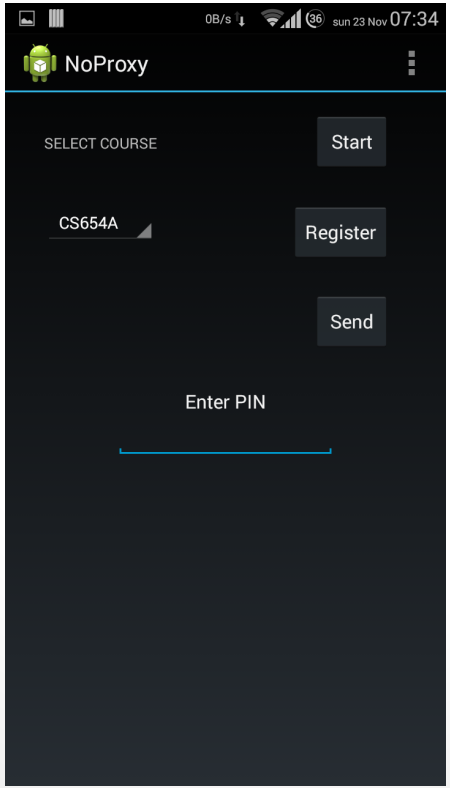
The main server

- The main server gets the roll number, date, course and attendance from the android device, and then enters it into a database.
- This database will have all the information of all courses and of all time.
- This will also provide interface for instructors/ students/parents to view attendance of students.
- It also has the facility for course instructor to login and edit attendances of students (in case there is some error).

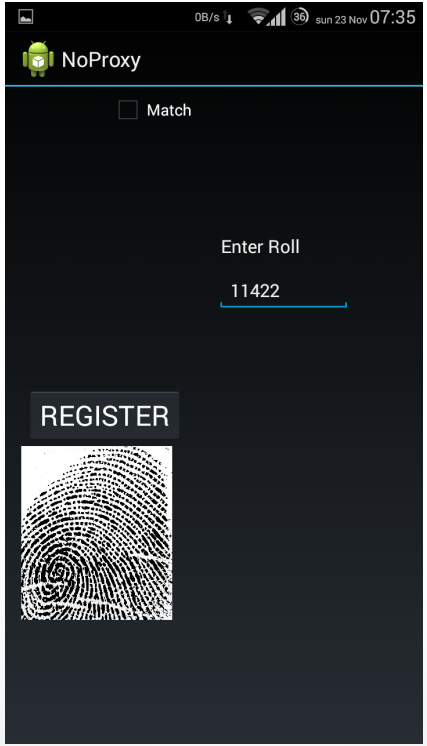
Equipments Used

- Secugen Hamster Plus Fingerprint Reader.
- An android device (Moto X) for testing.
- An Ubuntu-based server, with Apache & MySQL.

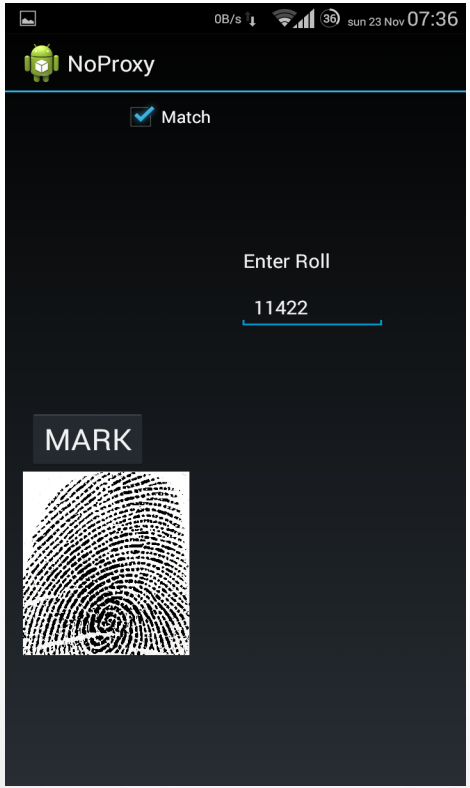
Home Screen


0B/s
sun 23 Nov 07:34
NoProxy
SELECT COURSE
Start
CS654A
Register
Send
Enter PIN

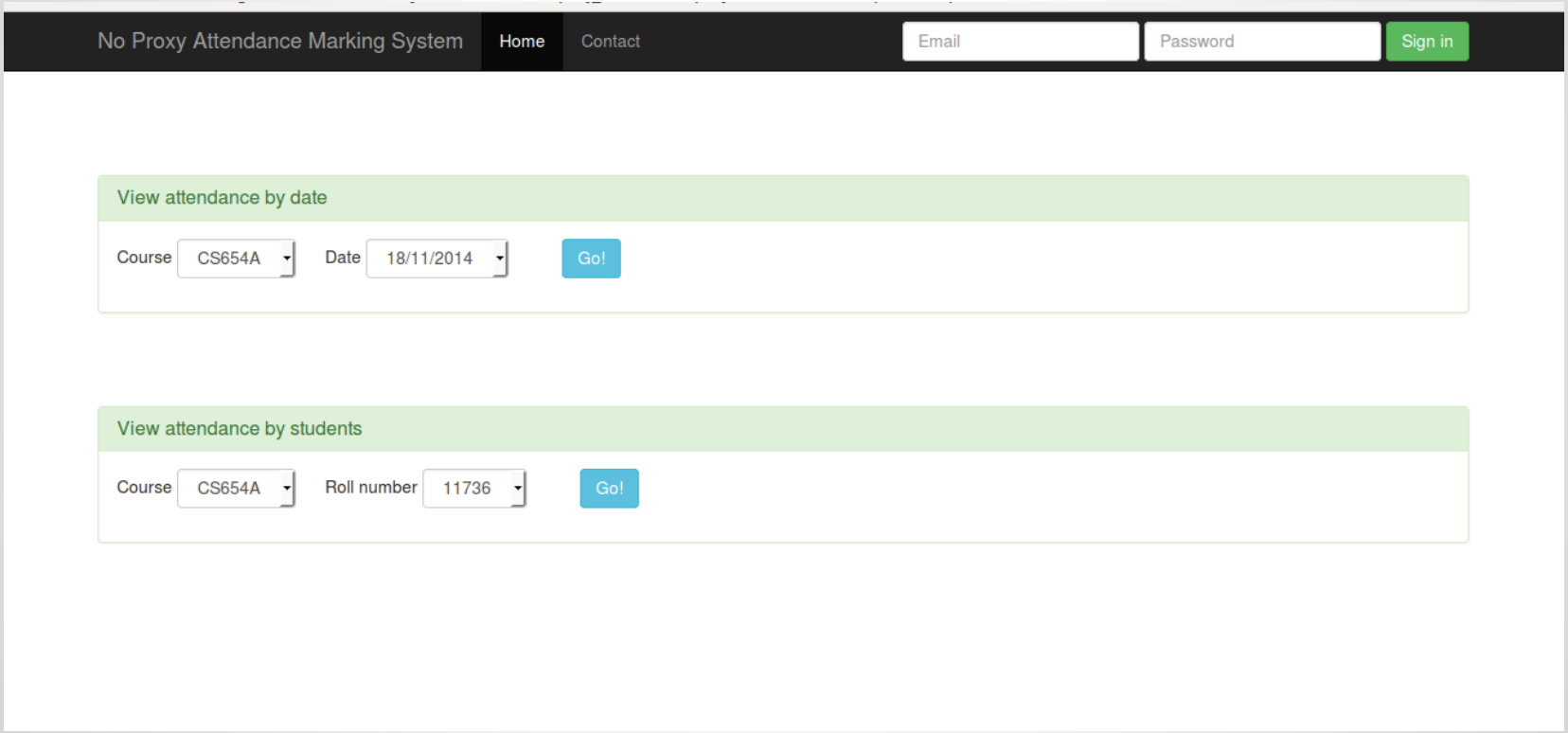
Registration Activity



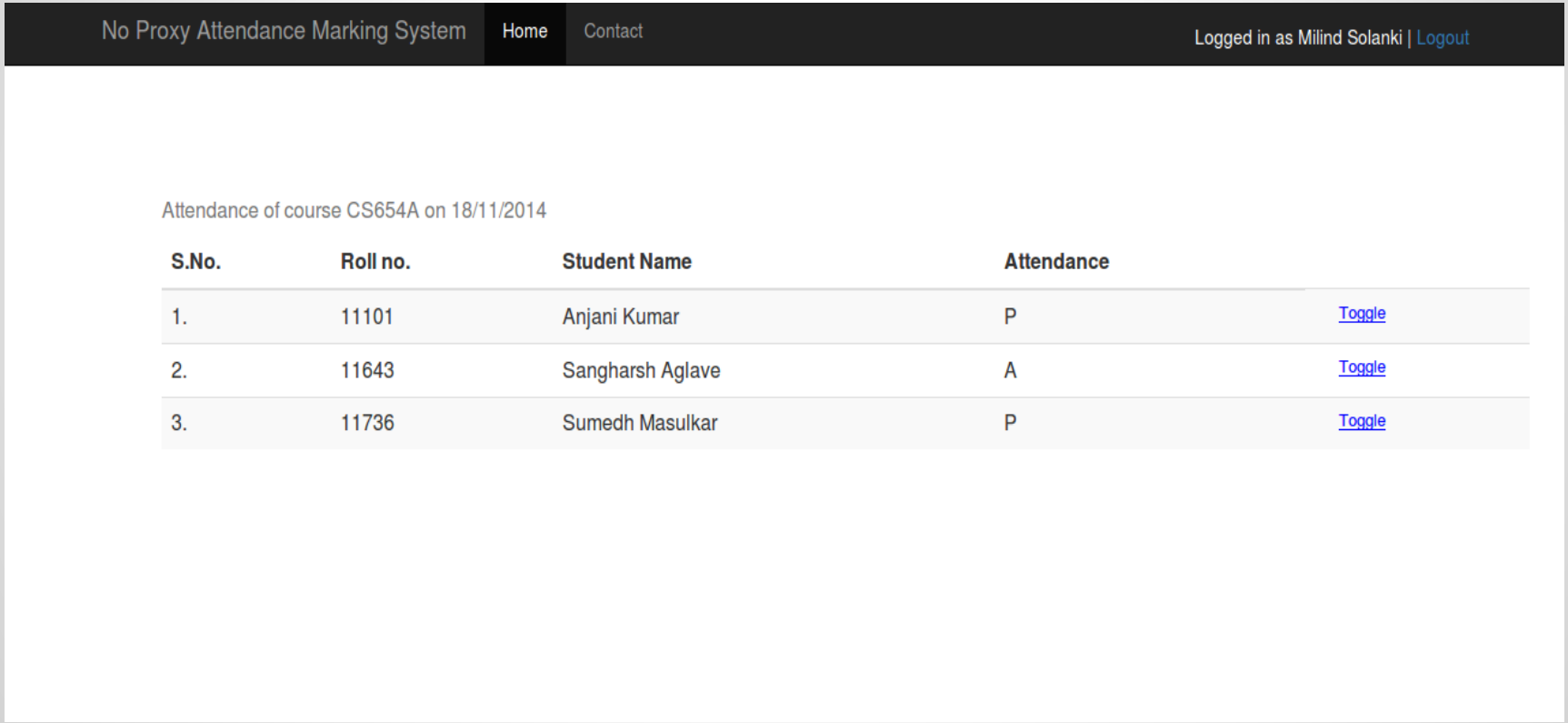
Attendance Activity



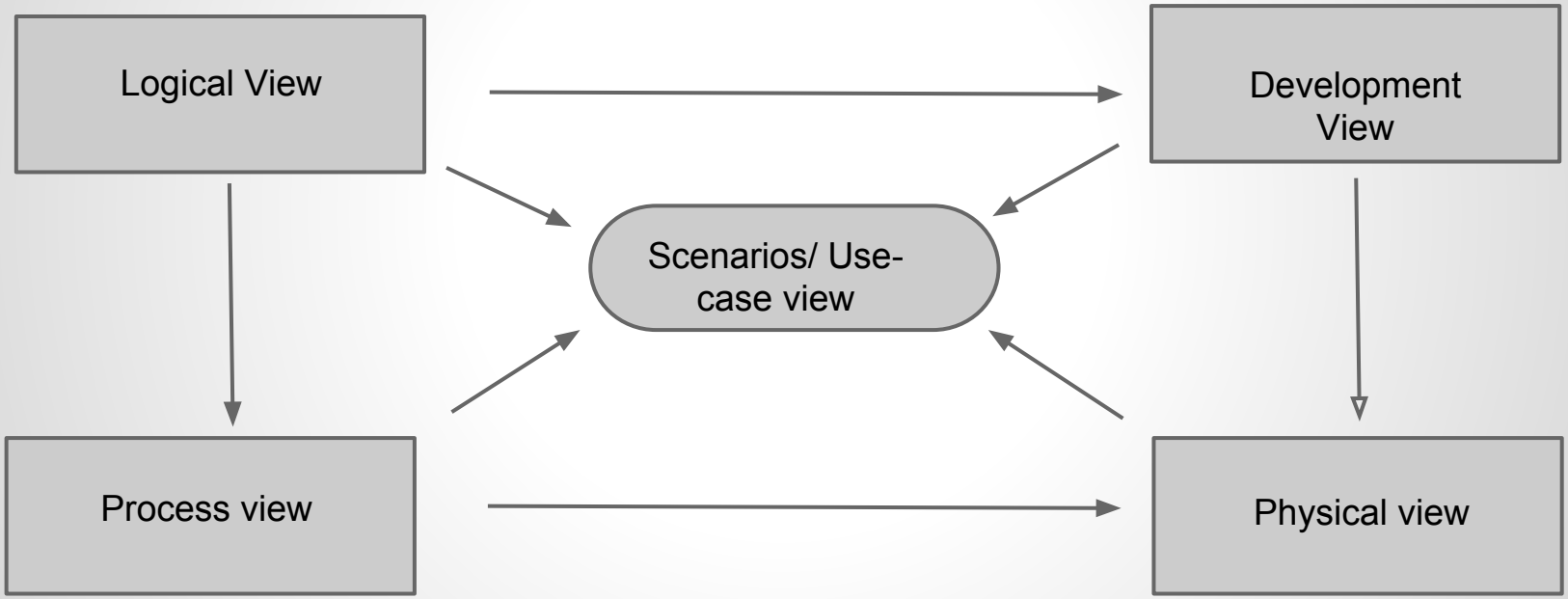
Web application to show attendance



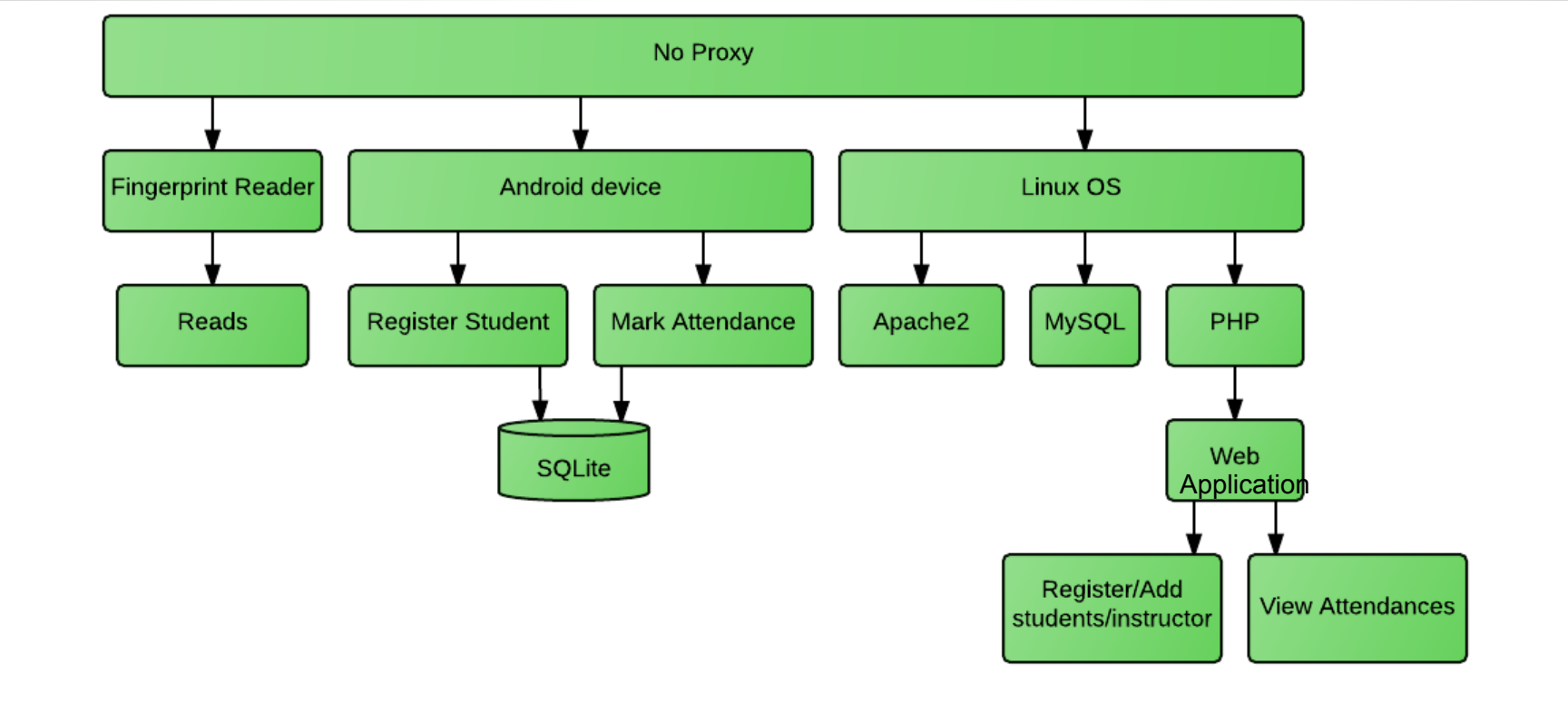
Web application to edit attendance



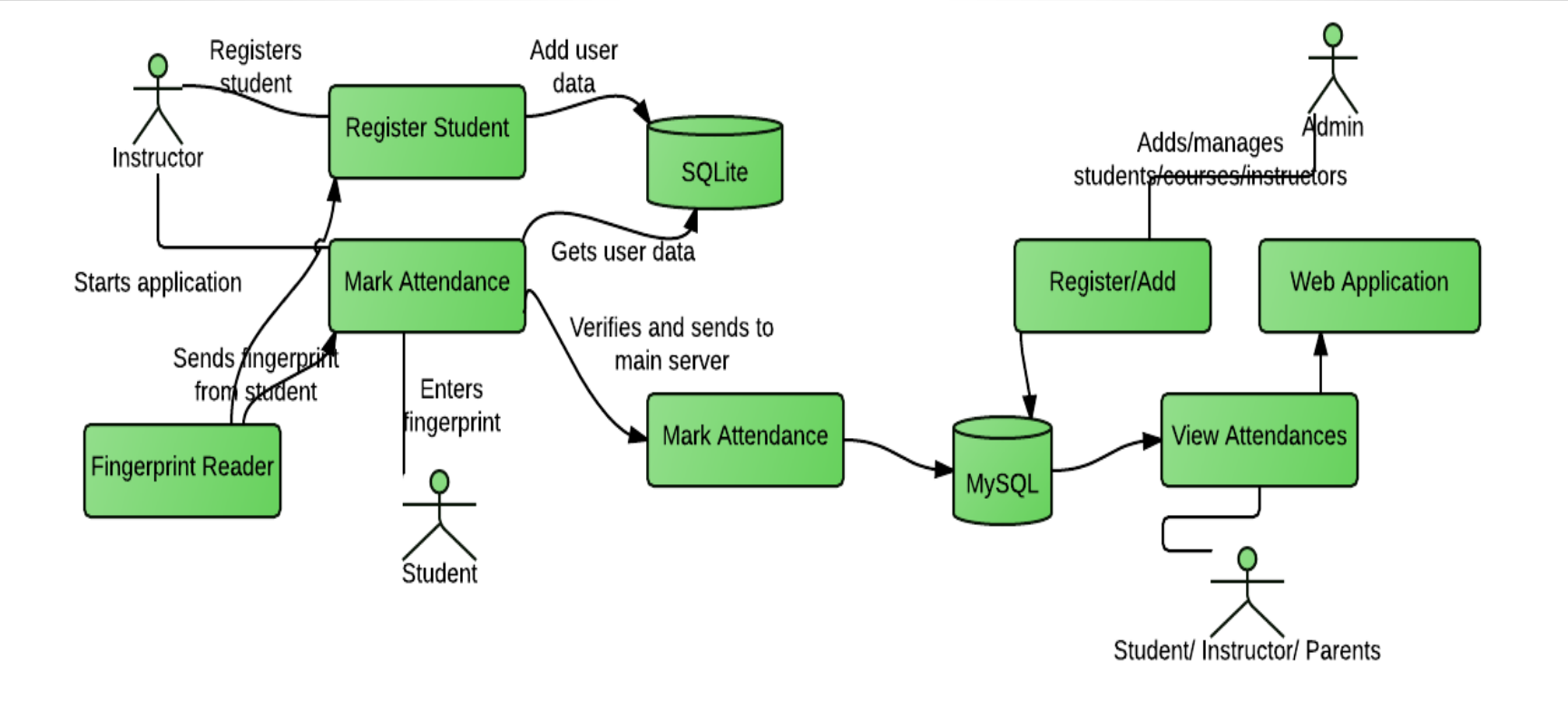
Architecture views



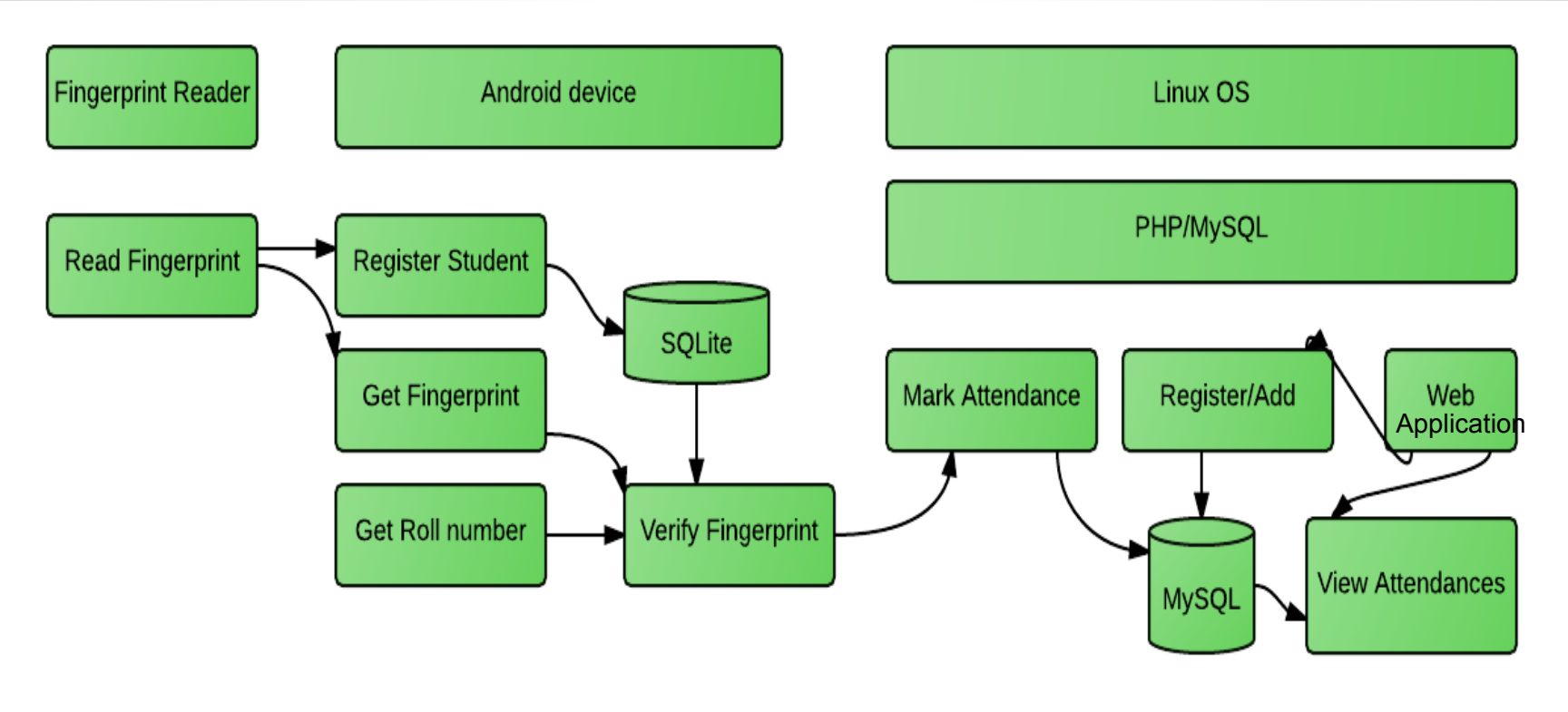
Logical View



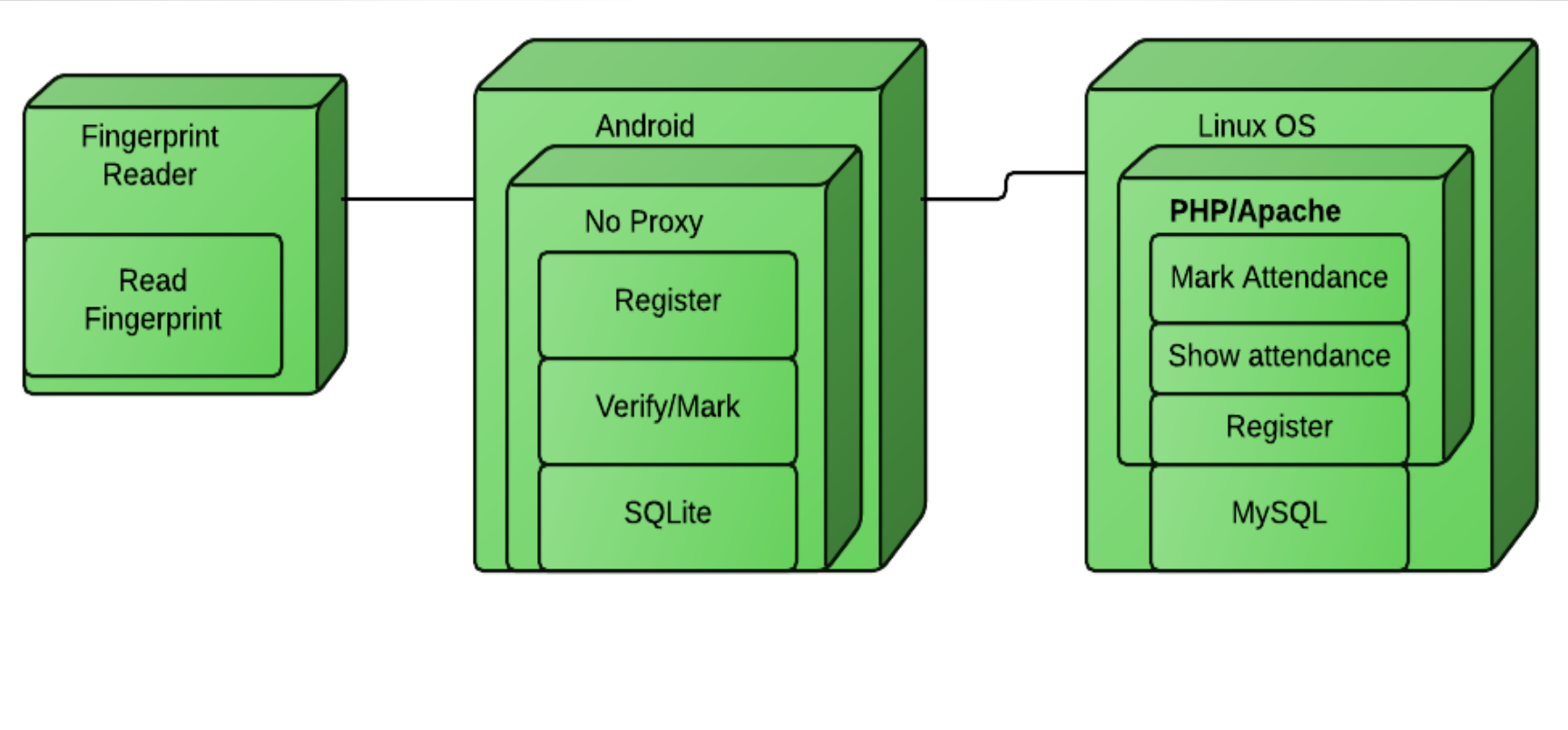
Process View



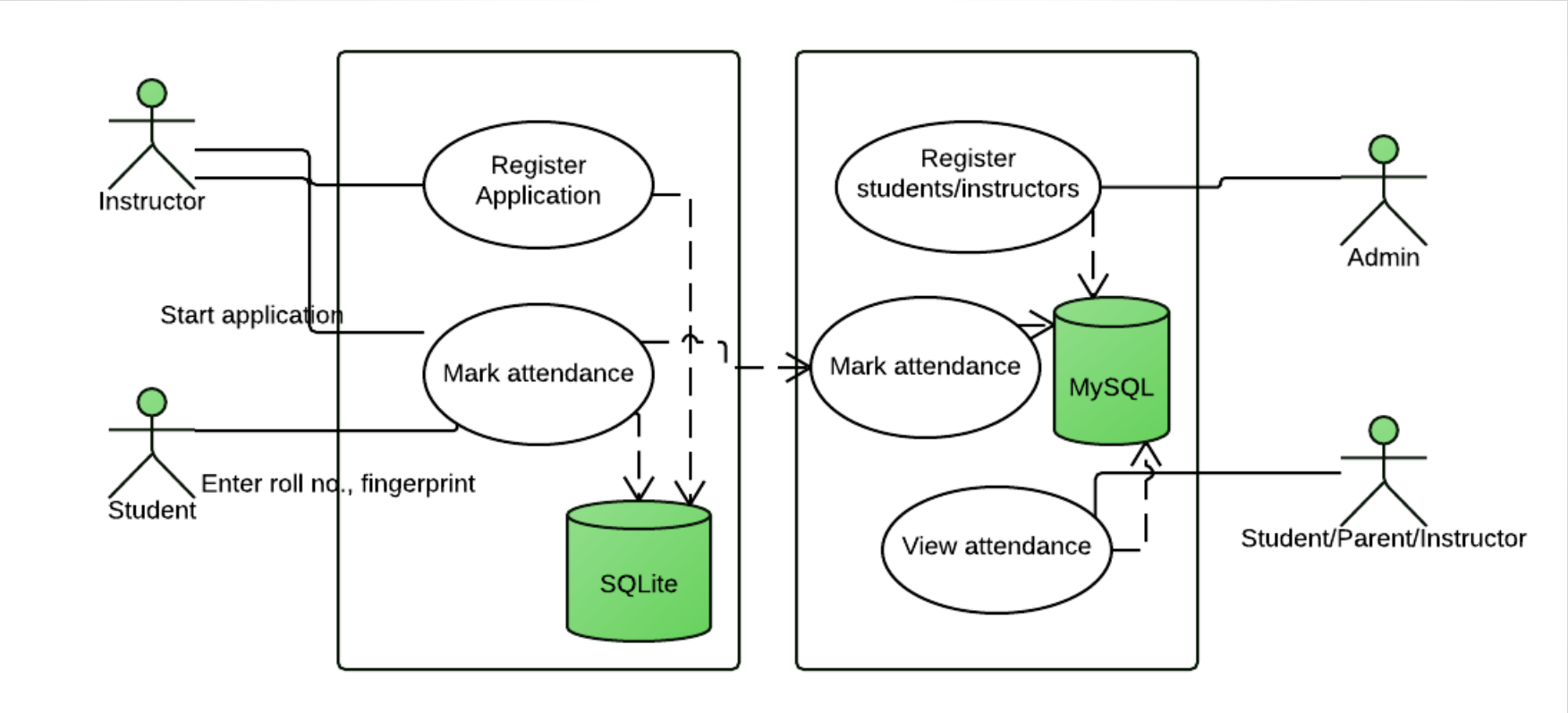
Development View



Physical View



Use-case View



Design Quality Attributes

- Modifiability: The components and their code are modular and can be modified easily. The web and android application codes and are independent of each other and can be modified separately.
- Reusability: The code for web application or the android application can be used as it is for similar application elsewhere.

Runtime Quality Attributes

- Performance: The complete process for a student would take less than 20-30 seconds. It takes less than a second to match the fingerprint.

- Reliability: Even if there is no internet connection, the android app will store the attendance of students and provides the option of sending them later, thus, ensuring attendance is marked reliably.

Runtime Quality Attributes

- Scalability: The system can be scaled up and down by changing number of devices depending on number of courses, number of students and time required to finish the process.

- Security: The system requires authentication to modify fingerprints, register students, modify attendance for students, etc. The server also verifies that the request to mark attendance is from verified source.

Runtime Quality Attributes

- Manageability: The instructor will just need to start and end the class, and for the web application just requires registration of students in courses, and addition of instructors by admin, which will be a very simple process.
- Usability: The system is very easy to use or learn, both the android and web applications are simple and anybody with knowledge of running android mobile and web browser can use both the applications.

Future Work / Improvements

- Multiple servers can be set up for better availability.
- Security of the system can be improved by having more strict checks that the request to update database comes from a verified source.
- More statistics related to attendance of students can be displayed.
- Instead of hardcoding the courses, Dynamic addition of courses could be implemented.
- Having an Instructor registration activity in the Android App.

- Instead of hardcoding the pin, ask for username and password of the instructor.
- Inserting data to the Register database in device through the server.

References

[1] FingerPrint Matching is handled by “Secugen FDx SDK Pro for Android.”:
http://www.secugen.com/download/sdkrequest.html

[2] Sending Data to Server:
http://hmkcode.com/android-send-json-data-to-server/

References

[3] DataBase Handling in Android:

http://mrbool.com/how-to-insert-data-into-a-sqlite-database-in-android/28895

[4] Bootstrap - http://getbootstrap.com/getting-started/

THANK YOU!