CERBERUS –

Biometric Attendance for CA Dept.

Cerberus - Live Project

Guide:

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Team Members:

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1.
Project Summary

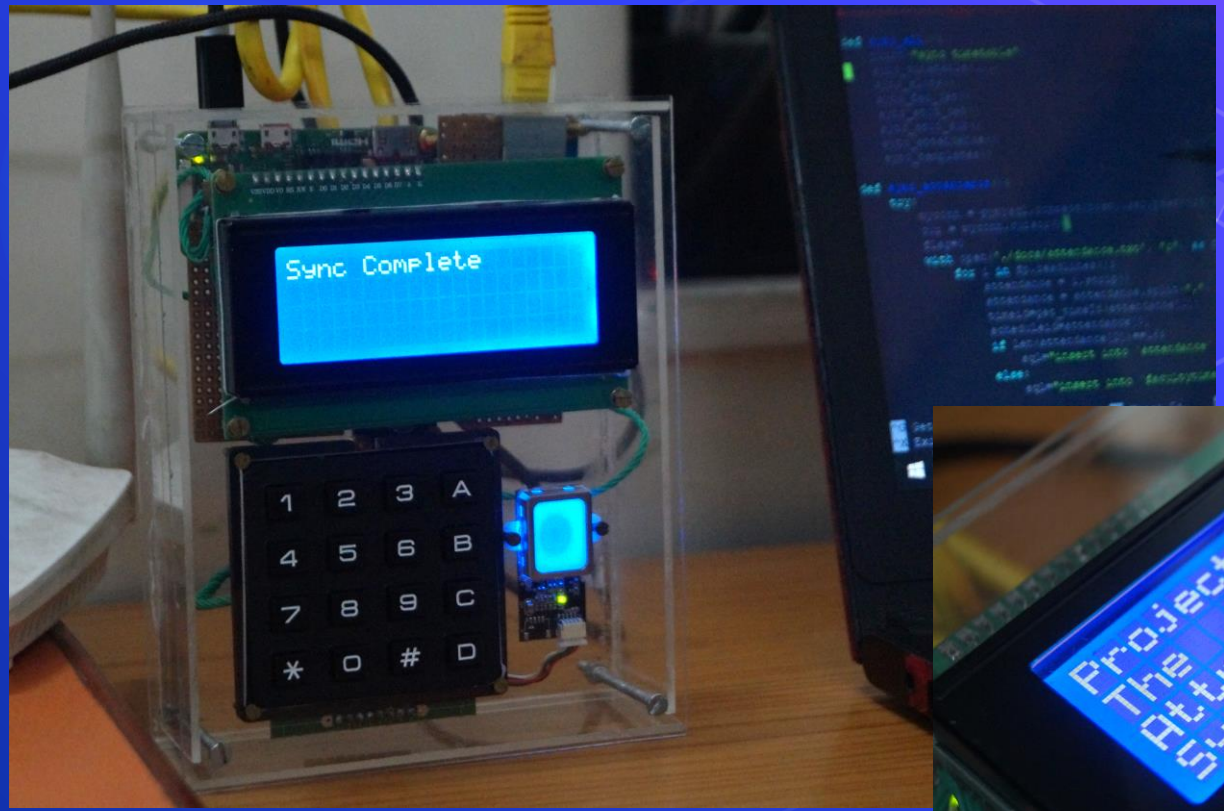
Let’s start with the first set of slides

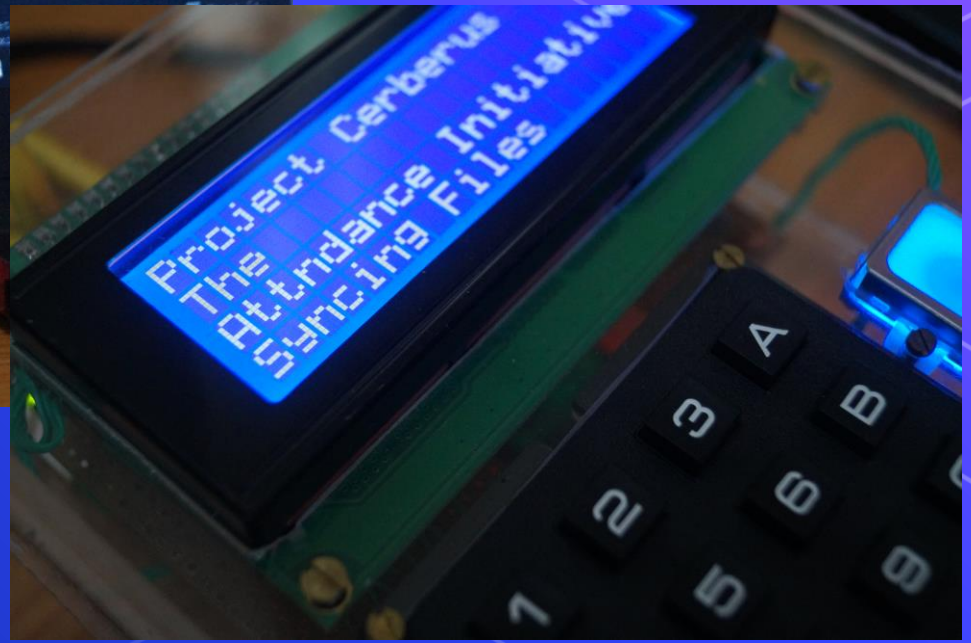
“

Our project focuses on managing a distributed system of devices that are capable of scanning biometrics for the use of attendance for a large scope of stakeholders automatically on the basis of a timetable.

“

The student will be marked present through biometric (fingerprint) **module** and the attendance data can be accessed on our **website** by the users.


Sync Complete
1 2 3 A
4 5 6 B
7 8 9 C
* 0 # D


Project Cerberus
The
Attndance Initiativ
Syncing Files
A
B
3
6
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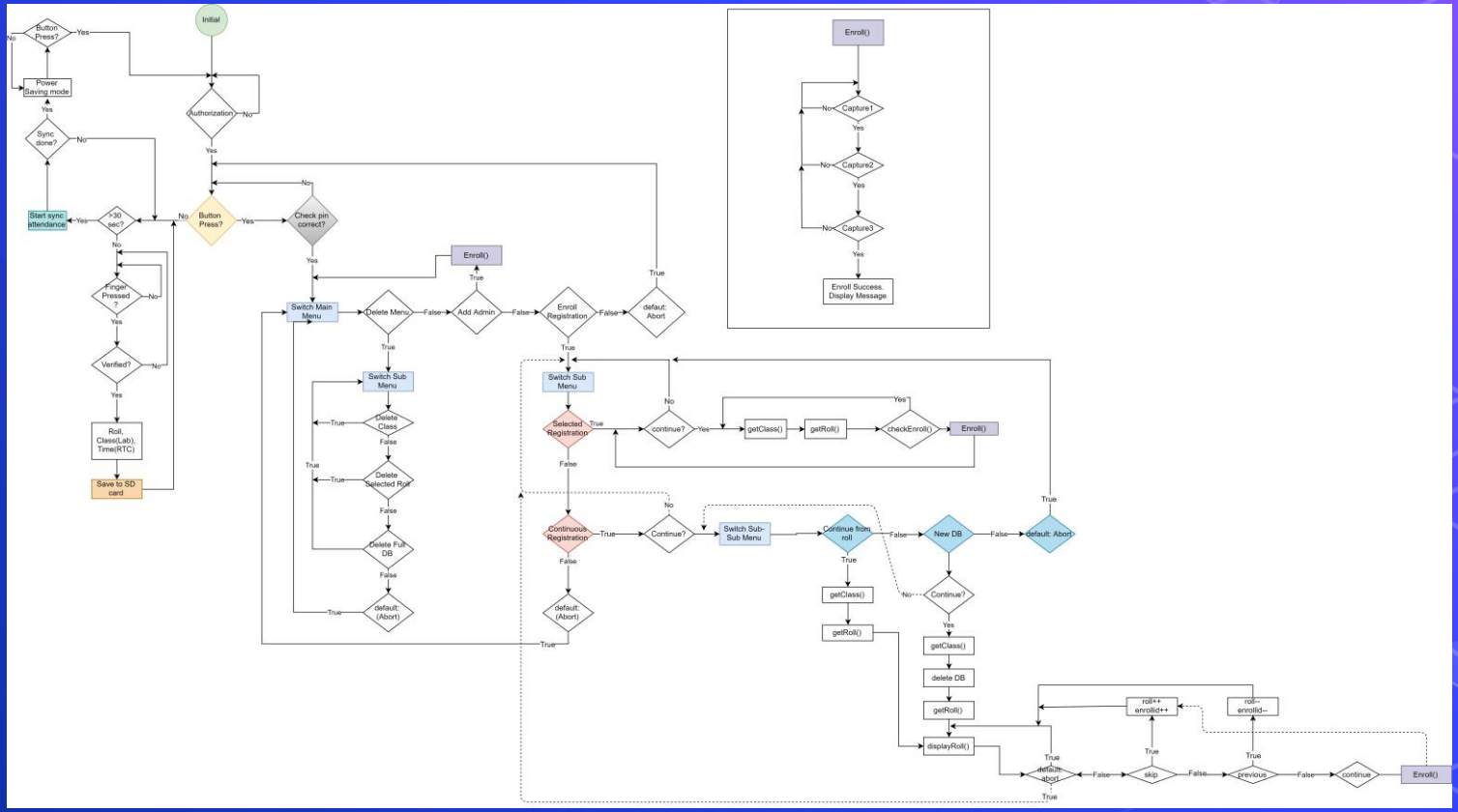
1

Flow-Chart of RaspberryPi



Scope of Device (w RaspberryPi)

- Enroll fingerprints
- Authentication
- Manage Faculty/ Admin (Fingerprint data)
- Manage Student (Fingerprint data)

Background Activities:

- Sync:
  1. Attendance to database
  2. Sync templates from database
  3. Sync timetable from database.
  4. Sync Student Details (PRN, subject, name, fingerprint)

Scope of Web-App (made w Servlet)

For Faculty:

- Login
- Timetable Management
- Subjects Management
- Student Management
- Attendance Management (Manual)
- Admin Management
- Student Progression
- Profile Management

For Students:

- Login
- View Attendance
- Select Electives

Tools and Technology Used:

On Device (RaspberryPi):

- OS: Raspbian
- Lang: Python
- Tool: Notepad++, Jupyter, PuTTY

Database:

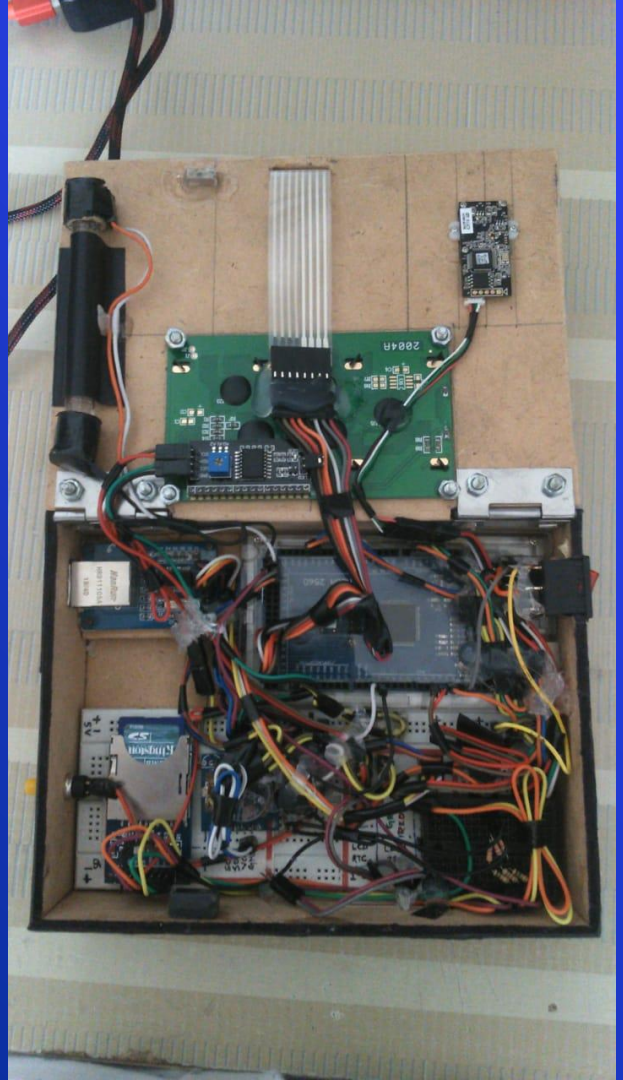
MySQL

On Web-App:

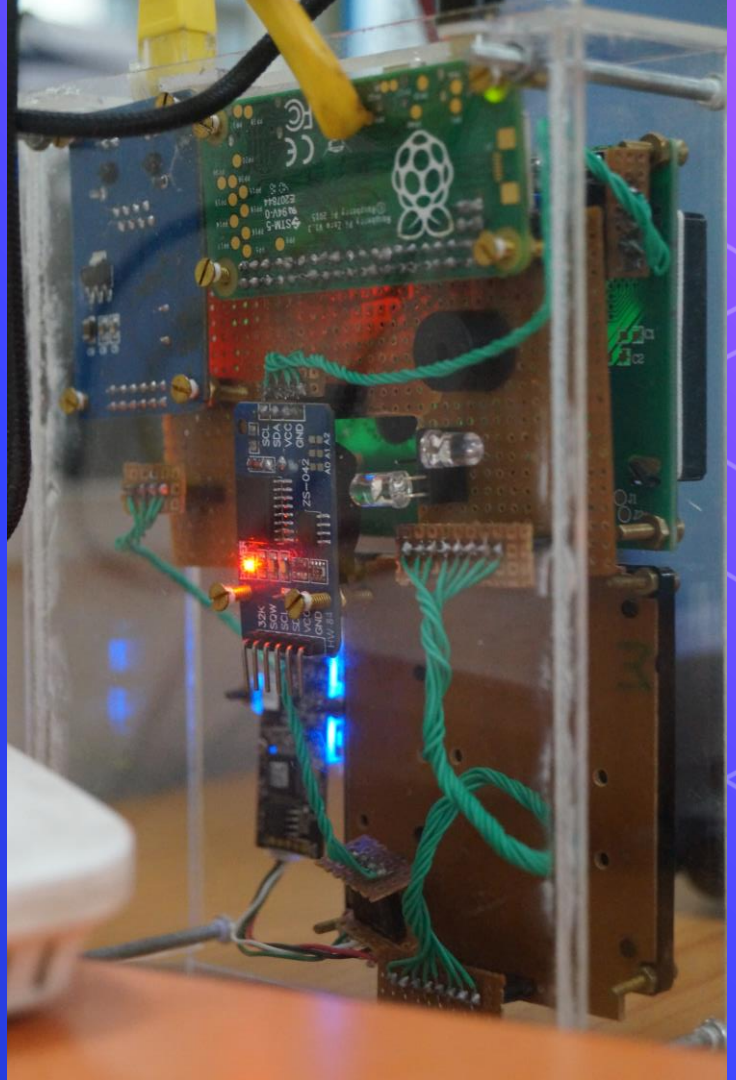
- frontend:
  - AJAX, HTML, JS, CSS
- backend:
  - Java-Servlet, JSP.

Server:

Apache Tomcat 7.0.3



Circuit of Arduino vs RaspberryPi



We switched to RaspberryPi

Feature	Arduino Mega	RaspberryPi Zero
RAM	8 KB	512 MB
Download Speed	16 KBPS	10 MBPS
OS	-	Linux Raspbian
Multitasking	No	Yes
Price	850	990

- Download/Upload Templates from/to FPS.
- Support for multiple SPI interface
- Inbuilt SD card support

Agile Methodology

To iterate the development and testing throughout the software development lifecycle of the project.

Extreme programming (XP) is a software development practice which is intended to improve software quality and responsiveness to changing customer requirements.

Backlogs

- Testing components/ Modules.
- FPS, LCD Libraries
- Custom functions for RaspberryPi
- Database connection with RaspberryPi
- Launcher
- functions for RaspberryPi
- Sync fingerprints
- Switching to GitHub for version control.
- Commercializing the project
- Circuit Diagram for Arduino/ RaspberryPi
- Blob/Clob for finger data
- Database Schema
- View Attendance
- View Timetable
- Edit Timetable
- Manage password
- Password encryption (SHA2)
- Edit timings
- Add slot
- Remove slot
- View Student Details
- Student Subject Selection
- Add Student
- Delete Student
- Manage Subjects (Add, View, Delete)
- Faculty Management (Add, View, Delete)
- Final Database Normalization

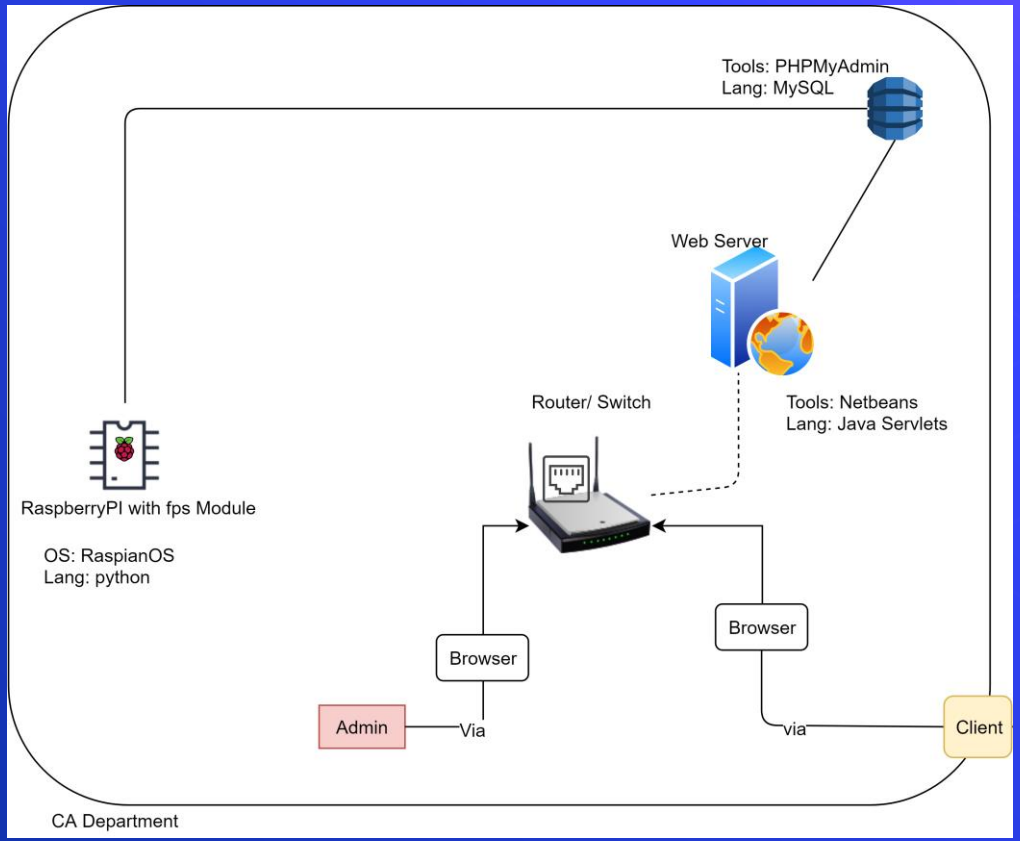
Backlogs 2

- Adding logs
- Dividing storage space into classes
- Simultaneous interaction of SPI Devices.
- Ethernet Sleep mode.
- Add light show for standby
- Download data to excel (Backup)
- Upload student data from excel file.
- Profile Page
- Activity log
- Session Management
- ReCAPTCHA
- Mailer
- OTP
- Email verification
- Handle SQL Exceptions
- Validations in forms (AJAX)
- Animations using CSS and JS
- Particle.js
- Theme and logo
- Box Design
- Student Progression
- JSON format data
- Testing
- About Us page
- Copy timetable from previous week
- Fix scrollbar
- First login asks for details
- Manual Attendance
- Email and network connectivity check
- Documentation
- Presentation

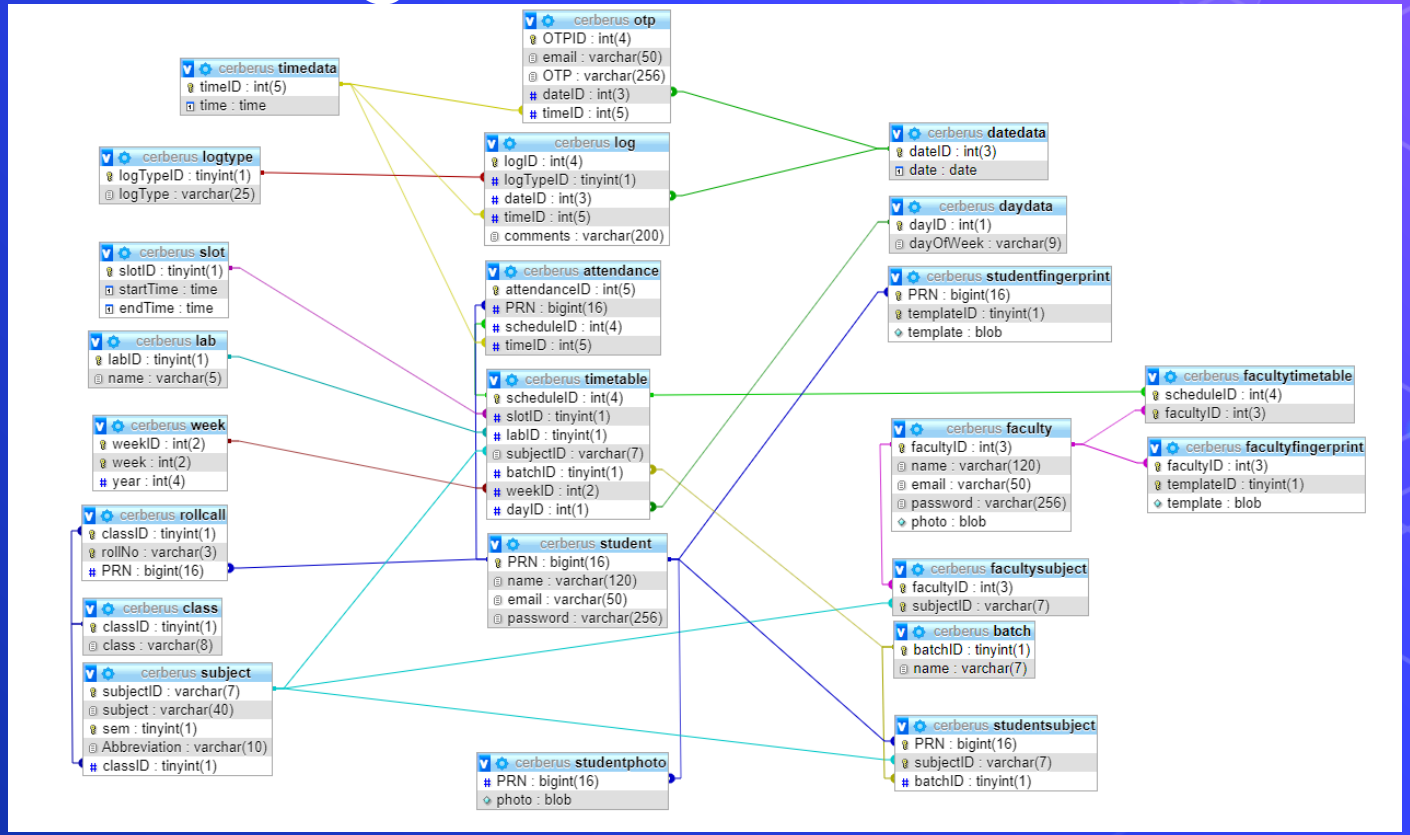
GitHub Demo w User Stories

Excel file with sprint and backlogs

System Architecture



System Design – ERD (Relational)



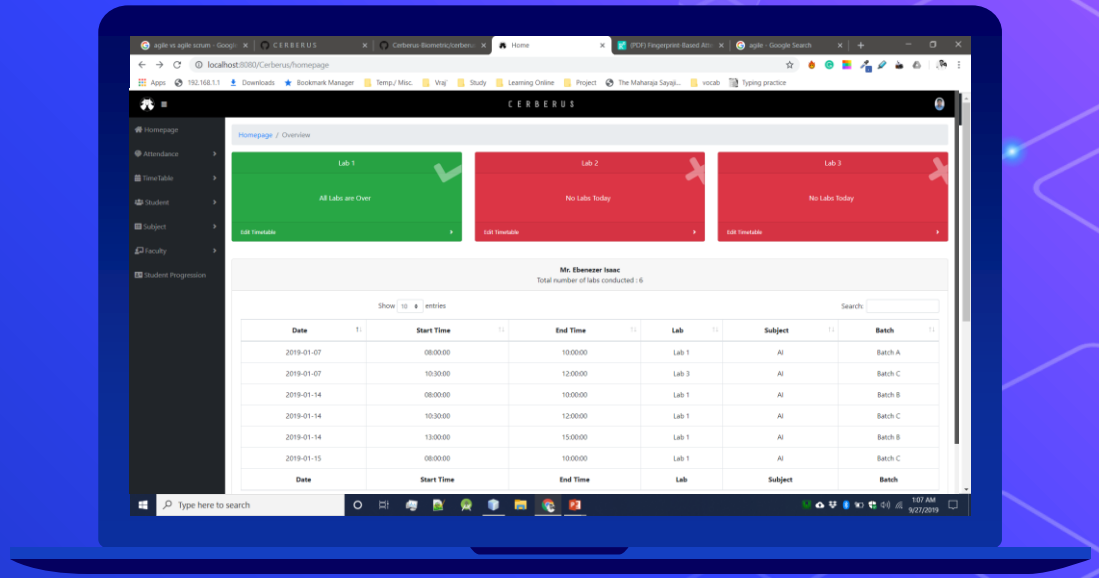
Tables and database dictionary from phpMyAdmin

2. Implementation

ScreenShots and Live Demo

Desktop project (Web)

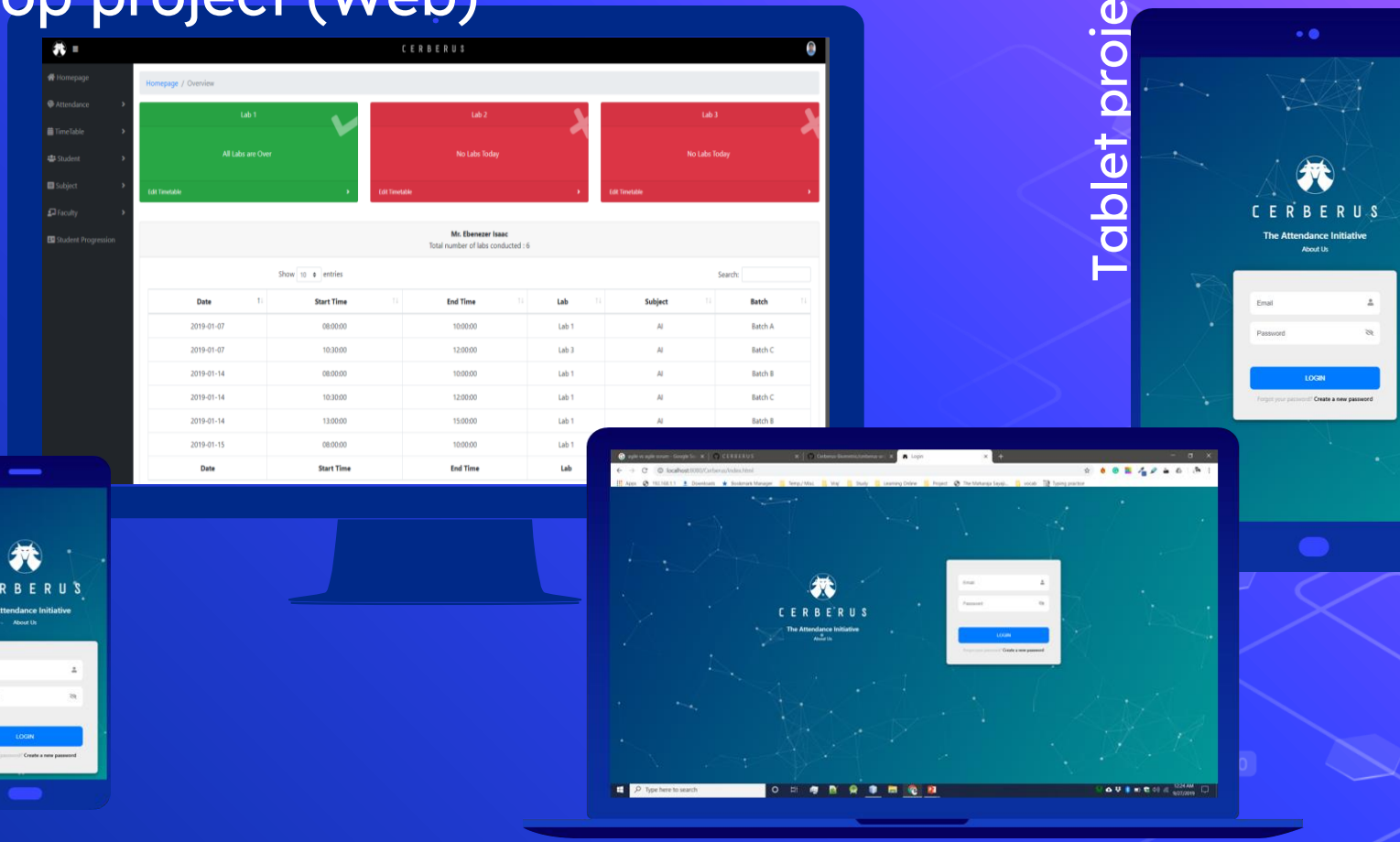
Home page when faculty logs In.



Desktop project (Web)

Tablet project

Mobile project



Demo of RaspberryPi and Web Application

Finance

RaspberryPi + Heatsink	1035
FPS Module	1604
Ethernet Module	250
RTC Module	110
Screen	450
Keypad	390
SD Card	250
Box Design	250
Misc.	150
	4490

Project Work Division

- Coding on RaspberryPi: Ebenezer
- Raspberry Circuit Design: Ebenezer
- Box design: Vraj.
- Backend: Ebenezer & Vraj
- Front end & GUI: Huseinali, Ebenezer
- Database & SQL: Vraj
- Documentation: Vraj
- Testing: All 3 of us.

Thank you!