CERBERUS –

Biometric Attendance.

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

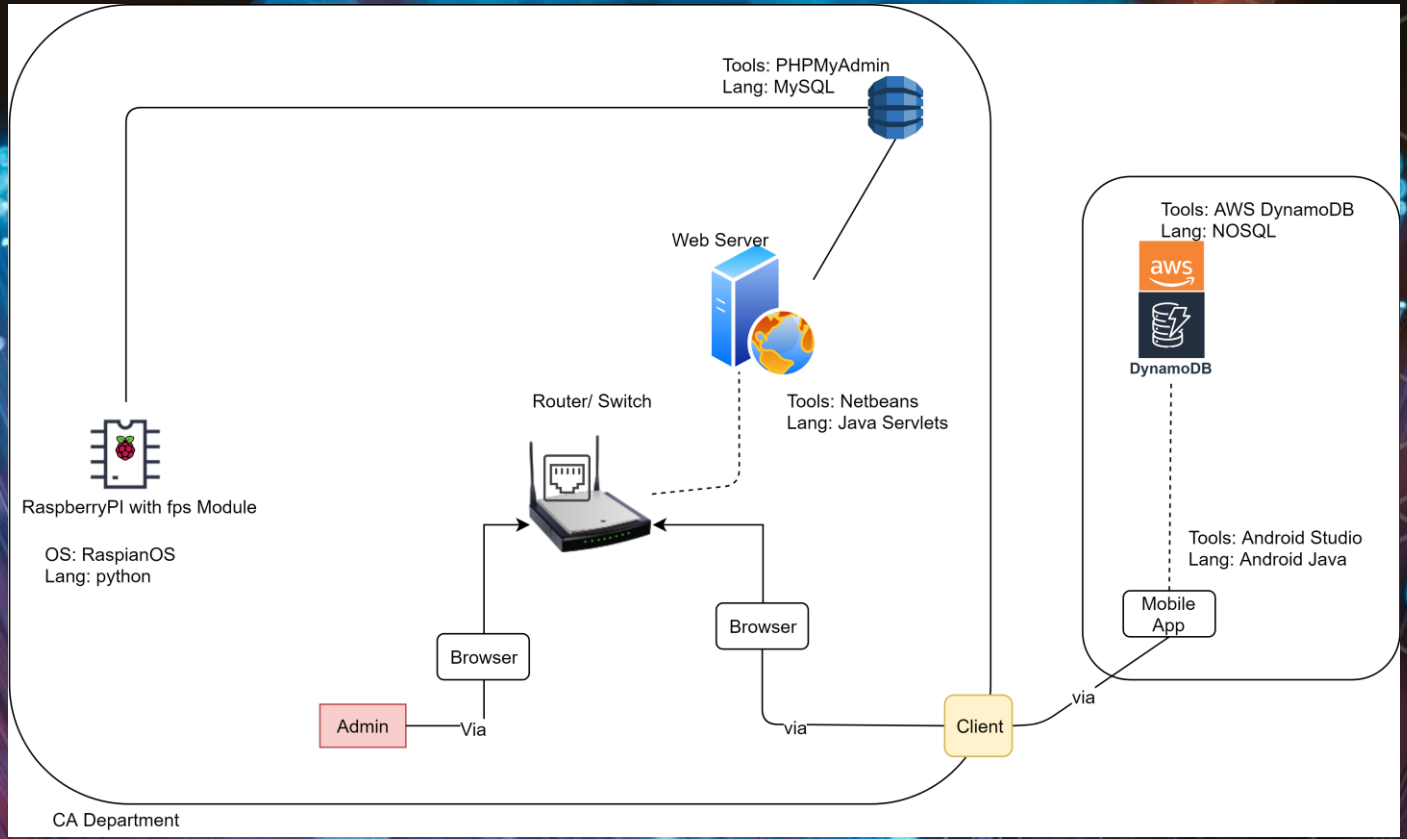
“

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.

Architecture



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. Fetch templates from database
  3. Fetch timetable from database.
  4. Fetch PRN

Scope of Web-App (made w Servlet)

For Faculty:

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

For Students:

- Login
- View Attendance
- Select Electives

Tools and Technology Used:

On Device (RaspberryPi):

- OS: Raspbian
- Lang: Python
- Tool: Notepad++

On Web-App:

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

Database:

MySQL

Server:

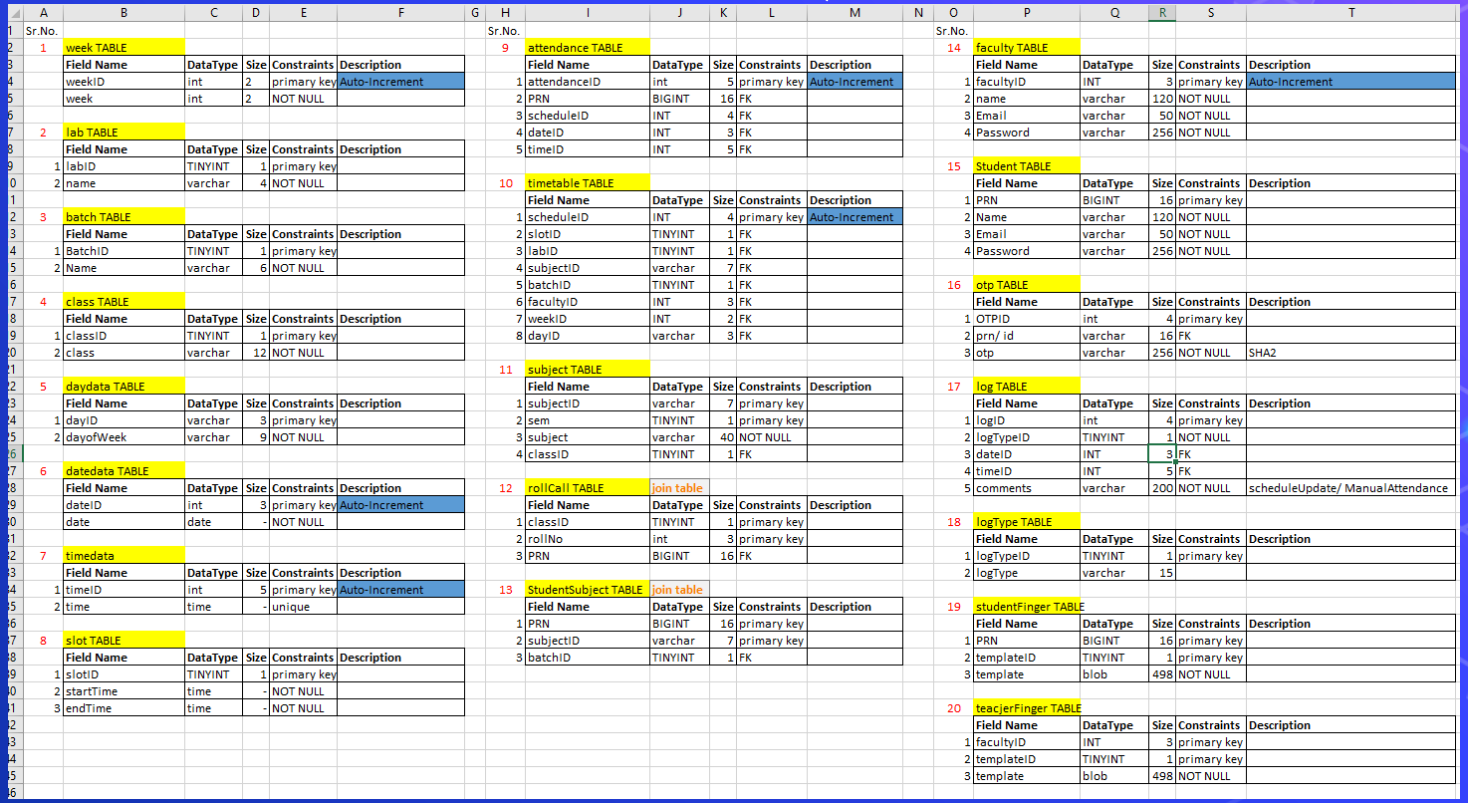
Apache Tomcat 8.0

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.

Tables of Database – (Data Dictionary)

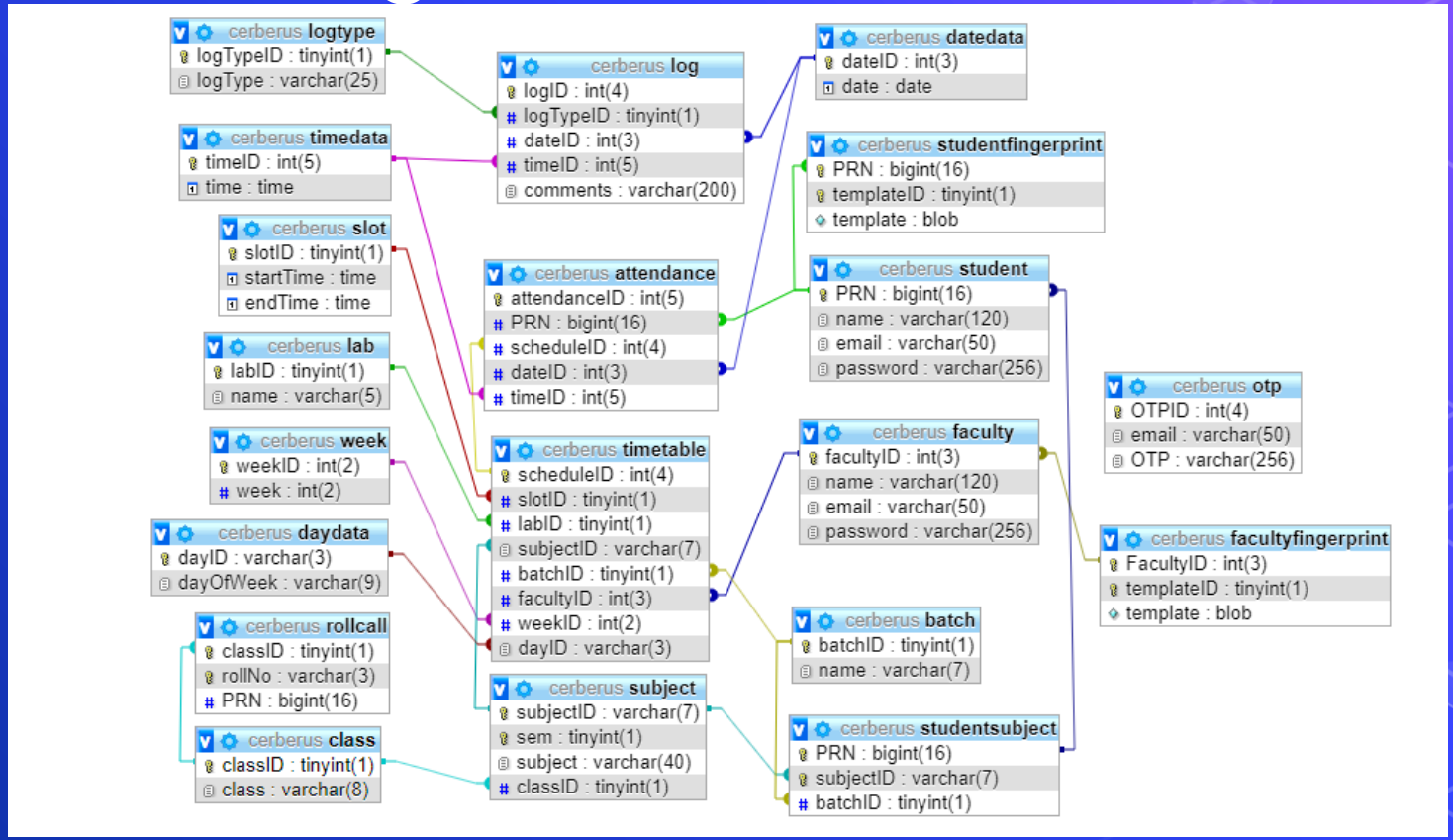


Sr.No.					
1	week TABLE				
	Field Name	DataType	Size	Constraints	Description
	weekID	int	2	primary key	Auto-Increment
	week	int	2	NOT NULL	
2	lab TABLE				
	Field Name	DataType	Size	Constraints	Description
1	labID	TINYINT	1	primary key	
2	name	varchar	4	NOT NULL	
3	batch TABLE				
	Field Name	DataType	Size	Constraints	Description
1	BatchID	TINYINT	1	primary key	
2	Name	varchar	6	NOT NULL	
4	class TABLE				
	Field Name	DataType	Size	Constraints	Description
1	classID	TINYINT	1	primary key	
2	class	varchar	12	NOT NULL	
5	daydata TABLE				
	Field Name	DataType	Size	Constraints	Description
1	dayID	varchar	3	primary key	
2	dayofWeek	varchar	9	NOT NULL	
6	datedata TABLE				
	Field Name	DataType	Size	Constraints	Description
	dateID	int	3	primary key	Auto-Increment
	date	date	-	NOT NULL	
7	timedata				
	Field Name	DataType	Size	Constraints	Description
1	timeID	int	5	primary key	Auto-Increment
2	time	time	-	unique	
8	slot TABLE				
	Field Name	DataType	Size	Constraints	Description
1	slotID	TINYINT	1	primary key	
2	startTime	time	-	NOT NULL	
3	endTime	time	-	NOT NULL	

Sr.No.					
9	attendance TABLE				
	Field Name	DataType	Size	Constraints	Description
1	attendanceID	int	5	primary key	Auto-Increment
2	PRN	BIGINT	16	FK	
3	scheduleID	INT	4	FK	
4	dateID	INT	3	FK	
5	timeID	INT	5	FK	
10	timetable TABLE				
	Field Name	DataType	Size	Constraints	Description
1	scheduleID	INT	4	primary key	Auto-Increment
2	slotID	TINYINT	1	FK	
3	labID	TINYINT	1	FK	
4	subjectID	varchar	7	FK	
5	batchID	TINYINT	1	FK	
6	facultyID	INT	3	FK	
7	weekID	INT	2	FK	
8	dayID	varchar	3	FK	
11	subject TABLE				
	Field Name	DataType	Size	Constraints	Description
1	subjectID	varchar	7	primary key	
2	sem	TINYINT	1	primary key	
3	subject	varchar	40	NOT NULL	
4	classID	TINYINT	1	FK	
12	rollCall TABLE	join table			
	Field Name	DataType	Size	Constraints	Description
1	classID	TINYINT	1	primary key	
2	rollNo	int	3	primary key	
3	PRN	BIGINT	16	FK	
13	StudentSubject TABLE	join table			
	Field Name	DataType	Size	Constraints	Description
1	PRN	BIGINT	16	primary key	
2	subjectID	varchar	7	primary key	
3	batchID	TINYINT	1	FK	

Sr.No.					
14	faculty TABLE				
	Field Name	DataType	Size	Constraints	Description
1	facultyID	INT	3	primary key	Auto-Increment
2	name	varchar	120	NOT NULL	
3	Email	varchar	50	NOT NULL	
4	Password	varchar	256	NOT NULL	
15	Student TABLE				
	Field Name	DataType	Size	Constraints	Description
1	PRN	BIGINT	16	primary key	
2	Name	varchar	120	NOT NULL	
3	Email	varchar	50	NOT NULL	
4	Password	varchar	256	NOT NULL	
16	otp TABLE				
	Field Name	DataType	Size	Constraints	Description
1	OTPID	int	4	primary key	
2	prn/ id	varchar	16	FK	
3	otp	varchar	256	NOT NULL	SHA2
17	log TABLE				
	Field Name	DataType	Size	Constraints	Description
1	logID	int	4	primary key	
2	logTypeID	TINYINT	1	NOT NULL	
3	dateID	INT	3	FK	
4	timeID	INT	5	FK	
5	comments	varchar	200	NOT NULL	scheduleUpdate/ ManualAttendance
18	logType TABLE				
	Field Name	DataType	Size	Constraints	Description
1	logTypeID	TINYINT	1	primary key	
2	logType	varchar	15		
19	studentFinger TABLE				
	Field Name	DataType	Size	Constraints	Description
1	PRN	BIGINT	16	primary key	
2	templateID	TINYINT	1	primary key	
3	template	blob	498	NOT NULL	
20	teacjerFinger TABLE				
	Field Name	DataType	Size	Constraints	Description
1	facultyID	INT	3	primary key	
2	templateID	TINYINT	1	primary key	
3	template	blob	498	NOT NULL	

System Design – ERD (Relational)

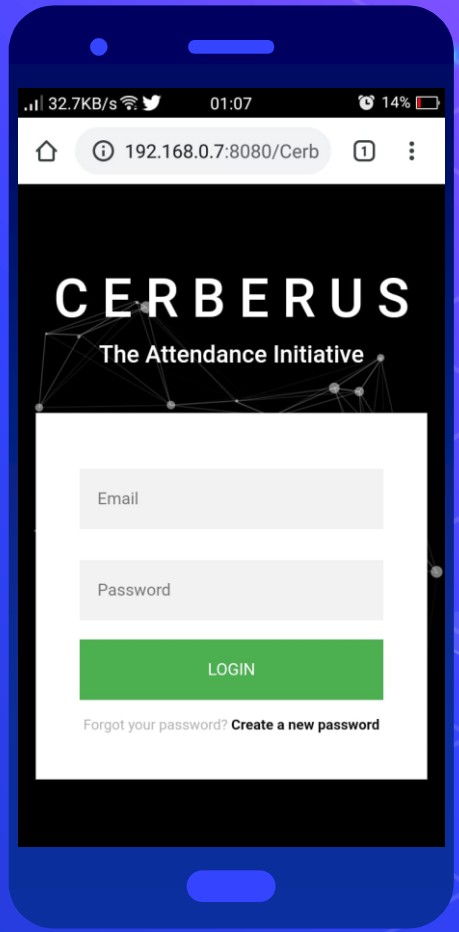


2. Implementation

ScreenShots and Live Demo

Mobile project

Perks of using Bootstrap - Index Page with Login

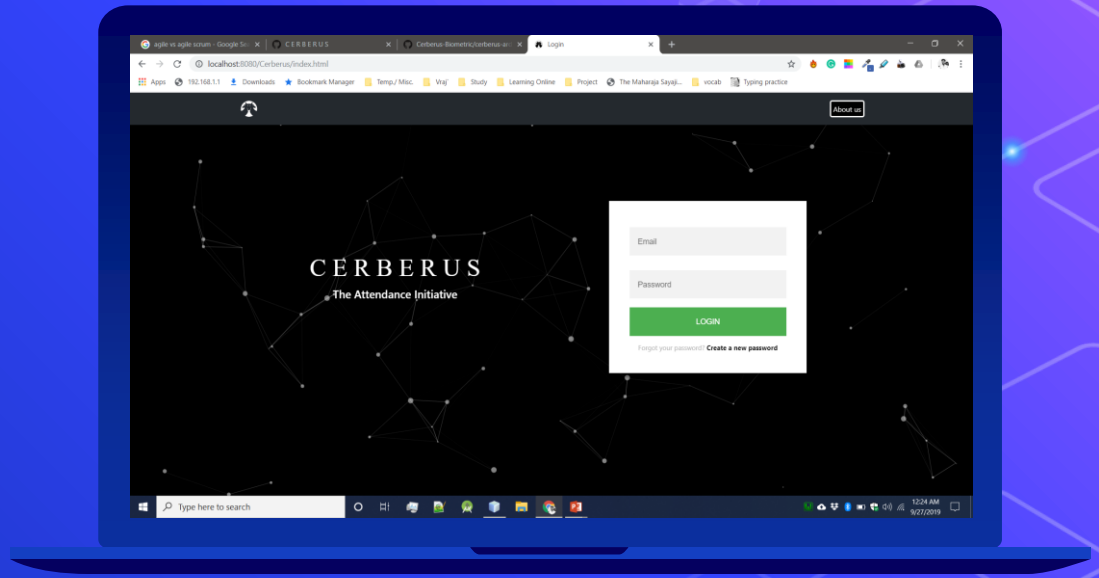


Tablet project

Index Page with Login

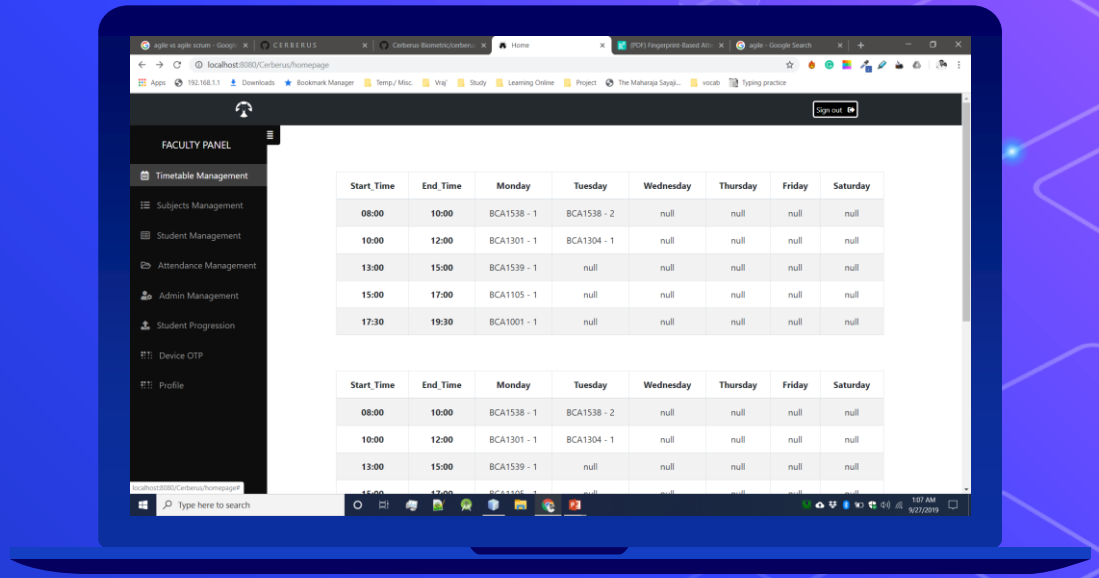
Desktop project (Web)

Index Page with Login



Desktop project (Web)

Home page when faculty logs In.



Project Work Division

- Arduino and circuit design: Ebenezer and Vraj
- RaspberryPi: Ebenezer
- Box design: Ebenezer.
- Backend: Ebenezer & Vraj
- Front end & GUI: Huseinali
- Database & SQL: Vraj
- Documentation: Vraj
- Testing: All 3 of us.
- Mobile-App: Huseinali

Thank you!

Any questions?