CLOUD BASED ATTENDANCE MANAGEMENT SYSTEM

Lakehead UNIVERSITY

Sai Surabhi Deepika – 0884203
Sanhith Reddy - 0889854
Sandeep Nannamu – 0882000

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1. ABSTRACT

Cloud based attendance management system deal with the maintenance of the student's attendance details. It generates the attendance of the student on basis of presence in class. It helps in maintaining daily basis of attendance, the staff will have their own individual accounts to make student attendance. The staff handling the particular course will be responsible to mark the attendance for all students. Only if a student is present the particular date, the attendance will be calculated. The student attendance report based on monthly attendance will be consolidated and generated. The website has been hosted on a cloud using Amazon AWS services for faster website speed and performance and so that we can simply be transferred to another server if one goes offline or while experiencing any technical issues.

2. KEYWORDS

Cloud Storage, attendance management, framework, administration system, efficiency, productivity, data integrity, admin, faculty, student, EC2, AWS, architecture, use case

3. INTRODUCTION

Attendance Management System has started trending as a well known module for School Administration Program. Numerous Academic Institutions like School / Colleges are beginning to implement it nowadays. The framework makes a difference in keeping track record of students and staff every day attendance. In comparison to the manual attendance recording framework it is more vigorous and precise to form a successful attendance recording framework.

In the present day age of Information & Innovation it has become apparent for corporate companies and instructive establishments to work through Cloud based ERP Frameworks and diminish all the manual admin paperwork. This decreases the by and large turnaround working time on the given specific assignment or occasion. And certainly spares more time than ever. Nowadays, with the

advancements within the innovation technologies, it has raised the level of administration work to the beat the benchmark standards. Lion's share of institutes are willing to apply for more School / College Management Administration System. In this way, the working strategies for admins within the school managements are changing and advancing in surprising ways.

A School / College attendance framework may be a School ERP Cloud Computer program that's utilized by instructors and School / College directors to keep track record of all the everyday student's participation and institution staff individuals. The utilization of management framework for day by day participation notices is more vigorous and well known than the standard manual attendance process. The School / College Participation Administration Framework makes a difference by helping guardians and higher management to routinely check on the students participation status through real-time framework. In this way, improving the efficiency and productivity of the students. Such frameworks offer assistance to instructors and school admins to productively oversee and track normal attendance as well.

Storing students and faculty timesheets and attendance details in a centralized cloud-based attendance management system will:

- Ensure data integrity
- Improve productivity
- Enhance the efficiency of admin staff
- Reduce administrative work
- Increase accuracy
- Lower admin costs
- It streamlines the Overall General Attendance Procedure
- Manage attendance of all the students and staff from a single platform
- Proxy attendance can be greatly reduced

The main benefit of implementing this attendance management system in cloud is that various branches of an academic institution all over the country can utilize this centralized management system. It reduces the cost of maintaining and managing IT systems, saving a lot of time and effort. Operating costs such as hardware and software needs, system upgrades are greatly reduced.

3.1 Purpose of the System

In the academic institutions nowadays, student and faculty hours are more flexible than the fixed timetables of primary and secondary schools. And to coordinate those more adaptable participation hours, this attendance management system gives a more adaptable attendance framework to keep track of who is on location, where they final checked in, and indeed check their presence at a particular lecture.

3.2 Scope

The scope of the project is the academic institution in which the software is being utilized, i.e. the project is developed as a cloud based web application, and it will work for a particular institution

3.3 Overview

Attendance Management System primarily has two main modules for proper functioning:-
First module is admin who has the right to clear space for upcoming batches of students. Approving account creation requests of new faculty, updating in subjects if necessary, and sending notice.
Second module is a user which can be a faculty or an operator. User has a right of updating daily attendance, generating report.

4. THE DETAILED DESCRIPTION OF SYSTEM

4.1 Product Perspective

The product Attendances Management system is a cloud based product and depends on the services of Amazon AWS since its being hosted on the AWS cloud. The product will automate various tasks associated with handling student attendance details and better organizing of the stored information and optimum performance, thus helping the academic institutions to ensure smooth working of these processes.

4.2 Functions

This system has two types of accessing modes -

i. Administrator
ii. User - Can be Faculty/ Student

(i) Administrator

Administrator has the rights to manage student and faculty details, add a new student, provide registration number for all students, assign each student courses etc.

(ii) User

There are two users

- Student: Student can login, check attendance details etc
- Faculty: Add student, view the student details and take attendance of students

4.3 User Characteristics

This system gives access to two kinds of users.

1. Administrator:

The administrators have privileges to add, delete and modify information stored in the database.

2. User: Authorized user like a teaching faculty has access to view the stored data in the database and can update the students' attendance in the form of formatted reports.

Students only have access to view the data stored in the database.

4.4 Constraints

The interface is only in English, no other language option is available. User can login with his approved username and password. There is no guest login option.

4.5 Assumptions and Dependencies

We assume that the faculty will be doing all the data entry and its accurate. We assume that all the computers that will be using the software will be part of the institution's LAN.

Users with administrator access should be careful in deleting or modifying any data knowingly or unknowingly which might lead to inconsistency of the database.

5. SYSTEM REQUIREMENTS AND SPECIFICATIONS (SRS)

Functional requirements state how a system behaves when encountered with user inputs. A few of the functional requirements are stated below:

- Faculty and students can create their own account, update profile details, passwords etc
- Record attendance of students and faculty
- Check average attendance
- User interface that is implemented will be simple and easy to use.
- View attendance from anywhere around the globe

Some of the non-functional requirements include the following:

- Accuracy: Software should be accurate and should provide correct attendance results
- Availability: Software should always be available to a user
- Ease of Use: The application should be user friendly and easy to use
- Robustness: Speed of computation should be good
- Portability: Software should be able to work on many platforms.

5.1 SYSTEM REQUIREMENTS

System requirements include software, hardware requirements and the data source. These are mentioned below:

Website setup:

- Hardware requirements:
  The minimum requirements for running the software are mentioned below.
  Processor: Intel Core i3
  RAM: 6 GB
  Memory: 20 GB

- Software requirements:
  Back end: Java, JDBC, Swing
  Operating System: Windows7/10
  User Interface: HTML, CSS, Bootstrap

Database: MySQL
Scripting language: Javascript
Programming Laguage: PHP

- Server Requirements: Apache on XAMP server

Cloud setup:

- The website is being hosted on the cloud using Amazon EC2 Microsoft Windows Server 2019 Base instance

5.2 Non Functional Requirements

Reliability – As the software is cloud based, it will be able to connect to the centralized database and operate as it is without any fail even in the event that the local institution LAN fails or in the event of the server being down due to a hardware or software failure.

Availability - The software will be available only to authorized users i.e faculty members of the institution like lecturers to mark the students' attendance, student to view the registered courses, admin to add and update students and faculty records.

Security - The software should be handled only by the administrator and authorized faculty members. Only the administrator has the right to assign privileges like creating new accounts and generating password. Only users approved by the admin can access the system with username and password.

6. FEATURES

The system is implemented as stages or different modules for better user friendly experience and maximum consistency. Below are a list of each module and its features.

Module 1: Student Module

- Create an account
- Update account password

- Can register for multiple lectures
- Check attendance for all the registered lectures
- View their attendance
- Generate/Download report of attendance in pdf format
- Check average attendance

Module 2: Faculty Module

- Create an account
- Update account password
- Add students to their courses
- View list of students assigned to them
- Mark attendance for each lecture
- Generate/Download report of attendance in pdf format
- Check average attendance
- Manage attendance of students in multiple lectures

Module 3: Admin

- Create an account
- Update account password
- Add students
- Add faculty members
- Add courses
- View list of students
- View attendance of students
- Generate/Download report of attendance in pdf format
- Check average attendance
- Manage attendance of students in multiple lectures
- Approve user accounts for faculty members
- Edit/modify/delete faculty accounts

7. ARCHITECTURE

7.1 System Architecture and Implementation

The plan of implementation for the system is shown in the figure below

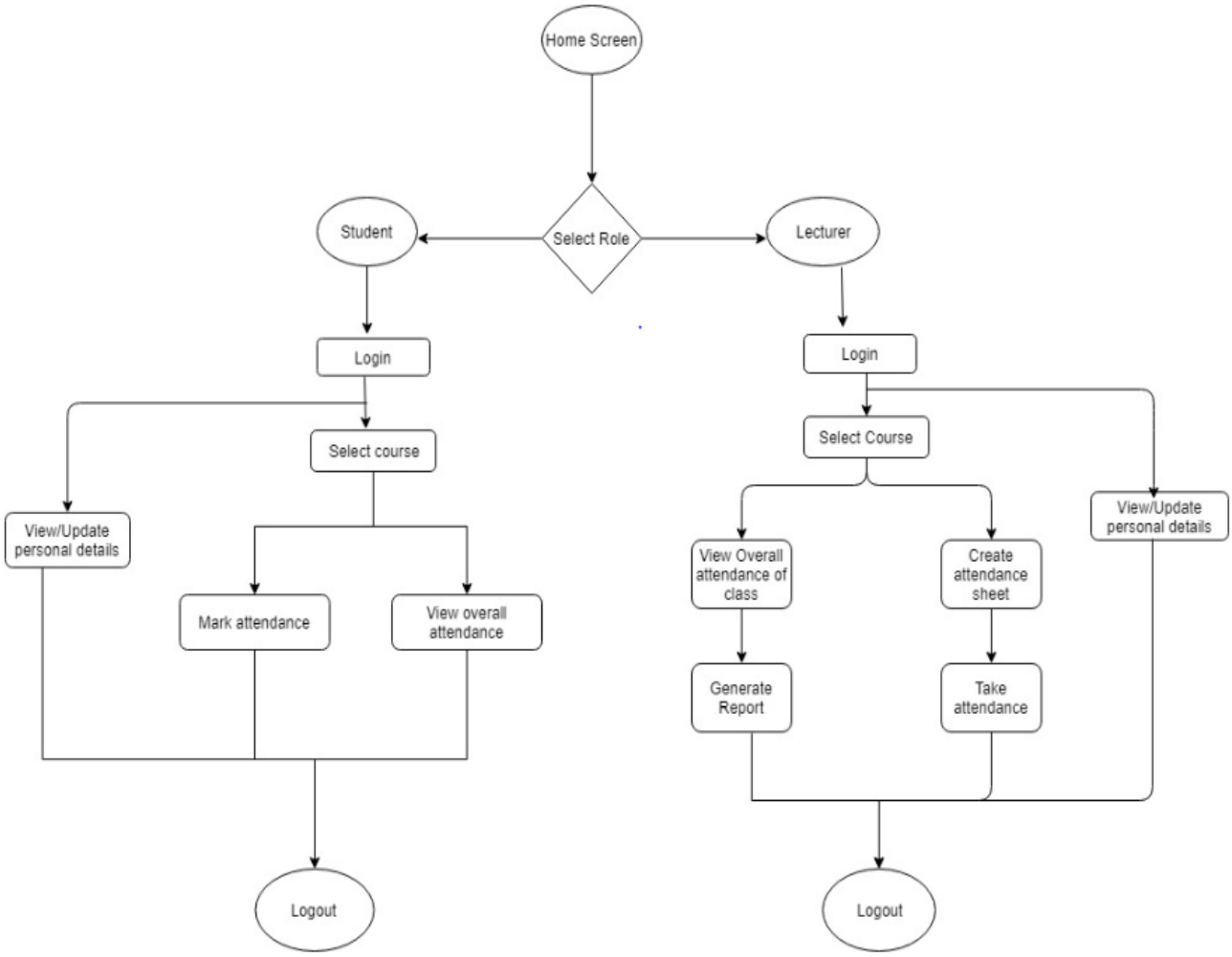


Figure 1: Design Flow

As shown in the figure, the website would begin with the home page. The home page will link to all important paths that a user can navigate to. The important pages that the home page is linked to are login pages for students and faculty, students profile, faculties profile, students attendance request, view attendance page, faculty's attendance approval , view overall attendance pages and so on.

The overall flow is as follows:

Students and faculty must register into the system first. Registration is only possible if their details are already entered into the database by admin. The registration requests will be first sent to admin for approval. Faculty and students can login into the system only if the registration request is verified and approved by the admin.
There are three actors in this system. Their functionalities are mentioned below

Admin:-

1) Verify details and approve/reject user registration requests
2) Update course schedules in the timetable
3) Can view or update their personal details
4) Can mark attendance for students
5) View overall attendance of the class
6) Generate and download report
7) Logout

Student:-

1) Students select their profile as students and login
2) Students can view or update personal details
3) Select the registered course
4) View overall attendance for all the classes taken place till now
5) Logout

Faculty:-

1) Faculty select their profile as faculty and login
2) Faculty can view or update their personal details
3) Faculty can mark attendance for students
4) View overall attendance of the class
5) Generate and download report
6) Logout

The use case diagram for the three actors in this system would be as shown below:

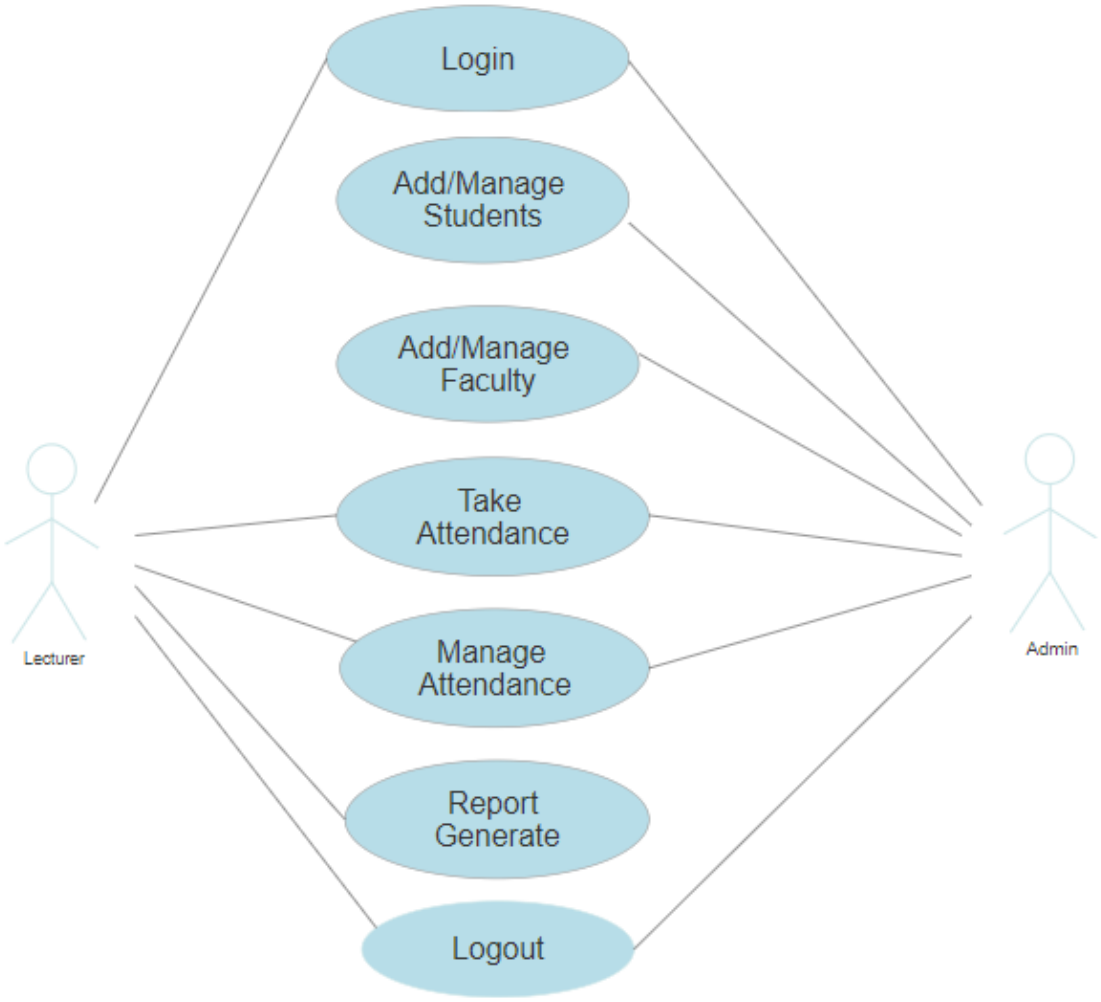


Figure 2: Use Case Diagram

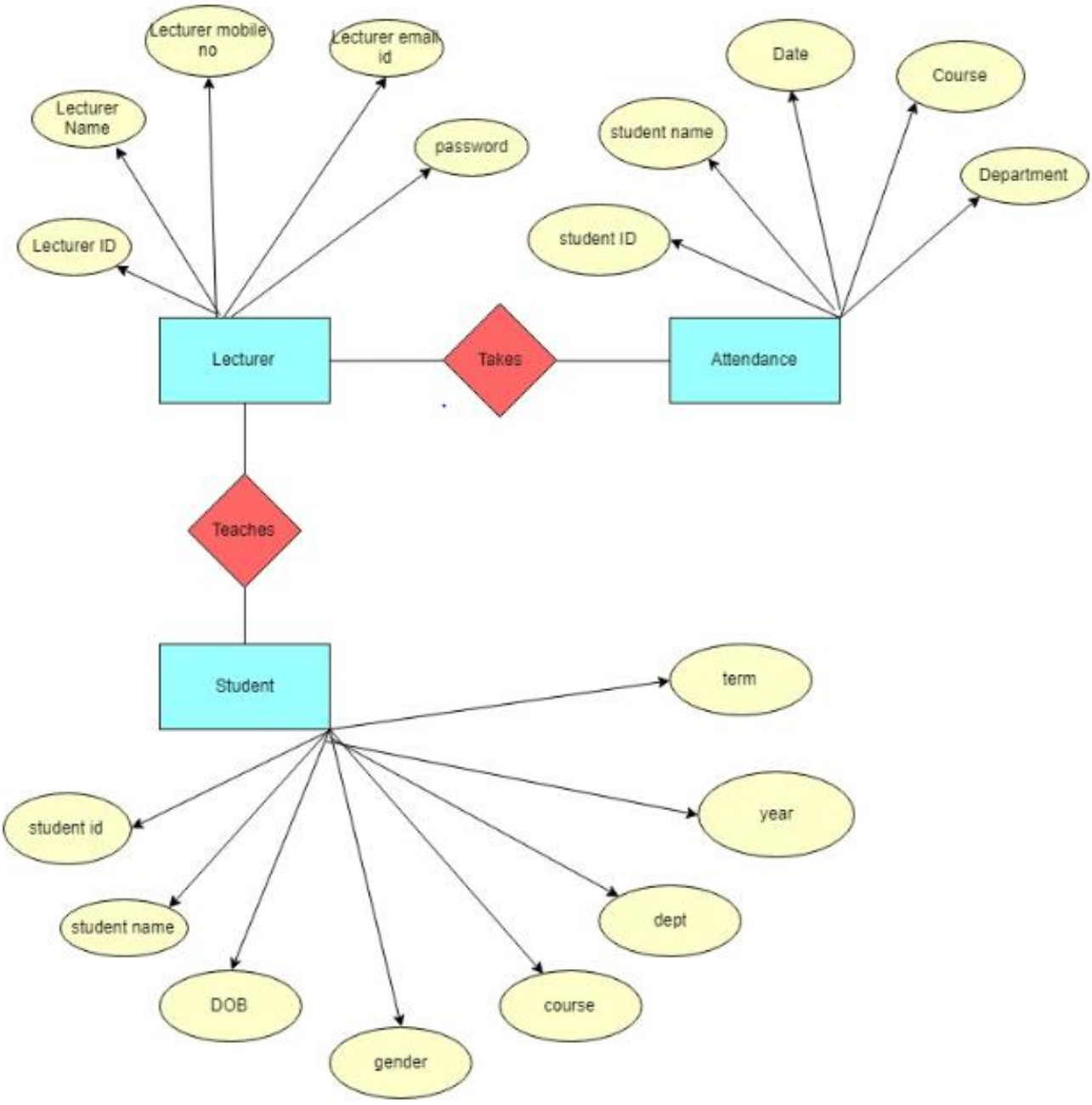


Fig 3: ER diagram for Attendance Management System

7.2 Database Structure

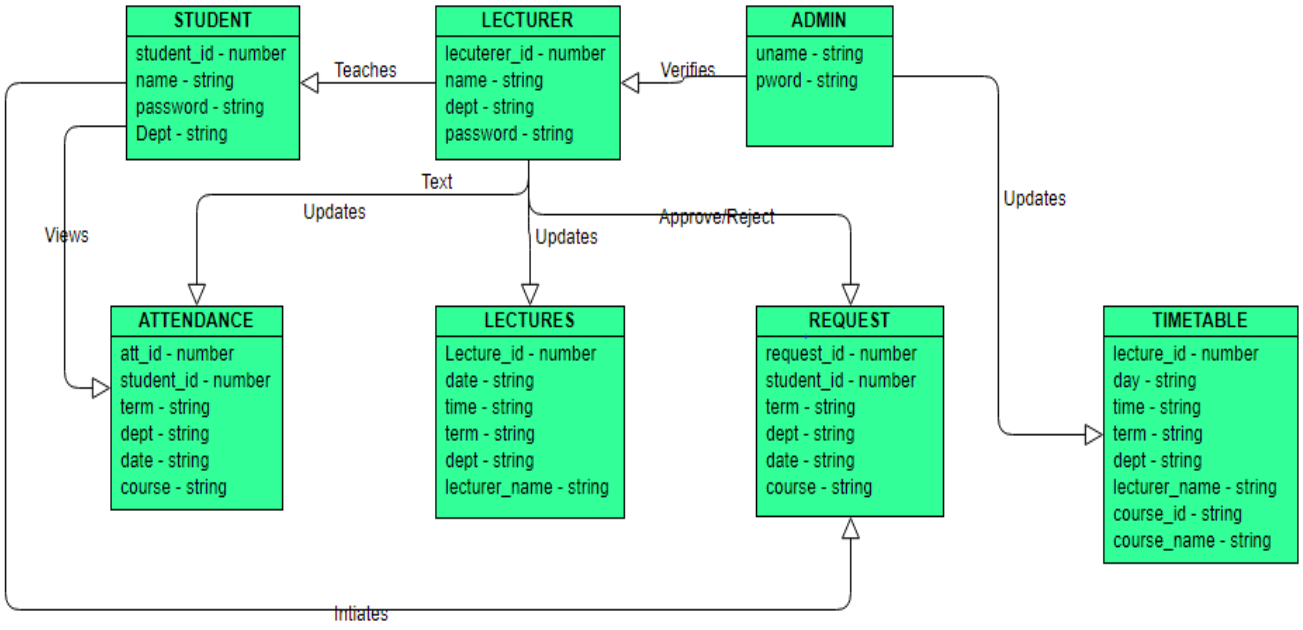


Fig 4: Class diagram for Attendance Management System

The complete system is very interactive and user friendly. It is divided into three modules and there are total seven tables in the database as shown above.

- There is many to many relationship between lecturer and student, student and request, lecturer and attendance, student and attendance

- There is one to many relationship between admin and lecturer, admin and student, admin and timetable

7.2 DEVELOPMENT

During the development phase, the coding of the front end or the user interface has been done in html, xhtml, css, javascript and php. For the backend programming, javascript and php programming have been used along with Mysql for the tables. We will be converting this database into a structured and readable format that can be easily accessed by our software.

7.2.1 Input Design

Input design is part of the overall framework plan that requires special consideration. Planning input data formats is to create the information entered simple and free from blunders. The input data forms are planned utilizing the controls accessible in PHP framework. Input design is the method of converting the user originated inputs to a computer based format. A user interacting through a desktop station must be able to tell the system whether to acknowledge the input to generate reports. The collection of input information is considered to be most expensive part of the system design. Since the input needs to be planned in such a way so as to urge relevant information, extreme care is taken to get related data. This system will prompt the users to enter required the inputs through allocation forms created such as student details form and subject entry form, time table form.

7.2.2 Output Design

Output design for this application "Cloud based attendance management system" generally refers to the results and data that are generated by the system for various end-users; output is the main reason for developing the system and the basis on which they evaluate the usefulness of the application. The output is designed in such a way that it is attractive, convenient and informative. Forms are designed with various features, which make the console output more pleasing. As the outputs are the most important sources of information to the users, better design should improve the system's relationships with us and also will help in decision making. Form design elaborates the way output is presented and the layout available for capturing information.

One of the most important factors of the system is the output it generates. This system refers to the results and information generated. Basically the output from a system is used to communicate the result of processing to the user. Attendance management system displays the report subject wise attendance maintaining by staffs. The whole report of all the students in an institution can be obtained on an administrator privileges only.

7.3 TESTING

Once source code has been created, program must be tried to reveal (and rectify) as numerous errors as conceivable some time recently conveyance to client. Our objective is to plan an arrangement of test cases that have a high likelihood of

finding blunders. To reveal the mistakes computer program methods are utilized. These techniques provide precise direction for planning test that Work out the inner rationale of computer program components, and Work out the input and yield spaces of the program to reveal mistakes In program function, behavior and performance. Internal program rationale is worked out utilizing —White box test case plan Techniques. Software necessities are worked out utilizing —block box test case Plan techniques. In both cases, the aim is to discover the greatest number of mistakes with the least sum of effort and time.

7.3.1 Testing Methodologies

A methodology for computer program testing must oblige low-level tests that are essential to confirm that a small source code portion has been accurately executed as well as high-level tests that validate major framework capacities against client prerequisites. A methodology must give direction for the practitioner and a set of breakthroughs for the director. Since the steps of the test methodology happen at a time when due date weight starts to rise, advance must be quantifiable and issues must surface as early as conceivable. Taking after testing strategies are well known and the same procedure is received during this venture testing.

Unit testing - Unit testing centers confirmation exertion on the littlest unit of program plan- the computer program component or module. The unit test is white-box situated. The unit testing executed in each module of student attendance administration Framework. by giving rectify manual input to the framework ,the information are put away in database and recovered. On the off chance that you need required module to get to input or gets the yield from the End user. Any blunder will collected the time will give handler to appear what sort of mistake will gathered.

System Testing - System testing is really an arrangement of distinctive tests whose essential reason is to completely work out the computer-based framework. Underneath we have depicted the two sorts of testing which have been taken for this venture. It is to check all modules worked on input premise .in case you need alter any values or inputs will alter all data. So specified input is a must.

Performance Testing - Performance testing is planned to test the run-time execution of program inside the setting of an integrated framework. Execution testing happens through all the steps within the testing prepare. Indeed at the unit level, the execution of a person module may be evaluated as white-box tests

are conducted. This system reduces the attendance table, codes required. It'll produce report very quick. No need to wait any additional time for getting the results. If the entered information is in correct format, result will appear in few milliseconds. The system memory used is also relatively low.

8. CONCLUSION

As the 'Cloud Based Attendance Management System' is deployed in the AWS cloud, it's pretty easy to manage and maintain. AWS benefits their user by providing services at the low cost, which do not have any upfront cost. The main advantage if hosting our site in AWS is its ease of use, speed and agility, secure, reliable, and no capacity limits. It is easily scalable if the scope of the attendance management system extends beyond a single academic institution. This website was hosted in AWS using the windows Server 2019 base instance of EC2. The Amazon EC2 running Windows Server provides seamless integration with existing Amazon EC2 features like Amazon Elastic Block Store (EBS), Amazon CloudWatch, Elastic Load Balancing, and Elastic IPs for long term secure maintenance of the website.

9. TIMEFRAME AND SCHEDULE

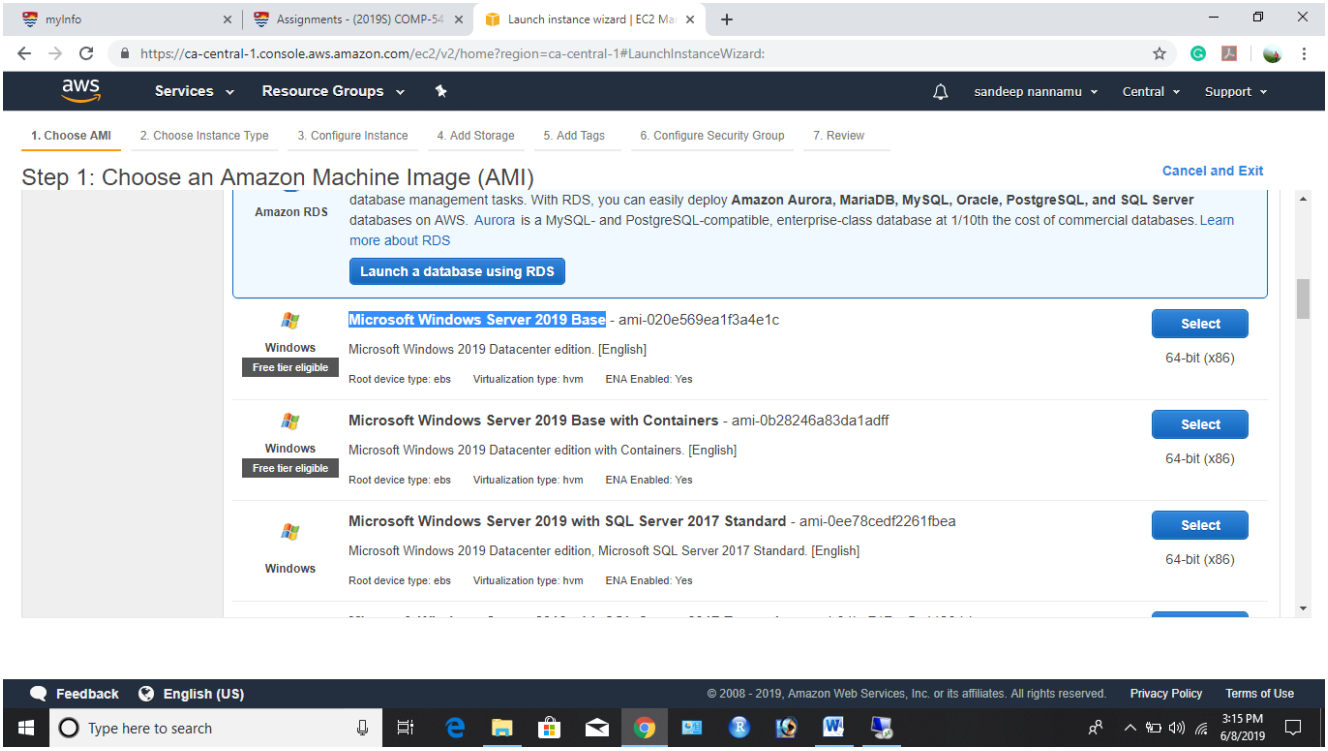
TOPIC	START DATE	END DATE	NO OF DAYS	ROLE
OVERALL PROJECT	15-May	12-Jun	21	Sandeep, Sanhith, Deepika
TOPIC and BACKGROUND RESEARCH	15-May	17-May	2	Deepika, Sanhith
WEBSITE DESIGN ABD BACKEND INTEGRATION	18-May	31-May	12	Sandeep, Deepika
DEPLOYING IN CLOUD	1-Jun	2-Jun	4	Sandeep, Sanhith
FINAL REPORT	9-Jun	12-Jun	2	ALL

10. GIT HUB LINK

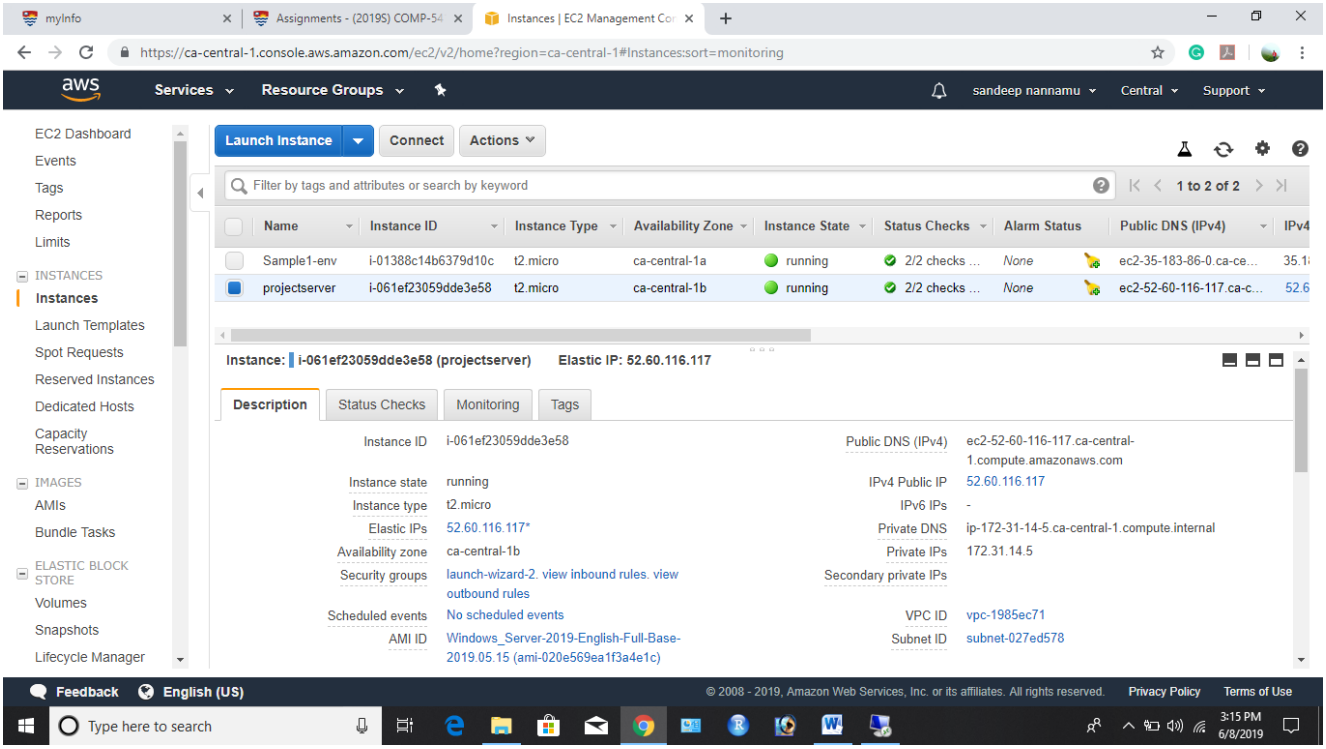
https://github.com/snannamu/Could-based-Attendance-Management-system

11. SCREENSHOTS

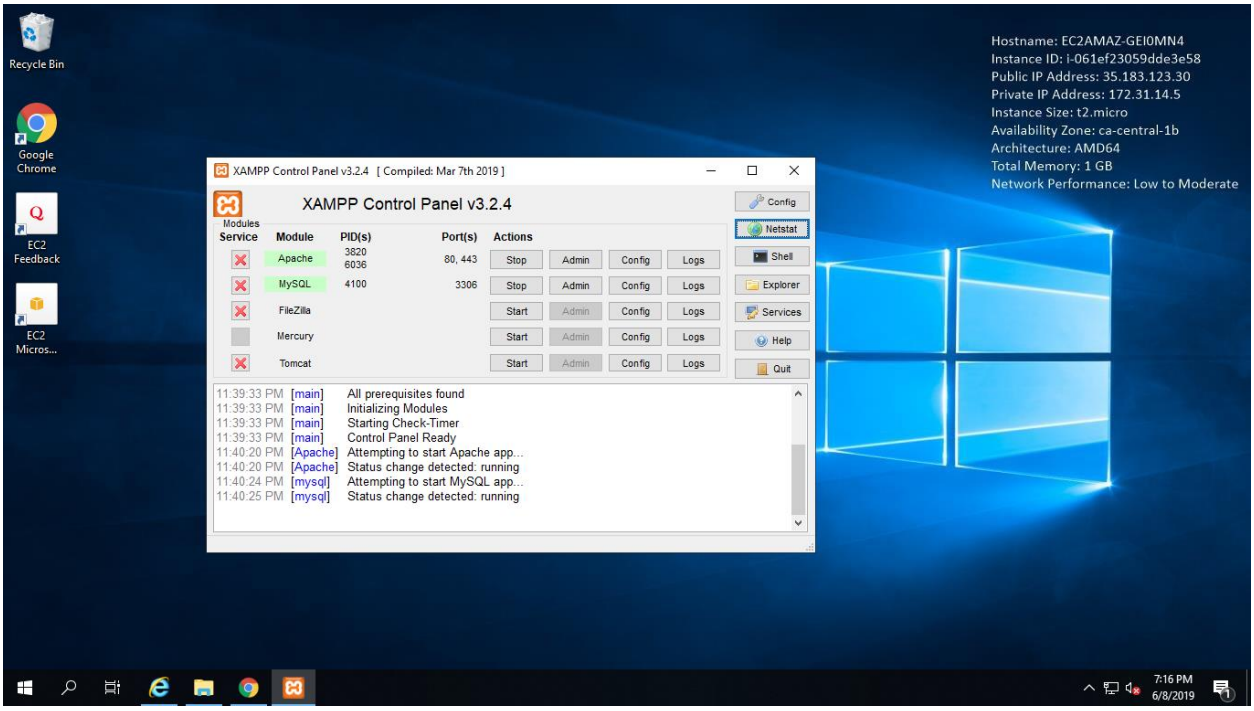
Windows server EC2 instance:



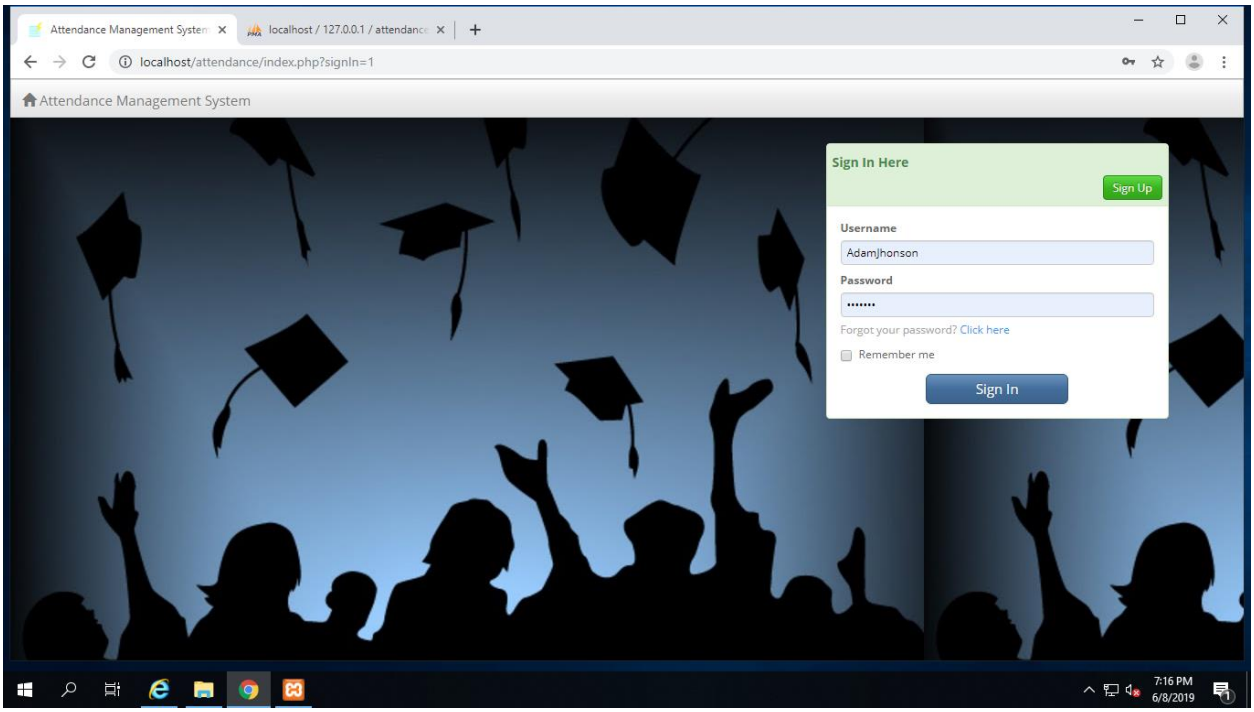
EC2 instance running with an elastic IP:



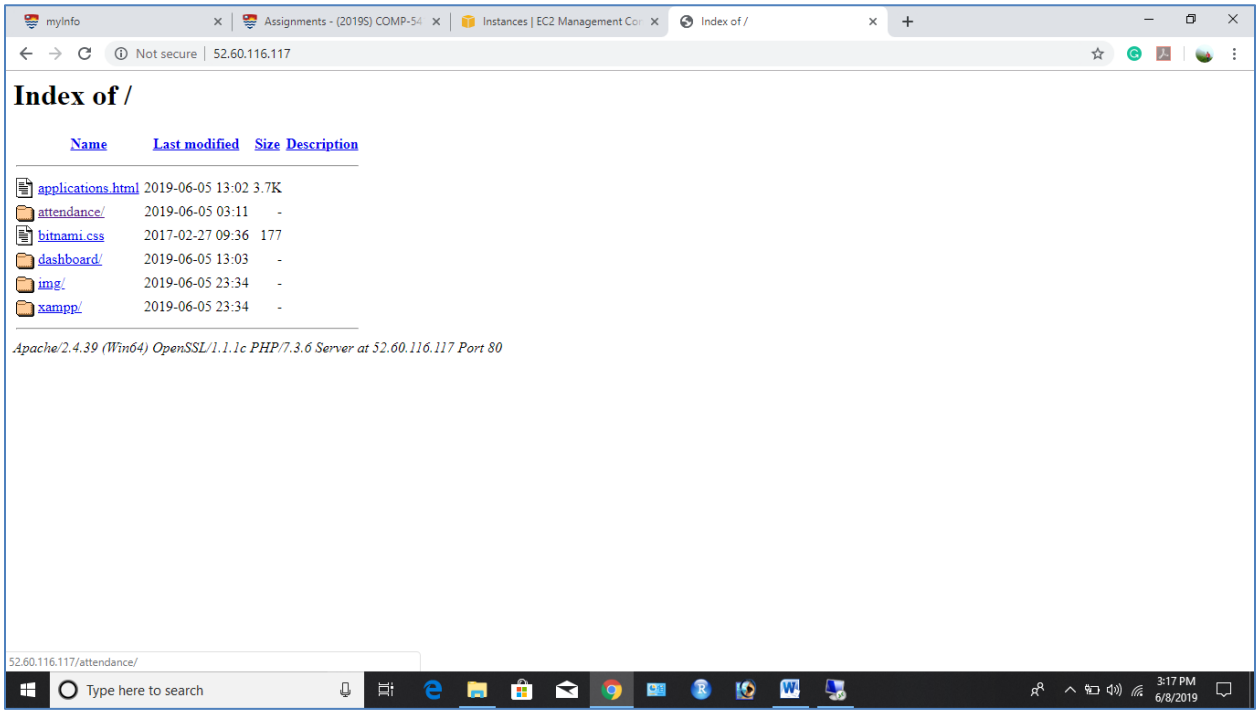
The remote desktop of the virtual windows system running on the EC2 instance in which XAMPP has been installed for deploying the website:



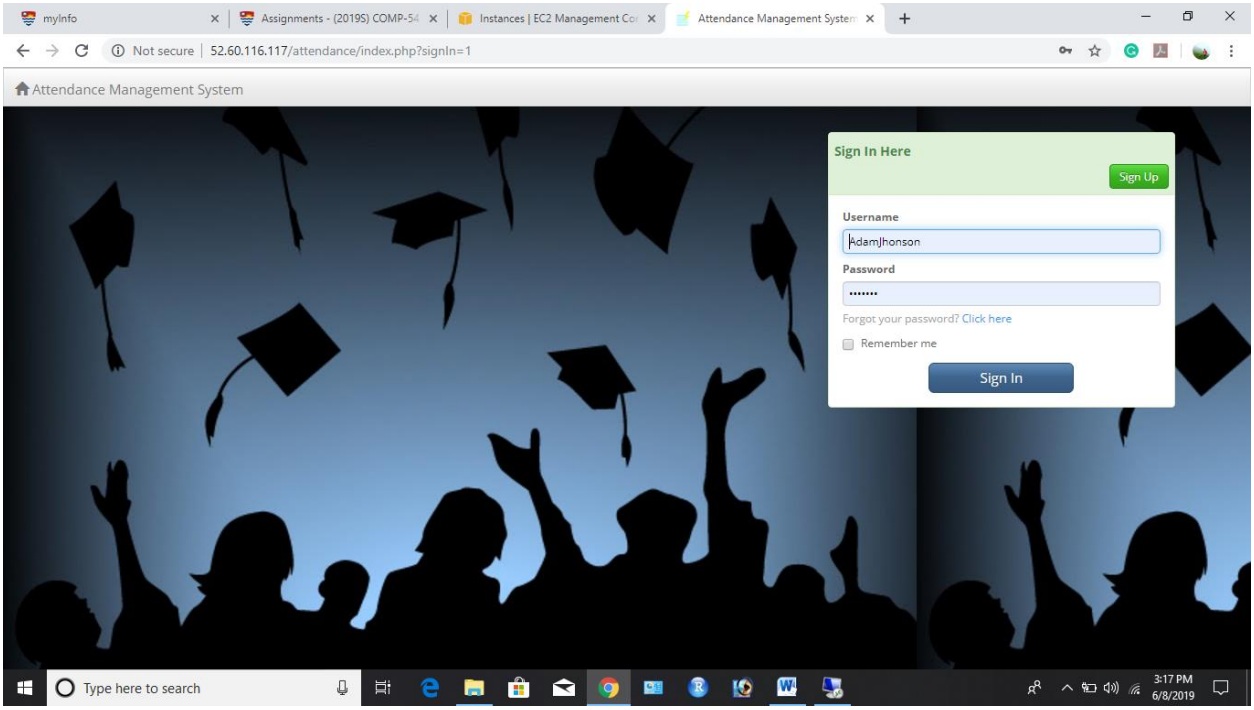
Website running successfully on the virtual windows:



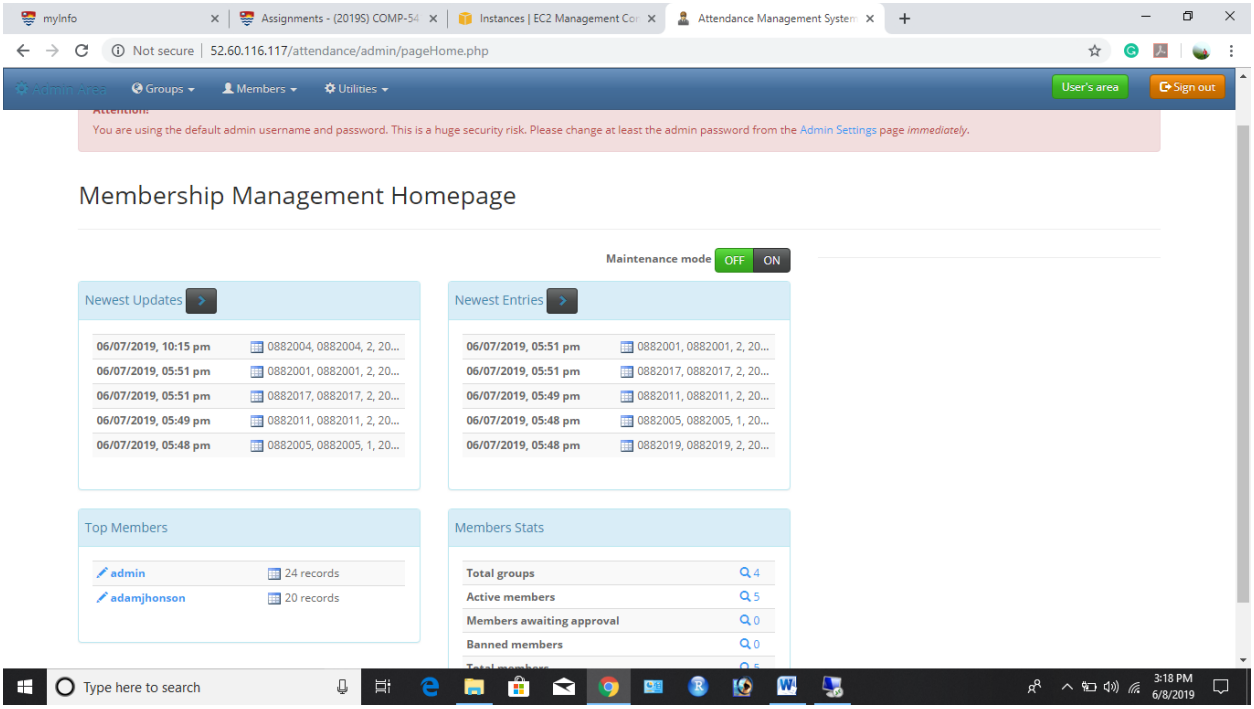
Accessing the website deployed in the cloud in a local system using the elastic IP allocated to the EC2 instance:



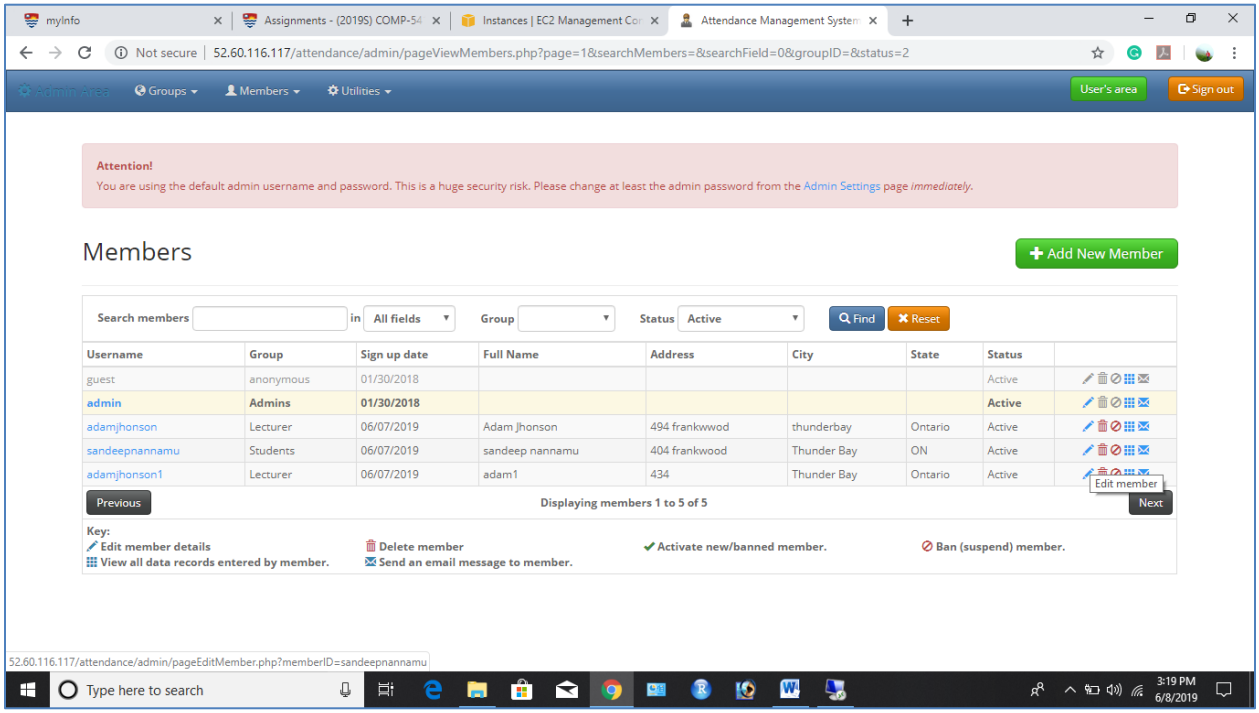
Homepage of the attendance management system deployed in cloud being accessed via a local system:



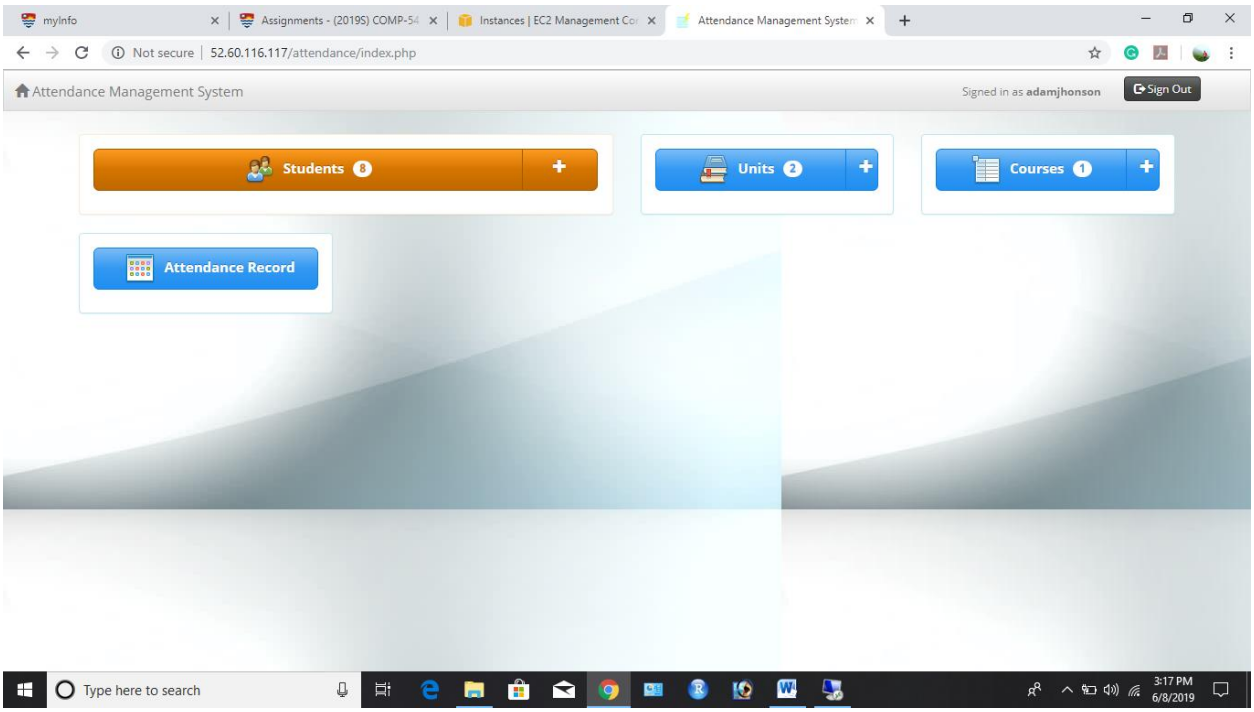
Admin area after login: Admin can see all the recent activities on the site



Active accounts page: Admin can approve activation of new account requests here and modify privileges of existing accounts

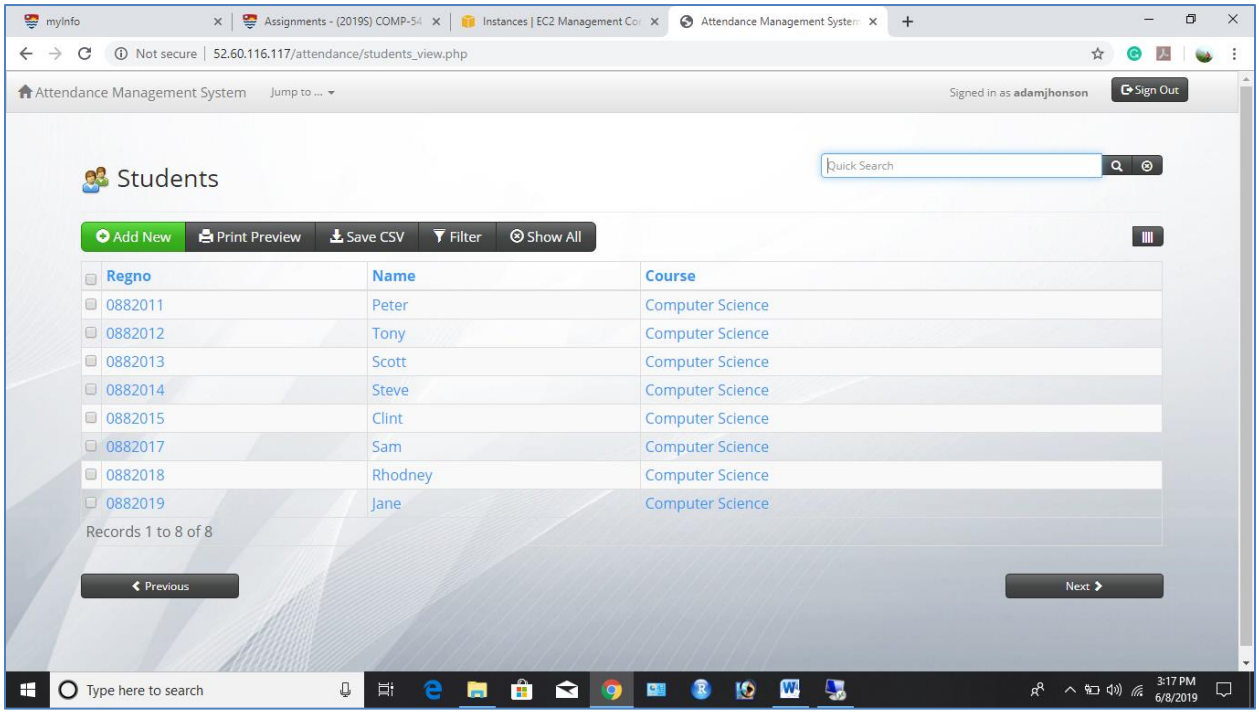


Faculty homepage after login:

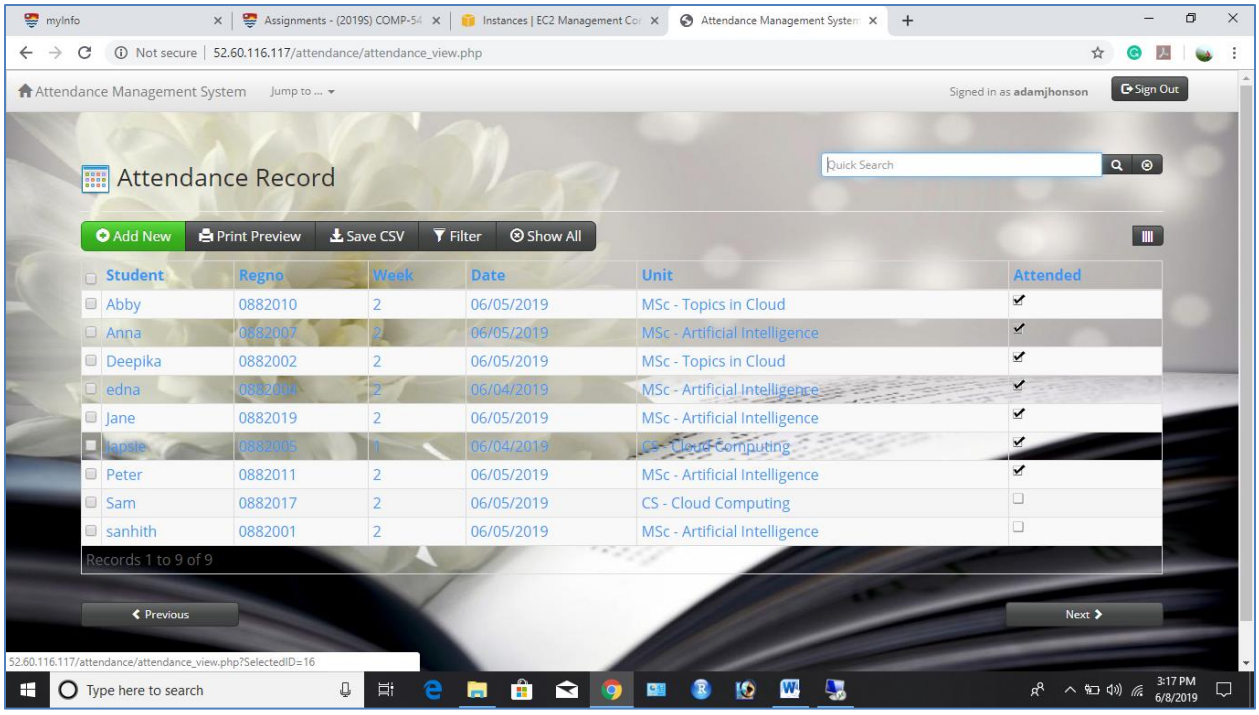


List of students page:

Faculty can view existing students and add new students to their course here



Attendance record page: Faculty can update students attendance here



Updating a student's attendance record: