IOT BASED ATTENDANCE AND SURVEILLANCE SYSTEM THROUGH FACE RECOGNITION

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by

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submitted by **"Sharyar Khan, Faizan Nazir, Bilal Raza, Ameer Hamza"** has been found satisfactory for requirements of the degree.

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Date: _____

DEDICATION

We would like to dedicate our work to our respected parents who have been there to appreciate, support and push us up in our hard times throughout our academic life. We also like to dedicate a part of our work to our respected and kind teachers that making usable to think wide and sharp in all prospective life.

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Sharyar Khan

Faizan Nazir

Bilal Raza

Ameer Hamza

CHAPTER 1

INTRODUCTION

Most educational institutions and international test centers, they use traditional methods for entrance and exit, by presenting an identity document or a passport. The entry procedures take a long time and constitute an obstacle in identifying the identity when the number of students is increased. Moreover, the difficulties you face in identifying impersonators. Also, most companies take a long time to record the attendance of employees in traditional ways using the most common fingerprint. Several institutions use different systems to manage attendance, such as fingerprint and magnetic cards, which depend on the method of use, cost, reliability and security.

The central ideology of this project is identifying faces in real-time video and mark their attendance and for supervision of prospect and maintain surveillance and generating record in database.

The images from real-time video frames will be extracted and compared with already available datasets and attendance will be marked automatically without user's interaction and after those reports will be generated automatically.

The main building of the project that is:

- Our system will extract images from real time video.
- Face Detection is going to detect the faces of the person from the images.
- The feature extractor extracts the features of the image.
- Extracted features are going to be compared with stored data of images already provided.
- Mark the attendance of matched faces.

1.1 PROJECT OBJECTIVES

The objective of this project is to develop face recognition based automated user attendance and surveillance system. Expected achievements in order to fulfill the objectives are:

- To detect the face segment from the video frame.
- To extract the useful features from the face detected.
- To classify the features in order to recognize the face detected.
- To record the attendance of the identified student/employee.
- To save Time.
- To maintain accurate record with images.
- Efficient Surveillance of student or employee.
- Easy to use.

1.2 PROJECT SCOPE

This system can be implemented to any organization in the locality or to multinational companies having the required resources which would allow them to be able to keep the attendance and surveillance 24/7 and update the information whenever something new comes up.

The admin portal provides a comfortable and user-friendly environment for the admin to be able to stay up to date without much hustle and allows them to keep track of every record/information.

The system is however to ensure security, access control, reliability, efficiency and better performance of attendance and surveillance system.

1.3 TOOLS FOR DEVELOPMENT

Our website is based on the following tools and computer languages:

1.3.1 BACK-END TOOLS AND TECHNOLOGIES

- Python (Django)
- OpenCV
- MySQL
- VS Code

1.3.2 FRONT-END TOOLS AND TECHNOLOGIES

- HTML/CSS (Bootstrap)
- JavaScript
- VS Code

1.4 HARDWARE REQUIREMENT

- Computers equipped with a minimum Core i3 processor or higher, the computer must have approximately 64GB of free hard drive space and 4GB of RAM or more. And must have a GPU.
- Cameras.

1.5 DEPLOYMENT

- Any Web Browser. Preferred (Google chrome)
- WSGI OR ASGI Python Standard Web Server, MYSQL DBMS Based on Linus OS

CHAPTER 2

STUDY OF EXISTING SYSTEM

Managing student attendance during lecture periods has become a difficult challenge. The manual system of taking attendance is done on paper by the use of pen, students write their names, index numbers and sign on a sheet of paper, this makes the system unreliable because students can write names for friends who are not in class. Also, the ability to compute the attendance percentage becomes a major task as manual computation produces errors, and also wastes a lot of time. For the stated reasons, an efficient attendance management system using bio-metrics is designed. This system takes attendance electronically with the help of a finger print device or facial recognition and the records of the attendance are stored in a database. Attendance is marked after student identification.

2.1 DISADVANTAGES OF EXISTING SYSTEM

Existing methods of student's attendance identification are mostly manual (i.e., use of paper sheets where students write and/or sign against their name) and using e-commerce website application like **BIMS portal** (i.e., This system captures user logs into the organizational website alongside other activities such as mouse clicks and keyboard taps). In manual system uses a log book. Users arrive at a terminal where the log book is placed. They write their names, the time of arrival and then sign against their names. Some organizations provide clock for arrivals to use at the terminal. This system is limited by lack of user authentication. Users may write wrong time and the log book may even be stolen or destroyed. Sometime forget to mark the attendance of present students.

If we talk about the biometric system for the professors or employees at the institutions or organization this system serves one at a time, this system is reliable but it is time consuming process so why not ship to the automatic attendance system which works on the face recognition technique.

2.2 PROPOSED SYSTEM

The automatic attendance system using facial recognition will automatically mark the attendance of the given particular person by extracting the feature of the image in a classroom or at entry gates the system will automatically mark the attendance of the students, professors or employees, if the image of the face of any given person matches with the any of the face in the given database the system has ability to find out that person extract the feature of that given image and mark the attendance of the particular person. This system is widely used in the various areas such as security control, police control, forensic medicine and management of the attendance system.

This system determines various unique features of a face that can distinguish it from the face of the any other people. These features could be size of eyes, nose, length of the face, size of lips, color of skin, when all these features of image is compared from the face of the people in the database which is already known the system automatically mark the attendance of a given particular person as a human being our brain is capable to do all of these automatically and instantaneously but to design a system , we have to use some component so for capturing image we take a camera as an input and a python programming language to extract the features of the image and to mark the attendance.

2.2.1 BENEFITS OF PROPOSED SYSTEM

In our work we tried to overcome some of the disadvantage.

This system can easily detect multiple faces at a time. So, time and resource saving. One can easily manage attendance with this system. Starting with the most efficient and significant benefit, saving time. As an automated attendance-management system, facial recognition provides precise time records, reducing costly mistakes. As a result, accurate data assists managers in providing specific productivity and payroll details.

The facial recognition system helps monitor the time and attendance of field employees. As a result, no extra technology is necessary to deploy a facial recognition attendance system, and hence no maintenance costs are incurred. This solution is both cost-effective and efficient when contrasted to other biometric solutions. Easily detect multiple faces at a time. So, time and resource saving.

There are several potential benefits to using a facial recognition attendance system for a project or in a workplace setting:

1. **Improved accuracy:** A facial recognition attendance system can accurately track attendance by identifying an individual's unique facial features. This can be more reliable than traditional methods like signing in with a pen and paper or using a punch card, which can be prone to errors or fraud.
2. **Increased efficiency:** A facial recognition attendance system can automate the attendance tracking process, which can save time and reduce the workload for HR or administrative staff.
3. **Enhanced security:** A facial recognition attendance system can provide an additional layer of security by ensuring that only authorized individuals are able to access a particular location or event.
4. **Greater convenience:** A facial recognition attendance system can be more convenient for employees, as they don't have to remember to sign in or out or carry around a physical card.
5. **Detailed tracking and reporting:** A facial recognition attendance system can provide detailed tracking and reporting on employee attendance, which can be useful for analyzing employee productivity or identifying patterns of absence.

Overall, a facial recognition attendance system can offer a range of benefits in terms of accuracy, efficiency, security, convenience, and tracking and reporting.

CHAPTER 3

REQUIREMENT ANALYSIS

Our project follows the steps of SDLC under which the SRS model developed for the system is listed below:

The SRS model contains

- Functional requirements
- Non-function requirements

3.1 FUNCTIONAL REQUIREMENTS

The Function requirements are part of the system that describe the functional behavior that should be possessed by the system. Each requirement maps to a high-level function that transforms the given set of input data into output data.

1. **Admin:**
    - The web portal should allow the admin to login to account
    - The web portal should allow the admin to create, delete, and update user accounts for employees.
    - The web portal should allow the admin to view and track employee attendance data.
    - The web portal should allow the admin to logout from portal.

2. **User:**
    - The web portal should allow user to login.
    - The web portal should allow user to view their own attendance data.
    - The web portal should allow user to logout from portal.

3.2 NON-FUNCTIONAL REQUIREMENTS

Non-functional are properties and qualities the software system must possess providing its intended functional requirements.

1. **Security:**

    - The system should protect against unauthorized access and data breaches, and ensure the confidentiality of personal information.

2. **Usability:**

    - The web portal should have a responsive and user-friendly interface that works well on different devices and browsers.

    - The camera should have a user-friendly interface for the admin and employees to easily access and view the recorded data.

3. **Performance:**

    - The web portal should have a fast and reliable connection to ensure that the user experience is smooth and seamless.

    - The web portal should have a scalable infrastructure to handle large amounts of data and traffic.

    - The surveillance camera should have a high level of accuracy in detecting and recording the presence of a person.

4. **Reliability:**

    - The web portal should have a reliable backup and recovery system to ensure the availability and integrity of the data.

    - The camera should have a reliable and stable connection to the database to ensure that the recorded data is properly stored and retrieved.

5. **Access Control:**

    - The web portal should have secure access controls to prevent unauthorized access to the recorded data.

3.2.1 USER USECASE DIAGRAM

The Use Case model of the UML is used here to specify the functionality of the system from the user's point of view and show the way the system and the users interact to achieve its stated functions and perform its goal.

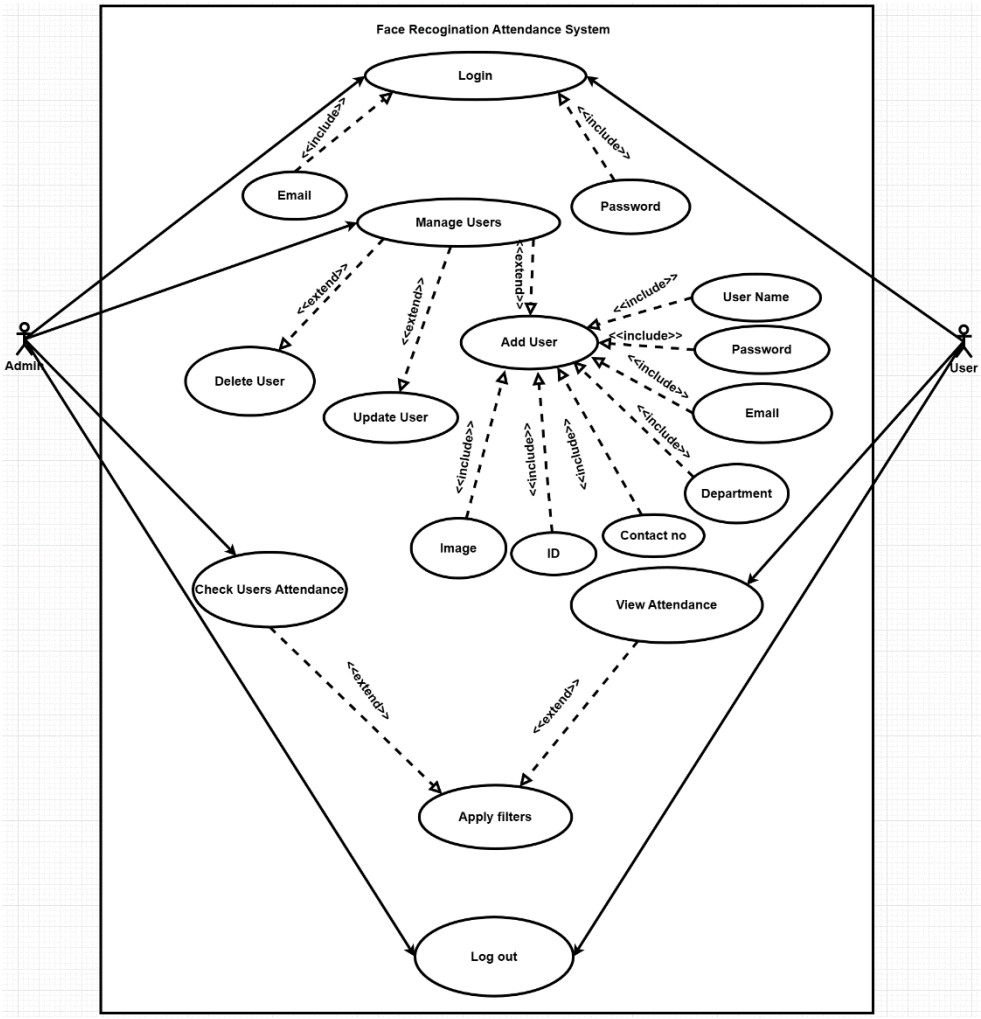


Figure 3.1 User and Admin Use Case Diagram

3.2.2 ADMIN USE CASE DIAGRAM:

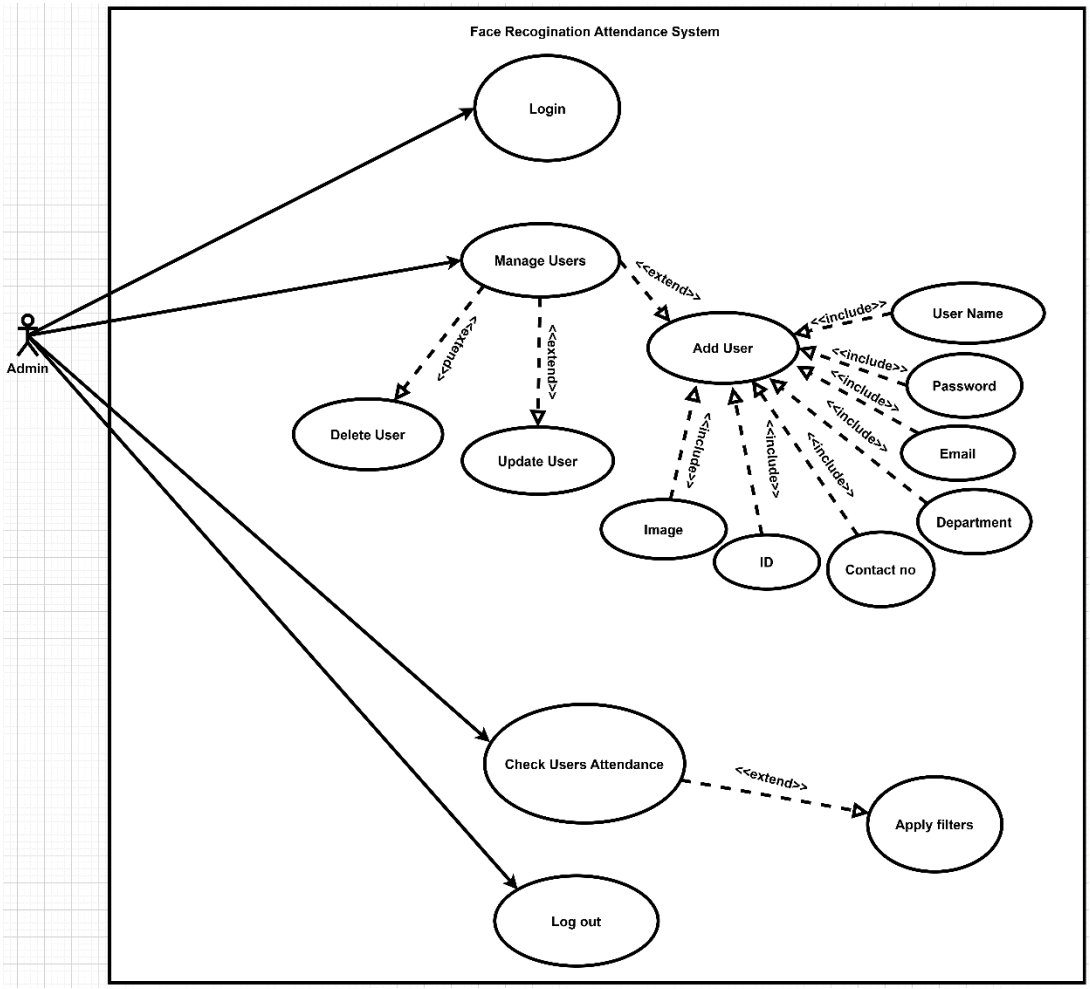


Figure 3.2: Admin use case diagram

3.2.3 USER USECASE DIAGRAM

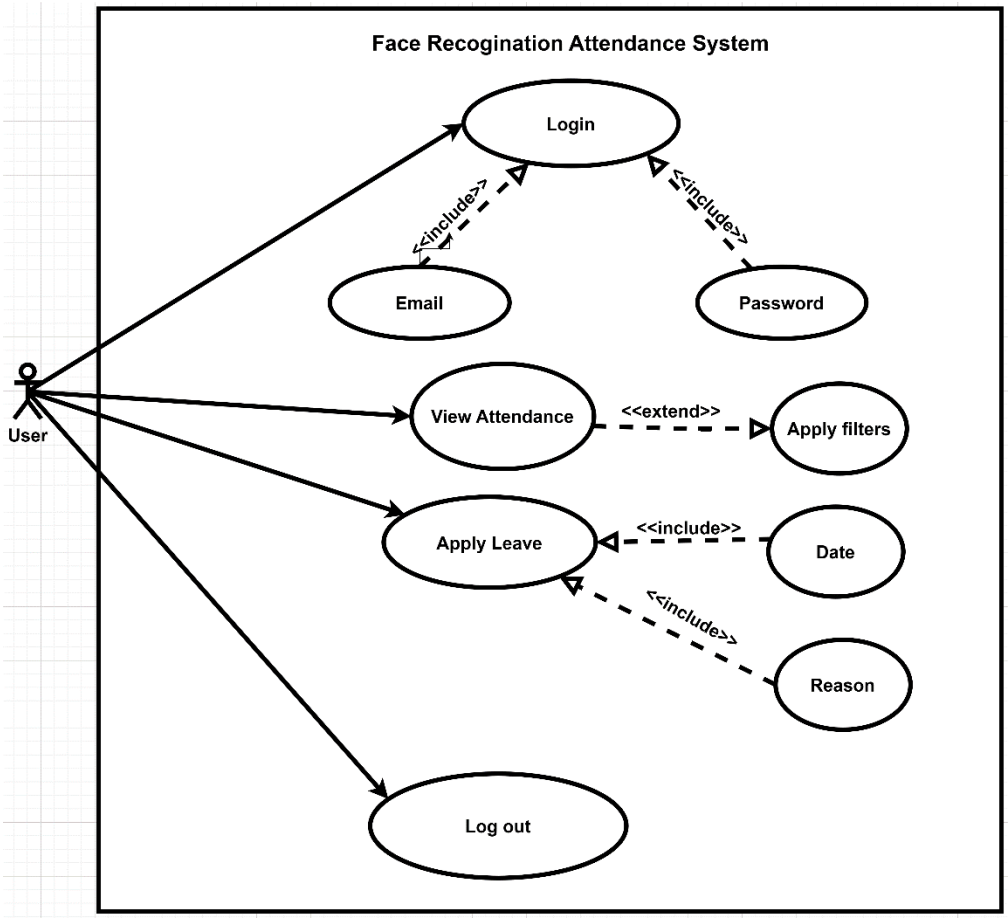


Figure 3.3: User use case diagram

3.3 USE CASE DESCRIPTION TABLES

3.3.1 ADMIN USECASE TABLES

Table 3.1: Admin Login

Use Case Name	**Login**	
Use Case ID	UC1	
Triggering Event	Admin needs to access the web portal.	
Brief Description	The admin logs in to their account by entering their email and password	
Actors	Admin	
Related use cases	N/A	
Stakeholders	Admin, Web portal	
Preconditions	Admin account must exist	
Postconditions	Admin successfully logs in	
Flow of Activities	Actor: Admin	System: Web Portal
	1.1 Admin enters email 1.2 Admin enters password 1.3 Admin requests login	1.4 Login successfully
Exception Conditions	1.5 System rejects login due to incorrect credentials	

Table 3.2: Create User Account

Use case name	Create User Account	
Use Case Id	UC2	
Triggering Event	Admin needs to create a new user account	
Brief Description	The admin creates a new user account by entering the necessary information	
Actors	Admin	
Related use cases	Update User Account, Delete User Account	
Stakeholders	Admin, Employee	
Preconditions	Admin must be logged in	
Post conditions	New user account is created	
Flow of activities	Actor: Admin	System: Web Portal
	1.1 Admin selects "Create User Account" option 1.2 Admin enters employee information (name, email, password, etc.) 1.3 Admin submits information	1.4 System creates new user account
Exception conditions	1.5 Account already exist	

Table 3.3: Update User Account

Use Case Name	**Update User Account**	
Use Case Id	UC3	
Triggering Event	Admin needs to update an existing user account	
Brief Description	The admin updates an existing user account by editing the necessary information	
Actors	Admin	
Related Use Cases	Create User Account, Delete User Account	
Stakeholders	Admin, Employee	
Preconditions	Admin must be logged in user account must already exist	
Post conditions	User account is updated	
Flow of Activities	Actor: Admin	System: Web Portal
	1.1 Admin selects "Update User Account" option 1.2 Admin selects user account to update 1.3 Admin edits employee information 1.4 Admin submits changes	1.5 System updates user account
Exception Conditions	N/A	

Table 3.4: Delete User Account

Use Case Name	**Delete User Account**	
Use Case Id	UC4	
Triggering Event	Admin needs to Delete an existing user account	
Brief Description	The admin deletes an existing user account.	
Actors	Admin	
Related Use Cases	Create User Account, Update User Account	
Stakeholders	Admin, Employee	
Preconditions	Admin must be logged in and user account must already exist	
Post conditions	User account is deleted	
Flow of Activities	Actor: Admin	System: Web Portal
	1.1 Admin selects "Delete User Account" option 1.2 Admin selects user account to delete 1.3 Admin confirms deletion 1.4 Admin submits changes	1.5 System deletes user account
Exception Conditions	N/A	

Table 3.5: View Attendance

Use Case Name	**View Attendance**	
Use Case Id	UC5	
Triggering Event	Admin needs to view employee attendance data	
Brief Description	The admin views employee attendance data	
Actors	Admin	
Related Use Cases	N/A	
Stakeholders	Admin, Employee	
Preconditions	Admin must be logged in	
Post conditions	Attendance data is viewed	
Flow of Activities	Actor: Admin	System: Web Portal
	1.1 Admin selects "View Attendance" option 1.2 Admin selects employee to view attendance data	1.3 System displays employee's attendance data
Exception Conditions	N/A	

Table 3.6: Admin Reset Password

Use case name	**Reset Password**	
Use case id	Uc6	
Triggering event	Admin has to Reset Password	
Brief description	The admin reset their password by entering the confirmation code send to their email associated with their account	
Actors	Admin	
Related use cases	N/A	
Stakeholders	Admin, Credential, Reset-Password	
Preconditions	Must be admin type	
Post conditions	Successfully reset the password	
Flow of activities	Actor	System
	1.1 Request for Password reset 1.2 Entail email and check your email and click at password reset link and enter your new password 1.3 Request password reset	1.4 Password Reset successfully
Exception conditions	1.5 Password Reset unsuccessful	

Table 3.7: Admin Logout

Use Case Name	**Logout**	
Use Case Id	UC7	
Triggering Event	Admin needs to logout from the web portal	
Brief Description	The admin logs out from their account	
Actors	Admin	
Related Use Cases	N/A	
Stakeholders	Admin, Web portal	
Preconditions	Admin must be logged in	
Post conditions	Admin successfully logs out	
Flow of Activities	Actor: Admin	System: Web Portal
	1.1 Admin selects "Logout" option	1.2 System logs out admin
Exception Conditions	N/A	

3.3.2 USER USECASE TABLES

Table 3.8: User Login

Use Case Name	**Login**	
Use Case ID	UC8	
Triggering Event	User needs to access the web portal.	
Brief Description	The user logs in to their account by entering their email and password	
Actors	User	
Related use cases	N/A	
Stakeholders	User, Web portal	
Preconditions	User account must exist	
Postconditions	User successfully logs in	
Flow of Activities	Actor: User	System: Web Portal
	1.1 User enters email 1.2 User enters password 1.3 User requests login	1.4 System verifies credentials and logs in
Exception Conditions	1.5 System rejects login due to incorrect credentials	

Table 3.9: View Attendance

Use Case Name	**View Attendance**	
Use Case Id	UC9	
Triggering Event	User needs to view their own attendance data	
Brief Description	The user views their own attendance data	
Actors	User	
Related Use Cases	N/A	
Stakeholders	User	
Preconditions	User must be logged in	
Post conditions	User views their own attendance data	
Flow of Activities	Actor: User	System: Web Portal
	1.1 User selects "View Attendance" option	1.2 System displays user's attendance data
Exception Conditions	N/A	

Table 3.10: User Reset Password

Use case name	**Reset Password**	
Use case id	Uc10	
Triggering event	User has to Reset Password	
Brief description	The user reset their password by entering the confirmation code send to their email associated with their account	
Actors	User	
Related use cases	Reset Password	
Stakeholders	User, Credential, Reset, Password	
Preconditions	Must be user type	
Post conditions	Successfully reset the password	
Flow of activities	Actor: User	System: Web Portal
	1.1 Request for Password reset 1.2 Entail email and check your email and click at password reset link and enter your new password 1.3 Request password reset	1.4 Password Reset successfully
Exception conditions	1.5 Password Reset unsuccessful	

Table 3.11: User Logout

Use Case Name	**Logout**	
Use Case Id	UC11	
Triggering Event	User needs to logout from the web portal	
Brief Description	The User logs out from their account	
Actors	User	
Related Use Cases	N/A	
Stakeholders	User, Web portal	
Preconditions	User must be logged in	
Post conditions	User successfully logs out	
Flow of Activities	Actor: User	System: Web Portal
	1.2 User selects "Logout" option	1.2 System logs out user
Exception Conditions	N/A	

CHAPTER 4

SYSTEM DESIGN

4.1 CLASS DIAGRAM

A class diagram is a type of diagram and part of a unified modeling language (UML) that defines and provides the overview and structure of a system in terms of classes, attributes and methods, and the relationships between different classes. It is used to illustrate and create a functional diagram of the system classes and serves as a system development resource within the software development life cycle.

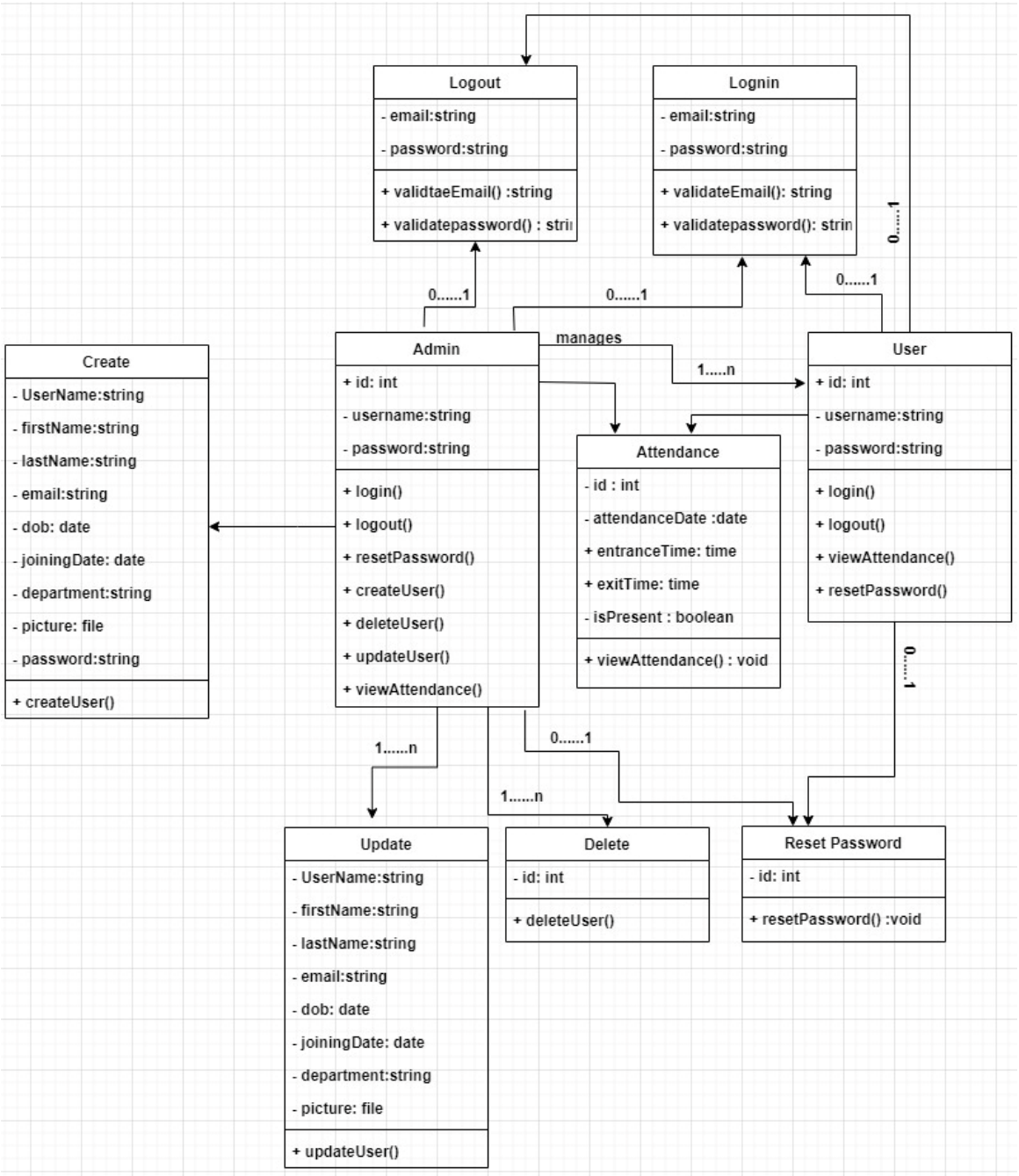


Figure 4.1 Class Diagram

CHAPTER 5

SYSTEM TESTING

5.1 FUNCTIONAL TESTING

Functional Testing is a type of black box testing whereby each part of the system is tested against functional specification/requirements.

5.1.1 Admin Use Cases

Table 5.1: Admin Login Testing

Test Case Id	TC-001	
Associated Use Case:	UC-O1	
Functionality to be Tested:	Verify that the admin can successfully log in to their account.	
Actor:	Admin.	
Pre-Conditions:	Application is up and running.	
Normal Flow:	**Expected Result:**	**Actual Results Pass / Fail**
Navigate to the web portal login page. Enter valid admin credentials (email and password). Click on the "Login" button.	The admin should be logged in and redirected to the admin dashboard.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results Pass / Fail**
Network Problem or user name / password is wrong.	System Displays error message.	Pass
Date		
Tester		

Table 5.2: Create User Account Testing

Test Case Id	TC-002	
Associated Use Case:	UC-O2	
Functionality to be Tested:	Verify that the admin can create new user account.	
Actor:	Admin.	
Pre-Conditions:	Admin is logged in the admin dashboard.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Login to the admin account. Navigate to the Add user. Create a new user account by providing valid employee details.	User account created successfully, and the changes are reflected in the system.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem or with same credential user exists.	User account is not created and System Displays error message.	Pass
Date		
Tester		

Table 5.3: Update User Account Testing

Test Case Id	TC-003	
Associated Use Case:	UC-O3	
Functionality to be Tested:	Verify that the admin can update user accounts.	
Actor:	Admin.	
Pre-Conditions:	Admin is logged in the portal.	
Normal Flow:	**Expected Result:**	**Actual Results Pass / Fail**
Login to the admin account. Navigate to the edit user. Update the details of an existing user account by entering updated new data in fields.	User accounts are updated successfully, and the changes are reflected in the system.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results Pass / Fail**
Network Problem.	User account is not created and System Displays error message.	Pass
Date		
Tester		

Table 5.4: Delete User Account Testing

Test Case Id	TC-004	
Associated Use Case:	UC-O4	
Functionality to be Tested:	Verify that the admin can delete user accounts.	
Actor:	Admin.	
Pre-Conditions:	Admin is logged in the portal.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Login to the admin account. Navigate to the delete user. Delete an existing user account by confirming.	User accounts are deleted successfully, and the changes are reflected in the system.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem	User is not deleted and System Displays error message.	Pass
Date		
Tester		

Table 5.5: Admin View Attendance Testing

Test Case Id	TC-005	
Associated Use Case:	UC-O5	
Functionality to be Tested:	Verify that the admin can view and track users' attendance data.	
Actor:	Admin.	
Pre-Conditions:	Admin is logged in in the admin dashboard.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Login to the admin account. Navigate to the view attendance section.	The admin should be able to view accurate attendance data for each user.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem	User attendance is not visible and System Displays error message.	Pass
Date		
Tester		

Table 5.6: Admin Reset Password Testing

Test Case Id	TC-006	
Associated Use Case:	UC-O6	
Functionality to be Tested:	Verify that the admin can reset their password.	
Actor:	Admin.	
Pre-Conditions:	Admin is logged in the portal.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Navigate to forgotten password on login page. Enter email and click sent instructions check your inbox. Click at password reset link and enter your new password. Click password reset.	The password should be reset.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem or user credentials/email is wrong.	Password Reset unsuccessful.	Pass
Date		
Tester		

Table 5.7: Admin Logout Testing

Test Case Id	TC-007	
Associated Use Case:	UC-O7	
Functionality to be Tested:	Verify that the admin can successfully log out from the portal.	
Actor:	Admin.	
Pre-Conditions:	Admin is logged in the portal.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Login to the admin account. Locate the logout button. Click on the logout button.	The admin should be logged out and redirected to the login page.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem.	The admin won't be able to log out and System Displays error message.	Pass
Date		
Tester		

5.1.2 Users Test Cases

Table 5.8: User Login Testing

Test Case Id	TC-008	
Associated Use Case:	UC-O8	
Functionality to be Tested:	verify that the user can successfully log in to their account.	
Actor:	User.	
Pre-Conditions:	Application is up and running.	
Normal Flow:	**Expected Result:**	**Actual Results Pass / Fail**
Navigate to the web portal login page. Enter valid user credentials (username and password). Click on the "Login" button.	The user should be logged in and redirected to their dashboard.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results Pass / Fail**
Network Problem or user email / password is wrong.	System Displays error message.	Pass
Date		
Tester		

Table 5.9: View Attendance Testing

Test Case Id	TC-009	
Associated Use Case:	UC-O9	
Functionality to be Tested:	Verify that the user can view their own attendance data.	
Actor:	User.	
Pre-Conditions:	User is logged in the portal.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Login to the user account. Navigate to the attendance section or dashboard. Verify the displayed attendance data belongs to the logged-in user only.	The user should be able to view their own accurate attendance data.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem or user is not available wrong.	System Displays error message.	Pass
Date		
Tester		

Table 5.10: User Reset Password Testing

Test Case Id	TC-010	
Associated Use Case:	UC-10	
Functionality to be Tested:	Verify that the user reset their password.	
Actor:	User.	
Pre-Conditions:	User is not logged in the Portal.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Navigate to forgotten password on login page. Enter email and click sent instructions check your inbox. Click at password reset link and enter your new password. Click password reset.	The password should be reset.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem or user credentials/email is wrong.	Password Reset unsuccessful.	Pass
Date		
Tester		

Table 5.11: User Logout Testing

Test Case Id	TC-011	
Associated Use Case:	UC-11	
Functionality to be Tested:	Verify that the user can successfully log out from the portal.	
Actor:	User.	
Pre-Conditions:	User is login in the portal.	
Normal Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Locate the logout button. Click on the logout button.	The user should be logged out and redirected to the login page.	Pass
Alternative Flow:	**Expected Result:**	**Actual Results** **Pass / Fail**
Network Problem.	The user won't be able to log out and System Displays error message.	Pass
Date		
Tester		

5.2 ACTIVITY DIAGRAM

An activity diagram is a type of UML diagram that is used to model the flow of control in a system. It is a visual representation of the steps involved in a process, and it can be used to describe both sequential and concurrent activities.

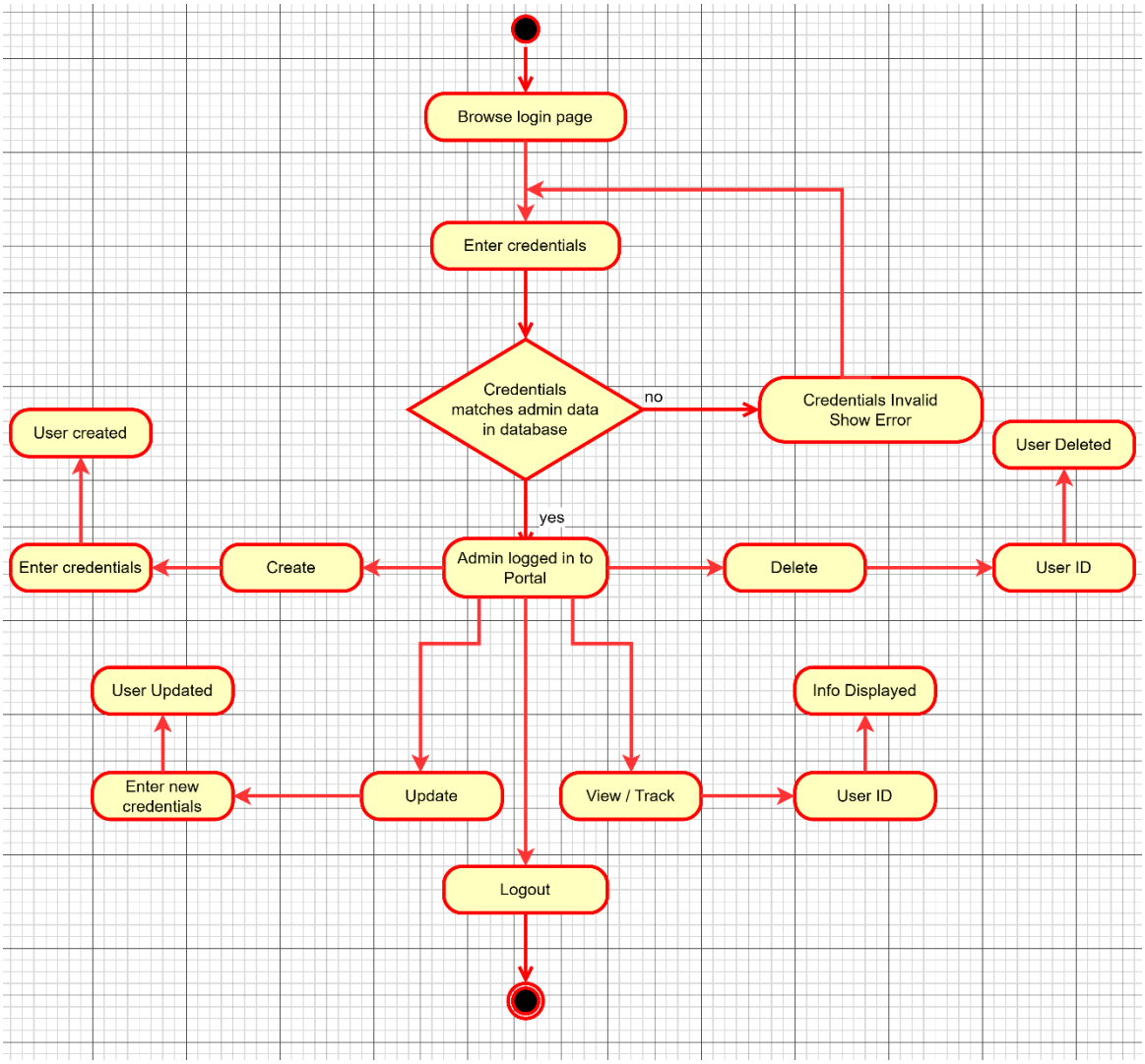


Figure 5.1: Admin Activity diagram

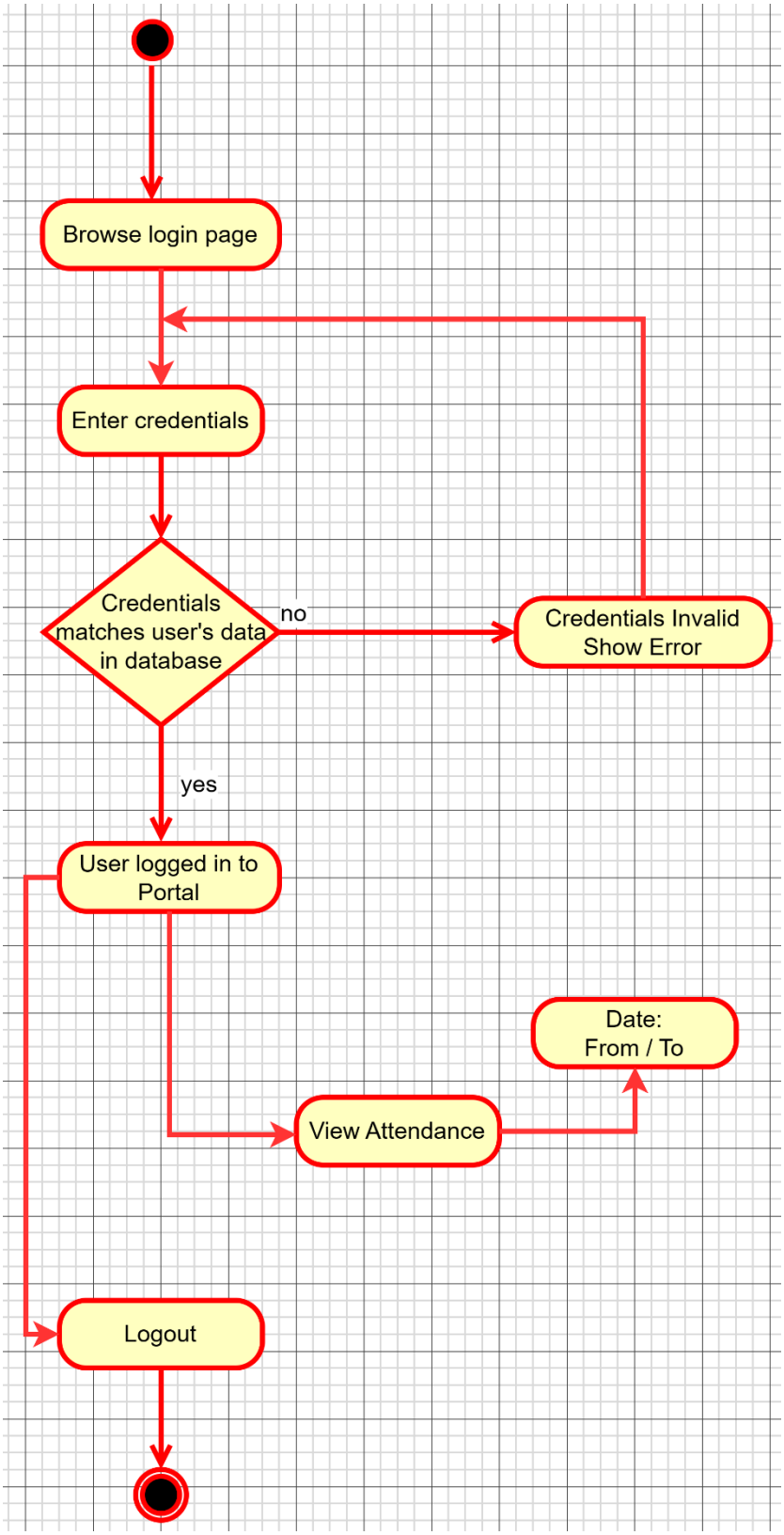


Figure 5.2: User Activity diagram

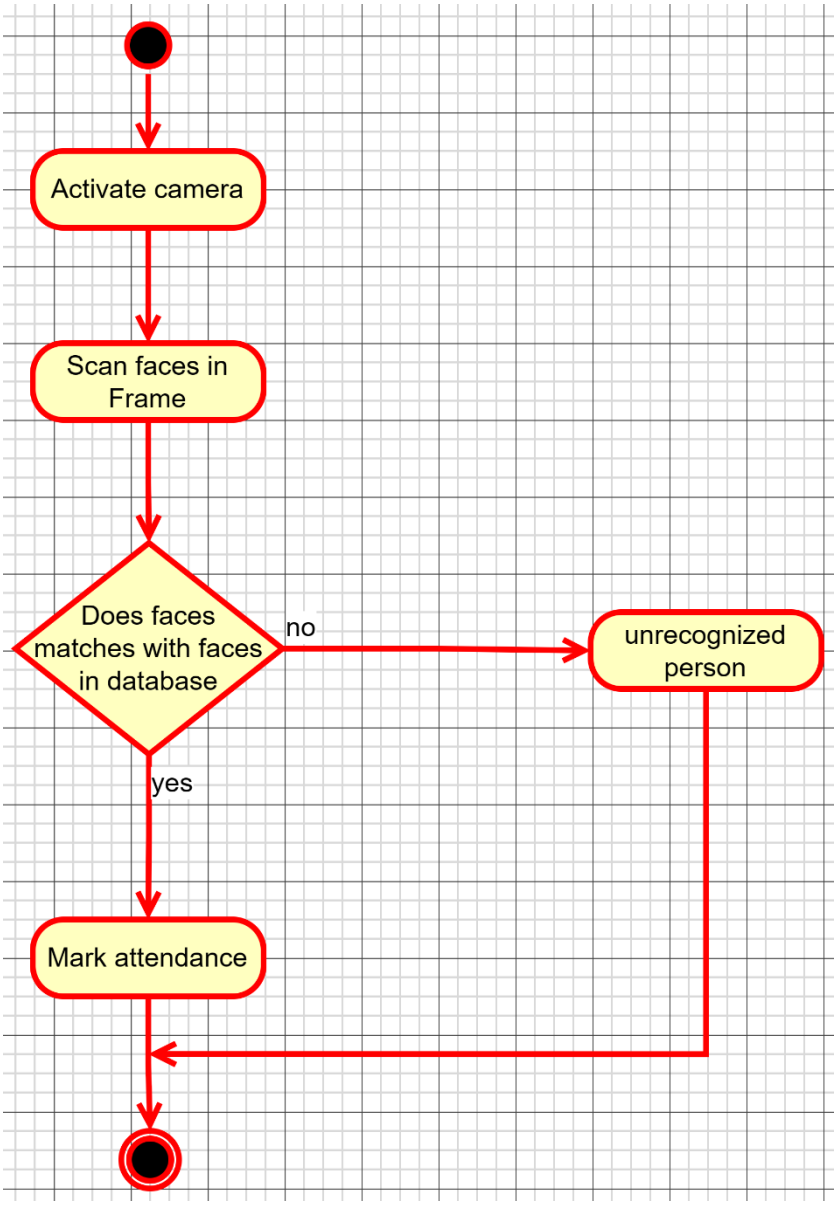


Figure 5.3: Camera Activity diagram

5.3 DATA FLOW DIAGRAM

DFD is a data modeling technique that is used to describe the flow of data through an information system. It is a graphical representation of the system that shows the data flows, data stores, and processes. DFDs are used to analyze and design information systems, and they can be used to communicate the system's design to stakeholders.

5.3.1 Admin Data Flow Diagram

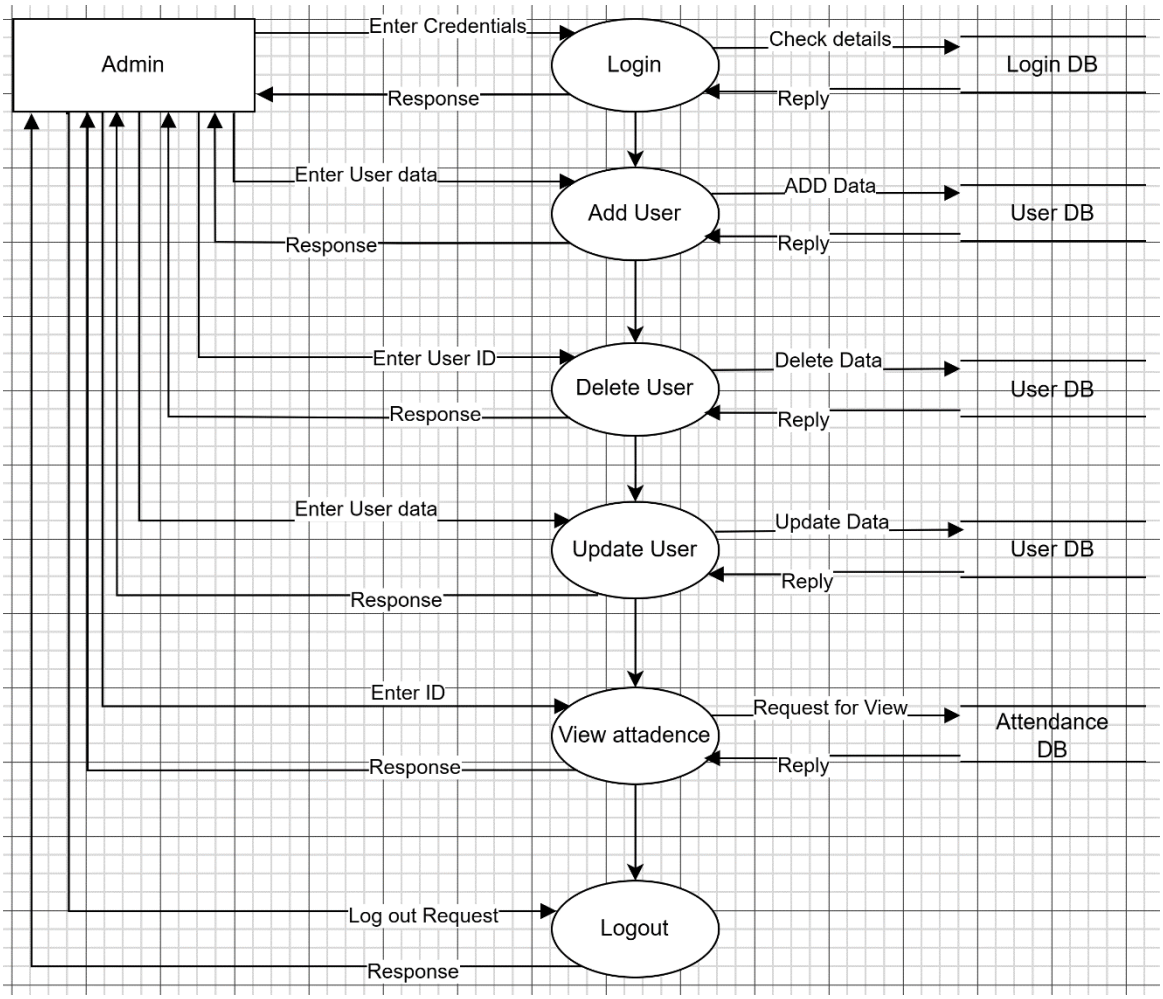


Figure 5.4: Admin Data diagram

5.3.2 User Activity Diagram

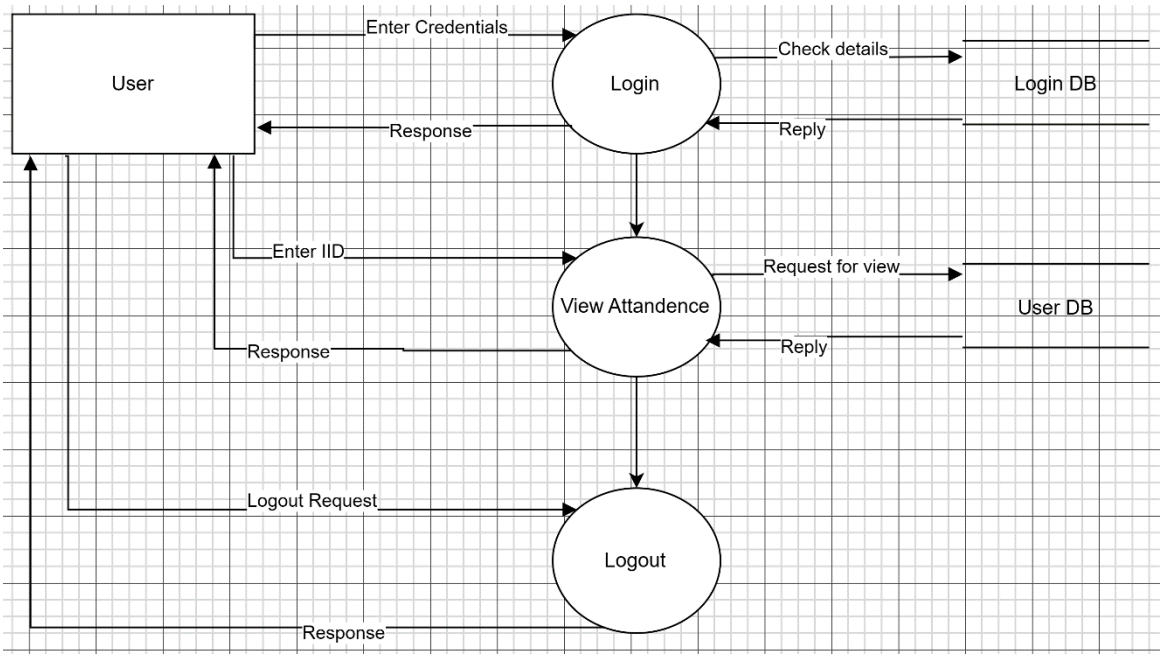
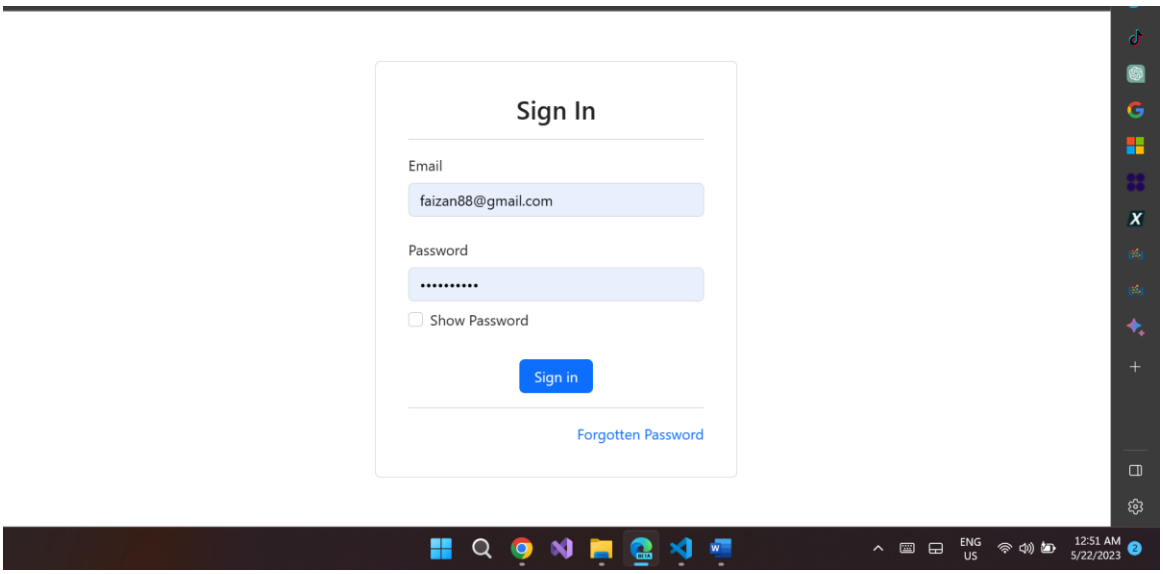


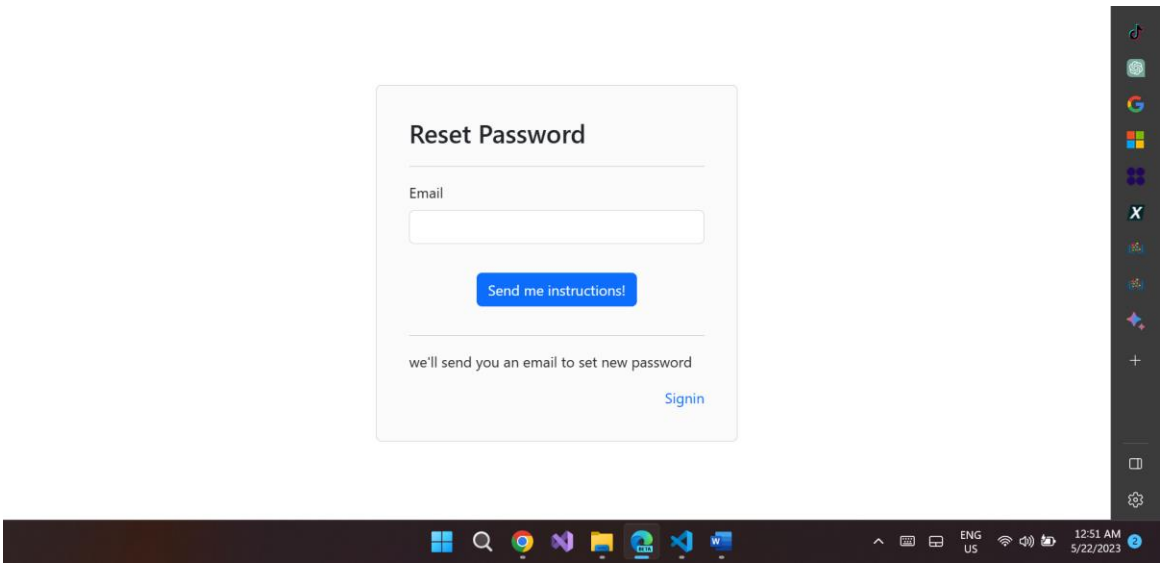
Figure 5.5: User Data diagram

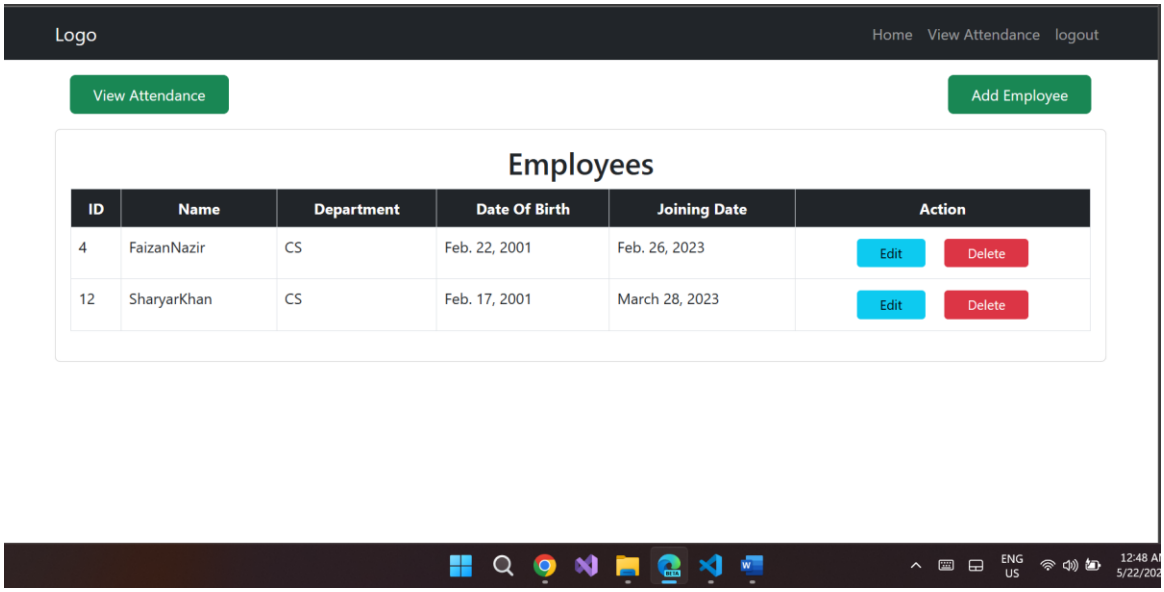
CHAPTER 6

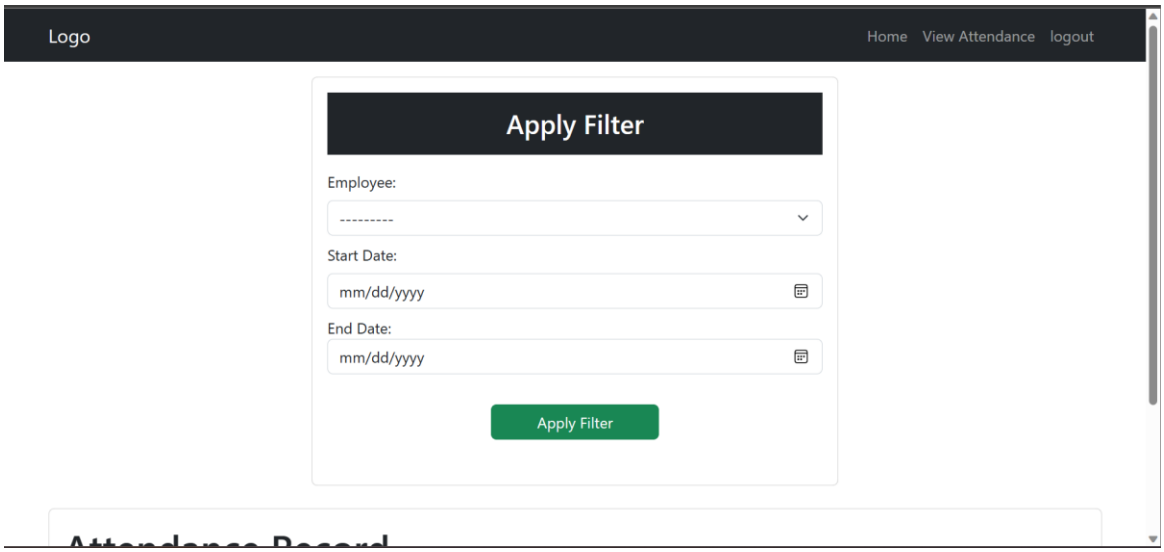
DESIGN MANUAL

6.1 ADMIN INTERFACE

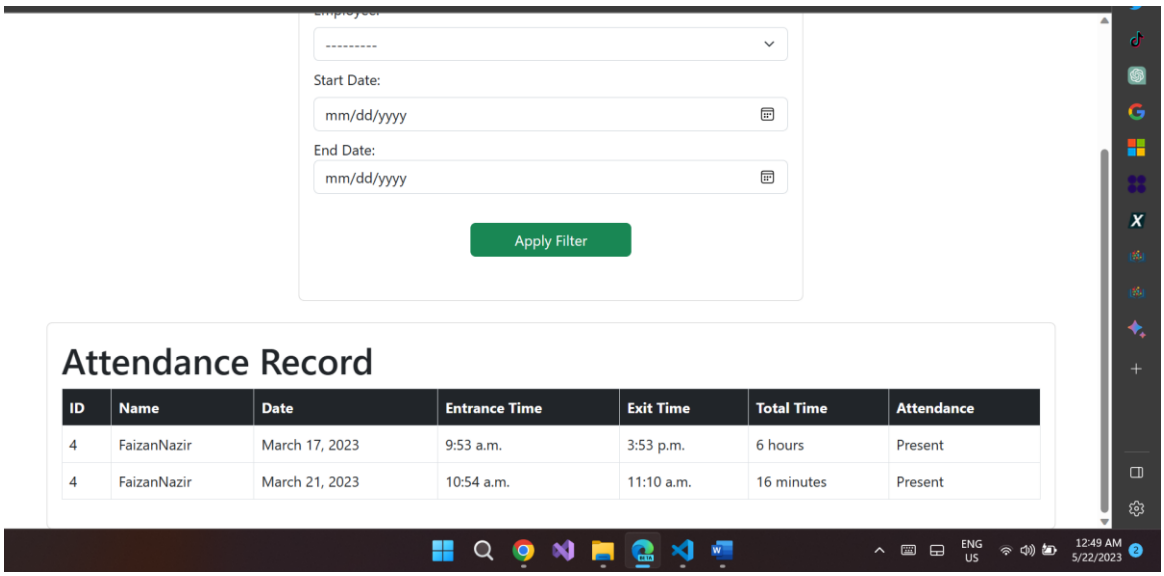




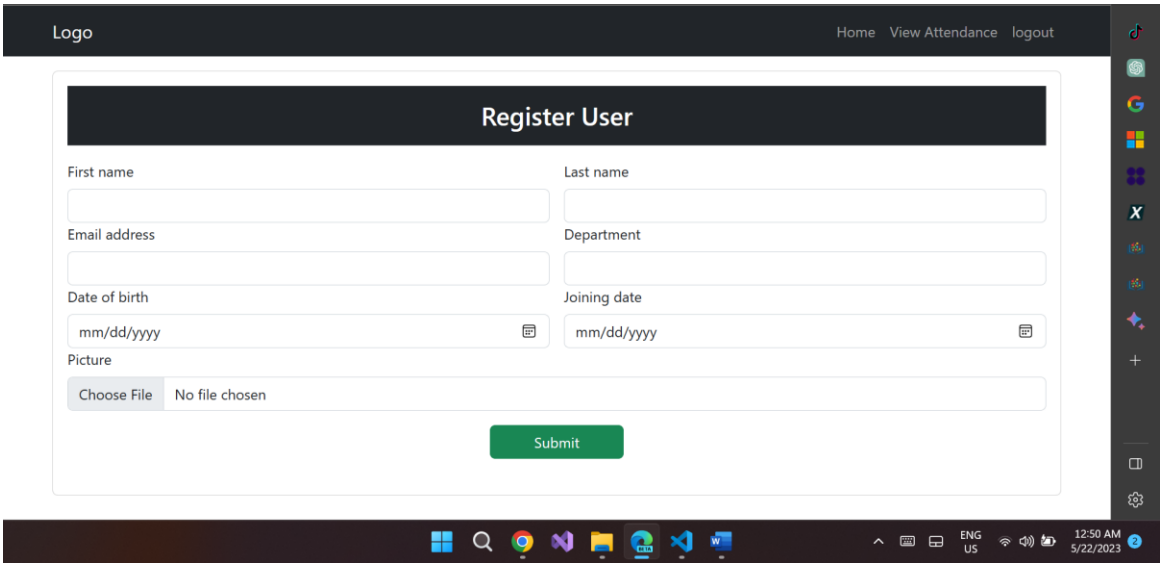

Logo
Home View Attendance logout
View Attendance
Add Employee
Employees
ID Name Department Date Of Birth Joining Date Action
4 FaizanNazir CS Feb. 22, 2001 Feb. 26, 2023 Edit Delete
12 SharyarKhan CS Feb. 17, 2001 March 28, 2023 Edit Delete

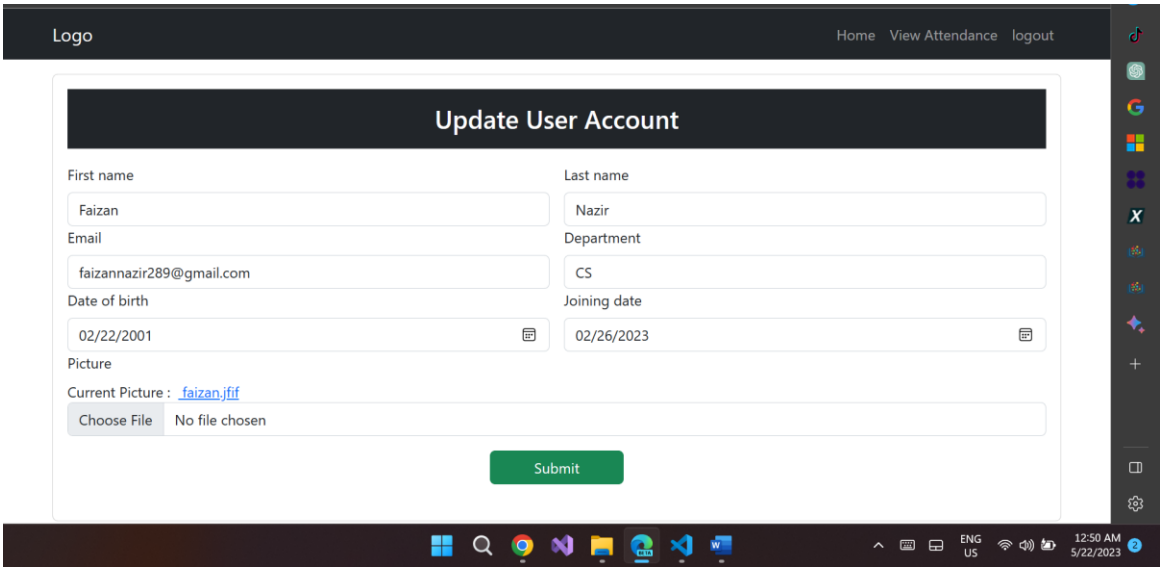

Logo
Home View Attendance logout
Apply Filter
Employee:

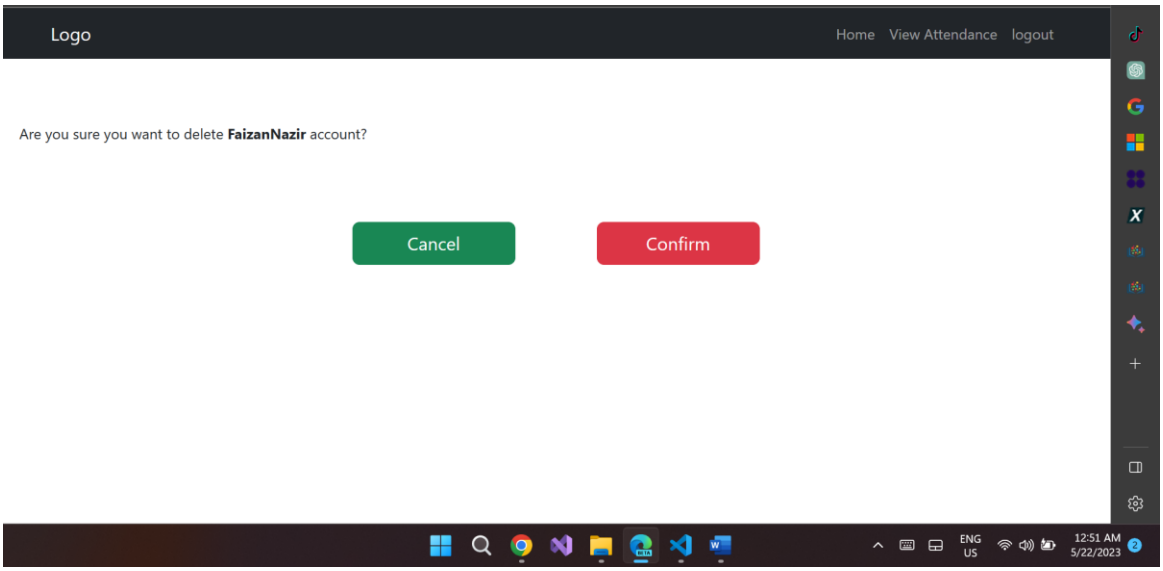
Start Date:
mm/dd/yyyy
End Date:
mm/dd/yyyy
Apply Filter



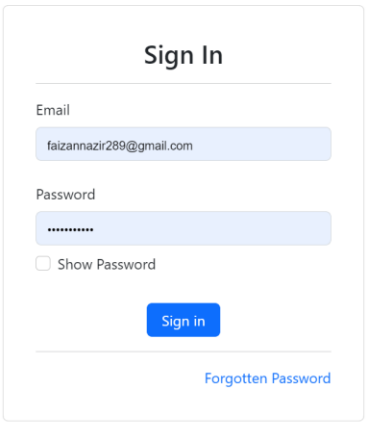
Start Date:
mm/dd/yyyy
End Date:
mm/dd/yyyy
Apply Filter
Attendance Record
ID Name Date Entrance Time Exit Time Total Time Attendance
4 FaizanNazir March 17, 2023 9:53 a.m. 3:53 p.m. 6 hours Present
4 FaizanNazir March 21, 2023 10:54 a.m. 11:10 a.m. 16 minutes Present

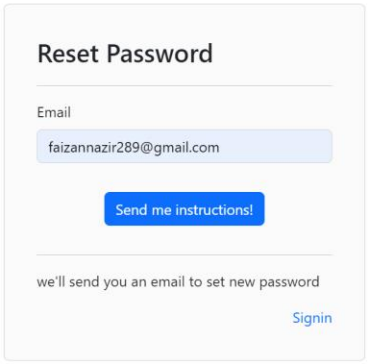

Logo
Home View Attendance logout
Register User
First name
Last name
Email address
Department
Date of birth
Joining date
mm/dd/yyyy
mm/dd/yyyy
Picture
Choose File No file chosen
Submit

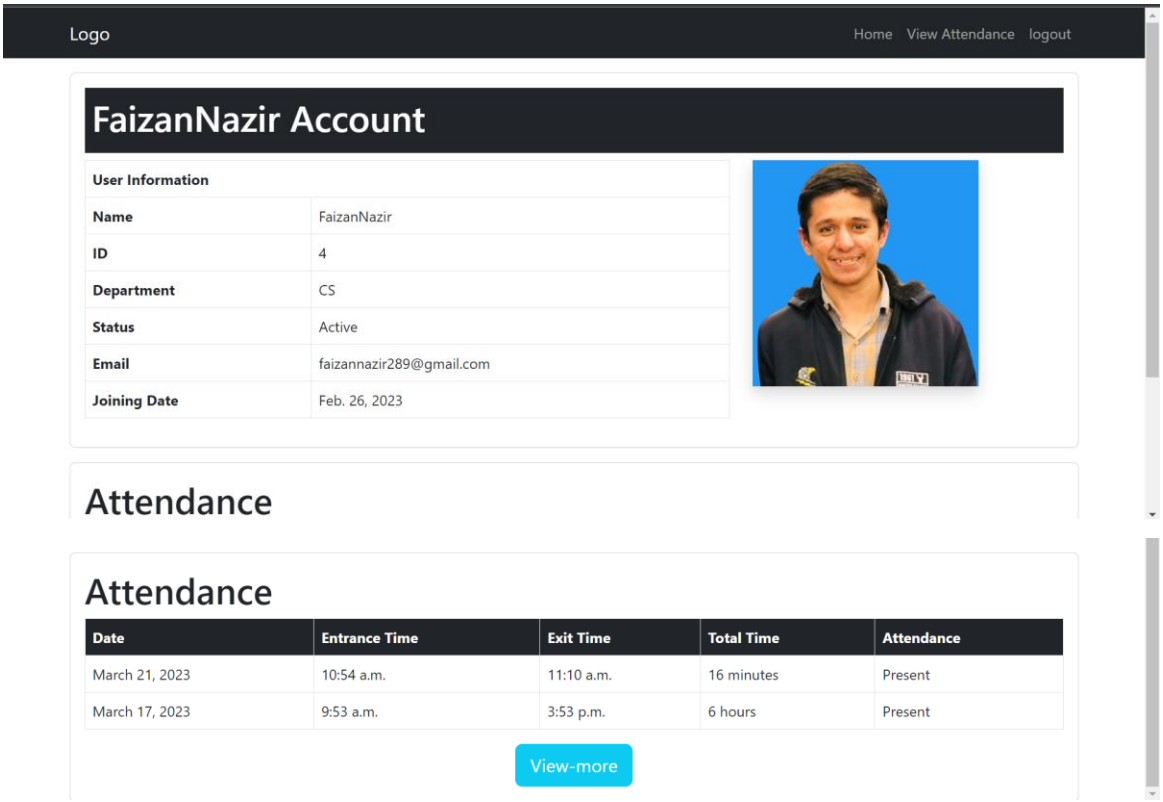

Logo
Home View Attendance logout
Update User Account
First name
Last name
Faizan
Nazir
Email
Department
faizannazir289@gmail.com
CS
Date of birth
Joining date
02/22/2001
02/26/2023
Picture
Current Picture : faizan.jfif
Choose File No file chosen
Submit


Logo
Home View Attendance logout
Are you sure you want to delete FaizanNazir account?
Cancel
Confirm

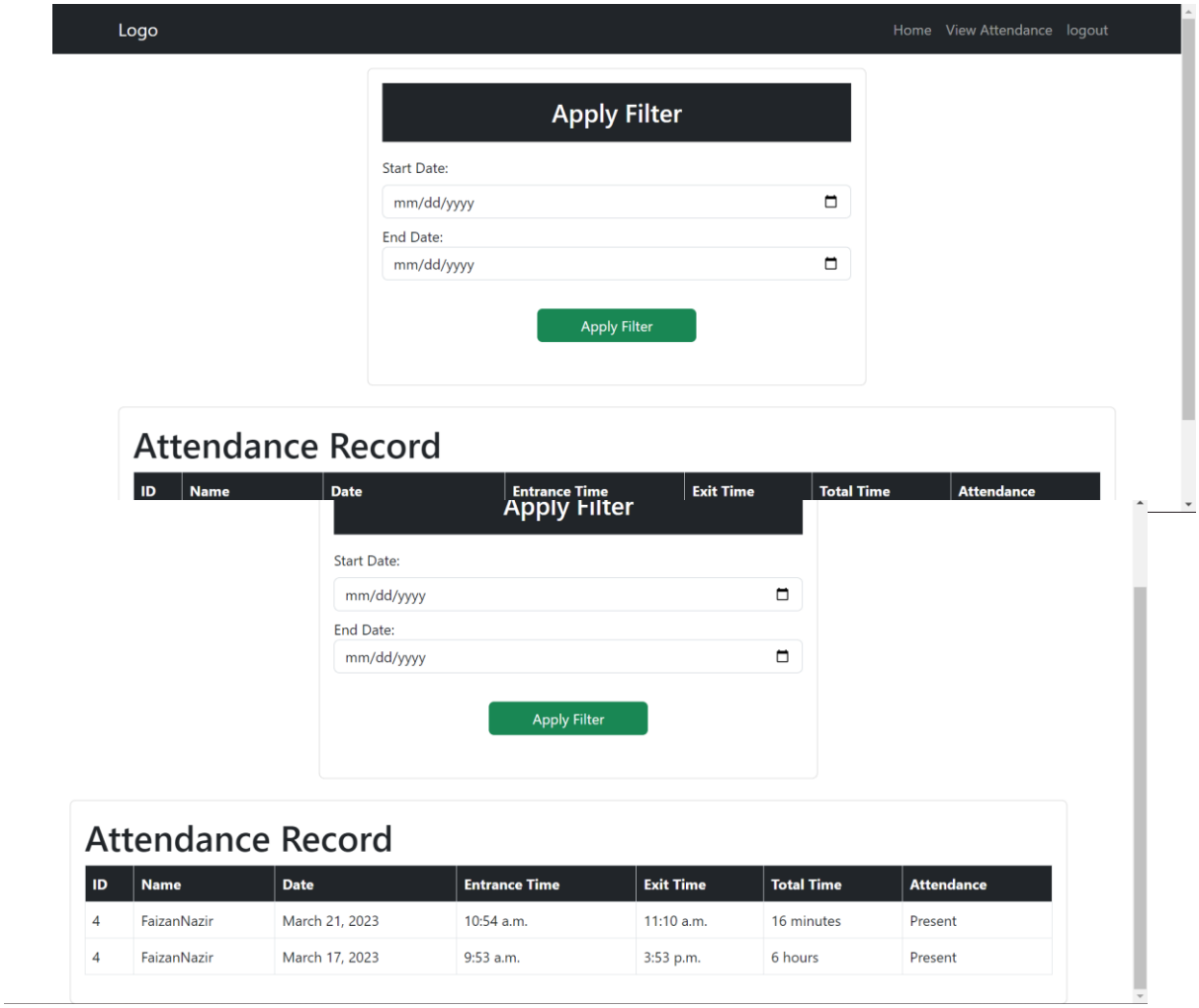
6.2 USER INTERFACE






Logo
Home
View Attendance
logout
FaizanNazir Account
User Information
Name
FaizanNazir
ID
4
Department
CS
Status
Active
Email
faizannazir289@gmail.com
Joining Date
Feb. 26, 2023
Attendance

Attendance
Date
Entrance Time
Exit Time
Total Time
Attendance
March 21, 2023
10:54 a.m.
11:10 a.m.
16 minutes
Present
March 17, 2023
9:53 a.m.
3:53 p.m.
6 hours
Present
View-more


Logo
Home View Attendance logout
Apply Filter
Start Date:
mm/dd/yyyy
End Date:
mm/dd/yyyy
Apply Filter
Attendance Record
ID Name Date Entrance Time Exit Time Total Time Attendance
Apply Filter
Start Date:
mm/dd/yyyy
End Date:
mm/dd/yyyy
Apply Filter
Attendance Record
ID Name Date Entrance Time Exit Time Total Time Attendance
4 FaizanNazir March 21, 2023 10:54 a.m. 11:10 a.m. 16 minutes Present
4 FaizanNazir March 17, 2023 9:53 a.m. 3:53 p.m. 6 hours Present

CHAPTER 7

CONCLUSION AND FUTURE WORK

7.1 CONCLUSION

The face recognition and attendance portal system are a web-based application that aims to automate the process of recording and managing employee attendance data using facial recognition technology.

The system consists of two main components: a web portal and a camera device. The web portal allows the admin to create, delete, and update user accounts for employees, as well as to view and track their attendance data. The camera device captures the face images of the employees and sends them to the web portal for verification and attendance marking. The system uses a deep learning model to perform face detection and recognition on the images.

The system has several advantages over the traditional methods of attendance management, such as reducing human errors, saving time and resources, enhancing security and privacy, and improving employee productivity and satisfaction. The system also has some limitations, such as requiring a stable internet connection, being dependent on the quality of the images, and having a possibility of false positives or negatives.

7.2 FUTURE WORK

Some possible future work to improve the system are:

- Allowing the user to create their own account and request approval from the admin.
- Creating a full management portal for every department with different functionalities, such as leave requests, shift assignments, etc.

- Decoding the images on the portal server and storing only the face features in the database, to reduce the storage space and increase the security.
- Optimizing the face recognition model to increase its accuracy and speed.
- Implementing a liveness detection mechanism to prevent spoofing attacks using images or videos.
- Improving the face detection performance by using a more robust algorithm that can handle different poses, expressions, lighting conditions, etc.
- Recording the attendance on local storage and updating it on the database when internet connection is restored, to avoid data loss or inconsistency in case of network failure.

7.3 REFFERENCES

- https://github.com/ageitgey/face_recognition
- https://www.djangoproject.com/
- https://getbootstrap.com/
- https://www.youtube.com/watch?v=xv_bwpA_aEA&list=PL-51WBLyFTg2vW-_6XBoUpE7vpmoR3ztO
- Meta Back-End Developer Professional Certificate | Coursera
- Create data-driven websites by using the Python framework Django - Training | Microsoft Learn