

# **Software Requirements Specification Document**

**Version 1.0**

***HACS ( HOSTEL ATTENDANCE COORDINATION SYSTEM )***

**Submitted to: Ms Arwinder Dhillon**

<b>Kashish</b>	<b>102117150</b>
<b>Drishti Agarwal</b>	<b>102117158</b>
<b>Chelsi</b>	<b>102117161</b>
<b>Shatakshi Saxena</b>	<b>102117165</b>

# TABLE OF CONTENTS

Chapter No.	Topic	Page No.
1.	<a href="#"><u>Introduction</u></a>	3
1.1	<a href="#"><u>Purpose of this Document</u></a>	3
1.2	<a href="#"><u>Scope of the Development Project</u></a>	3
1.3	<a href="#"><u>Definitions, Abbreviations and Acronyms</u></a>	5
1.4	<a href="#"><u>References</u></a>	7
1.5	<a href="#"><u>Overview</u></a>	8
2.	<a href="#"><u>Overall Description</u></a>	8
2.1	<a href="#"><u>Product Perspective</u></a>	9
2.2	<a href="#"><u>Product Functions</u></a>	12
2.3	<a href="#"><u>User Characteristics</u></a>	13
2.4	<a href="#"><u>General Constraints, Assumptions and Dependencies</u></a>	14
2.5	<a href="#"><u>Apportioning of the requirements</u></a>	16
3.	<a href="#"><u>Specific Requirements</u></a>	17
3.1	<a href="#"><u>External Interface Requirements</u></a>	17
3.2	<a href="#"><u>Detailed Description of Functional Requirements</u></a>	17
3.2.1	<a href="#"><u>Functional Requirements for Facial Recognition Based Attendance System</u></a>	17
3.2.2	<a href="#"><u>Functional Requirements for Leave Application</u></a>	18
3.2.3	<a href="#"><u>Functional Requirements for Profile Database</u></a>	19
3.3	<a href="#"><u>Performance requirements</u></a>	20
3.4	<a href="#"><u>Logical database requirements</u></a>	21
3.5	<a href="#"><u>Quality attributes</u></a>	22
3.6	<a href="#"><u>Other requirements</u></a>	22
4.	<a href="#"><u>Processing Models</u></a>	23
5.	<a href="#"><u>Change History</u></a>	31
6.	<a href="#"><u>Document Approvers</u></a>	31

## Software Bid/ Project Teams

### UCS 503- Software Engineering Lab

Group: 2CS6

Dated: 17-JAN-2023

**Team Name:**

**Team ID (will be assigned by Instructor):**

Name	Roll No	Project Experience	Programming Language used	Signature
KASHISH	102117150	<ul style="list-style-type: none"><li>• Face recognition and detection system using MATLAB</li><li>• BMI Calculator</li><li>• 2D snake game</li></ul>	MATLAB, Flutter, Dart	<u>Kashish...</u>
DRISHTI	102117158	<ul style="list-style-type: none"><li>• Face recognition and detection system using MATLAB</li><li>• Quiz App</li><li>• Phone Directory(using C)</li></ul>	MATLAB, Flutter, Dart	Drishti
CHELSEI	102117161	<ul style="list-style-type: none"><li>• Face recognition and detection system using MATLAB</li><li>• Notes Taking app</li><li>• Food related website</li></ul>	MATLAB, Flutter, Dart, HTML, CSS	<u>Chelsi..</u>
SHATAKSHI	102117165	<ul style="list-style-type: none"><li>• Face recognition and detection system using MATLAB</li><li>• LMS using Figma</li><li>• Scholar Verse: A Scholarship portal</li></ul>	MATLAB, Flutter, Dart, Figma, HTML, CSS	<u>Shatakshi.</u>

### Programming Language / Environment Experience

List the languages you are most comfortable developing in, **as a team**, in your order of preference. Many of the projects involve Java or C/C++ programming.

1. C , C++
2. Python
3. Html/CSS/Javascript

**Choices of Projects:**

	Project Name	Unique Selling Point
First Choice	Hostel Attendance Coordination System (HACS) using face recognition	Taking the manual system to the next level using face recognition in Attendance
Second Choice	Academic Management Website	Roadmap to each semester, Checkpoint setter, Chatbot.
Third Choice	Audio to text translator	Helps in translating into your native language and helps in maintaining a summary as well.
Fourth Choice	Healthcare	Tracker (Period/Emotional), Medical history, Awareness system.

**Additional Remarks/ Inputs**

**HACS (Hostel Attendance Coordination System)** is a new age, well organized, efficient UI-UX, AI based system which will not only help in maintaining hostel records but also marks your attendance using face recognition and automize the cumbersome tasks.

## **PROJECT OVERVIEW**

HACS is a cutting-edge solution designed to revolutionize the traditional method of attendance taking in hostels. The current manual system of taking attendance is time-consuming, prone to errors, and can result in discrepancies in records. HACS offers an efficient and reliable alternative to this by automating the entire process.

One of the main features of HACS is its facial recognition technology. This allows attendance to be marked. The facial recognition system is accurate and can handle a large number of students at once, making it an efficient solution for hostels.

HACS also provides a secure and efficient way to maintain hostel records of students. All the data related to student attendance and leave applications is stored online, making it easily accessible for hostel management and other authorized personnel. This eliminates the need for physical record-keeping, which can be cumbersome and time-consuming.

Another important feature of HACS is its online leave application system. Students can submit their leave requests online, which allows for quick and easy approval or rejection by hostel authorities. This system ensures that leave requests are processed in a timely manner and eliminates the need for students to physically visit the hostel office for this purpose. It also provides option to submit complaints and allow the authorities to redress them in a quick fashion.

It has a well-defined, user-friendly interface with the facility of chat bot. It also provides real-time view of hostel location along with the adjacent campus areas and has visual representation of hostel premises.

In conclusion, HACS is a game-changer for hostel attendance and record-keeping. Its automated attendance system, secure record-keeping, and online leave application system make it a reliable and efficient solution. By using HACS, hostel management can save time, reduce errors, and improve overall efficiency.

## **1. Introduction**

### **1.1 Purpose of this Document**

The purpose of this document is to collect and analyse all the ideas that have been taken into consideration to develop the software and its requirements with respect to consumer's needs. It shall also depict how we hope this product will be used to fulfil the functional requirements. It shall also outline concepts that may be developed later and document ideas that are being considered here may be discarded during the development phase as per the functional value analysis.

In the nutshell, this SRS document is to provide a detailed overview of our software product, its parameters and goals. It describes the project's target audience, user interface and hardware and software requirements. It defines how our client, team and stakeholders see the product and its functionality. Nonetheless, it helps any designer and developer to assist in software delivery lifecycle (SDLC) processes.

### **1.2 Scope of the Development of Project**

**HACS (Hostel Attendance Coordination System)** is an initiative that seeks to address a problem that both staff and students face in hostels. It is a new age, well organized, efficient UI-UX, AI based system which will not only help in maintaining hostel records but also marks your attendance using face recognition. This project is developed as a website to strengthen hostel attendance system by leveling up the current manual system along with providing other salient features.

The software must be able to perform the following operations:

1. **Management of database (Profile):** It must maintain a reliable and secure database comprising of required personal and academic details along with photographs of students and admin. This database must only be edited by caretaker or warden (admin). Other users (students) must only be able to view their respective details.
2. **Attendance:** It must assist hostel faculty to automize the attendance system of students on basis of facial recognition. Respective caretakers and wardens must have an option to view and mark attendance. No student should be able to mark their attendance, however, they can view it.
3. **Leave application:** The website must assist in automizing the process of applying and sanctioning of leave application. Students must be able to apply for a leave with the help of a form submission. Leave must only be sanctioned by the hostel authorities (admin). Status of leave applied must also

be visible through the interface.

4. **Complaint submission and redressal:** The users must be able to raise their complaints regarding hostel facilities and report bugs or problems in the website developed. Contact details of hostel authorities and creators of the website must be provided to ensure the same.

The product should ensure that it has the following **non-functional requirements**:

1. **Security:** To maintain privacy and develop a reliable system, the method of hashing will be used to store login details of users. The two-step authentication process will also be made available.
2. **Availability:** The system will be able to function effectively and efficiently even when the number of user access increases. It will not suffer for any downtime or unavailability.
3. **Modifiability:** The whole software will be divided into several modules so as to ensure that they are largely independent and thus, enhanced features can be easily accommodated in future.
4. **Performance and efficiency:** Code optimisation techniques will be followed. Also, dead code redundancy and reduced number of loops will be kept in mind. Coding with functions approach will be followed as well. In addition to that, the modules will be designed to be independent and the query response time will be kept as minimum as possible to ensure better performance.
5. **Robustness:** Ability of a system to perform well under a range of challenging or unexpected conditions. The system should be able to recognise and verify individuals even if there are variations in facial features. The system should be able to recover from errors of failures such as when the system encounters a face that it has not seen before or when there is a technical issue with hardware/software. Mean time to repair should be less.
6. **Portability:** The system is portable,i.e., it can be easily adapted to different environments or platforms making it more versatile and accessible to users in different contexts. The system should be designed to work with a range of devices such as desktop, computers, laptops, tablets and smartphones. It makes the system compatible with diiferent operating systems.

**7. Reliability:** The system should be highly reliable and available at all times. The attendance data should be stored safely and should not be lost due to system failure.

**8. Interportability:** It refers to the ability of facial recognition based attendance system to work seamlessly with other systems or applications. This system should be designed to integrate with other systems and should also have an application programming interface (API). System should support standard communication protocols such as http, ftp, or smtp to ensure compatibility with other systems.

**9. Reusability:** The system should be easily reused or repurposed for different applications or contexts. It should be designed in a modular way with components that can be easily replaces or reused. The system should also confirm to standard specifications or interfaces and should be flexible allowing it to be easily adapted or customized to meet the needs of different users.

**10. Usability:** The system should be user-friendly and easy to use for both students and staff members. The interface should be intuitive and easy to navigate

### **1.3 Definitions, abbreviations and acronyms**

#### **Definitions**

Table 1 gives explanation of the most commonly used terms in this SRS document.

**Table 1: Definitions for most commonly used terms**

<b>S.No.</b>	<b>Term</b>	<b>Definition</b>
1.	False positive	An incorrect match in which a person is incorrectly identified as someone else [2].
2.	False negative	A failure to match a person's face to a stored template, resulting in a failure to identify them [2].
3.	Liveness detection	The use of technology to determine whether a detected face is live or a still image, in order to prevent fraud or spoofing attacks [1].
4.	Facial landmark detection	The process of identifying specific points on a person's face, such as the corners of the eyes or the tip of the nose, in order to improve the accuracy of facial recognition.



5.	ISO/IEC 9075:2016	Information technology - Database languages - SQL: This standard specifies the SQL language used in relational database management systems (RDBMS) [8].
6.	ISO/IEC 13249:2019	Information technology - Database languages - SQL multimedia and application packages: This standard specifies extensions to the SQL language for multimedia and application packages.
7.	ISO 9001:2015	Quality management systems - Requirements: This standard is not specific to smart attendance technology but provides guidelines for ensuring quality management systems are in place
8.	ISO/IEC 27001:2013	Information technology - Security techniques - Information security management systems - Requirements: This standard specifies the requirements for an information security management system (ISMS) that can be used to manage and protect sensitive data, including attendance data.
9.	Face clustering	Compares all the face prints in a collection of images to one another in order to group the images containing a particular person or group of people. The clustered people might or might not then be identified as known individuals [3].
10.	Face tracking	Uses face prints to follow the movements of a particular person through a physical space covered by one or more surveillance cameras. The tracked person might or might not be identified. The tracking might be real-time or based on historical footage.

## **Abbreviations**

Table 2 gives the full form of most commonly used mnemonics in this SRSdocument.

**Table 2: Full form for most commonly used mnemonics**

S.No.	Mnemonic	Full Form
1.	HACS	Hostel Attendance Coordination System
2.	AFR	Automated Facial Recognition
3.	HID	Human Identification at a Distance
4.	FRVT	Face Recognition Vendor Test
5.	LDA	Linear Discriminant Analysis
6.	PCA	Principal Component Analysis
7.	CNN	Convolutional Neural Network
8.	FRR	False Rejection Rate
9.	FAR	False Acceptance Rate

## **1.4 References**

- [1]. N. Dalal, B. Triggs, "Histograms of oriented gradients for human detection," 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR'05), San Diego, CA, USA, 2005, pp. 886-893 vol. 1, doi: 10.1109/CVPR.2005.177.
- [2]. H. Lv, "Face Detection And Recognition Algorithm In Digital Image Based On Computer Vision Sensor," Shanghai, 2021.
- [3]. A. G. Menezes, J. M. D. da C. Sa, E. Llapa, and C. A. EstombeloMontesco, "Automatic Attendance Management System Based On Deep Oneshot Learning," in 2020 International Conference on Systems, Signals and Image Processing (IWSSIP), 2020, pp. 137–142.
- [4]. K. V, B. K, D. M, Dhanush Gowda H.L., "Face Recognition Based Attendance System," [Http://Www.Ijert.Org,Mysuru,2020](http://Www.Ijert.Org,Mysuru,2020).
- [5]. S. C. D, D. V. A., J. R. Dr. V Suresh, "Facial Recognition Attendance System Using Python And Open Cv," [Http://Www.Questjournals.Org](http://Www.Questjournals.Org), Vishakhapatnam, 2020.
- [6]. D. N., S. C., Nandhini R, "Face Recognition Based Attendance System," Blue Eyes Intelligence Engineering And Sciences Publication, Chennai, 2019.

- [7]. Bergasa-Suso J., Sanders D.A., Tewkesbury G.E., "Intelligent Browser-Based Systems To Assist Internet Users", Education, IEEE Transactions On, Vol.48, No.4, Nov. 2005.
- [8]. C. F., M. F., P. S., Nuruldelmia Idris, "A Generic Review Of Web Technology: Django And Flask," International Journal Of Advanced Computing Science And Engineering, Johor, 2020.
- [9]. Hostel-Management-System Link: <https://Github.Com/Topics/Hostel-Management-System>
- [10]. Hostel Management System. Link <http://www.ibizztech.com/HostelAttendanceSystem.html>
- [11]. Face Recognition Attendance System. Link: <http://www.ibizztech.com/HostelAttendanceSystem.html>

## **1.5 Overview**

The other sections of this document give a basic synopsis, describing the characteristics of the users of this project, the architecture of the product, and its functional and analytical requirements. General description of the project is discussed in section 2 of this document. The functional requirements, data needs, limitations, and assumptions made throughout the design of the multi-utility system are provided in section 2. The user's perspective on product use is also provided. The specifications for the product are provided in Section 3. The external interface requirements are also included in Section 3.0 along with a thorough explanation of the functional requirements.

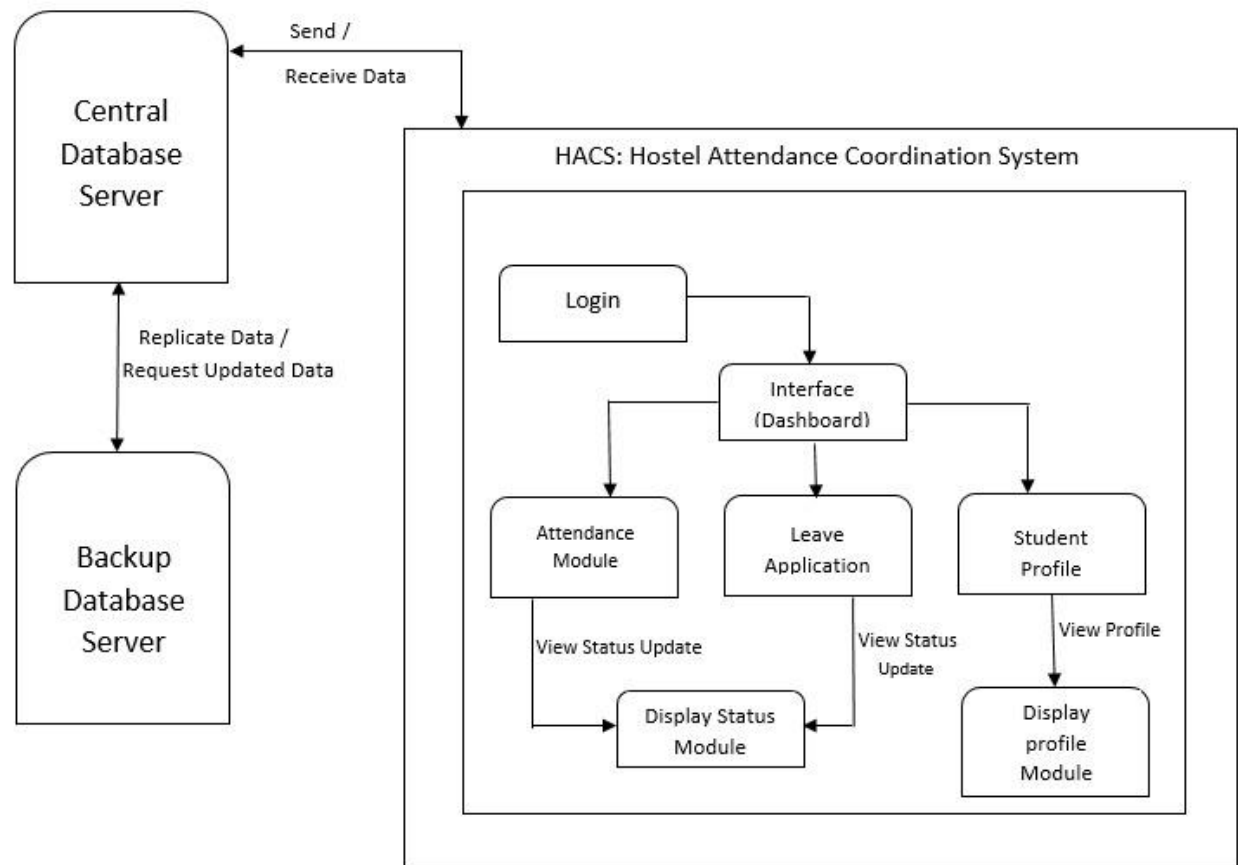
## **2. Overall Description**

From a product perspective, this system can offer numerous benefits to organizations of all sizes.

The system can provide organizations with an accurate, efficient and secure way to track student attendance while also offering numerous other benefits that can help in improving hostel management along with making it cost-effective.

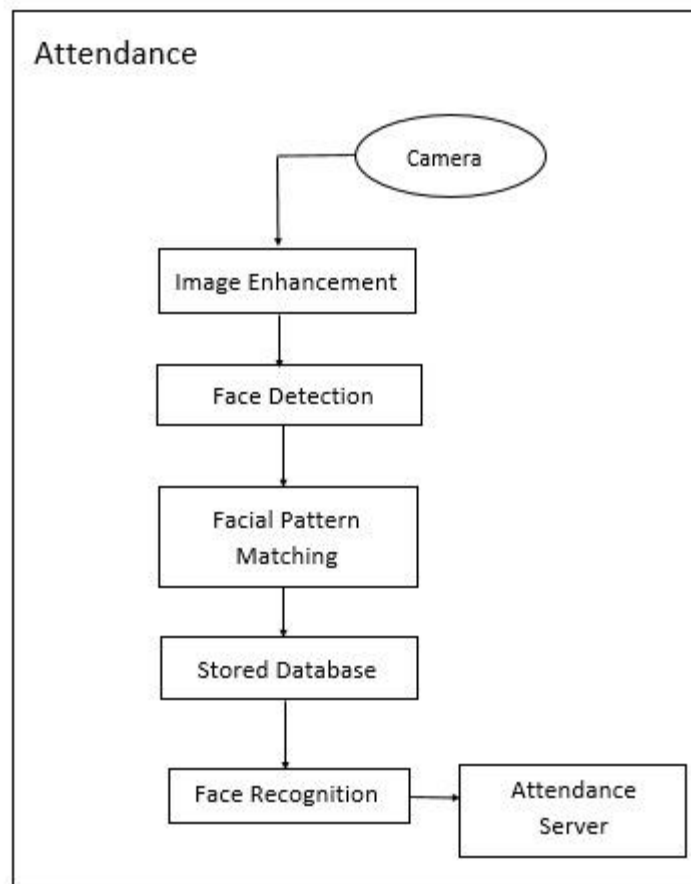
## 2.1 Product Perspective

Figure 1 shows the block diagram for the system.



**Figure 1: Block diagram for HACS (including facial recognition attendance based system)**

Figure 2 shows the block diagram for attendance module.



**Figure 2: Block diagram for attendance module in HACS**

The working of the salient features of HACS is as follows:-

1. **Smart Attendance System Module:** It is a computer-based system that uses facial recognition technology to identify and authenticate individuals for the purpose of tracking their attendance. Here is a general overview of how such a system works:

- Capture images: The first step is to capture images of the individuals whose attendance needs to be recorded. This can be done using integrated camera or a webcam.
- Preprocessing: The captured images are preprocessed to remove noise and adjust lighting conditions to further extract facial features.
- Feature extraction: The preprocessed images are then used to extract a set of unique features that are used to identify an individual. This can include measurements such as distance between eyes, length of nose, and shape of jawline.

- Enrollment: The extracted features are stored in a database along with the identity of an individual. This step is called enrollment and it is typically done once per individual.
- Recognition: When an individual appears for attendance, the system captures an image of their face and extracts the same features as in the enrollment step. The system then compares these features to those stored in the database to determine the identity of the individual.
- Attendance recording: If the system successfully identifies the individual, their attendance is recorded in the system. If not, the individual may be asked to try again.

**2. Student Profile Module (Maintaining Database):** It is a comprehensive tool for managing the information of students who reside in a hostel. To store and retrieve hostel student data using a relational database, we have used a database management system (DBMS) that supports SQL (Structured Query Language) language. Here are the steps that one might take:

- Design the database schema: Start by designing the database schema that defines the tables, columns and relationships between them.
- Table creation and data insertion: Once schema is designed, necessary tables in DBMS are created and the data is inserted.
- Retrieve data
- Update and delete data

Overall, a relational database provides a flexible and scalable way to store and manage hostel student data, allowing us to easily retrieve and manipulate the information as needed.

**3. Leave Application Module:** The process of submitting and approving leave applications is streamlined and automated. Here is a general overview of how a digitalized leave application system in a hostel management system works:

- The student logs into the hostel management system using their credentials.
- The student navigates to the leave application section of the system and fills in the required fields including the reason for the leave request, the date of departure, the expected date of return.
- The admin reviews and sanctions the applications according to their rules and regulations.
- The status of leave application is updated and can be viewed by the users.

By digitalizing the leave application process, the hostel management system saves time and resources

while ensuring that the process is efficient and accurate. It also provides an audit trail that can be used to track the leave application process and to identify any issues or bottlenecks that may arise.

**4. Display Modules:** It refers to the user interface or visual representation of the software system being developed. The display module is further divided into 2 modules:-

1. Display Profile Module: This shows the profile of the respective students including name, branch, roll no. and other details.
2. Display Status Module: This shows the attendance status, whether the student is marked present or absent as well as the leave status i.e. whether the leave applied by the student is sanctioned or not.

Overall, the display module is important for ensuring that the software system meets the user's needs and is easy to use. It helps the development team to understand the user's requirements for the user interface and to design a system that is both functional and user-friendly.

**5. A central database server and a backup database server** are also used in order to read/write data onto the repository. The central database server will periodically update the backup database server so that in case of server failure it can restore the data by retrieving the records stored in the backup database server tables.

## **2.2 Product Functions**

The student database is currently maintained using MS Excel files and the attendance is manually taken. The authorized personnel have to usually take attendance in a door-to-door fashion. It is quite erroneous as proxy attendance can also be there. This negatively impacts the reliability and security of the system. HACS is being developed to make these cumbersome tasks effortless, convenient and reliable by automizing them as well as reducing human involvement.

The product should be able to perform the following operations (Functional requirements):

- **Management of database (Profile):** It must maintain a reliable and secure database comprising of required personal and academic details along with photographs of students and admin. This database must only be edited by caretaker or warden (admin). Other users (students) must only be able to view their respective details.
- **Attendance:** It must assist the hostel faculty to automate the attendance system of students on basis of facial recognition. Respective caretakers and wardens must have an option to view and mark attendance. No student should be able to mark their attendance, however, they can view it.

• **Leave application:** The website must assist in automizing the process of applying and sanctioning of leave application. Students must be able to apply for a leave with the help of a form submission. Leave must only be sanctioned by the hostel authorities (admin). Status of leave applied must also be visible through the interface.

### **2.3 User Characteristics**

The goal is to design software to automize the attendance system using facial recognition and maintain proper database of hostel students and admin along with providing other additional features.

The user types are as listed below:

- Student
- Admin

Users can perform the following operations:

1. Login
2. View profile (database)
3. View leave application status

Students can perform the following operations:

1. Apply for leave application
2. Issue complaint by contacting authorized personnel

Admin can perform the following operations:

1. Mark attendance
2. Sanction leave
3. View profile (database)
4. Readdress complaints
5. View attendance statuts

As one can see from the list, each user will have different educational background and expertise level in using the system. Our goal is to develop a website that should be easy to use for all type of users. Thus, while designing the website one can assume that each user type has the following characteristics:

1. The user is computer-literate and has little or no difficulty in using facial recognition for attendance.



2. In order to use the facial recognition system it is not required that a user be aware of the internal working of the AI system. But he/she is expected to know what happens when the system recognizes the faces.

## **2.4 General Constraints, Assumptions and Dependencies**

The following list presents the *constraints or guidelines* that are imposed upon the implementation of HACS software:

- The hardware required for facial recognition for the purpose of attendance will require cameras and computer systems that can be quite expensive. The system must be designed with the available hardware in mind and constraints such as processing power and memory capacity must be considered.
- The storage and maintenance of personal and academics details of student and admin is associated with legal and ethical constraints as it contains sensitive information. The system must be designed with data privacy and security in mind to comply with relevant regulations and to protect the privacy of the individuals.
- The system must be designed with the users in mind and constraints such as user experience, user interface, and usability must be considered. The system should be easy to use and understand. It should require minimal training for users to be able to interact with the system.
- The cost of developing and implementing a facial recognition attendance system can be significant. Constraints such as budget and resource availability must be considered when designing the system.
- Cultural factors such as social acceptance, cultural norms and legal and ethical considerations must be taken into account when designing the system, particularly in cases where facial recognition may be perceived as invasive or intrusive.

### ☐ **Face recognition based attendance:**

Pre conditions: The system must have access to a database of stored images or videos for comparison. A valid input image or video must be captured by a camera or uploaded from a device. The captured image or video must contain a clear and recognizable face.

Post conditions: The system must accurately identify the individual in the captured image or video. It must also update the status to present and this should be visible in the database.

### ☐ **Leave application:**

Pre conditions: The users must have correct login credentials. The student must have a valid reason for request and they must select appropriate dates and duration of requested leave. The admin must check reason of request before sanctioning the leave.

Post conditions: The system must show the status of leave application i.e. if it has been sanctioned or not. Also, the database must be updated accordingly.

□ **Profile:**

Pre conditions: The user must have valid login credentials. The profile database system must be properly installed and configured on a reliable and secure server. The database schema and tables must be created and populated with accurate and up-to-date information.

Post conditions: It must accurately display the respective profile information for viewing. The system must allow admin to edit profiles, update information and save changes accurately and efficiently.

Overall, the above mentioned constraints and guidelines must be taken into account when designing the system to ensure that the system is effective, efficient, and meets the needs of the consumers. The pre and post conditions will ensure that the system is secure and reliable. It also makes sure that there is clear and consistent database maintenance.

The **assumptions and dependencies** taken into consideration while making the software are as listed below:

- The system assumes that there will be sufficient computing resources available to process the facial recognition algorithms in real-time and the database being used for recognition is up-to-date. It also assumes that the lighting conditions will be sufficient for accurate recognition and there will be a reliable internet connection.
- The system assumes that the students will provide accurate and complete information about their leave requirements. It also assumes that the admin will sanction leave as per the rules and regulations and only after checking the reason for request.
- The system depends on the availability of high-quality cameras that can capture clear images and on the availability of advanced facial recognition software that can accurately detect and match faces in real-time.
- The system depends on a reliable and efficient database management system to store and manage leave applications and student information.

## **2.5 Apportioning of requirements**

**HACS software is to be implemented in the following three phases:**

1. **Pilot Phase:** In this phase HACS software (that includes facial recognition system, leave application system and database system) will be implemented with the help of 20-30 students (classmates) and 4-5 authorized personnel where they will be testing the system. Access privileges will be provided for both users i.e. student and admin. They will also be assisted while testing the system and will be made familiar to the interface as well.

2. **Hostel wide implementation:** Following the successful completion of the pilot phase, we plan to deploy the same across our hostel. Camera integrated facial recognition based attendance system will be implemented in the hostel to provide ease of tasks which are being done manually at present. This system will detect all the students who enter the hostel premises and it will mark their attendance. Real time implementation of the same will be desired of the system so as to provide error free and reliable attendance system. The students will also be able to apply for leave from any browser or device from any location. It will also maintain a secure and reliable database.

3. **Extension of HACS system to other hostels in TIET:** In future, this system can be installed in all the hostels of the university which will help to manage all hostellers' database record in a secure and efficient manner. Other salient features will also be helpful. In addition to it, 2-step authentication will be added to make the system more secure and credible.

The same functionalities will be implemented in each phase; the only difference will be the scale of implementation.

### 3. Specific Requirements

#### 3.1 External Interface Requirements

The external interface requirements include:

- Camera interface: The facial recognition attendance system must be able to interface with the camera used to capture the image of student's face. The camera will be integrated into the system.
- User interface: To allow the users to interact with the system and access salient features the software will require to develop a user interface. This would be achieved by developing a website keeping in mind the consumer needs and preferences.
- Database storage: The database will be stored to maintain required personal and academic records of student and admin.

- Applying for leave: To enable the student to apply for a leave application the website will include a form submission.
- Calendar integration: The leave application and attendance record maintenance system may require calendar integration to allow users to view their leave application and attendance status.

These external interface requirements will assist in providing a user-friendly interface and add to the overall effectiveness and functionality of the system.

### **3.2 Detailed Description of Functional Requirements**

#### **3.2.1 Functional Requirements for Facial Recognition based Attendance system**

Table 3 gives the functional requirements for facial recognition based attendance system

**Table 3: Functional Requirements for Facial Recognition based Attendance system**

<b>Purpose</b>	This system captures student's facial image and matches it with their stored facial data to identify the student and record their attendance.
<b>Inputs</b>	The input to the facial recognition attendance system is a student's name, id and Facial image, which is captured using cameras installed in the hostels. The cameras can be placed at entry points of hostels.
<b>Processing</b>	The captured image is processed by system's software which extracts unique facial features and compares them to their stored facial data, once the student is identified the system records their attendance and updates the attendance database. The attendance data is stored securely and can be accessed by authorized personnel to analyze the attendance record of students.
<b>Outputs</b>	The output of the facial recognition attendance system is attendance data that is recorded and stored in the system's database. The attendance data typically includes the student's name and ID.

### **3.2.2 Functional Requirements for Leave Application**

Table 4 gives the functional requirements for Leave Application.

**Table 4: Functional Requirements for Leave Application**

<b>Purpose</b>	This system is a software-based solution that allows students to request leave from hostel, and for admins to manage and approve these requests.
<b>Inputs</b>	The input to the leave application system is a leave request submitted by a student. The student typically submits the request through an online portal, providing details such as the type of leave requested (e.g., sick leave, vacation leave), the start and end dates of the leave.
<b>Processing</b>	Once a student submits a leave request to the system, the request is sent for review to the admin, the admin can either approve or reject the request. Once the request is approved, the system updates the student's interface.

<b>Outputs</b>	The output of the leave application system includes updates on the status of the leave request via email.
----------------	---

### 3.2.3 Functional Requirements for Profile Database

Table 5 gives the functional requirements for Profile Database.

**Table 5: Functional Requirements for Profile Database**

<b>Purpose</b>	A profile database is a collection of information about students (name, roll number, branch, room number, parent's info and other info), typically stored in a digital format.
<b>Inputs</b>	An authorized/legitimate user typically initiates the input to the profile database view functionality. The user may access the database through an online website and provide login credentials to authenticate their access. Once logged in, the admin can search for and view profiles of students in the database.
<b>Processing</b>	The processing in the profile database view functionality involves several steps, including search, view. To view a student profile, the admin typically enters roll number of the student, The system then retrieves matching profiles from the database and displays them to the admin. The student can view their own profile by clicking on view profile button.
<b>Outputs</b>	The output of the profile database view functionality includes students' profiles.

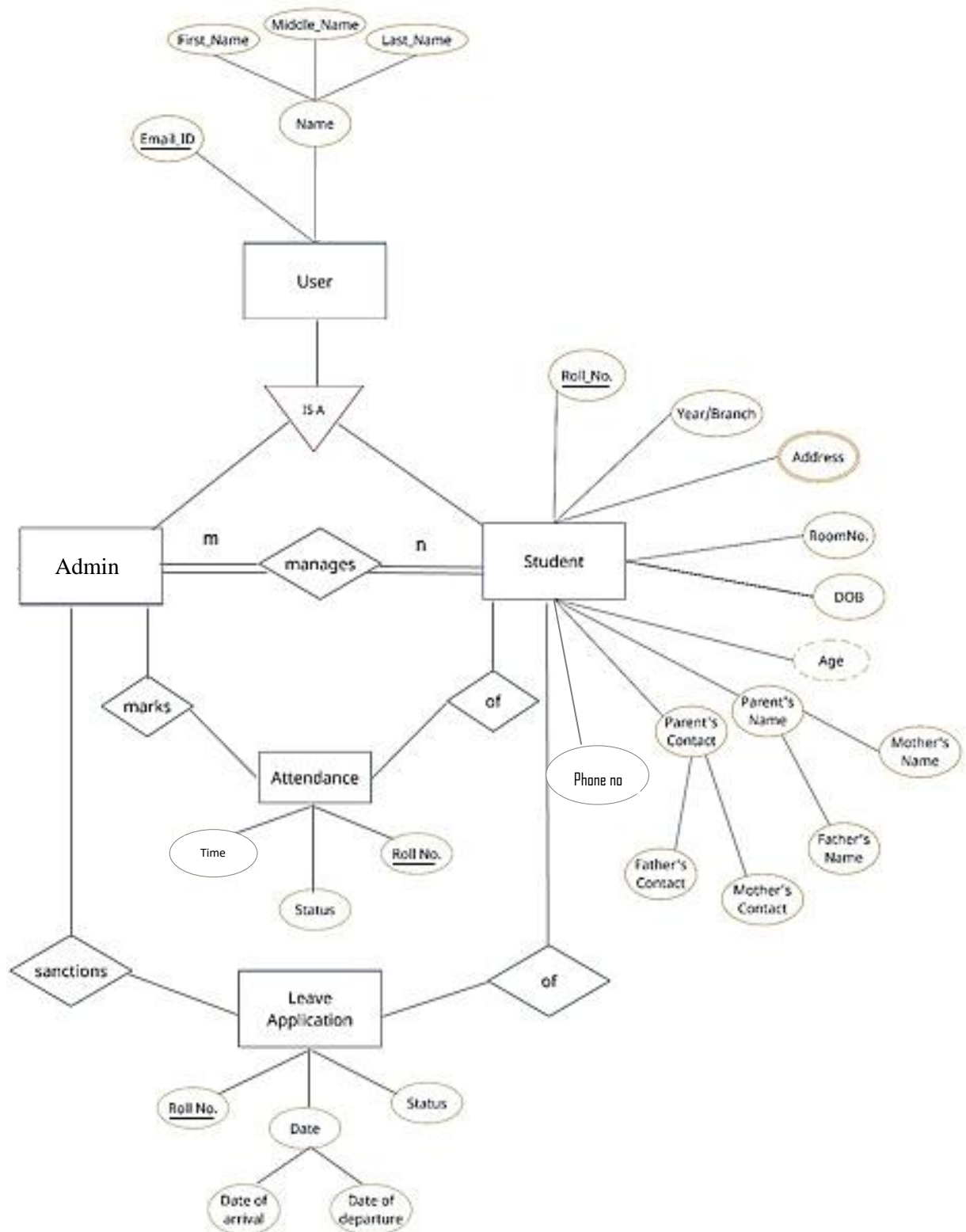
### **3.3 Performance Requirements**

- The software is designed for camera integrated facial recognition system. It should be able to accurately match the facial details with the stored database in a matter of seconds.
- The software will support simultaneous user access. It should be able to handle a large number of users and data inputs. It should be scalable to accommodate the growth of organization if there will be change in the number of users and thus the amount of data that needs to be processed.
- The system should be able to operate consistently and provide accurate data without any downtime or errors. It must be secure in order to protect the privacy and security of student and admin data. The system should be designed with robust security features including data encryption, access controls and intrusion detection.

These performance requirements are critical to ensure that the system can operate efficiently and effectively to meet the organization's needs.

### 3.4 Logical Database Requirements

Figure 3 shows ER diagram for the entire system





### **Figure 3: E-R Diagram for HACS (including facial recognition attendance based system)**

#### **3.5 Quality Attributes**

The product is targeted towards users like student and staff. The product must have accuracy in facial recognition system which increases the overall quality of the system. High accuracy ensures the reliability of the system. The system must have robust security measures to prevent unauthorized access and it should protect against hacking. The system must be scalable as it should be able to handle a large number of requests in a timely manner without slowing down or crashing at present or in future. The database must be consistent and up-to-date. The system must be user-friendly with an easy-to-use interface that admin or students can quickly learn to use. The modules must be designed to be independent so that query response time can be kept as less as possible. It must also be easy to test and debug to ensure that any issues can be quickly resolved. It must be reliable and available for use whenever the students need it to access the features and should not suffer because of unexpected downtime. The system must be compatible with various operating systems, browsers and devices ensuring that the users can access it from anywhere and on any device by just logging into the website. System is effective, efficient, and meets the needs of the organization or institution using it.

#### **3.6 Other Requirements**

Some additional features that our system will provide to ensure user friendliness are as given below:

1. Complaint submission and redressal: The users must be able to raise their complaints regarding hostel facilities and report bugs or problems in the website developed. Contact details of hostel authorities and creators of the website will be provided to ensure the same.
2. Chatbot: Important phone numbers, emails and FAQs will be provided.

## 4 Analysis Phase

*Use case scenario for login:*

- 1. (SR) The user is asked to log into the system.
- 2. (AA) The user enters email-id and password.
- 3. (SA) The system verifies the entered details with the database.
- 4. (SR) The system navigates to the interface (dashboard).

*Alternate Flow:*

- 4. (SA) The system displays an error message as the credentials are incorrect.
- 4.1 (AA) The user re-enters the credentials.

*Use case scenario for profile (View):*

- 1. (SR) The user is asked to log into the system.
- 2. (AA) The user enters his/her email-id and password.
- 3. (SR) The interface is shown by the system.
- 4. (AA) The user chooses the profile button.
- 5. (SR) The user is student. The system displays his/her profile information on the interface.

*Alternate flow:*

- 5. (SR) The user is admin. He/she can view any student's profile.
- 5.1. (AA) Admin chooses to view student profile and enter the student's roll number.
- 5.2. (SR) Student details are displayed on the interface.

*Use Case scenario for attendance:*

- 1. (SR) The Admin is asked to log into the system.
- 2. (AA) The Admin enters his/her email-id and password.
- 3. (SR) Interface is shown by the system.
- 4. (AA) The Admin chooses the attendance button.
- 5. (AA) The Admin chooses the add student button.
- 6. (AA) The Admin enters the student-ID and Student name.
- 7. (SA) The system captures student's facial data.

- 8. (SA) The student is added to the database.

*Alternate flow:*

- 5. (AA) The admin chooses take attendance button.
- 5.1. (SR) The captured image is matched with database.
- 5.2. (SA) Attendance is updated into database.

*Use Case scenario for Leave Application:*

- 1. (SR) The user is asked to log into the system.
- 2. (AA) The user enters his/her email-id and password.
- 3. (SR) Interface is shown by the system.
- 4. (AA) The user chooses the leave application button.
- 5. (AA) The user is student. They apply for leave application by entering date of departure, date of return and a valid reason.
- 6. (SR) The user will receive email regarding leave application status.

*Alternate flow:*

- 5. (AA) The user is admin. He/she sanctions the leave application if the reason is valid.
- 5.1 (SR) The system sends email to student regarding the leave application status.

Figure 4: shows the use case diagram for the entire system

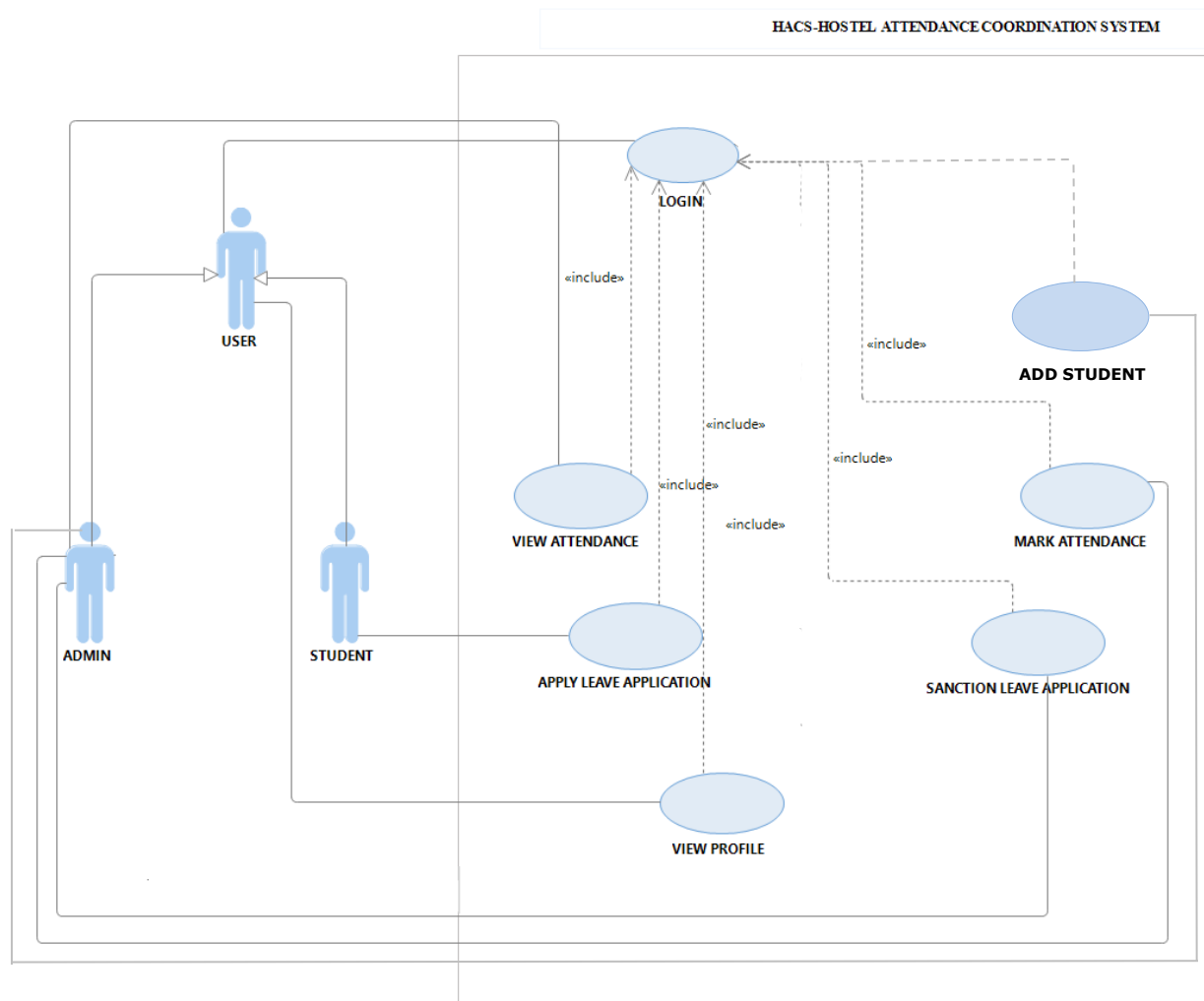


Figure 4: Use case diagram for HACS (including facial recognition attendance based system)

Table 6 gives the use case template for login functionality.

1. Use Case Title	Login
2. Abbreviated Title	Login
3. Use Case ID	1
4. Actors	Student , Admin
<b>5. Description</b> This use case describes how a user login into HACS.	
<b>5.1 Pre Conditions:</b> None	
<b>5.2 Task Sequence</b> 1. The system requests that the actor enter their email-id and password. 2. The actor will enter their email-id and password. 3. The system validates the entered credentials from the database and logs the actor into the system.	
<b>5.3 Post Conditions:</b> 1. The actor will log into the system if credentials are correct.	
<b>6. Modification History:</b> Date 24-feb-2023	
<b>7. Author:</b> Shatakshi Saxena	

**Alternate Flow:**

2. If the actor enters an invalid email-id and/or password an error message will be shown. The actor can then re-enter the credentials.

Table 6: Use case template for login functionality

Table 7 gives the use case template for view and edit profile feature.

1. Use Case Title	Profile (View)
2. Abbreviated Title	Profile
3. Use Case ID	2
4. Actors	Student , Admin
<b>5. Description</b> With the assistance of this feature, actor can view profile. Personal and academic information like name, roll number, D.O.B, branch , room number, contact number, parent's details etc. is being maintained.	
<b>5.1 Pre Conditions:</b> Actor must be logged in.	
<b>5.2 Task Sequence</b> 1. Interface will be shown by the system. 2. Admin will enter the roll number of the desired student profile and is able to view their profile details.	
<b>5.3 Post Conditions:</b> 1. Student can view their respective profile. 2. Admin can view specific student's profile, whose roll number is entered.	
<b>6. Modification History:</b> Date 24-feb-2023	
<b>7. Author:</b> Chelsi	

**Alternate flow:**

2. If user is student then they can only view their respective profile.

**Table 7: Use case template for view profile feature**

Table 8 gives the use case template for add student and mark attendance functionality.

1. Use Case Title	Attendance
2. Abbreviated Title	Attendance
3. Use Case ID	3
4. Actors	Admin
<b>5. Description</b> With this functionality admin can add student and mark their attendance.	
<b>5.1 Pre Conditions:</b> Admin must be logged in.	
<b>5.2 Task Sequence</b> 1. Interface will be shown by the system. 2. The admin will choose if they wish to add student or mark the attendance of student. 3. Admin will add new student in the database and system captures their facial data.	
<b>5.3 Post Conditions:</b> Admin can view the status of attendance.	
<b>6. Modification History:</b> Date 24-feb-2023	
<b>7. Author:</b> Drishti Agarwal	

**Alternate flow:**

- 3.1 The admin chooses to mark the attendance.
- 3.2 The system will capture and match student's facial data.
- 3.2 The system will update the attendance status of the student in the database.

**Table 8: Use case template for add student and mark attendance functionality**

Table 9 gives the use case template for applying and sanctioning leave application function.

1. Use Case Title	Leave application (Apply and sanction)
2. Abbreviated Title	Leave application
3. Use Case ID	4
4. Actors	Student , Admin
<b>5. Description</b> With the help of this feature the student can request for leave and admin can sanction the same. The actor will receive email regarding leave application status.	
<b>5.1 Pre Conditions:</b> User must be logged in.	
<b>5.2 Task Sequence</b> 1. Interface will be shown by the system. 2. If the user is student they will have to enter the required details to apply for leave application. 2.1 Student will enter a valid reason for the request. Also, the date of departure and return has to be entered. 2.2 Student will submit the application by filling the form.	
<b>5.3 Post Conditions:</b> The user will receive email regarding leave application status.	
<b>6. Modification History:</b> Date 24-feb-2023	
<b>7. Author:</b> Kashish	

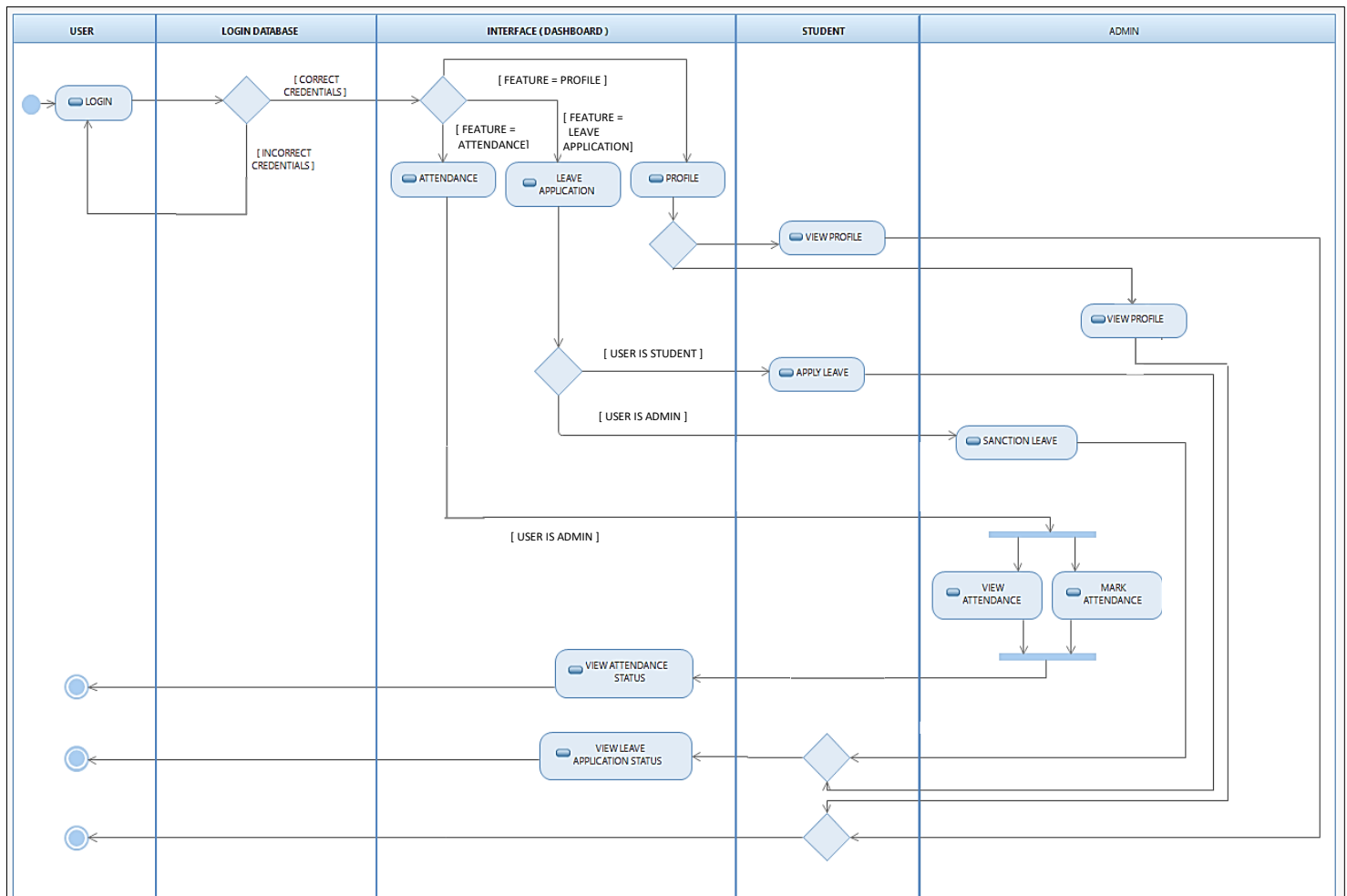
**Alternate flow:**

- 2.If the user is admin they will sanction the leave by checking if the reason is valid.

**Table 9: Use case template for applying and sanctioning leave application function**

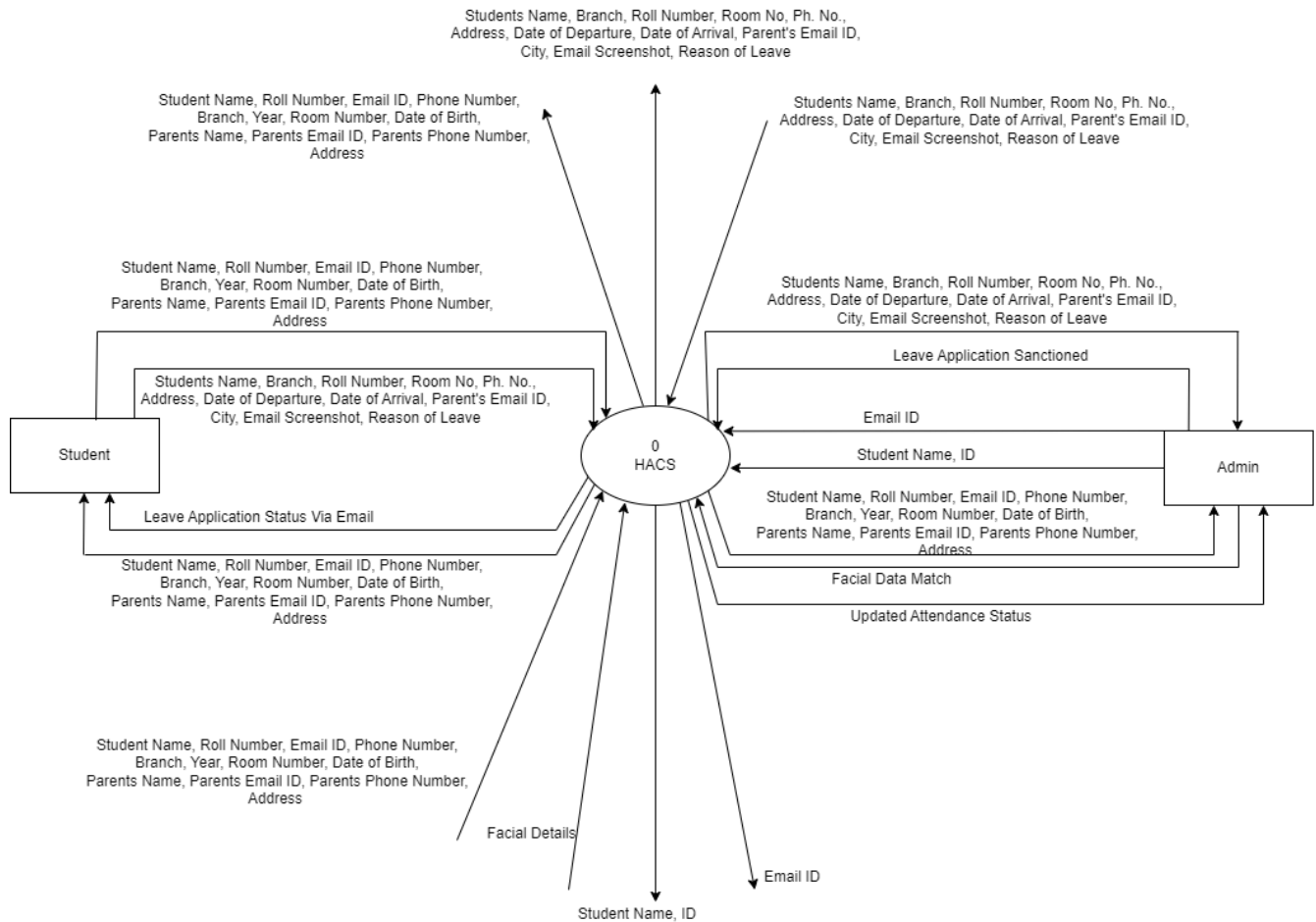


Figure 5: shows the swimlane diagram for the entire system

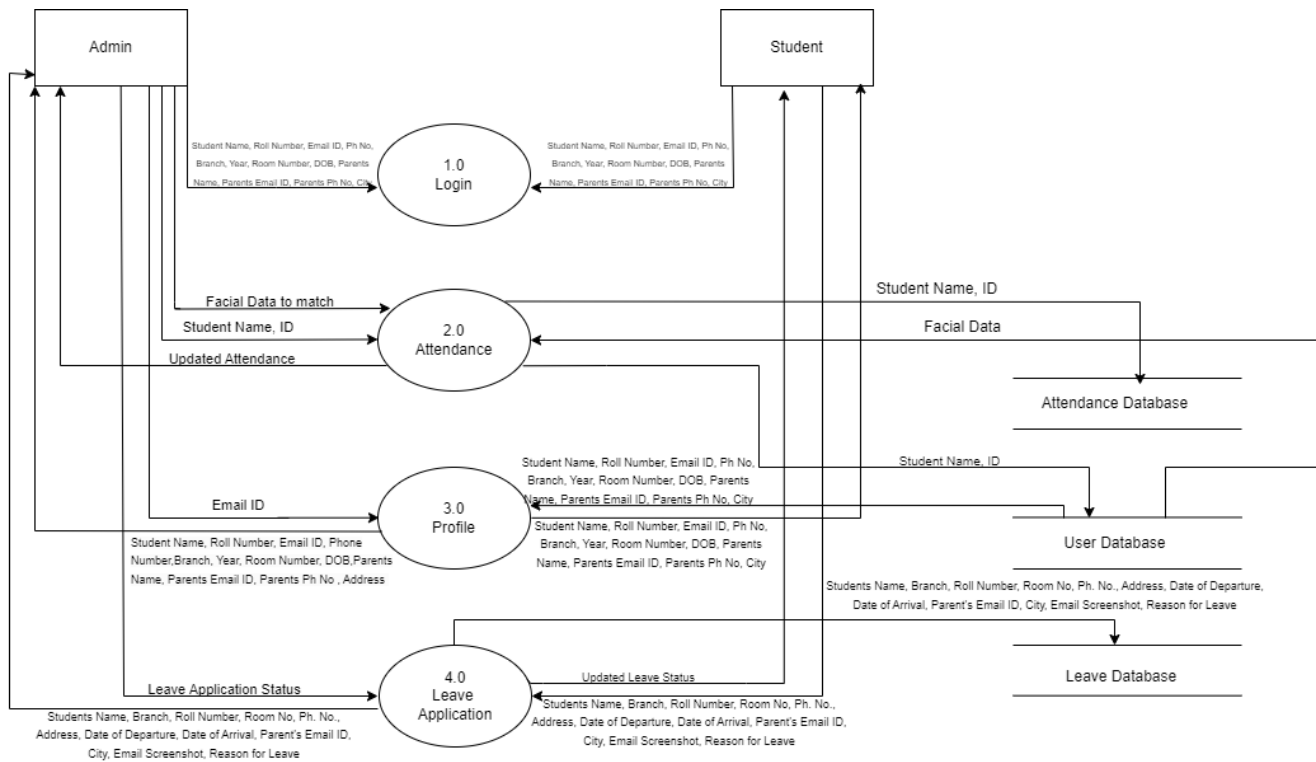


**Figure 5: Swimlane diagram for HACS (including facial recognition attendance based system)**

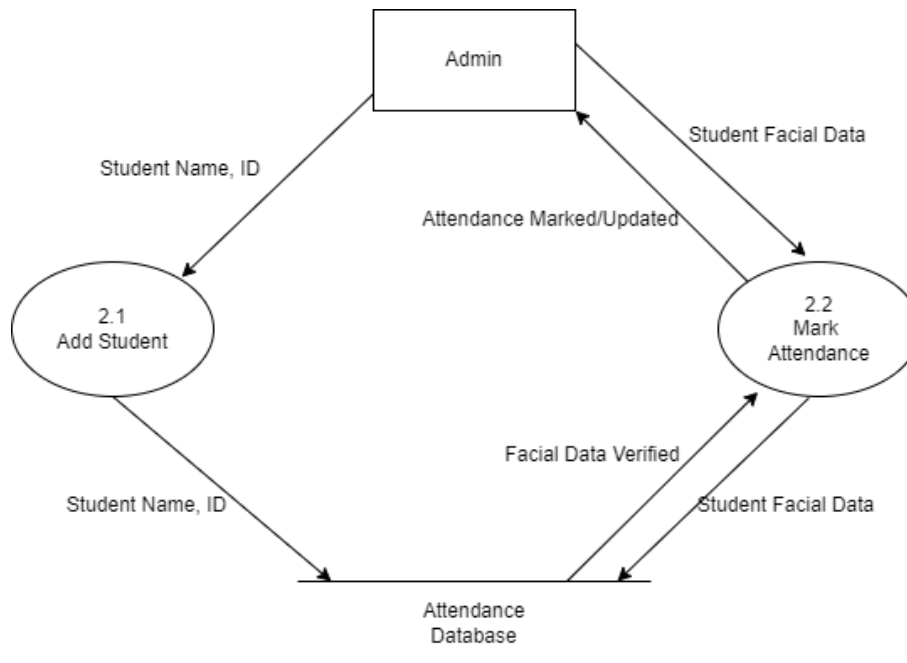
## Data Flow Diagrams (DFD)-



**Figure 6: DFD Level 0 for HACS**



**Figure 7: DFD Level 1 for HACS**



**Figure 8: DFD Level 2 for HACS**

## USER LOGIN

As a registered user I want to login so that I can access HACS

### LOGIN NOW

Don't have an account? [Register Now!](#)

### REGISTER NOW



Already have an account? [Login Now!](#)

## CONFIRMATION

### 1. Success-Valid user logged in and referred to home page.

- a) User enters correct username.
- b) User enters correct Password.
- c) User enters correct registration details.

### 2. Failure-

- a) User enters wrong Username.
- b) User does not enter Username/Password.
- c) User enters wrong password.
- d) User does not enter password in alphanumeric form.
- e) User enters mismatched password and confirm password.
- f) Student selects admin instead of student user-type and vice versa.

## LEAVE APPLICATION

As a registered student I want to apply for leave so that I can leave campus premises.

### Apply for a Leave

Full Name \*    
First Name Last Name

E-mail \*

Roll Number \*   
Roll Number

Room Number \*   
Room Number

Student's Contact \*

Parent's Contact \*

Address \*   
City   
State / Province

Date of Departure \*    
Date

Date of Arrival \*    
Date

Parent's Email ID \*   
example@example.com

Email Screenshot \*  No file chosen  
Upload a screenshot verification of email sent by parent

**SUBMIT**

## LEAVE APPLICATION

### CONFIRMATION

#### 1. Success- Student is able to apply for leave

- a) Student enters 10 digit phone number.
- b) Student enters valid email-ID.
- c) Student enters valid parent's email-ID.
- d) Student enters correct area code.
- e) Student enters date of departure less than date of arrival.

#### 2.Failure-

- a) Student enters less/more than 10 digit number.
- b) Student enters invalid email.(not written @ , .com)
- c) Student enters invalid parent's email.
- d) Student enters incorrect area code.
- e) Student enters date of departure more than date of arrival.

## LEAVE APPLICATION (ADMIN)

As a registered admin I want to sanction leave so that I can give permission to leave campus premises.

The screenshot displays the 'LEAVE APPLICATION (ADMIN)' interface. At the top, there are tabs for 'Inbox', 'Waiting For Me', 'Succeeded', 'Archive', and 'Trash'. Below these, there is a search bar and a filter icon. A list of submissions is shown on the left, with the first submission highlighted. The main area on the right shows the details of the selected submission. It includes the 'Date of Arrival' (Apr 20, 2023), 'Parent's Email ID' (rshishir@gmail.com), and an 'Email Screenshot' (LEAVE\_KASHISH.jpg). The submission is currently in the 'Waiting For Me' status. At the bottom, there is an 'Approval Step' section with a text area for comments and two buttons: 'Approve' (green) and 'Deny' (red). A 'Give Feedback' button is also present at the bottom right.

### LEAVE APPLICATION (ADMIN) CONFIRMATION

1. Success- Admin sanctions leave application.
  - a) Student details correct, leave application is approved.
  - b) Student details incorrect, leave application is denied.



## ATTENDANCE

As a registered admin I want to add student so that I can mark attendance.

The screenshot shows the HACS Face Recognition Based Attendance System interface. At the top, it displays the date "Saturday, 22 April 2023" and the time "16:22:37". Below this, there are two main sections: "Today's Attendance" and "Add New Student".

**Today's Attendance** section includes a "Take Attendance" button and a table with the following headers: S. No., Name, ID, and Time.

**Add New Student** section includes input fields for "Enter Student Name\*" and "Enter Student Id\*", an "Add New Student" button, and a status message "Total Students in Database: 1".

## ATTENDANCE

### CONFIRMATION

1. Success- Student is added to database and marked present
  - a) Admin enters only 2 digit ID.
  - b) Facial database recognised and attendance is marked.
  - c) Facial database not recognised and attendance not marked.
  - d) If student is standing far to the camera, attendance is not marked.
2. Failure-
  - a) Admin enters more than 2 digit ID.

## PROFILE (ADMIN)

As a registered admin I want to enter roll number so that I can view profile of desired student.

Student Name	raj
Roll Number	12
Email id	raj21@gmail.com
Date of Birth	09jan2003
Phone Number	9879877654
Branch Year	3
Room Number	432
Father's name	mokambo
Father's contact	8765432123
Mother's name	simran
Mother's contact	9876543213
City	delhi

Thank you for choosing HACS. We look forward to help you out.  
Reach us at: [hacs.dhara@gmail.com](mailto:hacs.dhara@gmail.com)

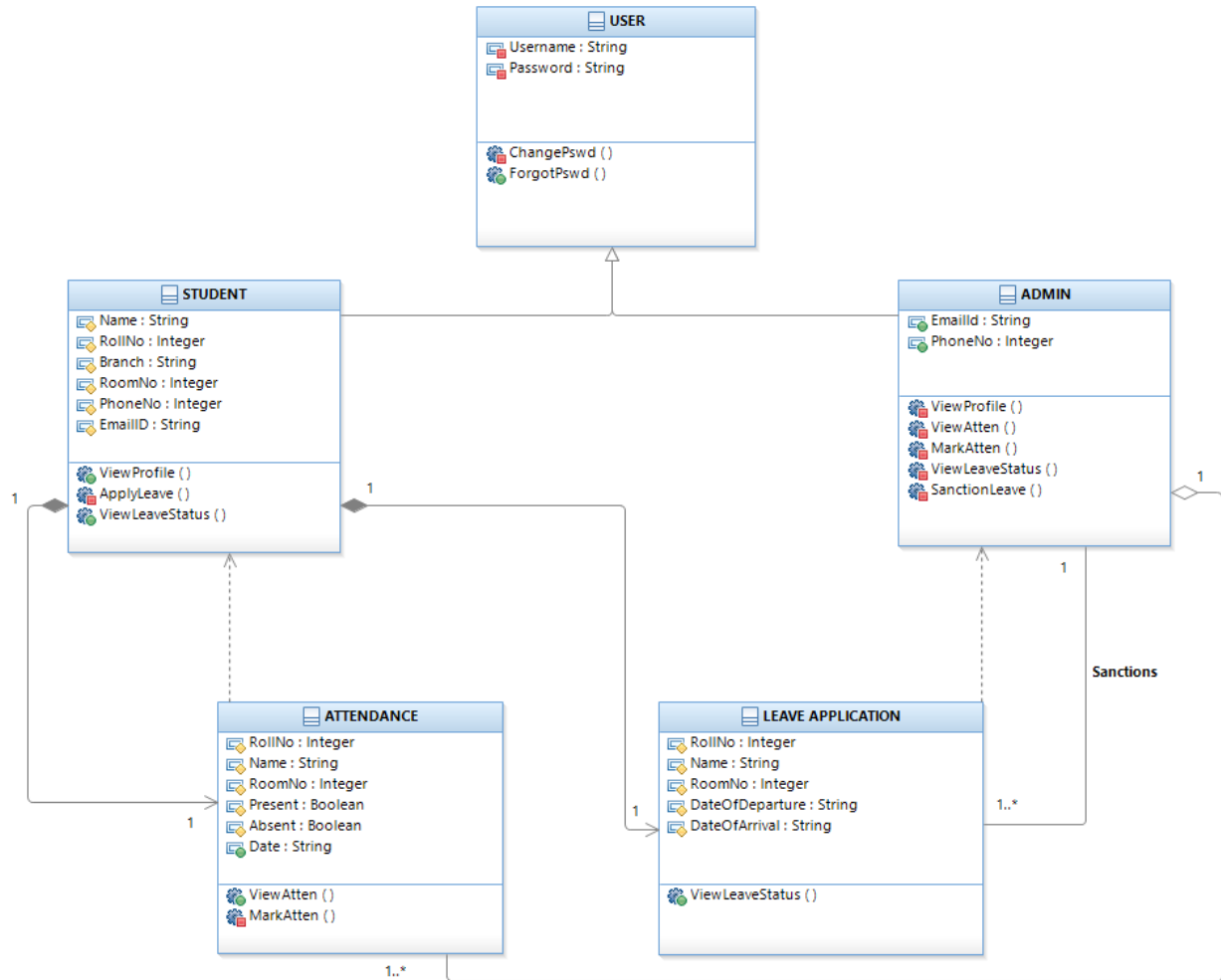
## PROFILE (ADMIN)

### CONFIRMATION

1. Success- Admin is able to view details of desired student.
  - a) Admin enters correct email-id of student.
2. Failure-
  - a) Admin enters incorrect email-id of student.

## Design Phase

### Class Diagram



**Figure 9: Class Diagram for HACS**

Figure 10: shows the sequence diagram for the entire system

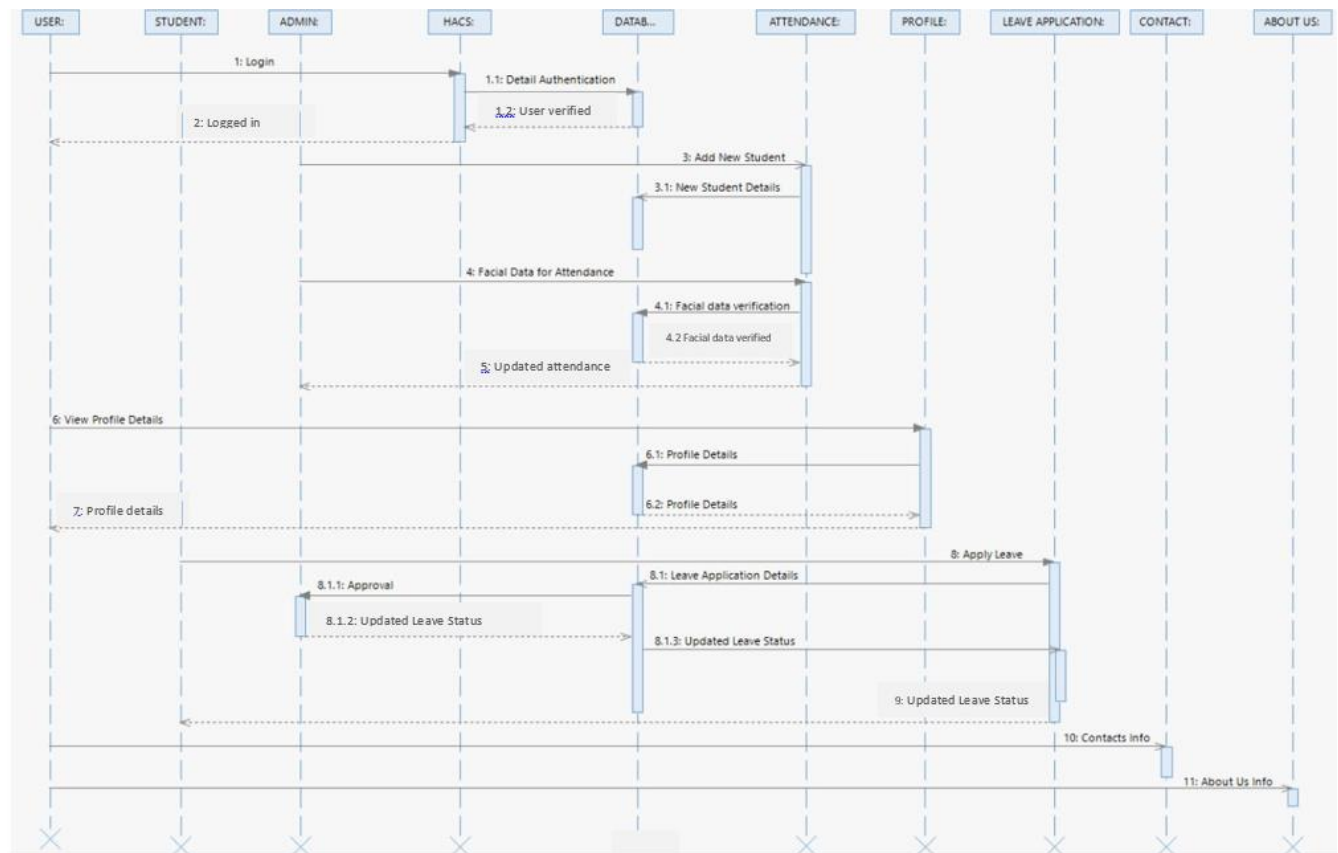


Figure 10: Sequence diagram for HACS

Figure 11: shows the collaboration diagram for the entire system

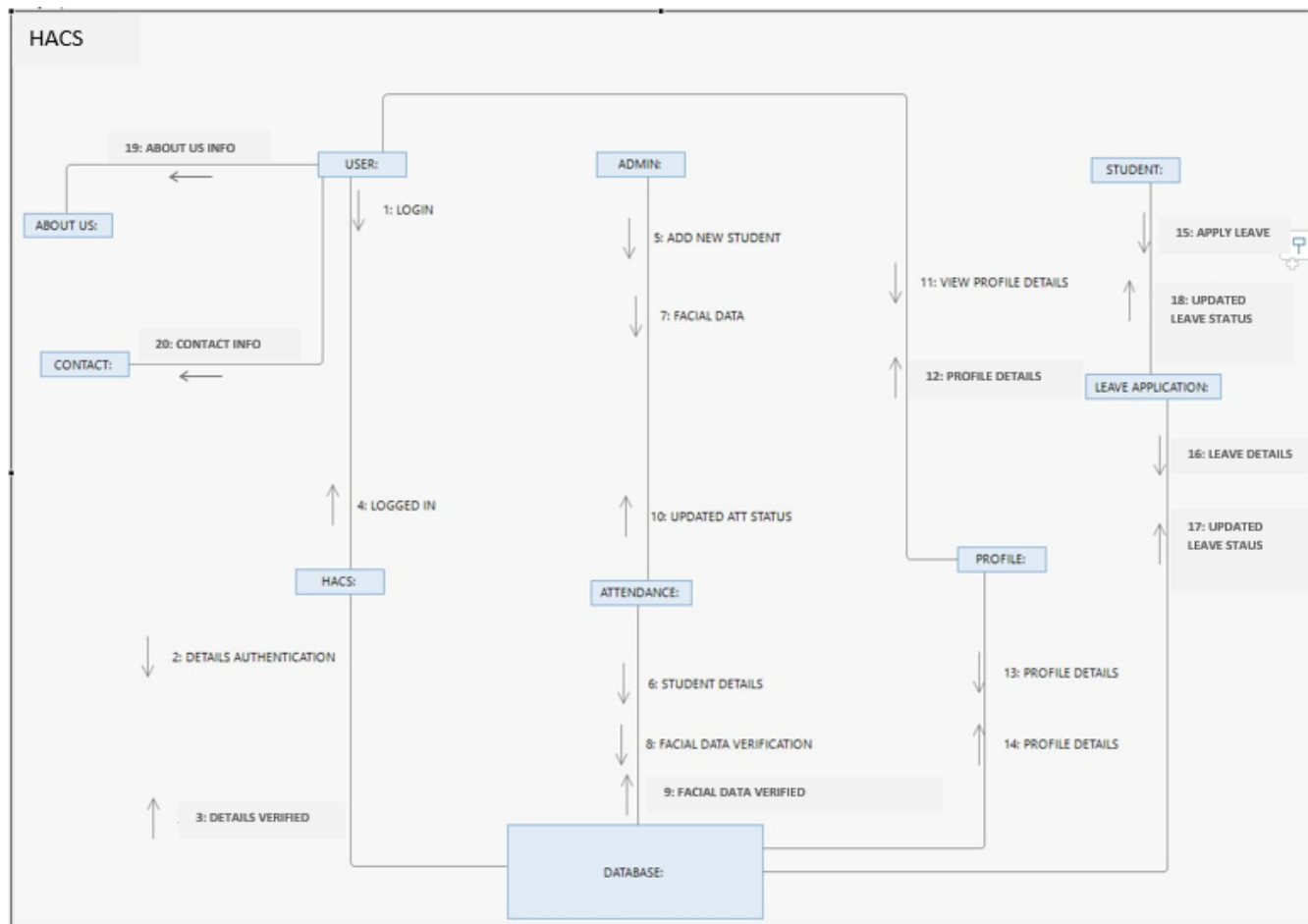
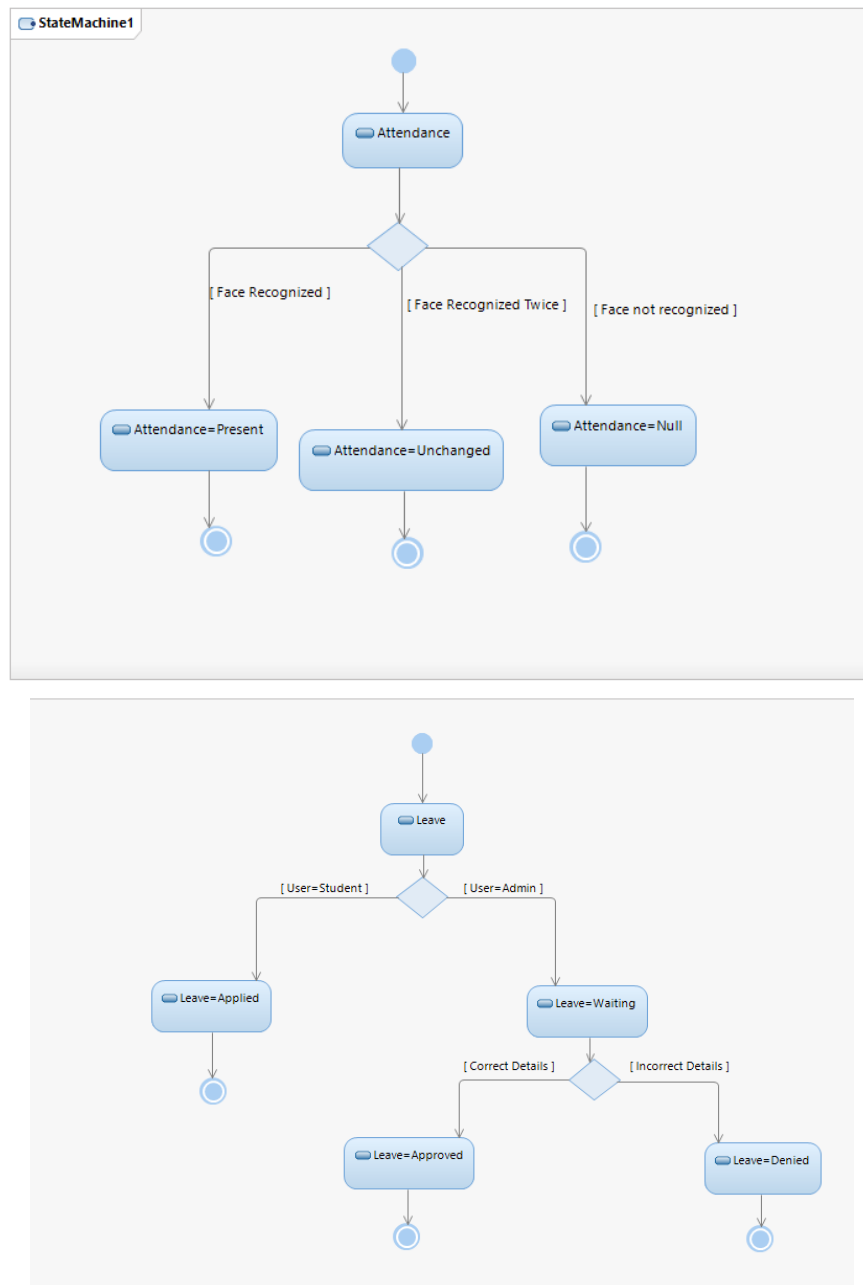


Figure 11: Collaboration Diagram for HACS

Figure 12: shows the state chart diagram for the entire system



**Figure 12: State chart Diagram for HACS**

## Implementation

Figure 13: shows the Component Diagram for the entire system (Student)

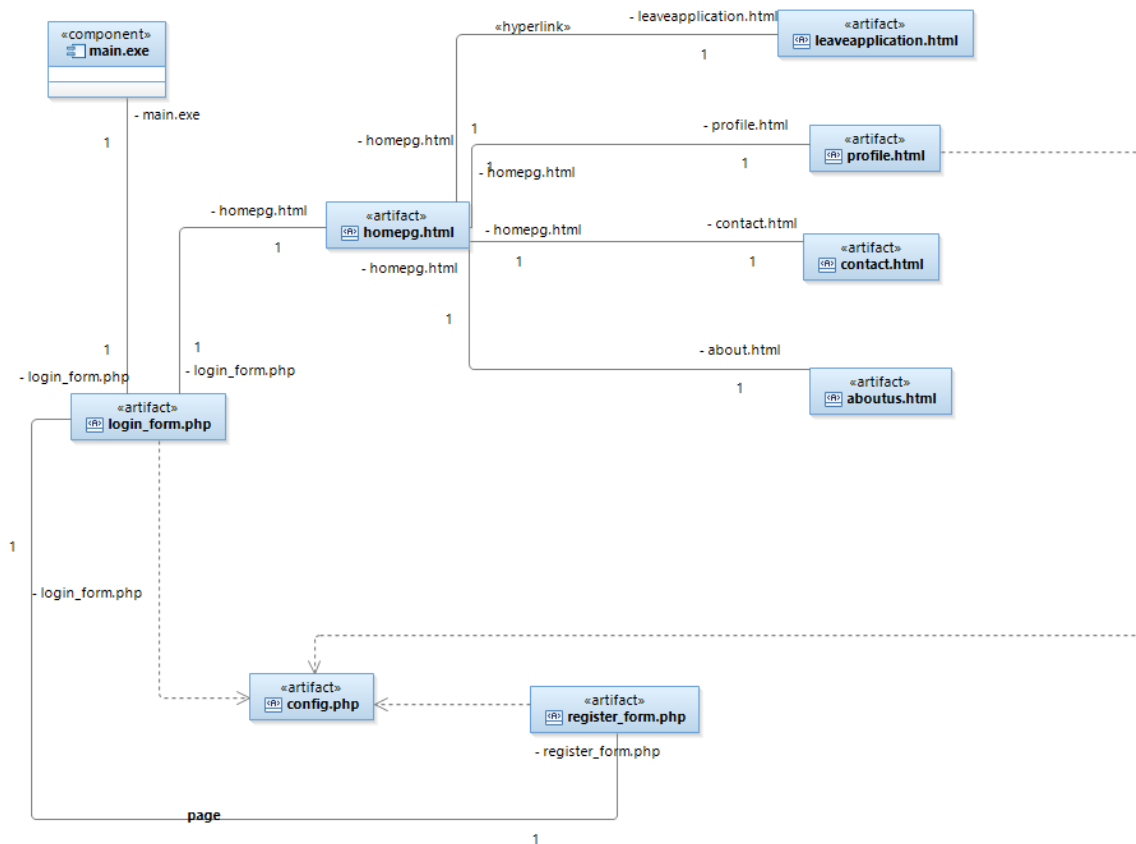


Figure 13: Component Diagram for HACS (Student)

Figure 14: shows the Component Diagram for the entire system (Admin)

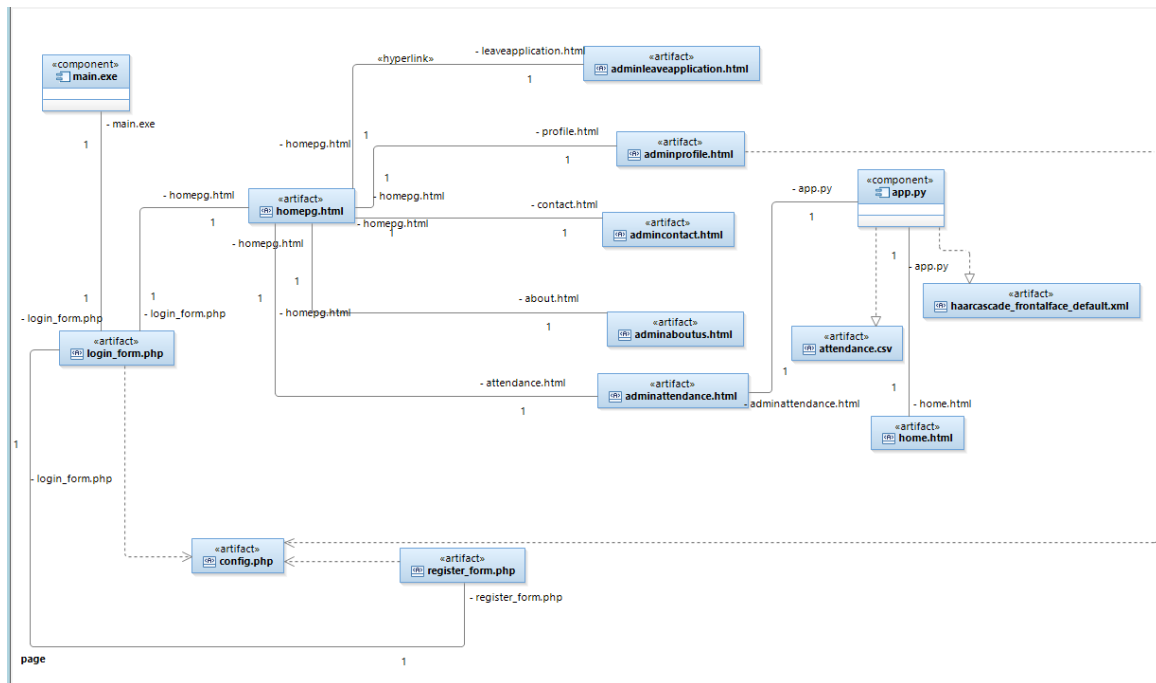


Figure 14: Component Diagram for HACS (Admin)



Figure 15: shows the Deployment Diagram for the entire system

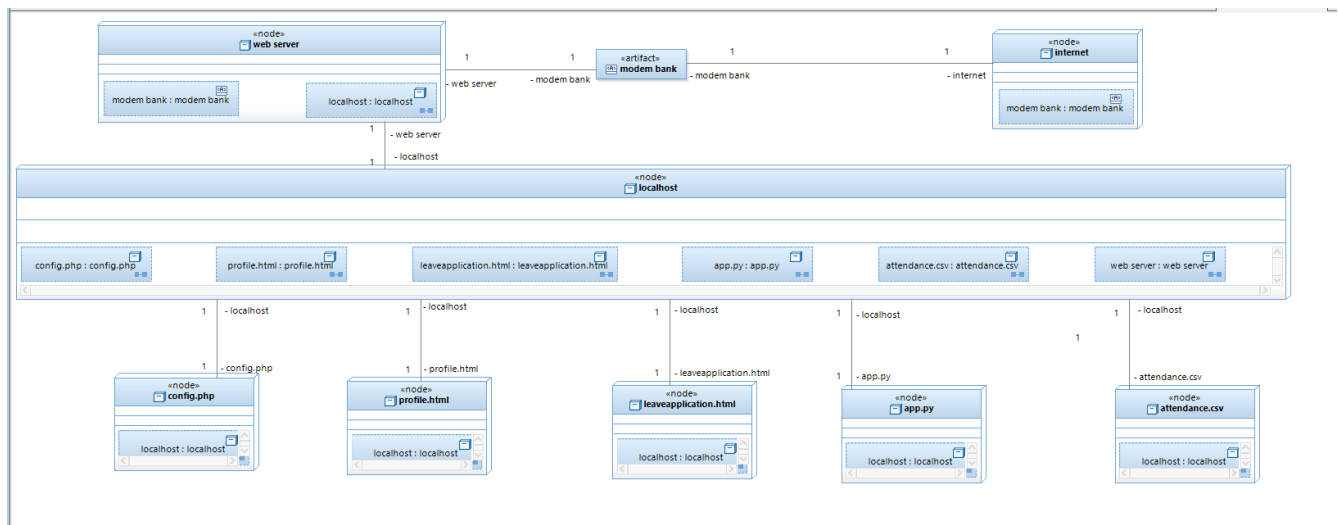
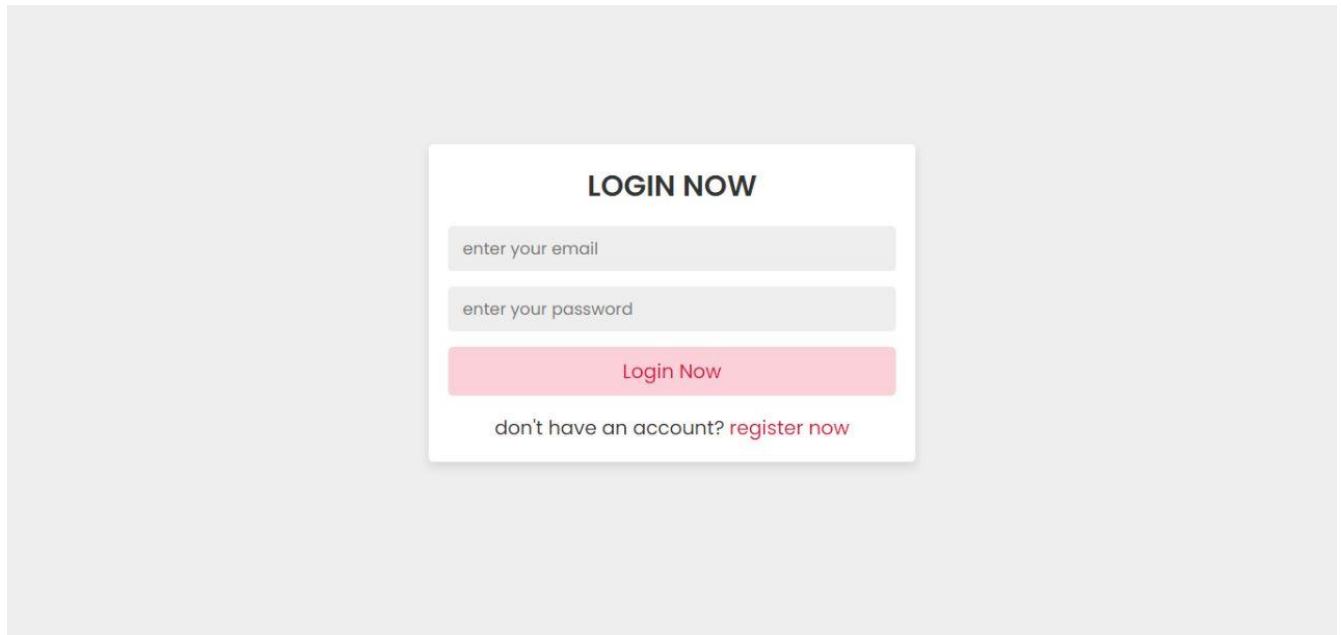


Figure 15: Component Diagram for HACS (Admin)

## SCREENSHOTS OF HACS-

### LOGIN

A screenshot of a login form titled "LOGIN NOW" centered on a light gray background. The form is a white card with a subtle shadow. It contains two input fields: "enter your email" and "enter your password", both with light gray borders. Below these is a pink button labeled "Login Now". At the bottom, it says "don't have an account? register now" with "register now" in red.

**LOGIN NOW**

enter your email

enter your password

Login Now

don't have an account? [register now](#)

## REGISTER

### REGISTER NOW

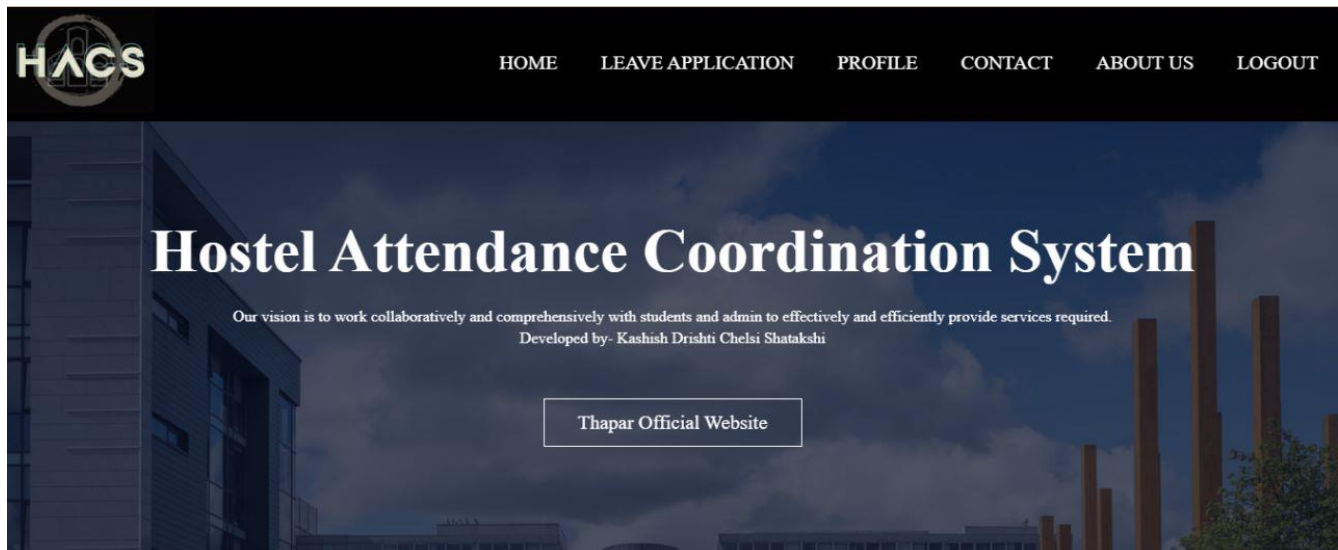
---

▼

Register Now

already have an account? [login now](#)

## HOME PAGE



### Services We Offer

Based on the typical functionalities of our website, here are the services we offer to our users:

#### Profile

It is a reliable and secure database comprising of required personal and academic details along with photographs of students and admin. HACS enable the student to view their own details. Also, the admin can edit the student details. Privacy is also maintained as each student can view only their profiles and not any other student's.

#### Attendance

HACS provide facial recognition based attendance system. It assists hostel faculty to automate the attendance system of students. Respective wardens and caretakers have an option to view and mark attendance while the student can only view their attendance status.

#### Leave Application

The website assists in automizing the cumbersome process of applying and sanctioning of leave application. Students are able to apply for a leave with the help of a form submission. Status of leave applied is provided through email.

#### Complaint Submission & Redressal

The users are able to raise their complaints regarding hostel facilities through form submission. Users can also report bugs or give feedback about the website through the email provided. Contact details of hostel authorities and website developers are also provided to ensure the same.

### Key Functionalities

Some key functionalities we offer to meet our objectives and provide value to our users:

#### Confidentiality

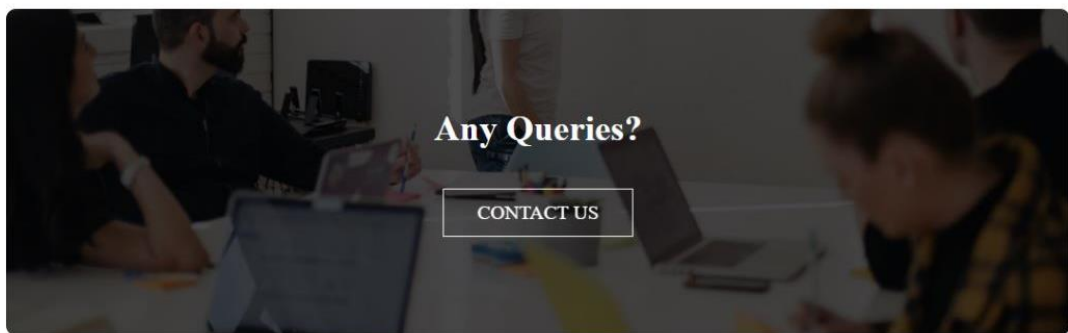
Confidentiality is a critical aspect that involves protecting the privacy and personal information of students. We provide procedures for collecting, storing and sharing information of students. We have encryption protocols to protect sensitive information. We respect the personal space and privacy of students and create secure and welcoming environment for them.

#### Integrity

Integrity is an essential component that reflects the honesty, fairness and ethical behavior of the hostel and its staff. To maintain integrity, we prioritize transparency and honesty in all aspects of operations. We maintain high standards of professionalism which ensure long term success. We have clear policies and procedures to prevent unethical behaviour.

#### Authenticity

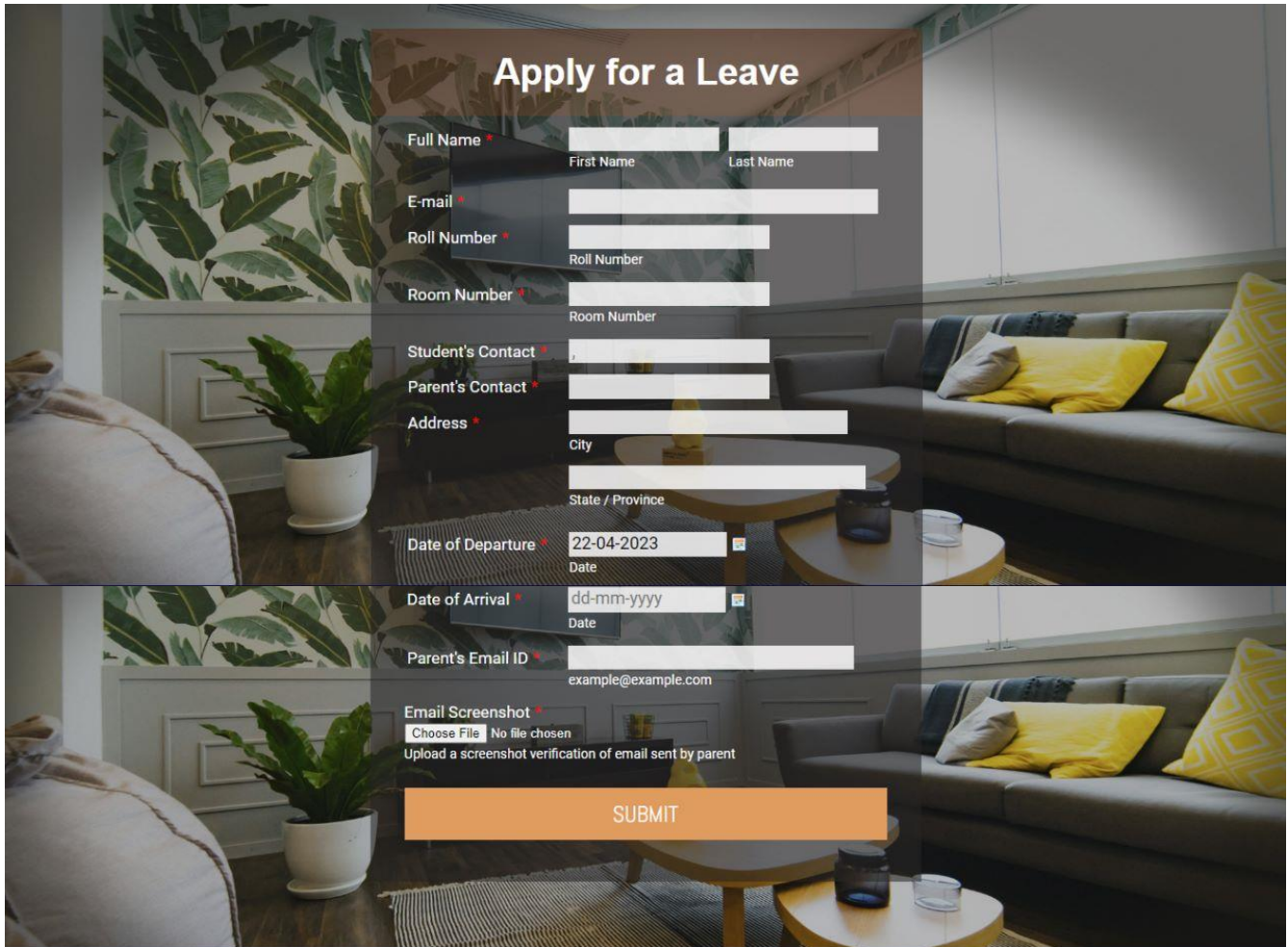
Authenticity is a crucial aspect of hostel management system and we ensure authenticity by providing genuine nature of facilities, services and staff. We ensure trust of guests by providing and storing accurate, honest and up-to-date information of services and amenities offered.



Thank you for choosing HACS. We look forward to help you out.  
Reach us at: [hacs.digipar@gmail.com](mailto:hacs.digipar@gmail.com)



## LEAVE APPLICATION PAGE



### Apply for a Leave

Full Name \*    
First Name Last Name

E-mail \*

Roll Number \*   
Roll Number

Room Number \*   
Room Number

Student's Contact \*

Parent's Contact \*

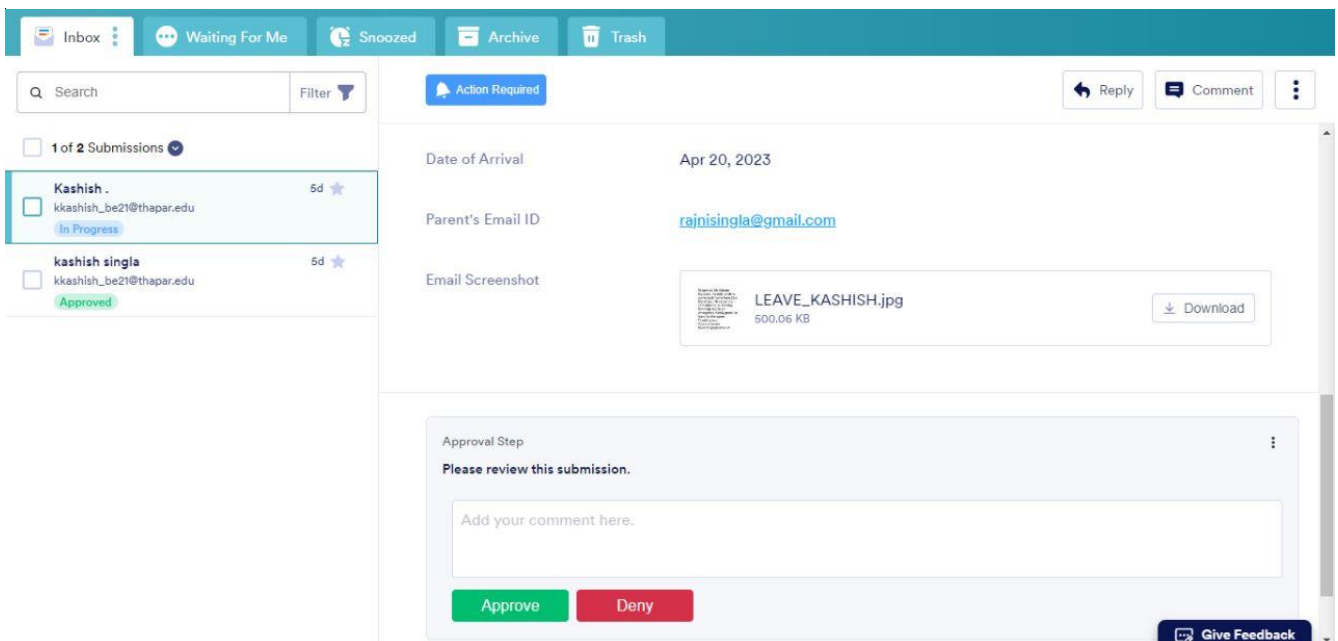
Address \*   
City  
State / Province

Date of Departure \*   
Date

Date of Arrival \*   
Date

Parent's Email ID \*

Email Screenshot \*  
 No file chosen  
Upload a screenshot verification of email sent by parent



Inbox Waiting For Me Snoozed Archive Trash

Search Filter

1 of 2 Submissions

☐ Kashish . 5d ★  
kkashish\_be21@thapar.edu  
In Progress

☐ kashish singla 5d ★  
kkashish\_be21@thapar.edu  
Approved

Action Required

Reply Comment

Date of Arrival Apr 20, 2023

Parent's Email ID [rajnisingla@gmail.com](mailto:rajnisingla@gmail.com)

Email Screenshot

LEAVE\_KASHISH.jpg  
500.06 KB

Approval Step

Please review this submission.

Add your comment here.




## PROFILE (Student)

HOME	ATTENDANCE	LEAVE APPLICATION	PROFILE	CONTACT	ABOUT US	LOGOUT
------	------------	-------------------	---------	---------	----------	--------

### PROFILE

Student Name	Chelsi
Roll Number	102117161
Email id	cchelsi_be21@thapar.edu
Date of Birth	01-Jan-2004
Phone Number	2147483647
Branch Year	2CS6
Room Number	431
Father's name	Amit
Father's contact	2147483647
Mother's name	Reena
Mother's contact	2147483647
City	Ludhiana

## PROFILE (Admin)


	HOME	ATTENDANCE	LEAVE APPLICATION	PROFILE	CONTACT	ABOUT US	LOGOUT
---	------	------------	-------------------	---------	---------	----------	--------

### PROFILE

Enter Roll Number

Submit

Thank you for choosing HACS. We look forward to help you out.  
Reach us at: [hacs@thapar@gmail.com](mailto:hacs@thapar@gmail.com)



## PROFILE

Enter Roll Number

Submit

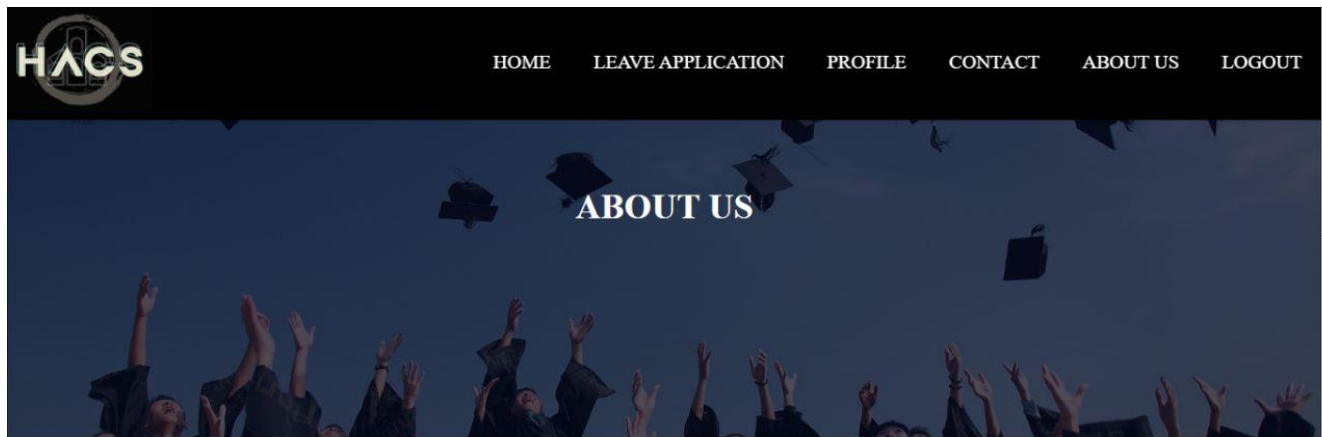
Student Name	raj
Roll Number	12
Email id	raj21@gmail.com
Date of Birth	09jan2003
Phone Number	9879877654
Branch Year	3
Room Number	432
Father's name	mokambo
Father's contact	8765432123
Mother's name	simran
Mother's contact	9876543213
City	delhi

Thank you for choosing HACS. We look forward to help you out.  
Reach us at: [hacs.thamr@gmail.com](mailto:hacs.thamr@gmail.com)





## ABOUT US



### HACS

We are a team dedicated to provide an efficient and reliable attendance tracking services as well as maintaining hostel records among various other facilities.

We understand the importance of maintaining accurate records for the safety and security of our users. We take pride in providing exceptional services and constant support. Our team is always on the line to address your concerns and queries.

[HOME](#)

### HOSTEL Q

It's a newly constructed hostel with cutting edge housing facilities like 24-hour wifi network, power and water supply. It has internationally recognised food service.

The hostel is located among serene and peaceful place surrounded by lush trees, blooming flowers, peacocks and chirping birds.



## What Students Say

Reviews from some of our HACS website users regarding the website as well as hostel facilities.

**Drishti Agarwal**  
★★★★★

The website has clean and modern design with user-friendly interface. The system performed good in terms of providing intended functions about the hostel. Cleaning services are maintained properly and I recommend students to stay in this hostel.

**Shatakshi Saxena**  
★★★★★

I appreciate the work done by the developers to maintain this website, the website is well maintained and reliable, navigation is easy. Moreover, the hostel facilities are good and I would recommend this university to other people as well.

**Kashish**  
★★★★★

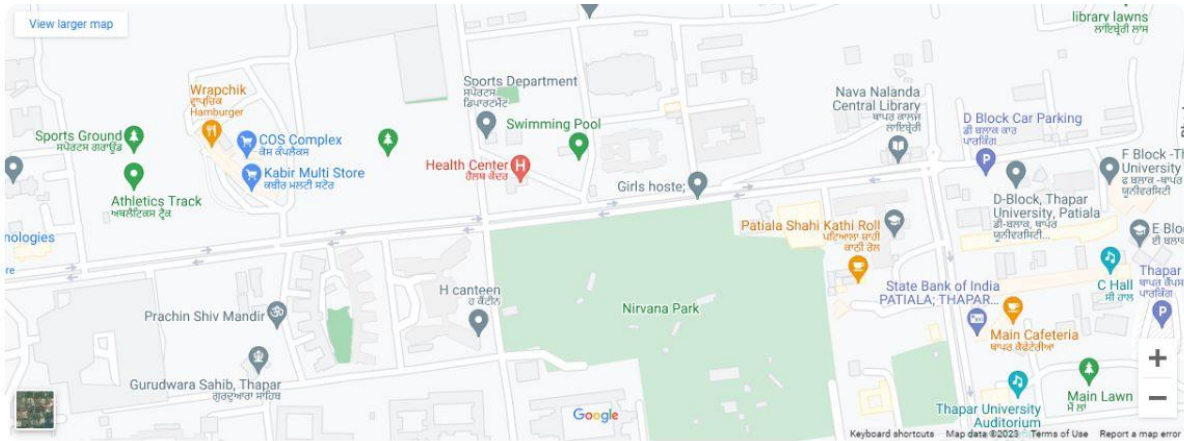
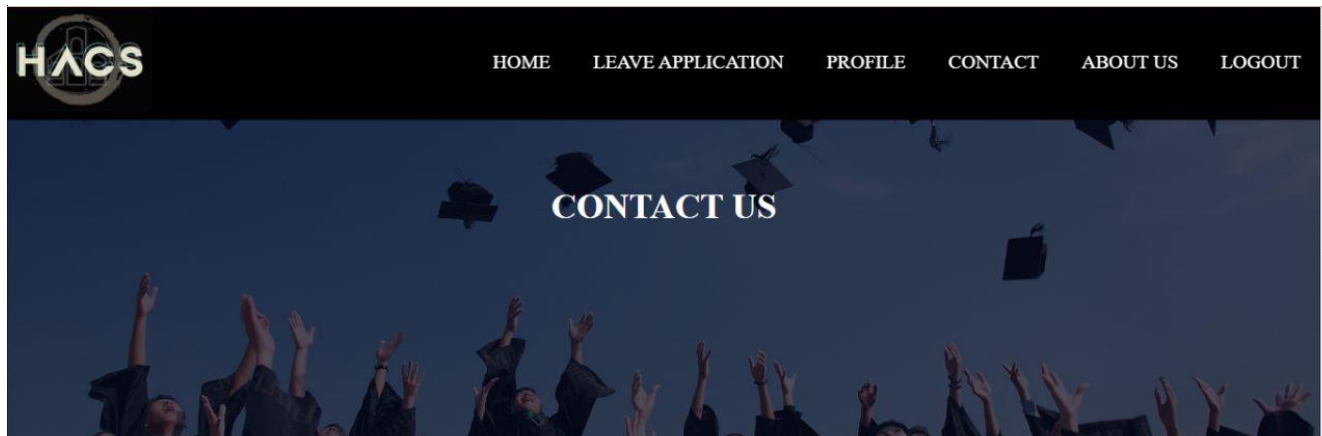
HACS is a solid choice for tracking attendance of students, it is user friendly and has extensive review section. The hostel looks nice as well in the videos provided. The system was efficient in terms of saving time and efforts.

**Chelsi**  
★★★★★

The website provides insights of the hostel and it has an easy-to-go feature of applying leave without the manual work. The support provided by the team is commendable. Staff and admin make our stay quite easy.

Thank you for choosing HACS. We look forward to help you out.  
Reach us at: [hacs.thanar@gmail.com](mailto:hacs.thanar@gmail.com)

## CONTACT



 **Hostel Q**  
Thapar Institute of Engineering and Technology,  
Patiala

**Wardens**  
Dr. Anju Bala 8288008175  
Dr. Parmita Roy 9988034083

 **Day Caretakers**  
Mr. Gurdit Singh 9877515904  
Mr. Amit Kumar 9888911208  
Mrs. Karamjeet Kaur 8725903967

**Night Caretakers**  
Mrs. Dilpreet Kaur 7986971106  
Mrs. Pooja 9988814753

 Warden: wardenq@thapar.edu  
Caretaker: caretaker.q@thapar.edu  
DOSA: dosa@thapar.edu

## ATTENDANCE (Admin)

# HACS Face Recognition Based Attendance System

Saturday, 22 April 2023

16:22:37

### Today's Attendance

**Take Attendance** ✓

S. No.	Name	ID	Time
--------	------	----	------

### Add New Student

Enter Student Name\*

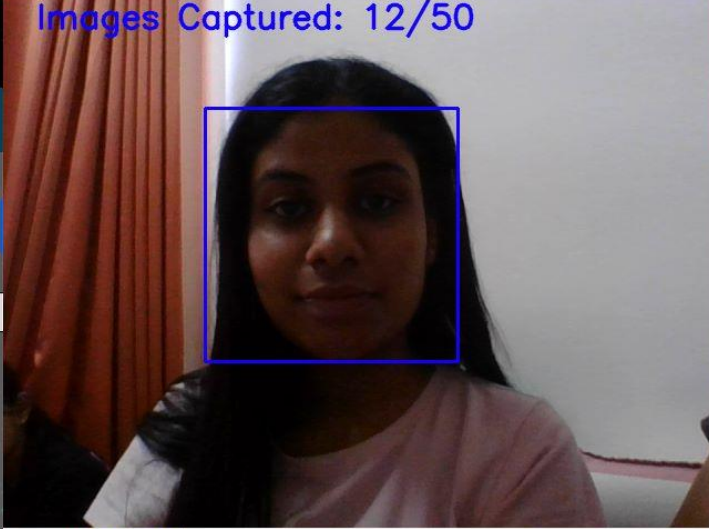
Enter Student Id\*

**Add New Student**

Total Students in Database: 1

Adding new User

Images Captured: 12/50



(x=382, y=91) ~ R:24 G:28 B:39

### Add New Student

Enter Student Name\*

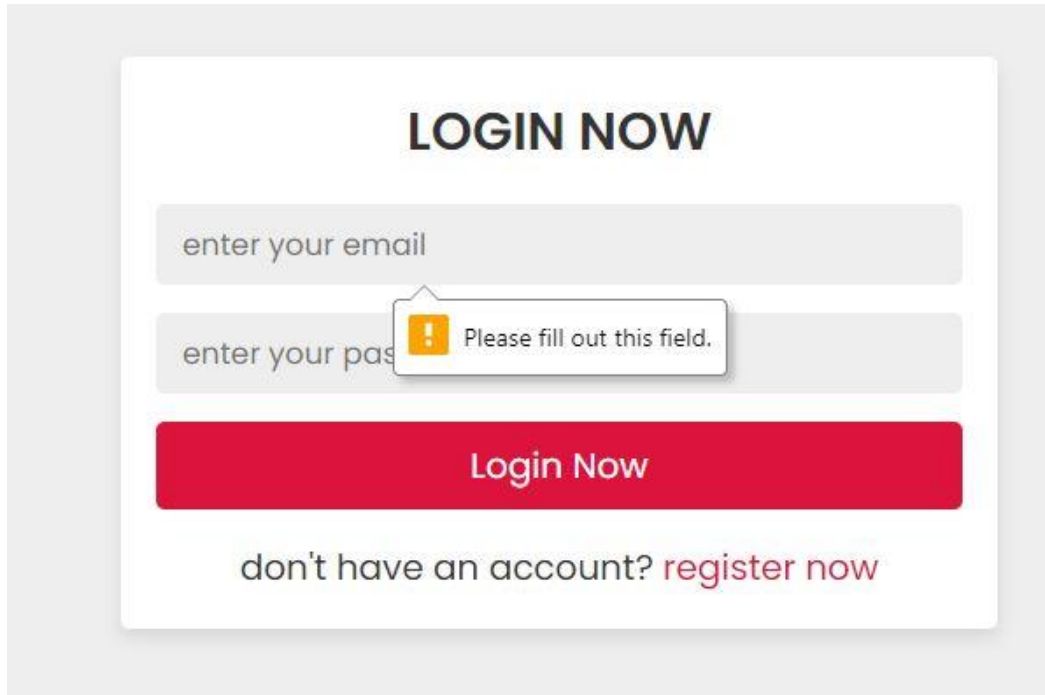
Enter Student Id\*

**Add New Student**

Total Students in Database: 1

## Test Plans

### LOGIN



**LOGIN NOW**

enter your email

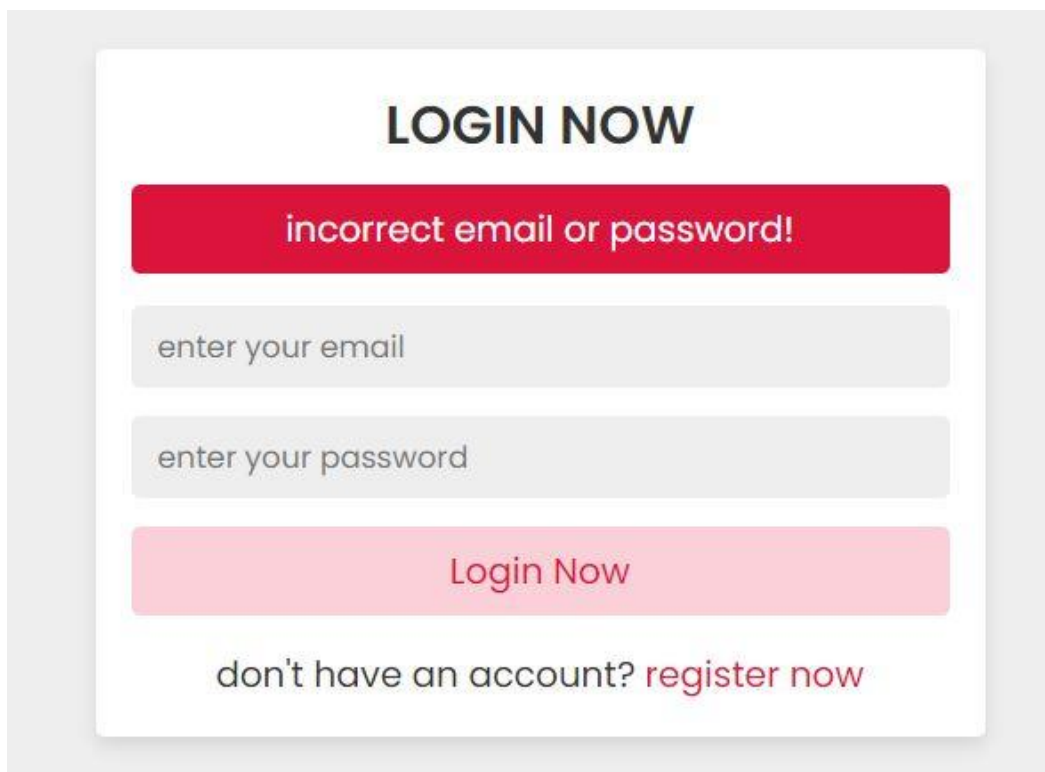
enter your password

Please fill out this field.

Login Now

don't have an account? [register now](#)

This screenshot shows a login form titled "LOGIN NOW". It features two input fields: "enter your email" and "enter your password". A validation error message, "Please fill out this field.", is displayed above the password field, indicating it is empty. Below the fields is a red "Login Now" button. At the bottom, there is a link "register now" for users who do not have an account.



**LOGIN NOW**

incorrect email or password!

enter your email

enter your password

Login Now

don't have an account? [register now](#)

This screenshot shows the same login form after an unsuccessful login attempt. A red error message, "incorrect email or password!", is displayed at the top. The "Login Now" button is now light red, indicating it is disabled. The input fields and the "register now" link remain visible.

## REGISTER NOW

Kashish

enter your email

enter your roll



Please fill out this field.

## REGISTER NOW

Shatakshi

ssaxena|



Please include an '@' in the email address. 'ssaxena' is missing an '@'.



## REGISTER NOW

password not matched!

enter your name

enter your email

enter your roll Number

enter your password

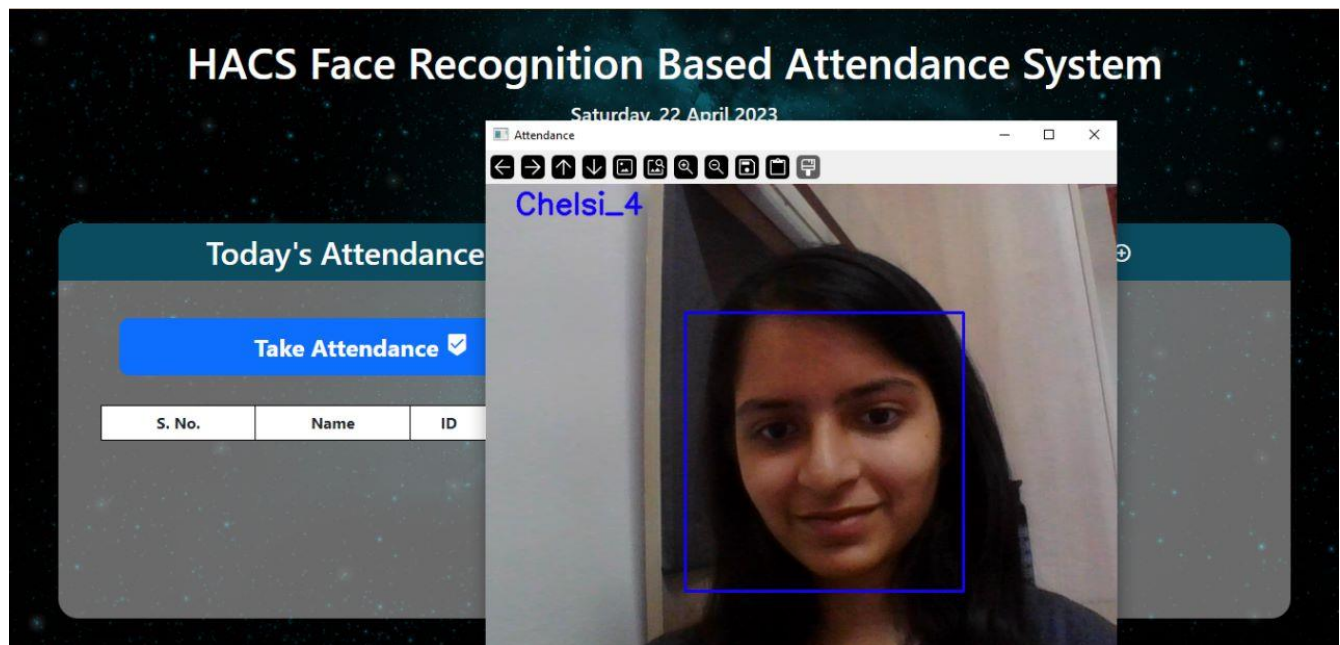
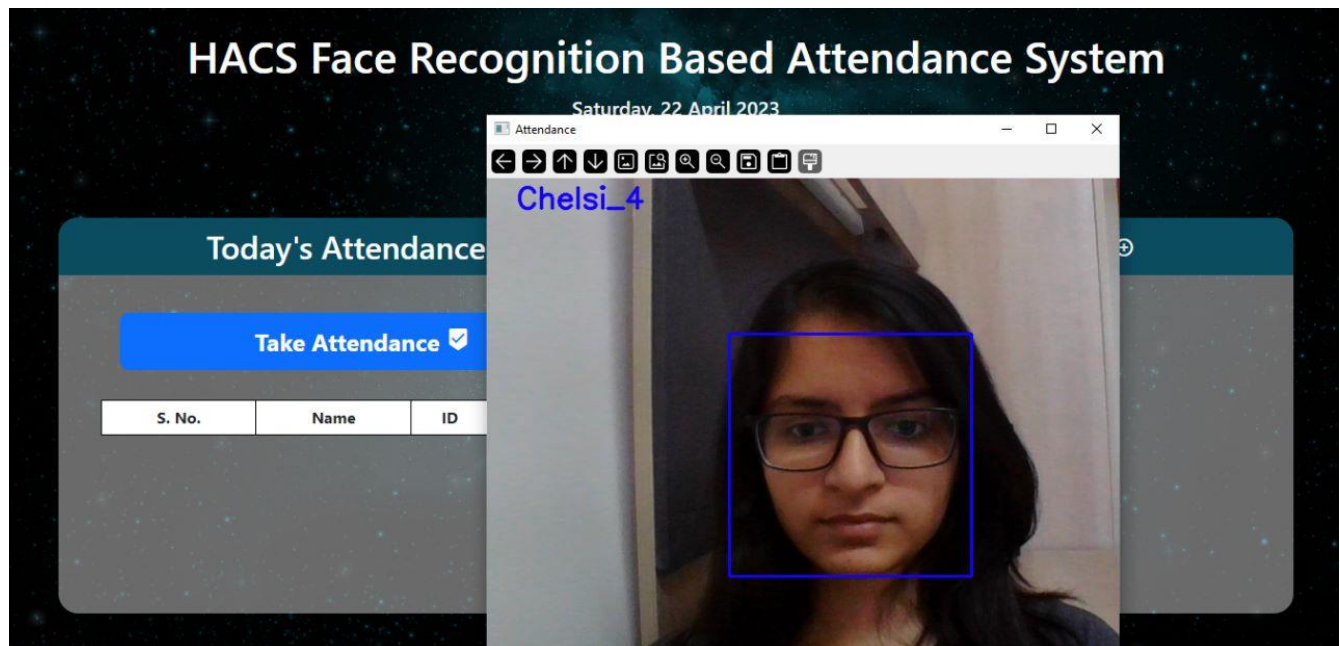
confirm your password

## LEAVE

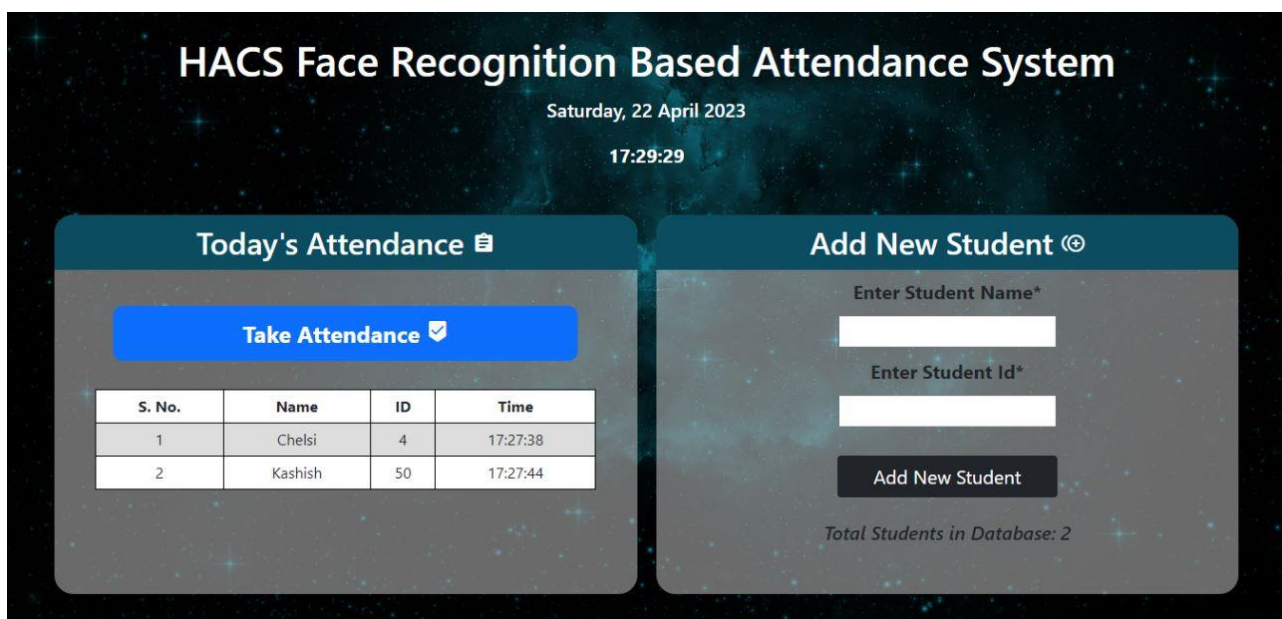
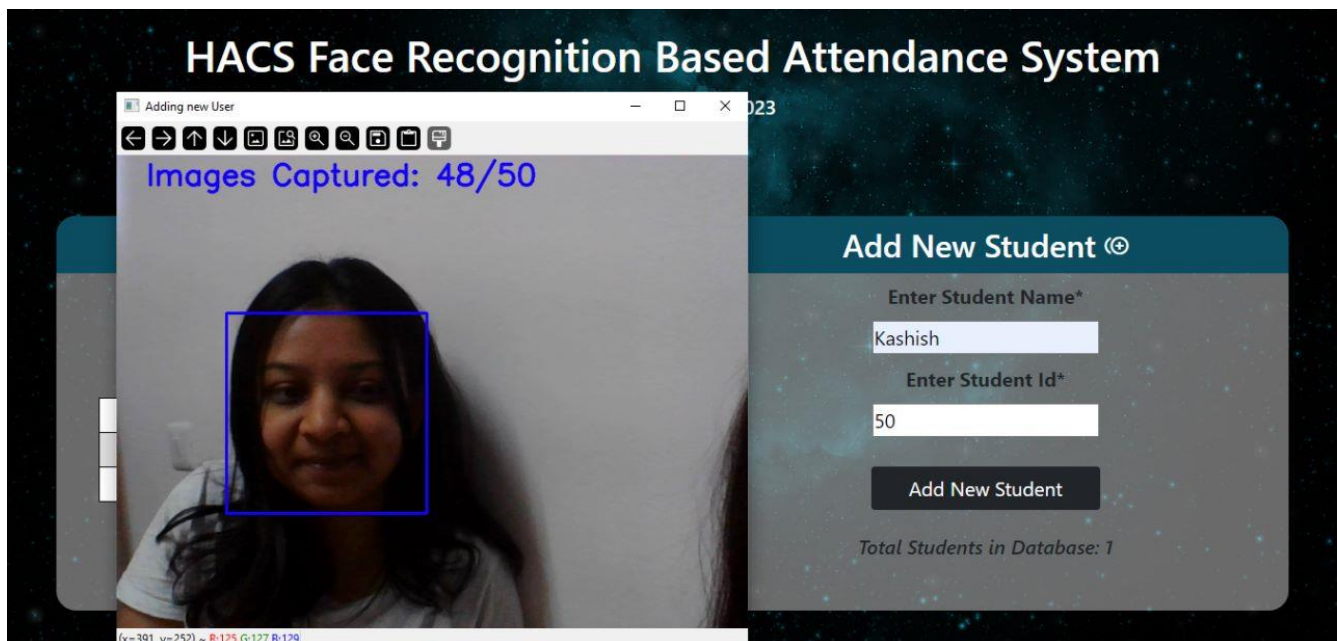
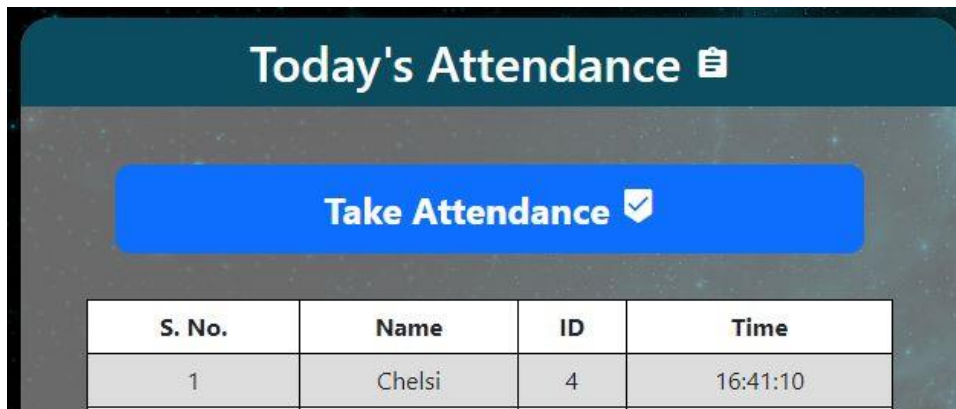
### Apply for a Leave

Full Name *	kashish	.
	First Name	Last Name
E-mail *	kkashish_be21	Enter a valid e-mail address
Roll Number *	abc	This field can only contain numeric values
	Roll Number	
Room Number *		This field is required.
	Room Number	
Student's Contact *	8765567843	
Parent's Contact *	9876545__	Field value must fill mask.
Address *	Ludhiana	
	City	
	Punjab	
	State / Province	
Date of Departure *	22-04-2023	
	Date	
Date of Arrival *	24-04-2023	
	Date	
Parent's Email ID *	abc@gmail.com	Free email accounts are not allowed
	example@example.com	
Email Screenshot *	Choose File testimonial-k.jpg	
Upload a screenshot verification of email sent by parent		
SUBMIT		
There are errors on the form. Please fix them before continuing.		

## ATTENDANCE







## Test Cases:

### Test Case - Register

Test Case #: 1

Test Case Name: Register user

Page 1 of 1

System: HACS

Subsystem: Register User

Designed By: Chelsi

Design Date: 20-03-2023

Executed By: Kashish

Execution Date: 20-04-2023

Short Description: Register new user.

#### Pre-Conditions:

The system shows interface to register user.

Step	Action	Expected System Response	Pass/Fail	Comment
1.	Submit with all details in correct format.	The system will store the user details and register user.	Pass	
2.	Submit without filling all fields.	The system should alert the user to fill all fields.	Pass	
3.	Submit email id without putting @ or dot (.) extension.	The system should raise an error.	Pass	
4.	Submit form with numerals in name.	The system should alert the user to put alphabets only.	Fail	User name should only be alphabetical.
5.	Submit form with alphabets in roll no.	The system should ask to only put integer values.	Pass	
6.	Submit form with different values in password and confirm password fields.	The system should alert user to input valid password.	Pass	

#### Post-Conditions:

The user is registered and all details are stored in database.

## Test Case - Login

Test Case #:2

Test Case Name: Login

Page 1 of 1

System: HACS

Subsystem: Login

Designed By: Shatakshi

Design Date: 20-03-2023

Executed By: Drishti

Execution Date: 20-04-2023

Short Description: Multi-login interface with option to register new user.

### Pre-Conditions:

The user is registered in order to login.

The user has valid email id and password.

Step	Action	Expected System Response	Pass/Fail	Comment
1.	Submit with correct user email and password.	The system will match details with database and authenticated user will be logged in.	Pass	
2.	Submit without filling email id.	The system should alert the user to fill email id.	Pass	
3.	Submit without filling password.	The system should alert the user to fill password.	Pass	
4.	Submit with incorrect details.	The system should ask the user to input valid details.	Pass	
5.	Submit email id without putting @ or dot (.) extension.	The system should raise an error.	Pass	

### Post-Conditions:

The user is registered and all details are stored in database.

The user is successfully logged in and can access all features.

## Test Case - Attendance

**Test Case #:** 3

**Test Case Name:** Add Student & Mark Attendance

**Page 1 of 1**

**System:** HACS

**Subsystem:** Attendance

**Designed By:** Kashish

**Design Date:** 22-03-2023

**Executed By:** Chelsi

**Execution Date:** 20-04-2023

**Short Description:** Add student for attendance database and mark attendance.

### Pre-Conditions:

The admin is logged in.

The system shows interface for adding new student details- name and id.

The system shows interface for take attendance.

The camera is working properly and web server has access to it.

Step	Action	Expected System Response	Pass/Fail	Comment
1.	Submit student name and id.	The system will record facial data by accessing camera and store it in database.	Pass	
2.	Submit without filling name.	The system should alert the admin to fill name.	Pass	
3.	Submit without filling id.	The system should alert the admin to fill id.	Pass	
4.	Take attendance option chosen.	The system verifies student face with its database and update attendance status.	Pass	
5.	Attendance being taken for person whose database is not present.	System should not record attendance.	Pass	
6.	Attendance being taken by multiple persons.	System should record attendance of all present users.	Pass	
7.	Attendance being taken by person who is already marked present.	System should not update time in that student's attendance.	Pass	
8.	Attendance being taken by person without spectacles.	System should recognise and mark attendance.	Pass	
9.	Attendance being taken by person wearing mask.	System should recognise and mark attendance.	Fail	System doesn't recognise.

### Post-Conditions:

New student database is being stored.

Facial data is stored along with name and id.

Daily attendance being marked is shown on interface.

Previous attendance is available in .csv files.

The model is trained to recognize students as per database.

## Test Case – Leave Application

**Test Case #:** 4

**Test Case Name:** Leave Application (Student)

**Page 1 of 1**

**System:** HACS

**Subsystem:** Leave Application

**Designed By:** Drishti

**Design Date:** 26-03-2023

**Executed By:** Shatakshi

**Execution Date:** 20-04-2023

**Short Description:** Student can apply for leave application by providing valid details.

### Pre-Conditions:

The student is logged in.

The system shows interface to enable student to apply for leave.

Step	Action	Expected System Response	Pass/Fail	Comment
1.	Submit form with all correct details.	The system should show application submission confirmation message.	Pass	
2.	Submit without filling some fields.	The system should alert the student to fill all fields.	Pass	
3.	Submit email id without putting @ or dot (.) extension.	The system should alert the student to fill valid email-id.	Pass	
4.	Submit form with name as numerals.	The system should raise an error.	Fail	System should only allow user to fill alphabets.
5.	Submit form with alphabets in roll number.	The system should alert the student to only fill numerals.	Pass	
6.	Submit form with contact digits less than and more than 10.	The system should ask the student to only input 10 digits.	Pass	
7.	Submit form with dates in past.	The system should not allow the user to input dates in past.	Pass	
8.	Submit form with free email addresses as input.	The system should alert the student to fill valid email-id.	Pass	

### Post-Conditions:

Leave is applied with student details.

Student receives email to confirm that leave application is applied successfully.

Student receives email about updated application status (Approve/Deny) after admin takes action on it.

## **5 Change History**

431433	Version 1.0 – Initial Release

## **6 Document Approvers**

SRS for HACS (Hostel Attendance Coordination System) approved by:

---

**Ms. Arwinder Dhillon**

**Designation: Lecturer Contractual (S)**

**Date: 24.02.2023**