Progressive Education Society's

Modern College of Arts, Science and Commerce

(Autonomous)

Shivajinagar, Pune - 411005

"Attendance Management System Using Face Recognition "

Submitted by

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Certificate

This is to certify that the Project Entitled

"Attendance Management System Using Face Recognition"

SUBMITTED BY

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is a bonafide work carried out by Students under the supervision of ***Prof. Manisha Suryavanshi*** *and it is submitted towards the partial fulfillment of the requirement of M.Sc.(Computer Science) sem II Academic Year 2022-23.*

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Place : Modern College of Arts, Science and Commerce (Autonomous) Shivajinagar

Date : 23/05/2023

Abstract

This project will develop an attendance management system using face recognition technology. The system will automate the process of taking attendance, making it more efficient and accurate. Students can simply scan their faces to mark their attendance, which eliminates the need for teachers to manually take attendance. This can save teachers time and improve the accuracy of attendance records.

The project is expected to realize the following benefits:

- **Increased efficiency:** Teachers will save time by automating the process of taking attendance.
- **Improved accuracy:** Attendance records will be more accurate, as they will not be subject to human error.
- **Reduced workload**: Teachers will have less work to do, as they will not need to manually take attendance.
- **Increased security:** Face recognition systems can be used to prevent unauthorized access to facilities

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It gives us a great pleasure and satisfaction in presenting this report on our project **"Attendance Management System Using Facec Recognition ".** We would like to express our special thanks of gratitude and appreciation to all those who gave us the opportunity to complete this report. we are very grateful to our college and our Head of Department **Prof. Shamkant S. Deshmukh**.

Special thanks to our project guide **Prof. Manisha Suryawanshi** for giving us the golden opportunity to do this wonderful project on the topic "Attendance management system using face recognition", which also helped us to enhance our knowledge whose help, suggestions and encouragement helped us in all the time of fabrication process and in writing this report. We also sincerely thanks for the time spent proofreading and correcting our many mistakes

We thank with all our heart and express our honor and deep gratitude to all the staff members of the Computer Science Department for helping us in every way possible for them.

We would like to thank all those, who have directly or indirectly helped us in the completion of thework during this project work.

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Introduction

Project Title: Attendance System Using Face Recognition.

This project will develop an attendance management system using face recognition technology. The system will automate the process of taking attendance, making it more efficient and accurate. Students can simply scan their faces to mark their attendance, which eliminates the need for teachers to manually take attendance. This can save teachers time and improve the accuracy of attendance records.

The objectives of this project are to:

- Develop an attendance management system using face recognition for schools and colleges.
- Automate the attendance taking process.
- Provide real-time attendance data.
- Track student and staff attendance.
- Identify any attendance problems.

Project Scope:

The scope of this project includes the development of the following:

- A face recognition system that can accurately identify students and staff.
- An attendance management system that can automatically mark attendance based on face recognition data.

A real-time attendance dashboard that can be used to track student and staff attendance

Problem Definition

The problem definition for an attendance management system using face recognition is as follows:

- **Problem:** Traditional attendance management systems are time-consuming and labor-intensive. They require teachers to manually take attendance, which can lead to errors and missed attendance.
- **Symptoms:** Teachers spend a significant amount of time taking attendance. Attendance is often inaccurate, due to human error. Students may miss attendance due to forgetfulness or other reasons.
- **Root Cause:** Traditional attendance management systems are based on manual processes.
- **Solution:** A face recognition-based attendance management system can automate the process of taking attendance, making it more efficient and accurate. Students can simply scan their faces to mark their attendance, which eliminates the need for teachers to manually take attendance. This can save teachers time and improve the accuracy of attendance records.
- **Benefits:** A face recognition-based attendance management system can provide the following benefits:

- **Increased efficiency:** Teachers can save time by automating the process of taking attendance.
- **Improved accuracy:** Attendance records will be more accurate, as they will not be subject to human error.
- **Reduced workload:** Teachers will have less work to do, as they will not need to manually take attendance.
- **Increased security:** Face recognition systems can be used to prevent unauthorized access to facilities.

A face recognition-based attendance management system can be a valuable tool for schools and businesses. It can help to improve efficiency, accuracy, and security.

Need For Computerised System

- **Accuracy:** Manual attendance taking is prone to errors, such as human mistakes in recording attendance or students clocking in for other students. Face recognition is a more accurate way to mark attendance, as it can identify individuals based on their facial features.
- **Efficiency:** Manual attendance taking can be time-consuming, especially for large schools with a large number of students. Face recognition can automate the attendance process, saving time and effort for students and administrators.
- **Security:** Face recognition provides a more secure way to mark attendance than manual attendance taking. It is difficult for students to impersonate others when using face recognition, as the system can identify individuals based on their facial features.

computerization of the attendance management system using face recognition can provide a number of benefits, including accuracy, efficiency, and security. These benefits can help schools improve their attendance management process and save time and money.

In addition to the above benefits, computerization of the attendance management system can also provide the

following benefits:

- **Improved data security:** Computerized systems can be more secure than manual systems, as they are less susceptible to human error and fraud.
- **Increased efficiency:** Computerized systems can automate many of the tasks involved in attendance management, such as recording attendance and generating reports. This can free up time for administrators to focus on other tasks.
- **Improved decision-making:** Computerized systems can provide administrators with more data to make informed decisions about attendance policies and procedures. This can help to improve student attendance and academic performance.

computerization of the attendance management system can provide a number of benefits for schools. These benefits can help to improve efficiency, accuracy, security, and decision-making.

Database Design

Table 1:

1 Messages | 2 Table Data | 3 Info

fname	lname	contact	email	password
abc	abc	1234567890	abc@gmail.com	1234
Ajay	chirmade	4567891230	ajay@gmail.com	1234
asd	asd	7894561230	asd@gmail.com	1234
dur	chd	5769842310	dur@gmail.com	12346
Durgesh	Chirmade	8796779701	durgesh@gmail.com	dur@123
qwe	qwe	7894563210	qwe@gmail.com	1234
(NULL)	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*

Database: face_recognition **Table**: register

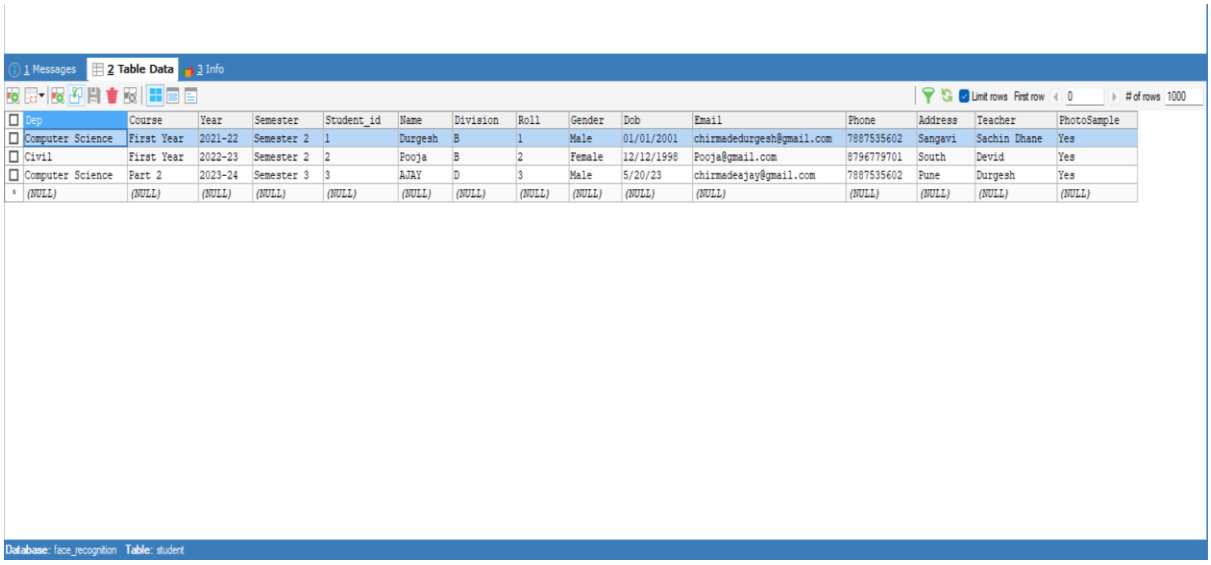
Table 2:

1 Messages | 2 Table Data | 3 Info

id	roll	name	department	time	date	attendance
1	1	Durgesh	Computer Science	19:15:07	14-04-2023	Present
101	1	Durgesh	Computer Science	19:15:07	14-04-2023	Present
102	1	Durgesh	Computer Science	09:22:31	21/05/2023	Present
2	2	Pooja	Civil	09:22:38	21/05/2023	Present
(NULL)	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*

Database: face_recognition **Table**: stdattendance

Table 3:



1 Messages | 2 Table Data | 3 Info

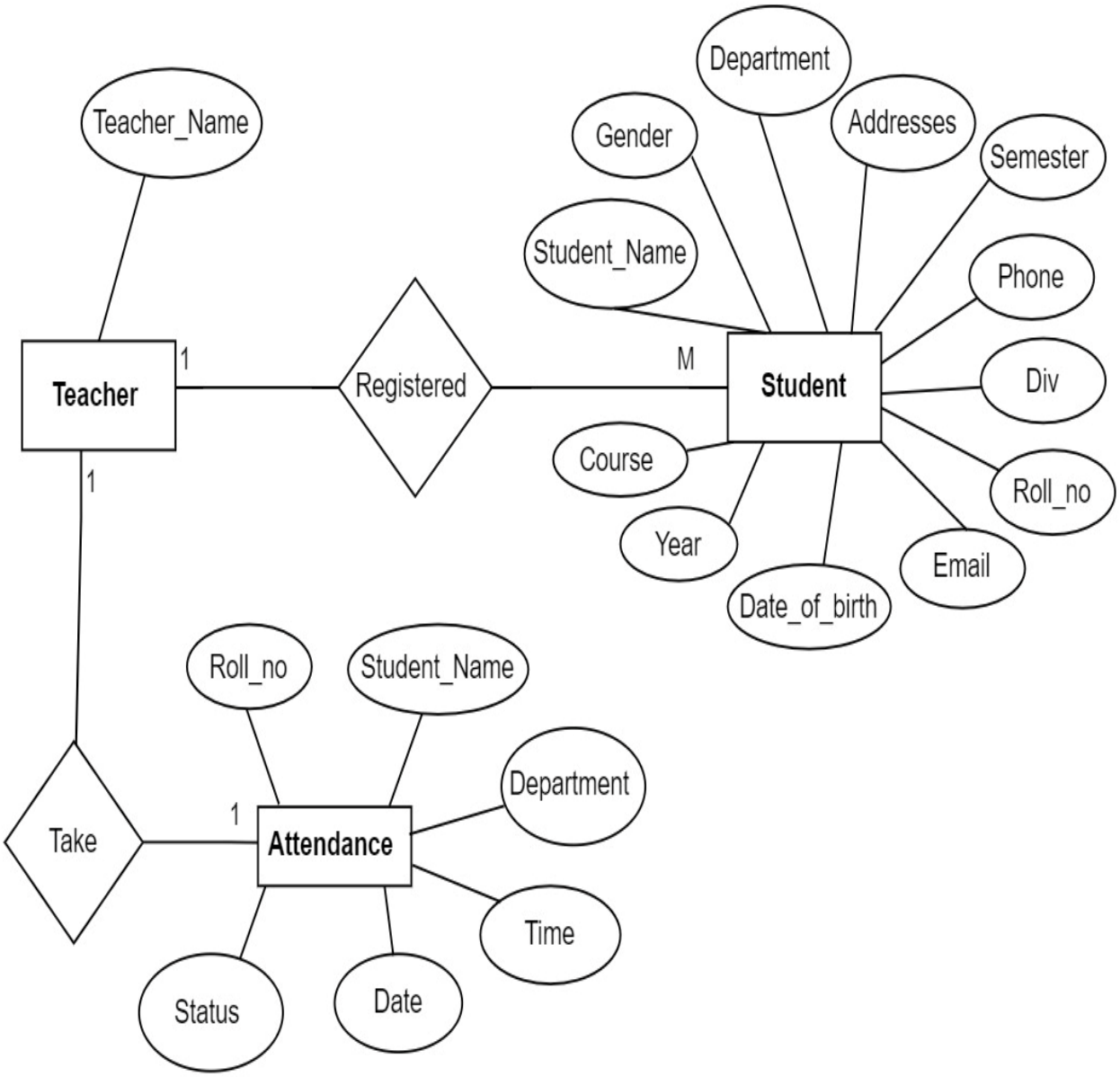
Limit rows First row 0 # of rows 1000

Dep	Course	Year	Semester	Student_id	Name	Division	Roll	Gender	Dob	Email	Phone	Address	Teacher	PhotoSample
Computer Science	First Year	2021-22	Semester 2	1	Durgesh	B	1	Male	01/01/2001	chirmadedurgesh@gmail.com	7887535602	Sangavi	Sachin Dhane	Yes
Civil	First Year	2022-23	Semester 2	2	Pooja	B	2	Female	12/12/1998	Pooja@gmail.com	8796779701	South	Devid	Yes
Computer Science	Part 2	2023-24	Semester 3	3	AJAY	D	3	Male	5/20/23	chirmadeajay@gmail.com	7887535602	Pune	Durgesh	Yes
(NULL)	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*	*(NULL)*

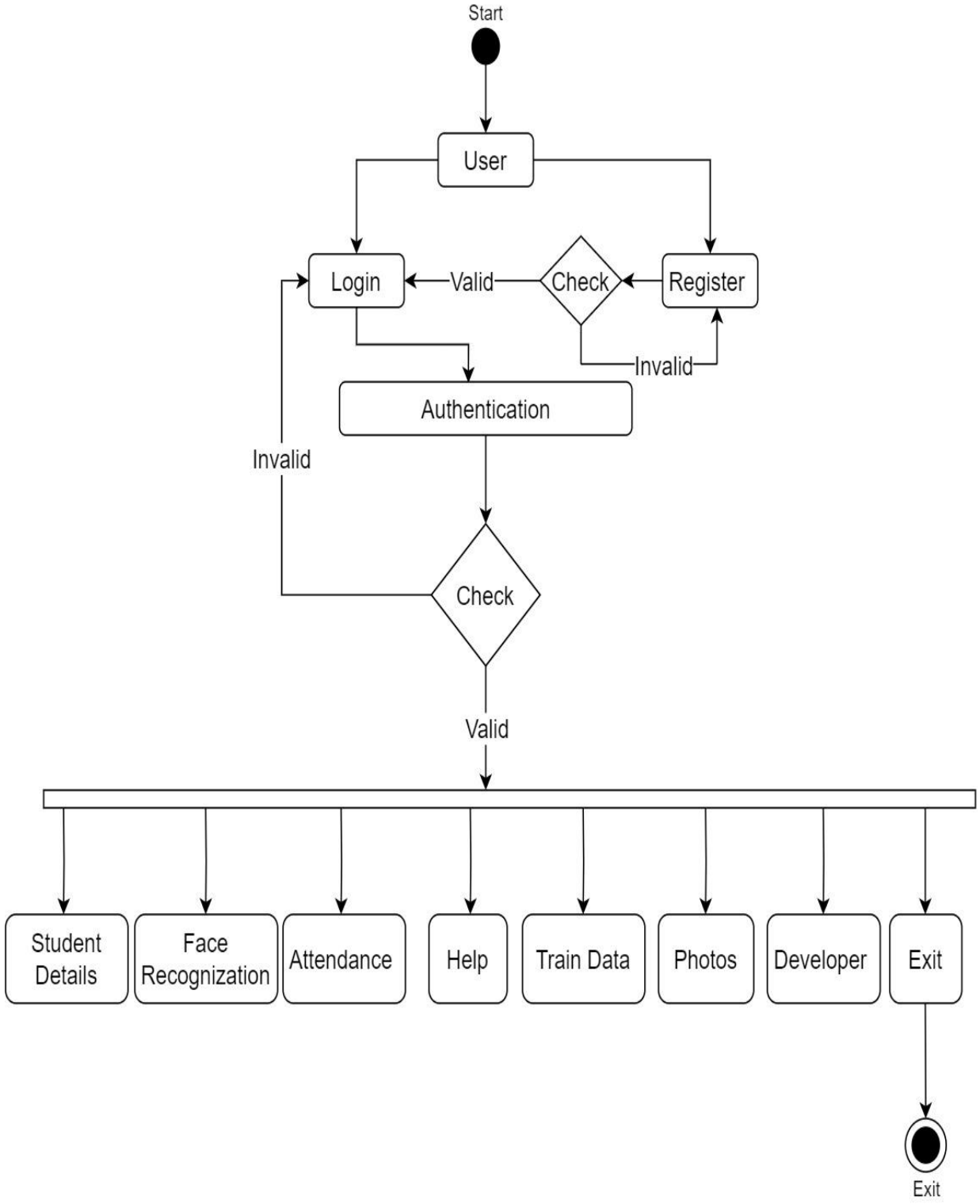
Database: face_recognition Table: student

Design Analysis

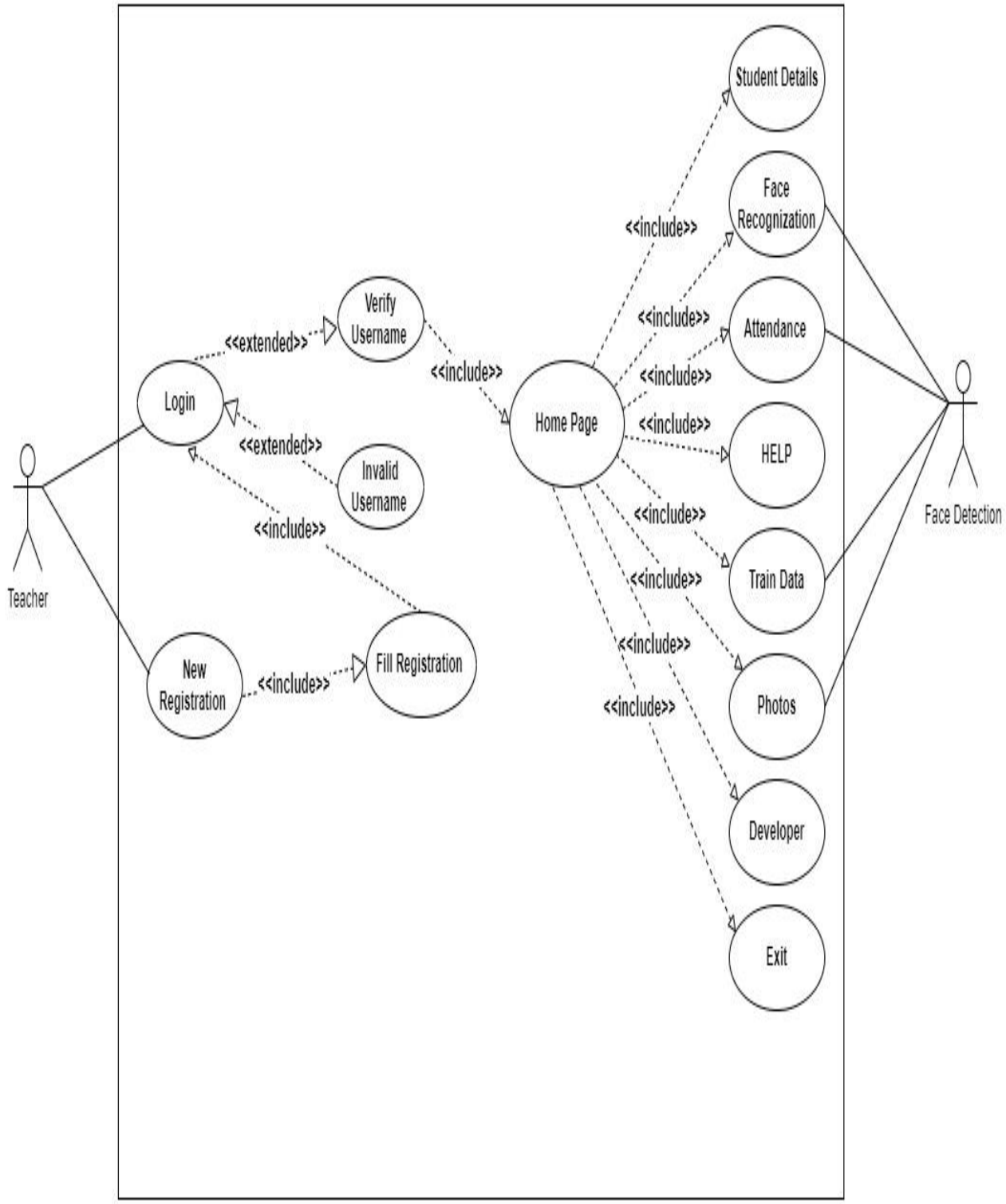
5.1 ER Diagram:



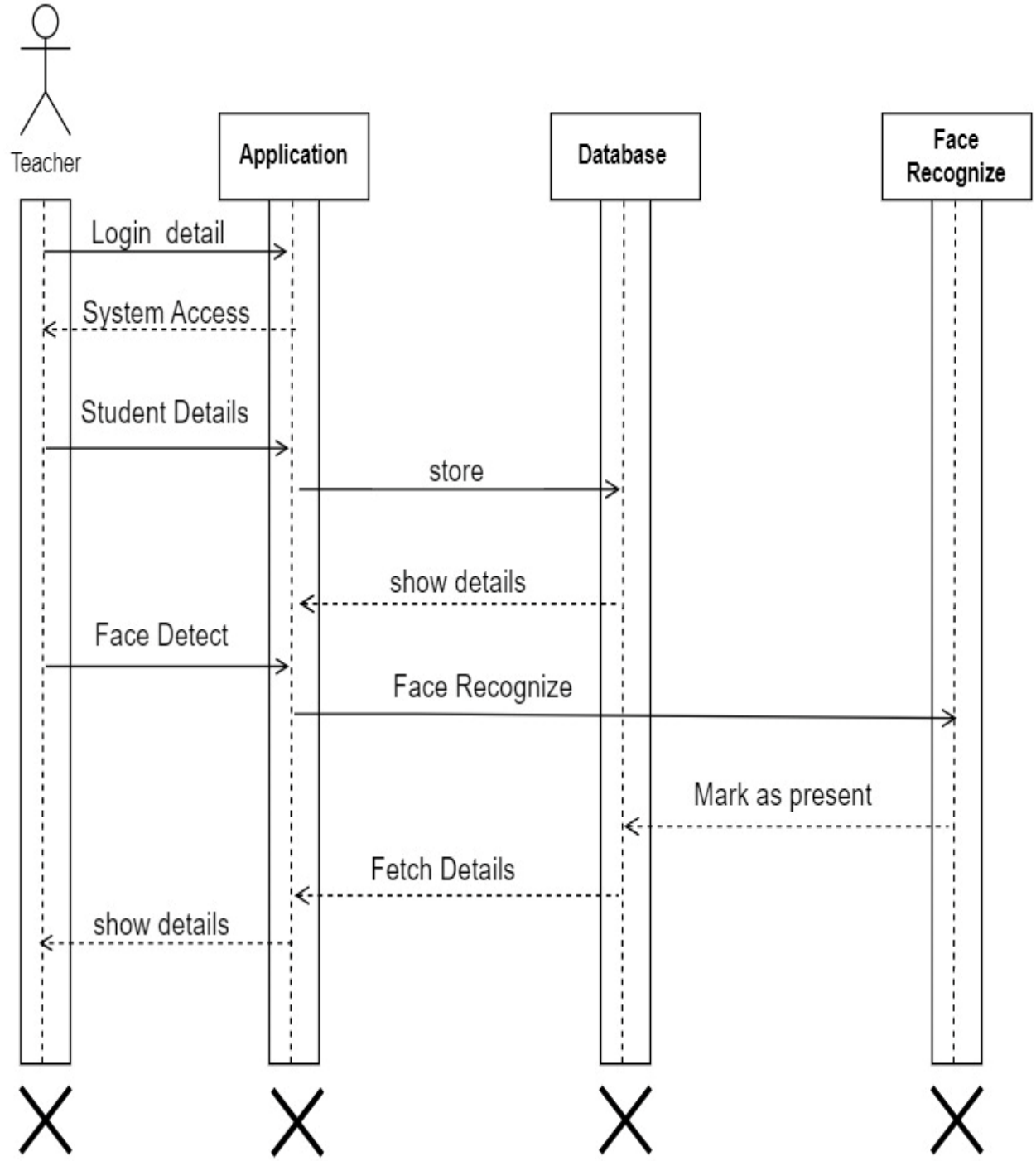
5.2 Activity Diagram



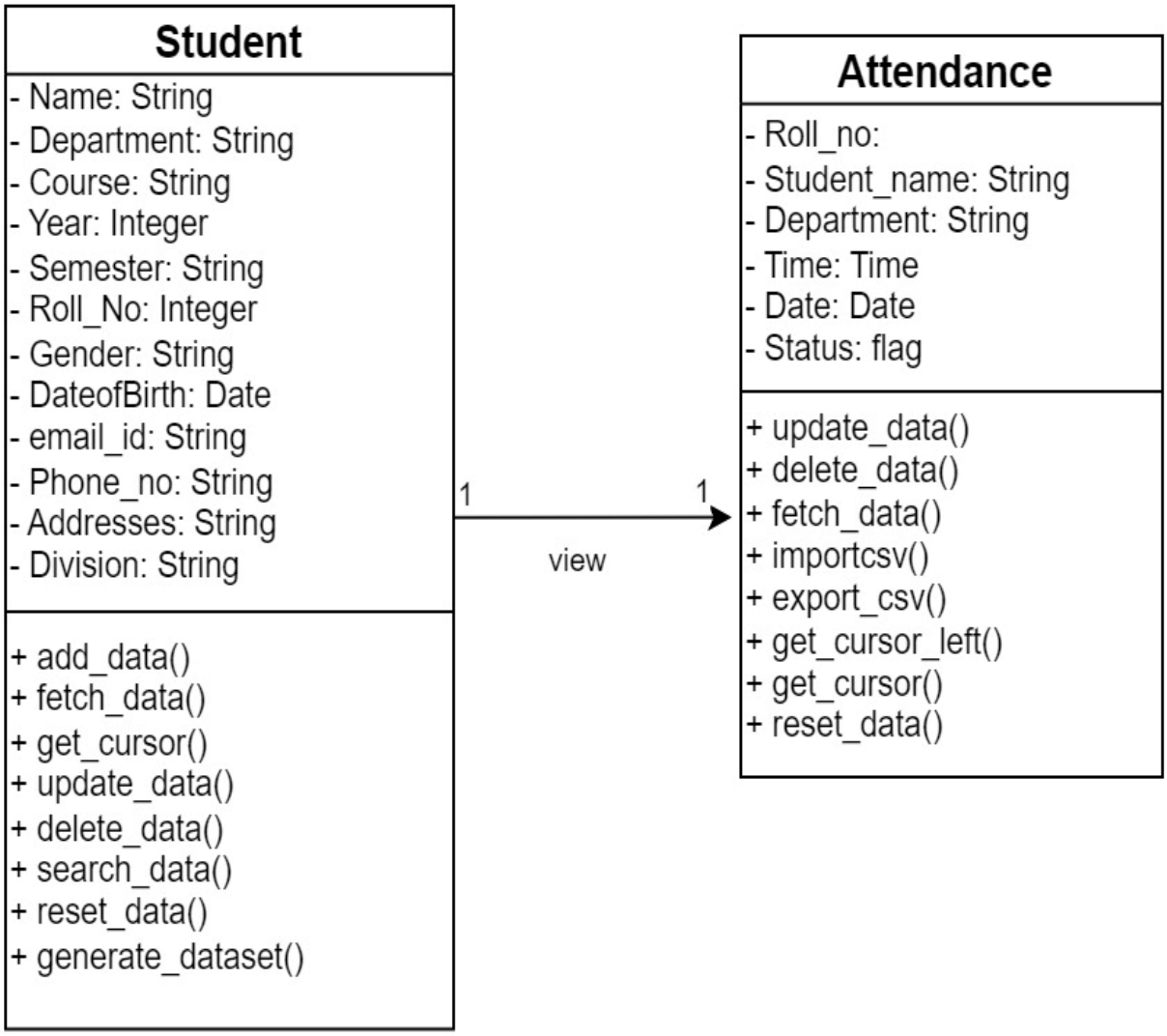
5.3 Use Case Diagram



5.4 Sequence Diagram



5.5 Class Diagram



Proposed System

The proposed system will be a face recognition attendance system that will be developed using Python and the OpenCV library. The system will be able to recognize faces from a database of known faces and mark attendance accordingly. The system will also be able to generate reports on attendance.

The system will be composed of the following components:

- A computer with a webcam.
- The Python programming language.
- The OpenCV library.
- A database of known faces.

The system will work as follows:

1. The student will enter the classroom and stand in front of the webcam.
2. The system will capture the student's face and compare it to the faces in the database.
3. If the system finds a match, the student's attendance will be marked.
4. If the system does not find a match, the student's attendance will be marked as absent.

The system will also be able to generate reports on attendance. These reports can be used by administrators to track student attendance and to identify students who are absent frequently.

The proposed system will be a valuable tool for schools and colleges that need to manage attendance. The system will improve accuracy, efficiency, and security, and it will help to reduce administrative workload.

System Requirements

8.1 Hardware Specification

- i3 Processor Based Computer or higher
- Memory: 1 GB RAM
- Hard Drive: 50 GB
- Monitor
- Internet Connection

8.2 Software Specification

- Ide: Pycharm
- Languages: Python
- Database: MS SQL Server

Advantages

The advantages of an attendance management system using face recognition for schools and colleges are as follows:

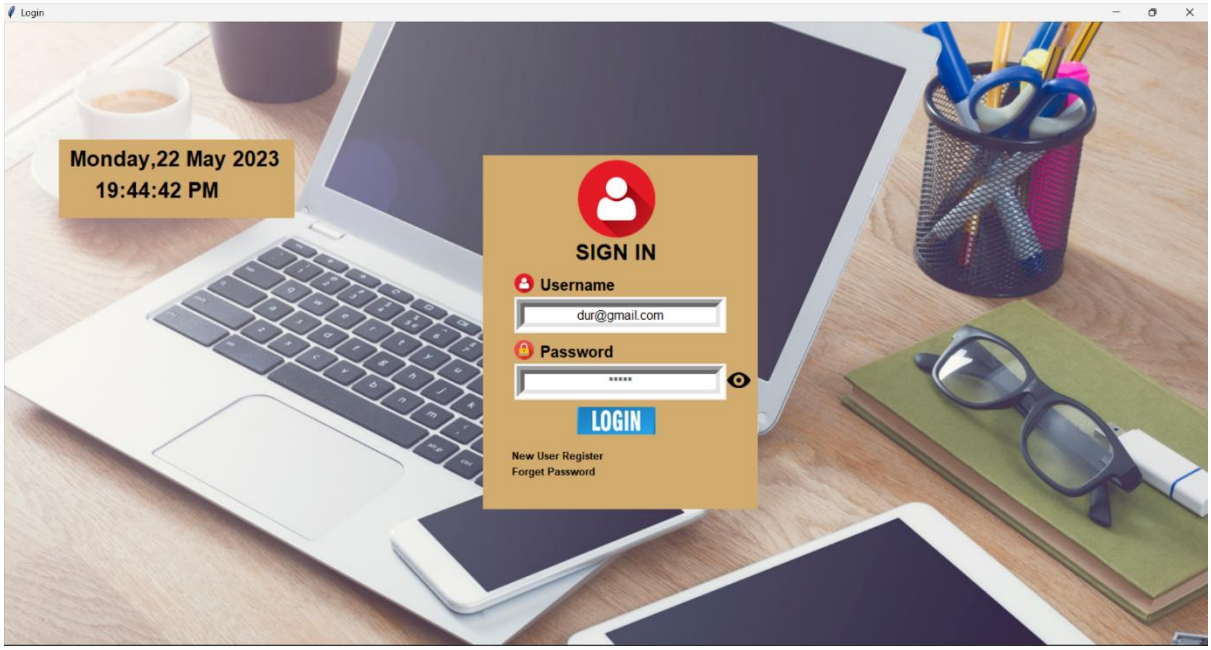
- **Automated attendance taking:** The system will automatically mark attendance for students and staff, eliminating the need for manual attendance taking. This will save time and money, and it will also reduce the risk of errors.
- **Real-time attendance data:** The system will provide real-time attendance data, which can be used to track student and staff attendance and identify any attendance problems. This information can be used to improve student and staff attendance, and it can also be used to identify students who may be at risk of dropping out.
- **Improved student and staff attendance:** The system will help to improve student and staff attendance by making it easier for them to mark their attendance. This is especially beneficial for students who are absent frequently, as it will help them to stay on track with their studies.
- **Increased security:** The system can help to increase security by preventing unauthorized access to school or college facilities. This is because the system can only be accessed by authorized users who have been granted access by the system administrator.

- **Improved data security:** The system can help to improve data security by encrypting all attendance data. This will help to protect the data from unauthorized access or tampering.
- **Reduced administrative workload:** The system can help to reduce the administrative workload by automating many of the tasks associated with attendance management. This will free up administrators to focus on other tasks, such as improving student learning.
- **Improved communication:** The system can help to improve communication between students, staff, and administrators by providing a centralized location for attendance data. This will make it easier for everyone to stay up-to-date on attendance information.
- **Enhanced efficiency:** The system can help to enhance efficiency by streamlining the attendance management process. This will save time and money, and it will also improve the accuracy of attendance data.
- **Improved decision-making**: The system can help to improve decision-making by providing administrators with real-time data about student and staff attendance. This information can be used to make better decisions about things like class scheduling, resource allocation, and student support services.

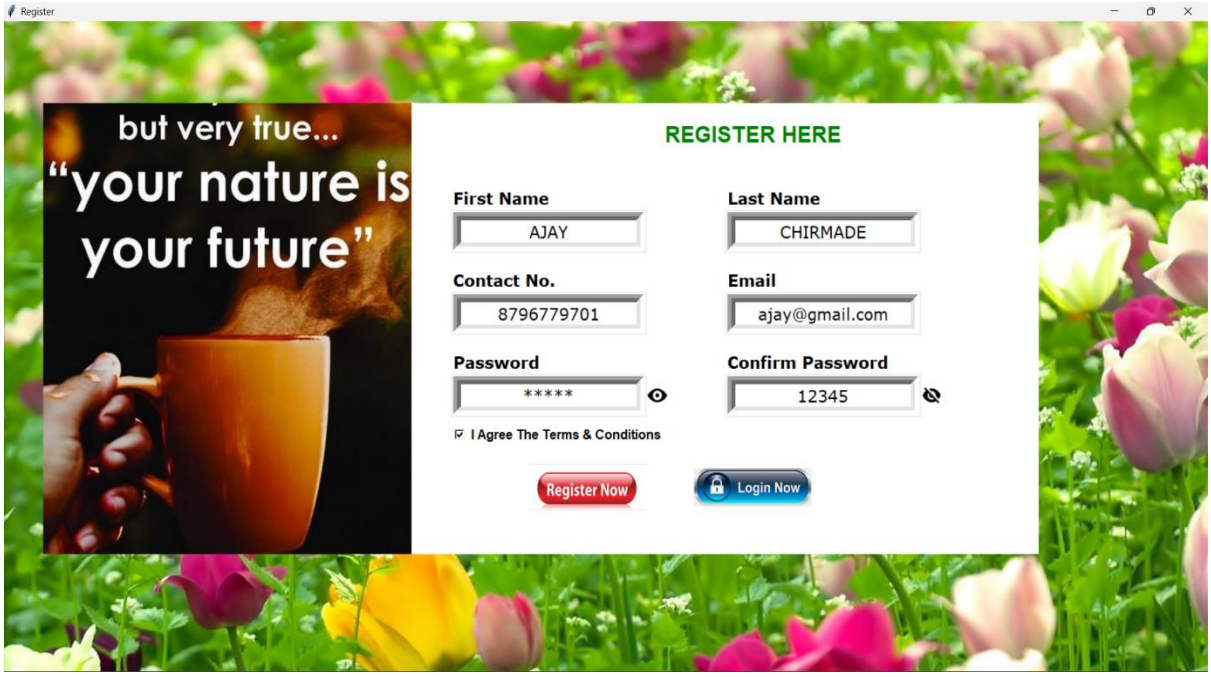
an attendance management system using face recognition can provide a number of advantages for schools and colleges. These advantages include automated attendance taking, real-time attendance data, improved student and staff attendance, increased security, improved data security, reduced administrative workload, improved communication, enhanced efficiency, and improved decision-making.

Input-Output Screen

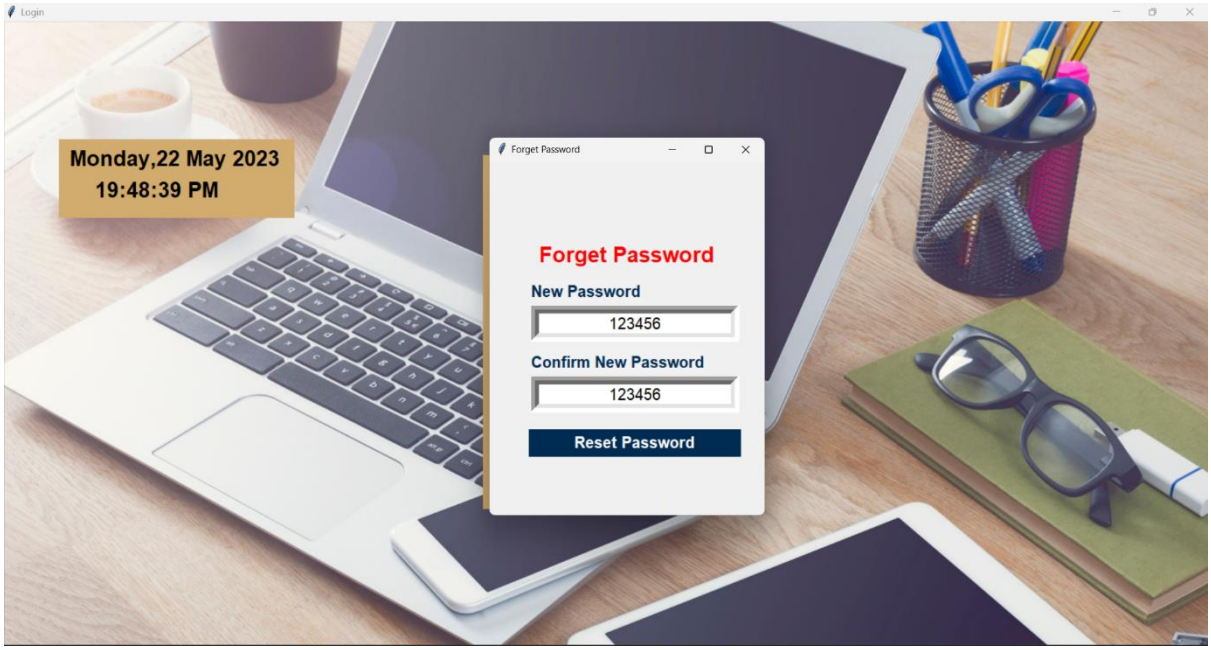
9.1



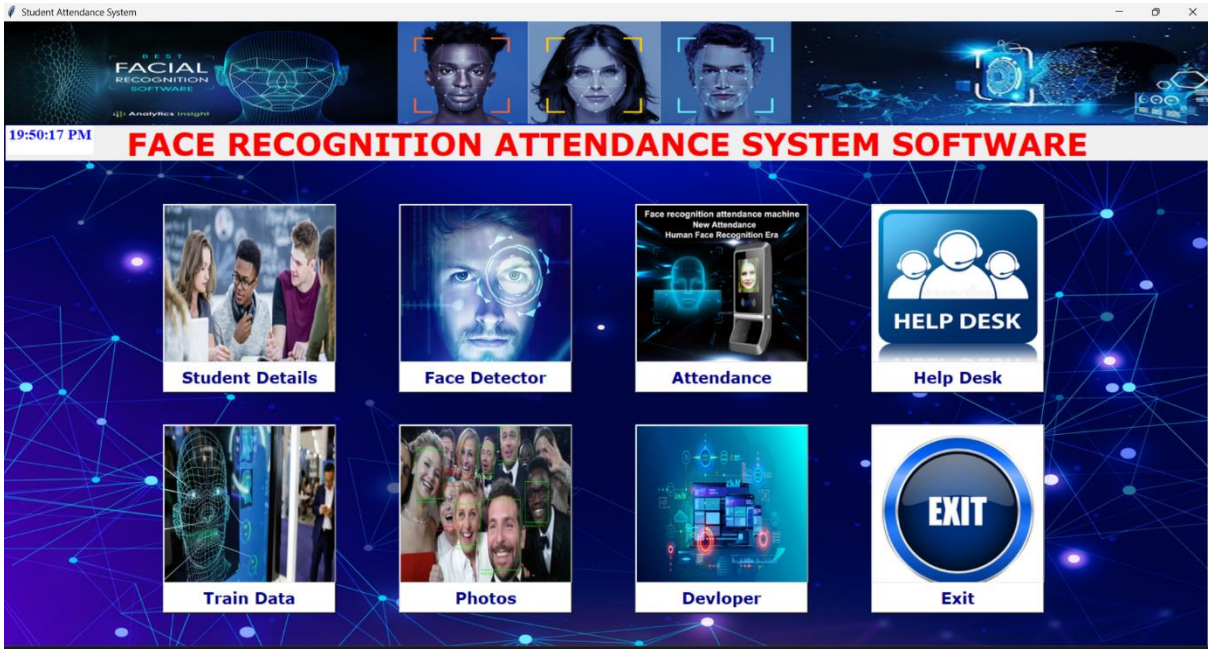
9.2



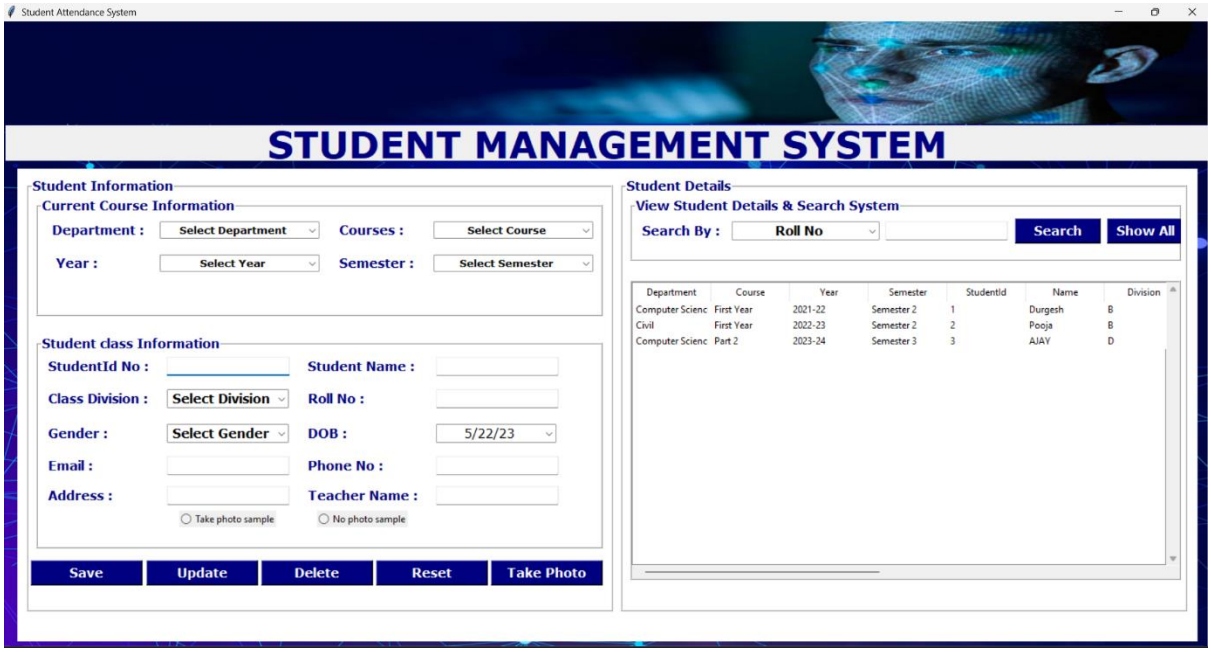
9.3


Login
Monday,22 May 2023
19:48:39 PM
Forget Password
Forget Password
New Password
123456
Confirm New Password
123456
Reset Password

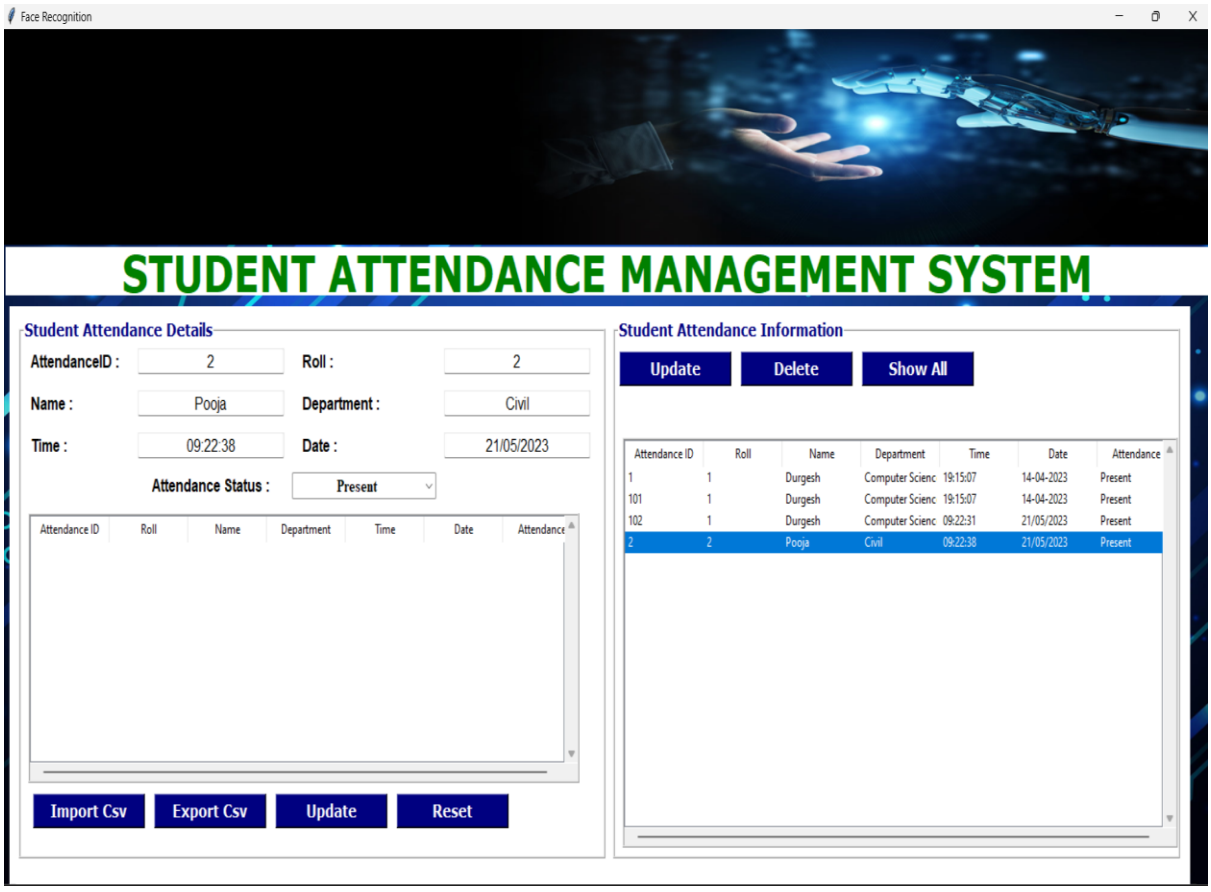
9.4


Student Attendance System
FACIAL RECOGNITION SOFTWARE
19:50:17 PM
FACE RECOGNITION ATTENDANCE SYSTEM SOFTWARE
Student Details
Face Detector
Face recognition attendance machine
New Attendance
Human Face Recognition Era
Attendance
HELP DESK
Help Desk
Train Data
Photos
Devloper
EXIT
Exit

9.5


Student Attendance System
STUDENT MANAGEMENT SYSTEM
Student Information
Current Course Information
Department :
Select Department
Courses :
Select Course
Year :
Select Year
Semester :
Select Semester
Student class Information
StudentId No :
Student Name :
Class Division :
Select Division
Roll No :
Gender :
Select Gender
DOB :
5/22/23
Email :
Phone No :
Address :
Teacher Name :
Take photo sample
No photo sample
Save
Update
Delete
Reset
Take Photo
Student Details
View Student Details & Search System
Search By :
Roll No
Search
Show All
Department Course Year Semester StudentId Name Division
Computer Scienc First Year 2021-22 Semester 2 1 Durgesh B
Civil First Year 2022-23 Semester 2 2 Pooja B
Computer Scienc Part 2 2023-24 Semester 3 3 AJAY D

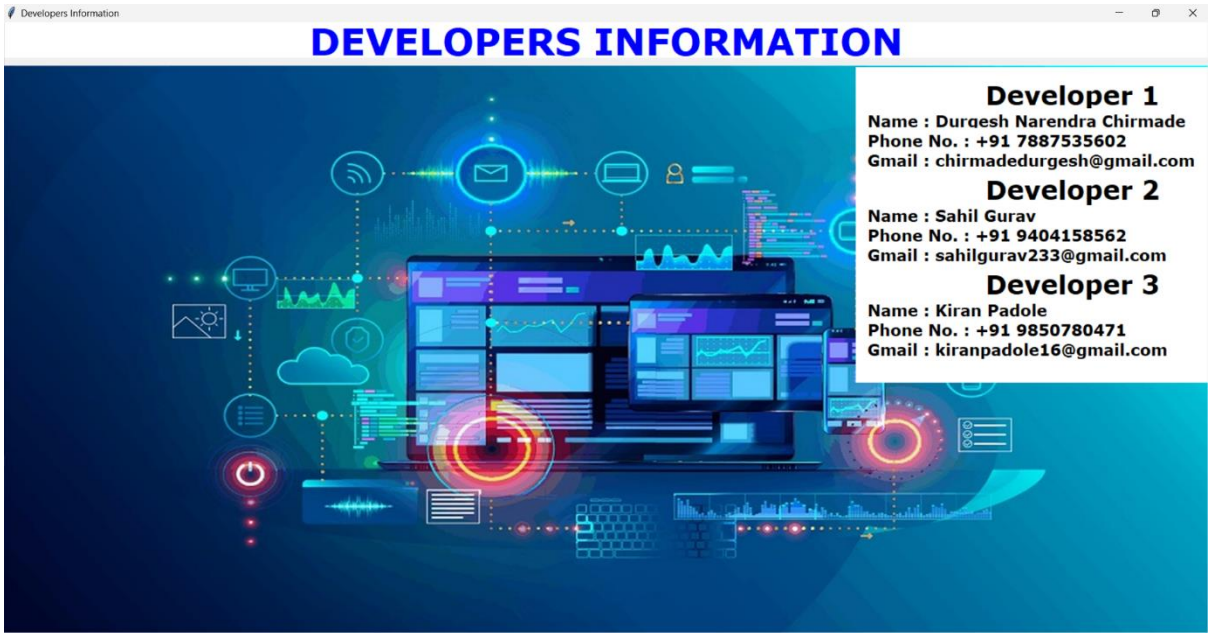
9.6


Face Recognition
STUDENT ATTENDANCE MANAGEMENT SYSTEM
Student Attendance Details
AttendanceID :
2
Roll :
2
Name :
Pooja
Department :
Civil
Time :
09:22:38
Date :
21/05/2023
Attendance Status :
Present
Attendance ID Roll Name Department Time Date Attendance
Import Csv
Export Csv
Update
Reset
Student Attendance Information
Update
Delete
Show All
Attendance ID Roll Name Department Time Date Attendance
1 1 Durgesh Computer Scienc 19:15:07 14-04-2023 Present
101 1 Durgesh Computer Scienc 19:15:07 14-04-2023 Present
102 1 Durgesh Computer Scienc 09:22:31 21/05/2023 Present
2 2 Pooja Civil 09:22:38 21/05/2023 Present

9.7

Train Data
TRAIN DATA SET
Train Dataset
AI

9.8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Limitation/ Drawback

The limitations of an attendance management system using face recognition for schools and colleges are as follows:

- **Cost:** The system can be expensive to develop and implement.
- **Accuracy:** The system can be inaccurate, especially in cases where students or staff are wearing sunglasses, hats, or other face coverings.
- **Privacy:** The system can raise privacy concerns, as it collects and stores biometric data about students and staff.
- **Acceptance:** The system may not be accepted by all students and staff, especially those who are concerned about privacy or accuracy.
- **Technology:** The system is dependent on technology, and it may not be reliable in cases of power outages or other technical problems.

an attendance management system using face recognition can provide a number of advantages for schools and colleges. However, it is important to be aware of the limitations of the system before implementing it.

Here are some additional limitations of face recognition systems:

- Environmental factors: Face recognition systems can be affected by environmental factors such as lighting, shadows, and occlusions.
- Variations in appearance: Face recognition systems can be affected by variations in appearance such as hair style, makeup, and facial hair.
- Young children: Face recognition systems may not be accurate for young children, as their faces are still developing.
- People with disabilities: Face recognition systems may not be accurate for people with disabilities that affect their appearance, such as burns or scars.

Despite these limitations, face recognition systems can be a valuable tool for schools and colleges. By carefully considering the limitations of the system, schools and colleges can implement a face recognition system that will provide a number of benefits.

Conclusion

In conclusion, an attendance management system using face recognition can be a valuable tool for schools and colleges. The system can provide a number of advantages, including automated attendance taking, real-time attendance data, improved student and staff attendance, increased security, improved data security, reduced administrative workload, improved communication, enhanced efficiency, and improved decision-making. However, it is important to be aware of the limitations of the system before implementing it.

The system can be expensive to develop and implement, it can be inaccurate, it can raise privacy concerns, it may not be accepted by all students and staff, and it is dependent on technology. Despite these limitations, face recognition systems can be a valuable tool for schools and colleges. By carefully considering the limitations of the system, schools and colleges can implement a face recognition system that will provide a number of benefits.

Here are some additional considerations for schools and colleges that are considering implementing a face recognition attendance management system:

- **Cost:** The cost of implementing a face recognition attendance management system will vary depending on the size of the school or college, the number of students and staff, and the features of the system.

- **Accuracy:** The accuracy of face recognition systems can vary depending on the quality of the images, the lighting conditions, and the features of the system. It is important to test the system with a variety of students and staff to ensure that it is accurate.
- **Privacy**: Face recognition systems collect and store biometric data about students and staff. It is important to have a clear privacy policy in place that explains how the data will be used and protected.
- **Acceptance:** Some students and staff may be concerned about the privacy implications of face recognition systems. It is important to communicate with students and staff about the benefits of the system and to address their concerns.
- **Technology:** Face recognition systems are dependent on technology. It is important to have a backup plan in place in case of power outages or other technical problems.

By carefully considering these factors, schools and colleges can implement a face recognition attendance management system that will provide a number of benefits.

Reference

- https://www.python.org/
- https://towardsdatascience.com/face-recognition-how-lbph-works-90ec258c3d6b