KARNATAK UNIVERISTY DHARWAD

KANARA WELFARE TRUST's DIVEKAR B.C.A COLLEGE KARWAR

Department of Computer Applications

CERTIFICATE

This is to certify that Mr. KishanKumar Dahiya has satisfactorily completed Project work entitled "AUTO - LOG ATTENDANCE SYSTEM" for the partial fulfillment of Bachelor of Computer Applications by Karnatak University, Dharwad for the academic year 2020-21.

Guide   **Head of the Department**   **Principal**

Exam Registration No: 18U12615

Examiners:

1._____

2._____

ABSTRACT OF PROJECT

These days everything is being made Automatic or smart in one or another way. With the advancement in technology, various day-to-day tasks are made easy and simple with the application of the latest technologies. A task like marking the attendance of students at an institution is a hassle and subject to human error, data redundancy, loss of records, etc. Hence, I have used "Facial Recognition" as the base to develop this software which will simplify the process; make it more accurate and reduce redundancy. In this project, I have used various Deep Learning libraries and algorithms provided by python language to mark attendance automatically. This makes the task more time and cost-efficient also is very accurate and less redundant.

DECLARATION

I hereby declare that this project entitled "AUTO - LOG ATTENDANCE SYSTEM" has been carried out by me under the guidance of Dr. Harish Kamat, Dept. of B.C.A, KWT'S BCA College Karwar and submitted in partial fulfillment of the requirement for the award of the degree Bachelor of Computer Application by Karnatak University, Dharwad during the academic Year 2020-2021.

I further declare that this work is not been submitted either in full or part for the award of any degree or diploma of this or any other university/institute.

Place: Karwar

Date:

Mr. KishanKumar Dahiya

USN : 18U12615

ACKNOWLEDGEMENT

I take this occasion to thank God, almighty for blessing us with his grace and taking our endeavor to a successful culmination. I extend my sincere and heartfelt thanks to our Principal, Dr. Keshava K G, for providing me with the right guidance and advice at the crucial junctures and for showing me the right way. I extend my sincere thanks to our respected Head of the Department Dr. Harish Kamat, for allowing us to use the facilities available. I would like to thank my Guide Dr. Harish Kamat and the other faculty members also, at this occasion. Last but not the least, I would like to thank my friends and family for the support and encouragement they have given me during the course of our work.

KANARA WELFARE TRUST

DIVEKAR BCA COLLEGE

KARWAR

PROJECT REPORT ON

"AUTO - LOG

ATTENDANCE SYSTEM"

SUBMITTED BY

Mr. KishanKumar Dahiya   18U12615

GUIDED BY

Dr. Harish Kamat

HOD

KWT's DIVEKAR BCA COLLEGE KARWAR

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Introduction

Face detection is a computer vision technology that helps to locate/visualize human faces in digital images. This technique is a specific use case of object detection technology that deals with detecting instances of semantic objects of a certain class (such as humans, buildings or cars) in digital images and videos. With the advent of technology, face detection has gained a lot of importance especially in fields like photography, security, and marketing.

This is a project about Facial Recognition-Based Attendance System for any respective client. In this synopsis, the problem, project objectives and the background information of the project will be discussed.

Something simple as taking attendance is what takes a good portion of time and effort at various institutions, firms etc. Keeping the records on paper is a hassle to anyone.

According to the previous attendance management system, the accuracy of the data collected is the biggest issue. This is because the attendance might not be recorded personally by the original person, in another word, the attendance of a person can be taken by a third party without the realization of the institution which violates the accuracy of the data.

For example, let's consider a school; student A is lazy to attend a class, so student B helped him/her to sign for the attendance which in fact student A didn't attend the class, but the system overlooked this matter due to no enforcement practiced. Supposing the institution establish an enforcement, it might need to waste a lot of human resource and time which in turn will not be practical at all. Thus, all the recorded attendance in the previous system is not reliable for analysis usage.

My project is directed towards simplifying the process of taking attendance and save time, resources etc. while at it also increasing the accuracy and simplify the process of retaining the records.

I am developing the project using python OpenCV with Tkinter GUI interface and Mysql database. While at it we make sure this is easy to implement, better than current existing systems within same range.

Objectives

- To develop Smart Attendance System which will make process of taking attendance easy.

- To ensure the speed of the attendance recording process is faster than the previous system which can go as fast as approximately 3- 5 second for each student.

- Have enough memory space to store the database locally.

- To develop an interface which is simple and easy to understand/use.

- Able to recognize the face of an individual accurately based on the face database stored locally. The software identifies faces which are already recognized and automatically adds the attendance with time to the CSV.

- Easy register and self-refurbishing of data.

- Develop a database for the Attendance Management System locally

- Provide a user-friendly interface for admins to access the attendance CSV and for Students to mark their attendance.

- Allow admins to add students and store their faces in the database by using a GUI.

- Able to retrieve/store the data easily in local database i.e CSV or excel file.

- Able to show an indication to the user whether the data is successfully stored or not.

System Analysis

Existing System :

There are various ways in which attendance is logged currently. For example, at any school / college the existing system involves personnel taking an attendance register and calling out roll in class. The assigned teacher / lecturer for that class has to call out all rolls, make sure to mark absent or present to the student on register daily. All this is to be done manually.

There are several drawbacks in this system which include marking wrong status for any student as present or absent on register by mistake, marking present for a student who isn't even present at school / college as someone else might have responded to the roll-call and confused the personnel, difficulty in transferring the data from record to another, retrieval of data whenever needed is a hassle, fear of losing the record due to some reasons like accidental damage to the records, loss of Hard-copy file etc.

This whole process is very time consuming. tiring and resources consuming, there is no accuracy in retaining the data, manual labor to transfer the data to local database etc

In-case anyone wants to opt for high-tech security system it is very costly for a small task such as auto-logging of data based on face-recognition.

Proposed System :

My project is directed towards simplifying the process of taking attendance and save time, resources etc while at it also increasing the accuracy and simplify the process of retaining the records.

The proposed system software will be portable and easy to set-up on low cost by anyone who has the required hardware and software specifications met. There is no need of any high-tech equipment's to set this up.

This system can be set up easily on any PC after few changes to source code, database locations etc. It uses the HAAR Cascades and LBPH algorithm to recognize face.

The proposed system will make it quick to take attendance by making it automatic. For this the user (ex: Student, Staff) must register his/her self on the software through a user-friendly GUI form-based interface which is easy to use and understand. The data input taken is stored locally in the system.After this the machine is photo trained to recognize the user based on the photo input taken which would take roughly 10 seconds.

Technical Requirements

Hardware Requirements :

- **Processor** : Inter Atom processor or Intel Core i3 processor or higher.

- **RAM** : 2GB or more.

- **Monitor** : Any modern monitors of minimum 15inch or more.

- **Keyboard** : A Standard key board with 101-103 alpha numeric keys.

- **Mouse** : Any standard mouse will work.

- **Webcam** : Any standard webcam will work

Software Requirements :

- **OS** : Windows* 7 or later, mac OS, and Linux.

- **IDE** : Any python IDE (Ex : VS Code)

- **Editor** : Visual Code or latest version of Python, Any of the other code editors.

- **MySQL** : MySQL to can manage databases. (Ex : MySQL Workbench)

- **GUI** : Tkinter, pip required are to be installed.

Software Requirement Specification

1.Visual Studio Code

Visual Studio Code is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add additional functionality.

Visual Studio Code is a source-code editor that can be used with a variety of programming languages, including Java, JavaScript, Go, Node.js, Python and C++. It is based on the Electron framework, which is used to develop Node.js Web applications that run on the Blink layout engine. Visual Studio Code employs the same editor component (codenamed "Monaco") used in Azure DevOps (formerly called Visual Studio Online and Visual Studio Team Services).

Instead of a project system, it allows users to open one or more directories, which can then be saved in workspaces for future reuse. This allows it to operate as a language-agnostic code editor for any language. It supports a number of programming languages and a set of features that differs per language. Unwanted files and folders can be excluded from the project tree via the settings. Many Visual Studio Code features are not exposed through menus or the user interface but can be accessed via the command palette.

2.MySQL Workbench

MySQL Workbench is a visual database design tool that integrates SQL development, administration, database design, creation and maintenance into a single integrated development environment for the MySQL database system. It is the successor to DB Designer 4 from fabFORCE.net, and replaces the previous package of software, MySQL GUI Tools Bundle.

3.Python

Python is an interpreted high-level general-purpose programming language. Python's design philosophy emphasizes code readability with its notable use of significant indentation. Its language constructs as well as its object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

Python is dynamically-typed and garbage-collected. It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library
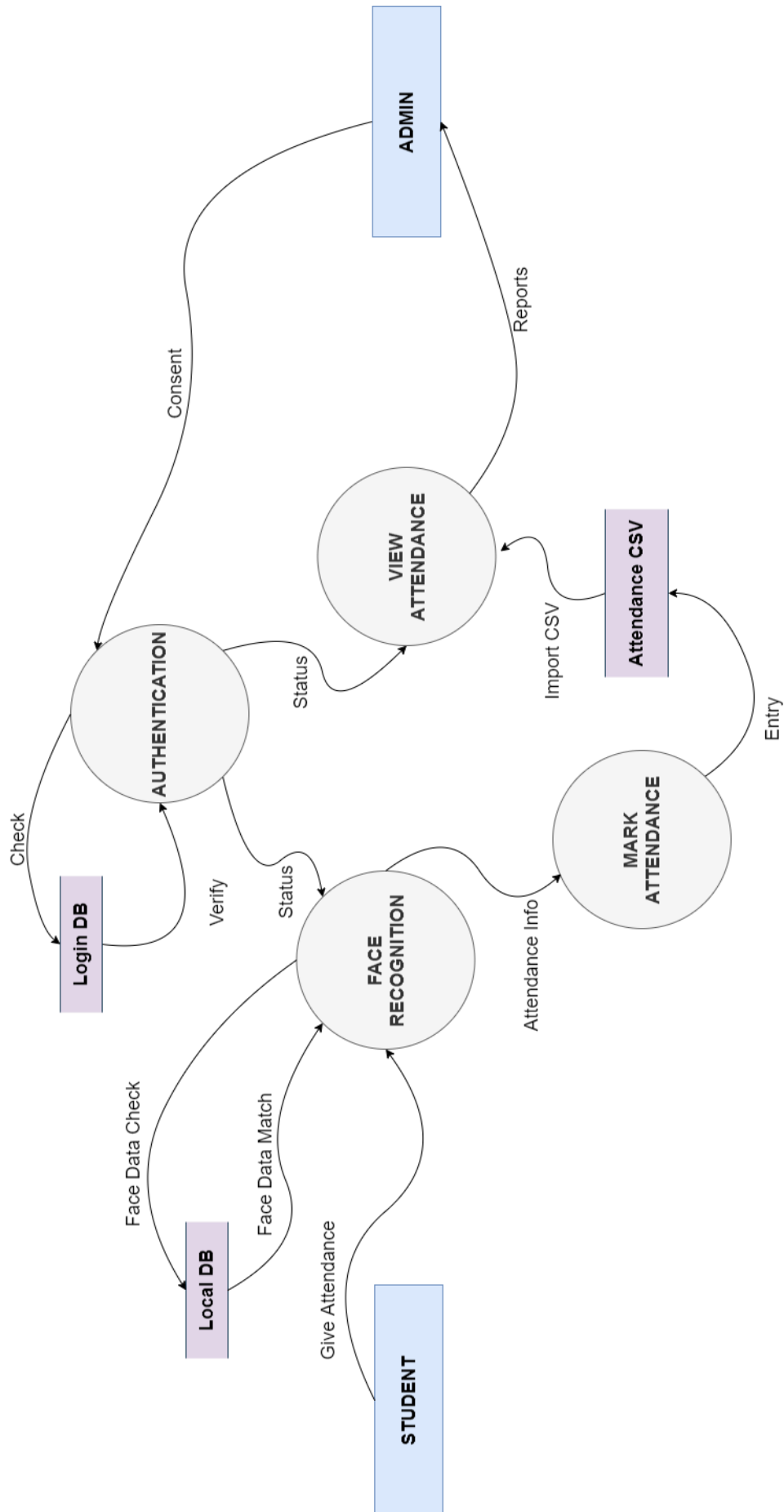
System Design & Analysis

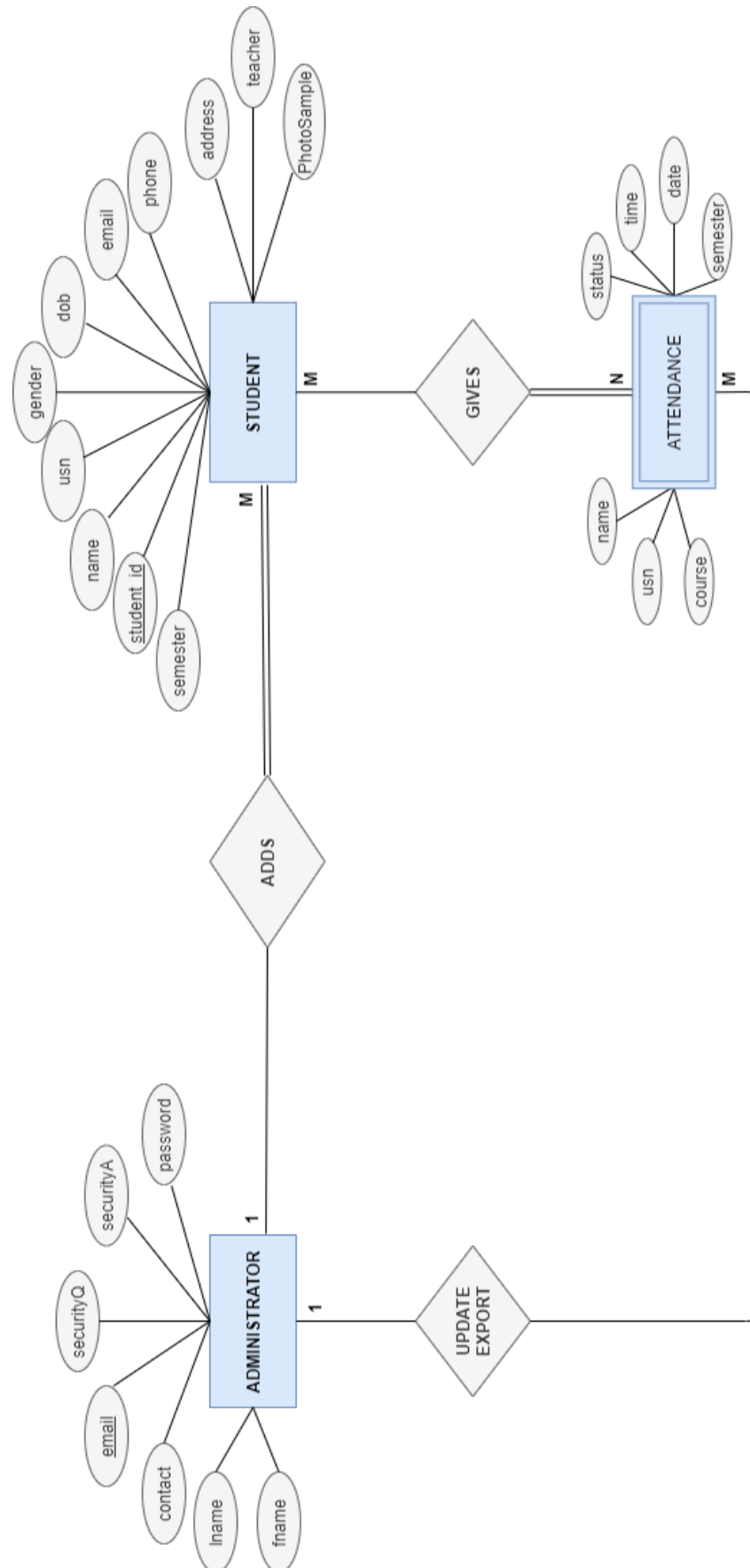## Data Flow Diagram

1) 0-Level DFD

ADMIN

Data

Reports

Auto-Log Attendance System

Attendance

STUDENT
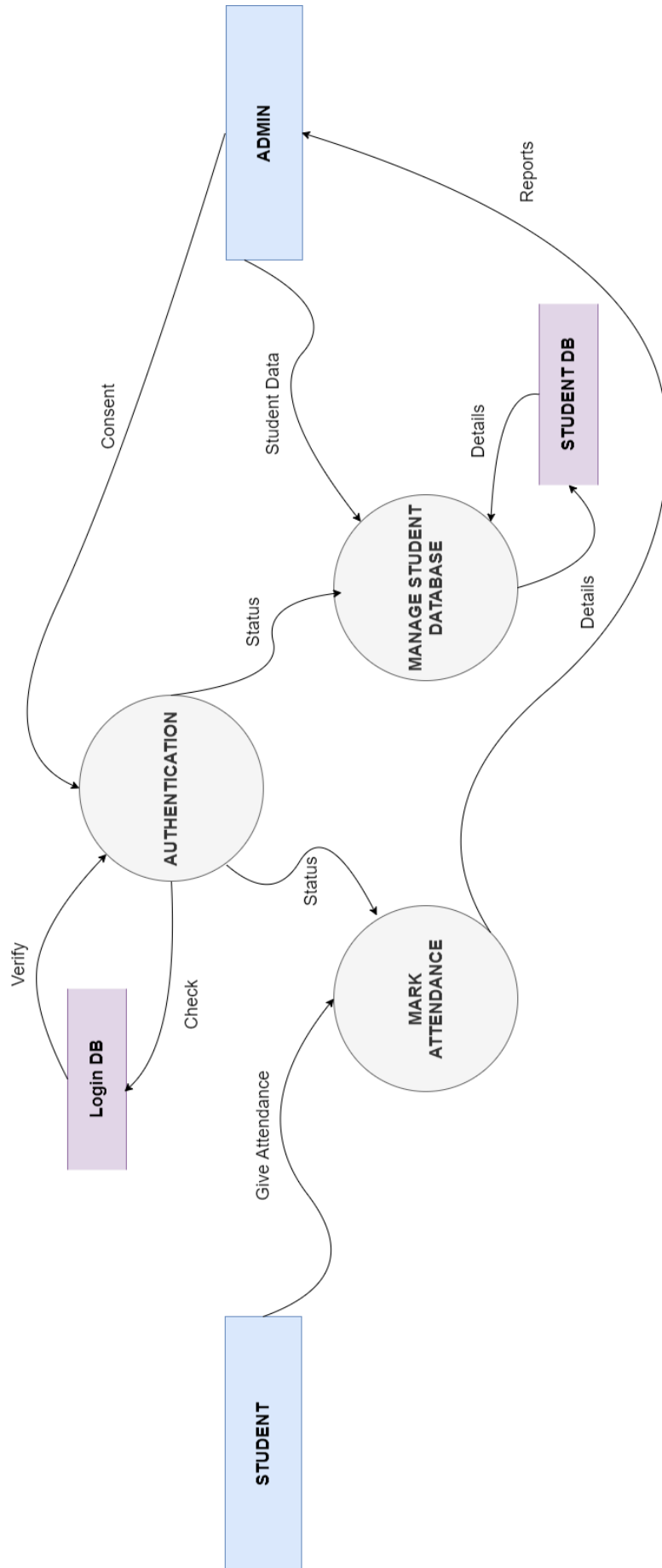
2) 1-Level DFD

3) 2-Level DFD

Entity Relationship Diagram

Table Structure
1.Register (Admin) Table

Column Name	Datatype	Constraint
fname	Varchar(45)	-
lname	Varchar(45)	-
email	Varchar(45)	Primary key
contact	Varchar(45)	-
securityQ	Varchar(45)	-
securityA	Varchar(45)	-
password	Varchar(45)	-

2.Student Table
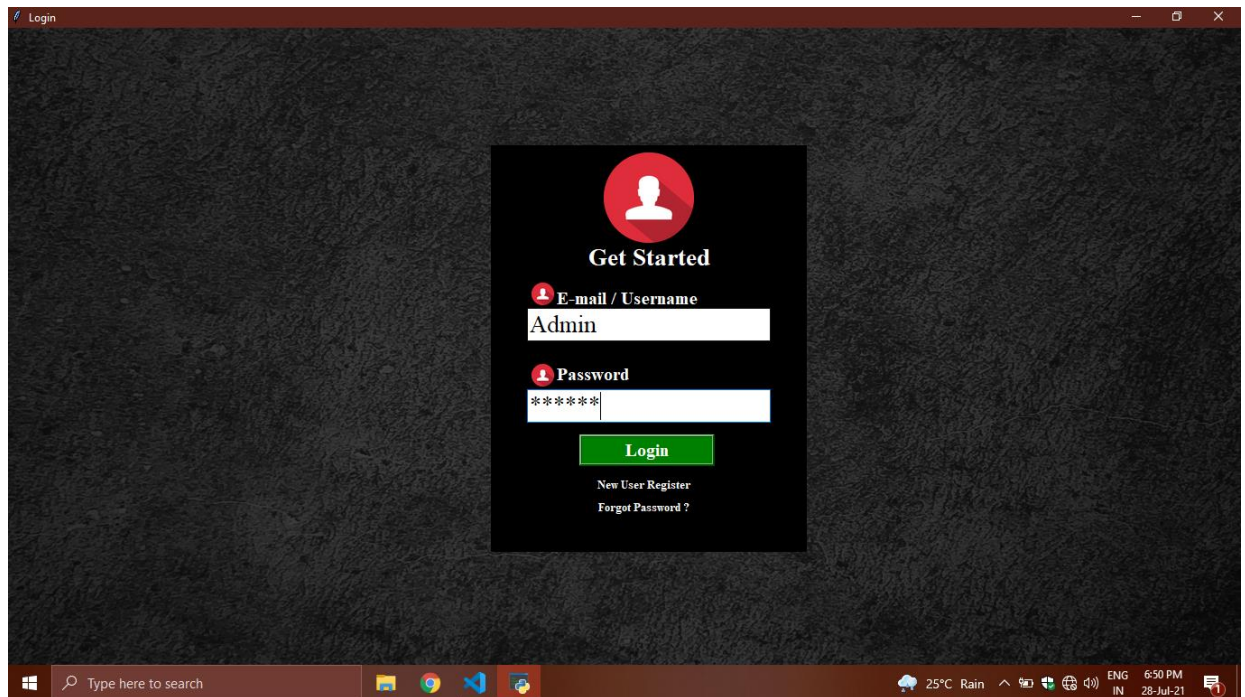
Column Name	Datatype	Constraints
department	Varchar(45)	-
year	Varchar(45)	-
semester	Varchar(45)	-
student_id	Varchar(45)	Primary key
name	Varchar(45)	-
rollno	Varchar(45)	-
gender	Varchar(45)	-
email	Varchar(45)	-
phone	Varchar(45)	-
address	Varchar(45)	-
photosample	Varchar(45)	-

3.Attendance Table

Column Name	Datatype	Constraints
department	Varchar(45)	-
year	Varchar(45)	-
semester	Varchar(45)	-
student_id	Varchar(45)	Primary key
name	Varchar(45)	-
rollno	Varchar(45)	-
gender	Varchar(45)	-
email	Varchar(45)	-
phone	Varchar(45)	-
address	Varchar(45)	-
photosample	Varchar(45)	-

Forms

Login Window

Register Window

Home Screen Window

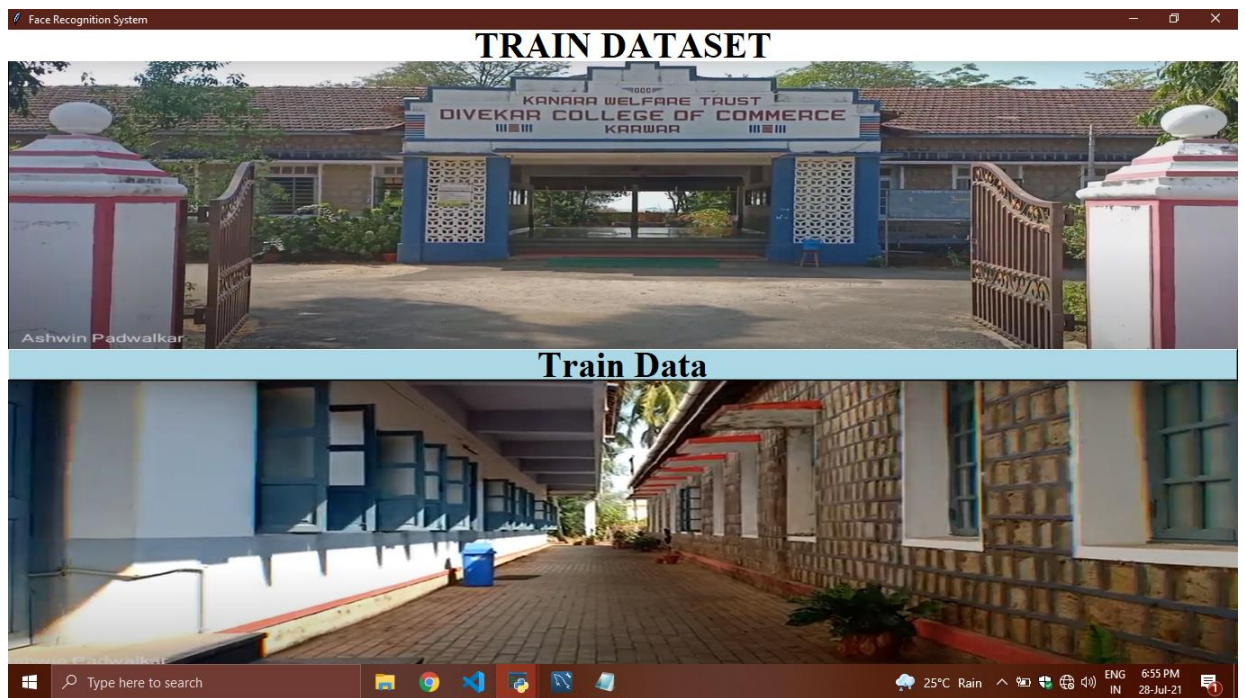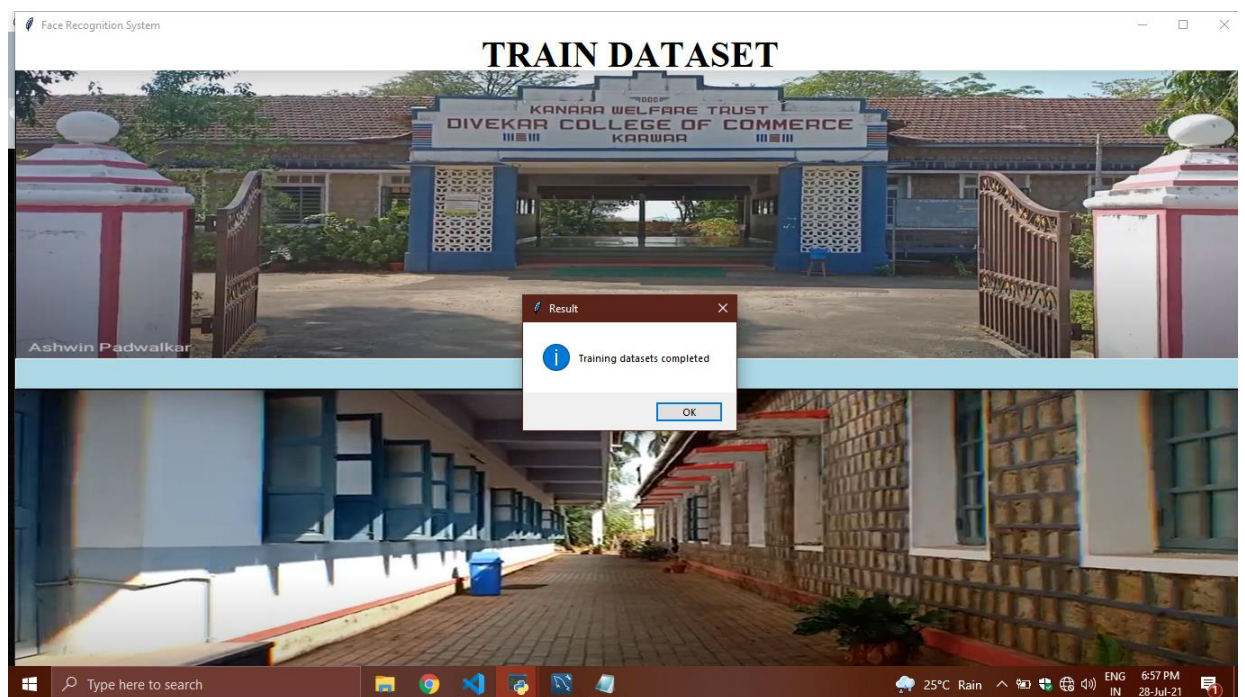**Student Management Window**

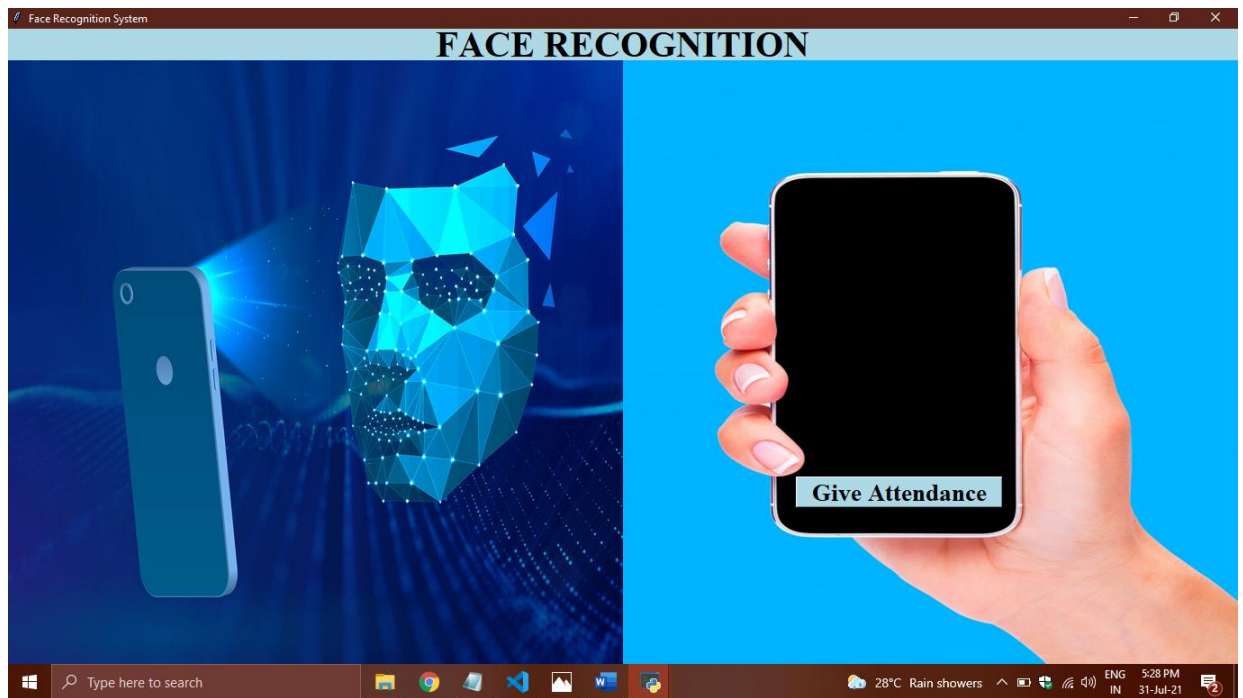**Adding Face Data**
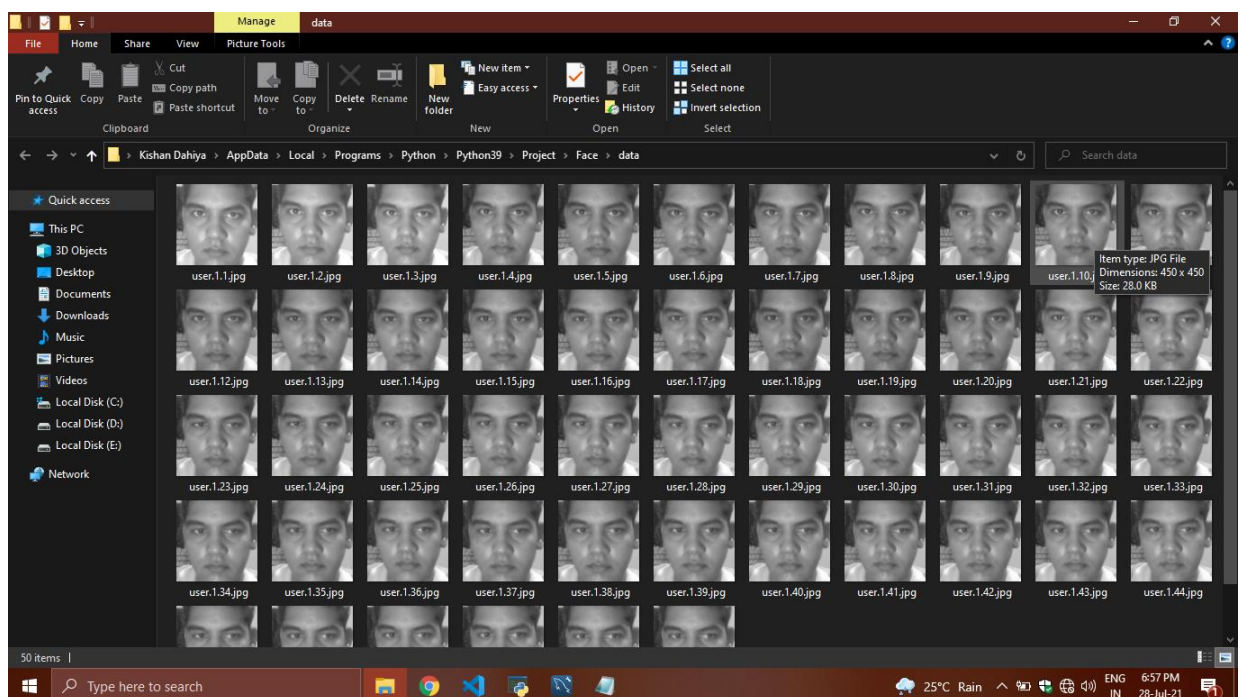
Collected Face Data Stored Locally

Train Face Data Window

Train Face Data Window

Mark Attendance Window

Face Recognition Window

Attendance Management Window

Developer Info Window

Report

- The Admin should be registered to use the software.

- If not registered, one can register through register window.

- After logging into the system, the admin has various options to choose from.

- The Admin can add/update student's data through Student Management window.

- Face data is collected through Student Management window.

- The collected Face Data must be trained, it can be done in Train Face Data window.

- When data is trained, a prompt will popup on Train Data Window.

- The attendance can be given in Mark Attendance window by tapping on the Give attendance button.

- When clicked, a Facial Recognition window will pop up. If successfully identified; a green box is shown on screen with Student details and attendance is marked in database. If failure; a red box is shown on screen with "Unknown Face".

- Press "Enter" to stop Facial Recognition window.

- The attendance is stored in a .csv file locally.

- Admin can view/export attendance in Attendance Management window.

- Developer's information is shown in Developer Info window.

- To exit from project press exit button or close the windows.

Limitations of the Project

- Currently the software is small scale idea which can be used in various situations not just for automatic attendance but also for task like finding any registered criminals through high accuracy Face-recognition.

- The GUI design is choppy with little knowledge of the used libraries.

- Overall Cost is reduced but it takes time to code the windows and set buttons, sometimes the resolution of other system can lead to mismatched, weird layout if elements are not fixed in frame.

- There are some minor fixes needed when its added to any system which are rectified easily with the help of support and few read through the code.

- The admin user page isn't correctly set up as of now.

- Data is stored locally before being exported so there is always risk of losing it in-case of accidental delete

- Layout is quite not attractive usually.

Future Enhancements of the Project

- Fixing the difference between User and Admin interface, permissions etc.

- Opting for a safer alternative than local database for initial database storing.

- Fixing the layout of all windows to more pleasing one.

- Fixing the bugs by providing quick support on request

- This idea can be implemented on bigger scale along with knowledge of the used libraries of python and coding.

- It is cost-efficient idea which is simple to code for anyone with little knowledge of python language and building GUI with the help of Tkinter, this can be implemented in various places by modifications to the layout and idea but using the same algorithm, libraries etc.

- More features can be added to make it more appealing and flexible to the user and the admins.

- Creating a backup locally & storing data online on servers would also make it more secure

- Listening to user's suggestions and regularly updating the software as much as possible.

Bibliography

➢ Python Basics Course from EduYear - https://eduyear.in/trainings

➢ Face Recognition for Beginners - https://towardsdatascience.com/face-recognition-for-beginners-a7a9bd5eb5c2 (April 28, 2018)

➢ Smart Attendance System using OPENCV based on Facial Recognition - https://www.ijert.org/smart-attendance-system-using-opencv-based-on-facial-recognition (March 11, 2020)