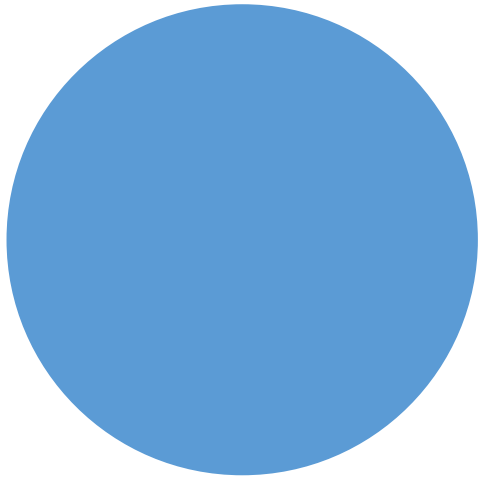
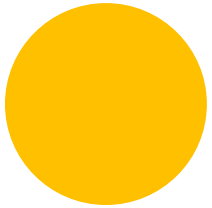



Project Codebase Introduction

COMP3278A 2022

Project

Course Project

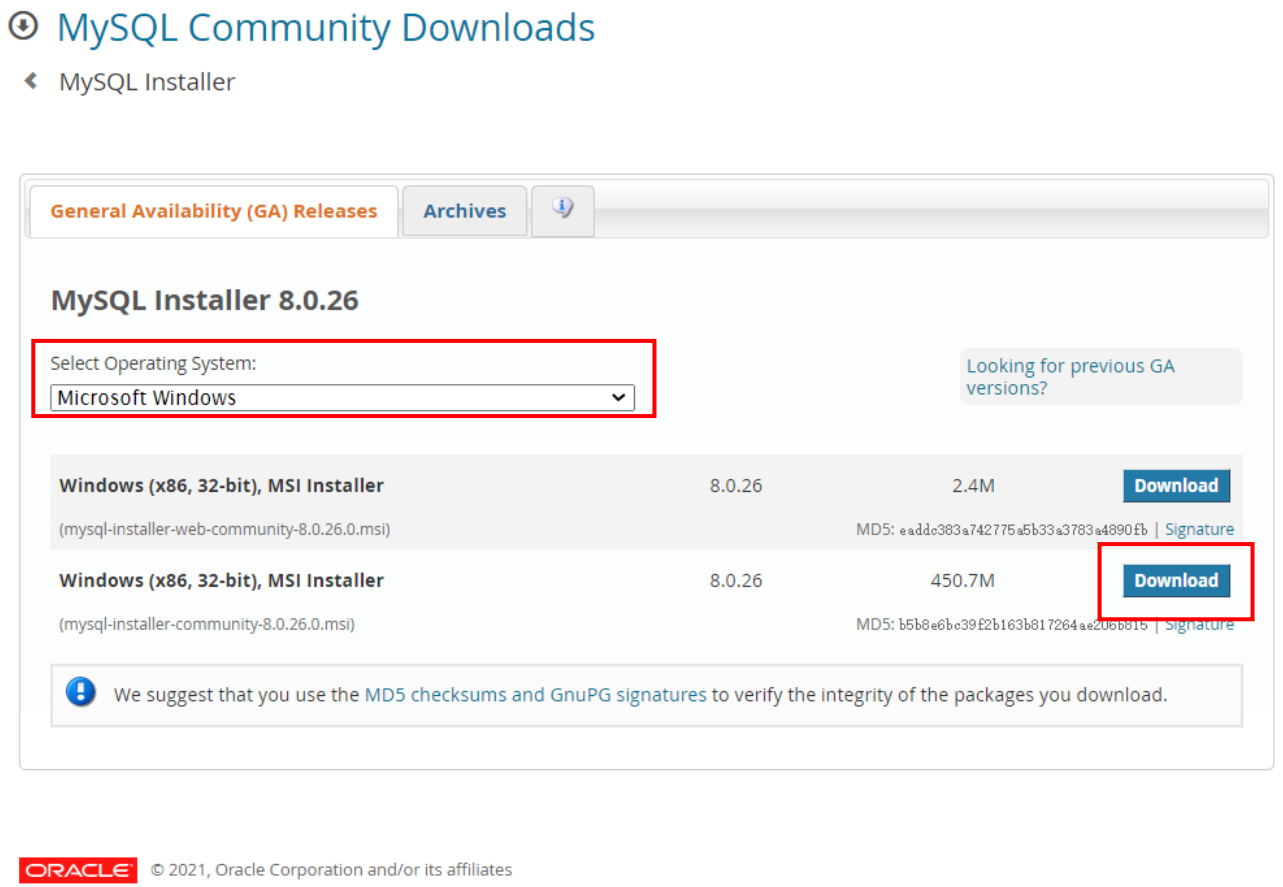
Project Descriptions. You are invited to develop a **facial login component** of an Intelligent Course Management System (ICMS). The face login component may have the following functions.

- When a student login with his/her face, his/her information such as name, login time, and welcome message will be presented in the graphics user interface (GUI).
- If the student has class within one hour, the corresponding course information, classroom address, teacher's message, links of Zoom, tutorial/lecture notes, other course materials and so on and so forth will be presented in the GUI. The student could click the links to redirect to Zoom or other materials. The GUI should also allow the student to send the above information to his/her email address by email.
- If the student does not have class at the moment, the GUI could present a personal class timetable for the student.
- The system should record the latest behaviour of the student, such as when he/she logins the system, how long the student stays in the system, etc.

Usage

- Install MySQL on local machine

  download MySQL from https://dev.mysql.com/downloads/installer/



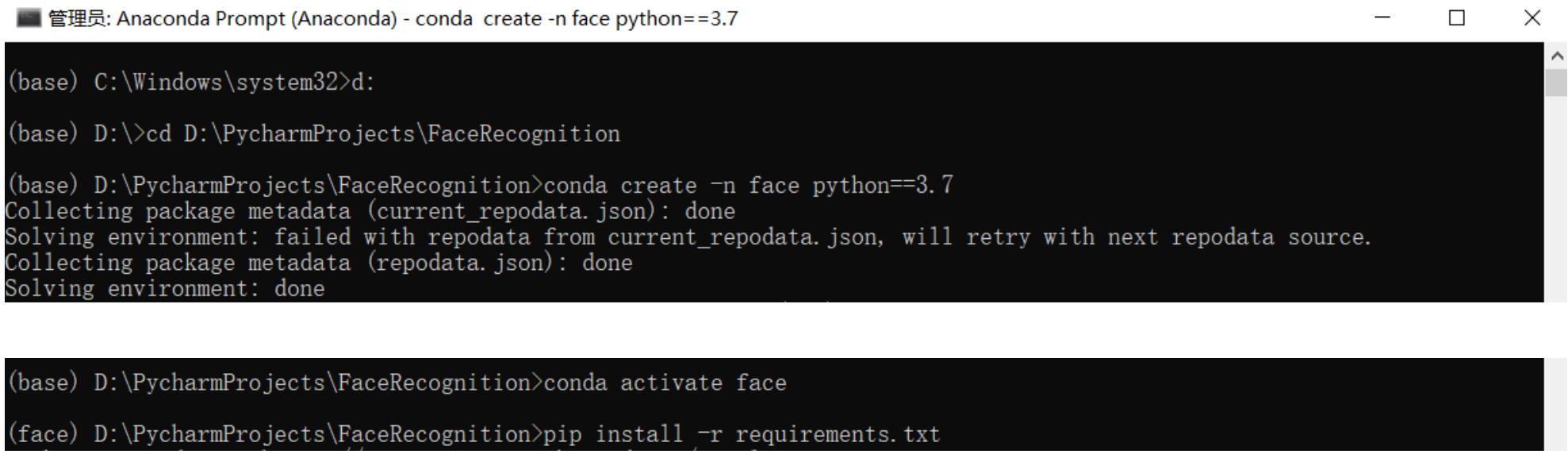
Usage

- Install MySQL on local machine

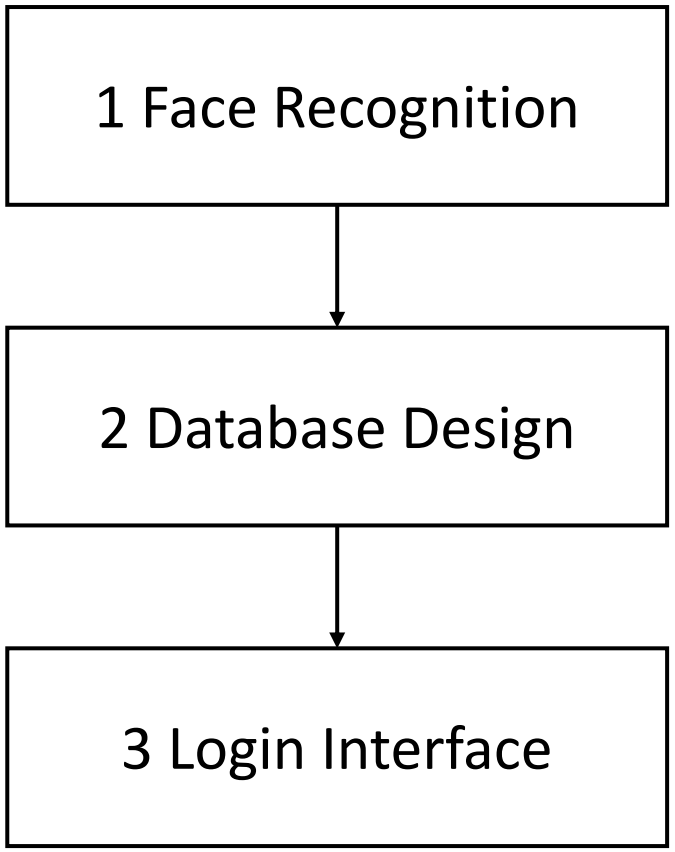
  You'll obtain an account and password after installation.

- Create a virtual environment using Anaconda

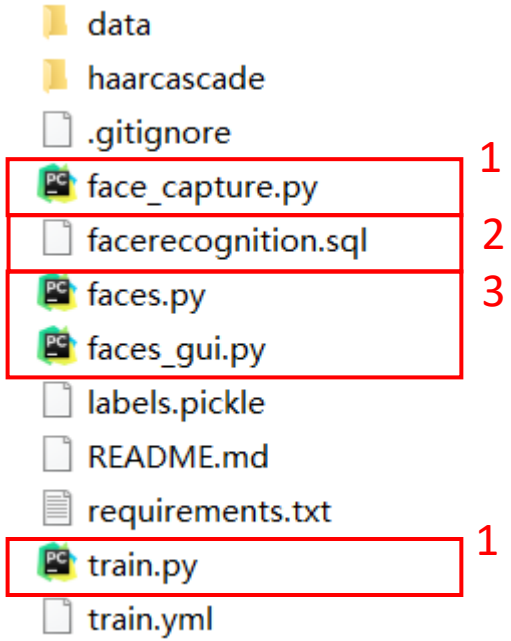
```
conda create -n face python=3.7
conda activate face
pip install -r requirements.txt
```



Overview



Folder Structure



1 Face Recognition

- Collect face data using camera face_capture.py
  - The images will be saved in `data/Jack` folder.
  - **Note:** Only one person's images can be captured at a time.

```
"""
user_name = "Jack"    # the name
NUM_IMGS = 400        # the number of saved images
"""
python face_capture.py
```

- Train a face recognition model train.py
  - `train.yml` and `labels.pickle` will be created at the current folder.

```
python train.py
```

2 Database Design

- Design database

facerecognition.sql

  - We provide a sample code for TABLE `Student`.
  - Your database should have at least five tables. How to design the tables is your design choice.

```sql
CREATE TABLE `Student` (
  `student_id` int NOT NULL,
  `name` varchar(50) NOT NULL,
  `login_time` time NOT NULL,
  `login_date` date NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

2 Database Design

- Import database

```
# login the mysql command
mysql -u root -p

# create database.
#'mysql>' indicates we are now in the mysql command line
mysql> CREATE DATABASE facerecognition;
mysql> USE facerecognition;

# import from sql file
mysql> source facerecognition.sql
```

```
mysql> SELECT * FROM Customer;
+-------------+------+------------+------------+
| customer_id | name | login_time | login_date |
+-------------+------+------------+------------+
|           1 | JACK | 07:46:34   | 2021-09-01 |
+-------------+------+------------+------------+
1 row in set (0.00 sec)
```

3 Login Interface

- OpenCV Interface

faces.py

  - The camera will be activated and recognize the faces using pretrained model.
  - You need to implement more useful functions for the interface.

```
python faces.py
```

```
If the face is recognized
    if not find the student information in the database
        output "NOT FOUND"
    else
        update the login_time and login_date in database
        # implement other useful functions here
else
    output "UNKNOWN"
```

```
mysql> SELECT * FROM Customer;
+-------------+------+------------+------------+
| customer_id | name | login_time | login_date |
+-------------+------+------------+------------+
|           1 | JACK | 01:05:11   | 2021-09-06 |
+-------------+------+------------+------------+
1 row in set (0.00 sec)
```

OpenCV GUI tutorial: https://docs.opencv.org/4.5.2/dc/d4d/tutorial_py_table_of_contents_gui.html

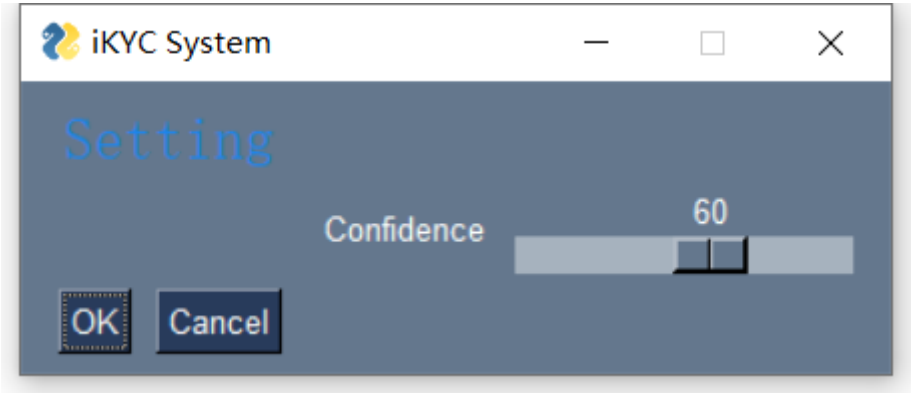
3 Login Interface

- PySimpleGUI Interface

faces_gui.py

  - PySimleGUI is a simple and effective python package for interface.

```
python faces_gui.py
```



PySimleGUI tutorial: https://pypi.org/project/PySimpleGUI/

Final Words

Course Project

Development Tool Examples:

- **Face Recognition:** Python + OpenCV (full codes provided).
- **GUI**: Python GUI or Qt or html. (code not provided).
- **Database**: Python + MySQL (sample codes provided).
- **Other**: You can use any other development packages if you see fit. However, the DBMS must be MySQL.

Marks (course project 20% of the final mark).

- **10%** for software development. (4% GUI implementation + 6% database implementation)
- Other **10%** for presentation (5 to 10 minute), including but not limited to development plan, milestones, **contribution of each group member** **(tell us if there is a free-rider in your group)**, **video recording of demo**, software design, database design (**ER Diagram, tables**), difficulties you encountered and how to solve them, etc.
- Live demo is allowed, but please make sure your program works well and stably in order to save time in presentation.
- Creative GUI design, creative software functions or creative DB design will have bonus points.