ML110 Homework 4

MLLO 20220429

Part I: SQL Client-Side Programming

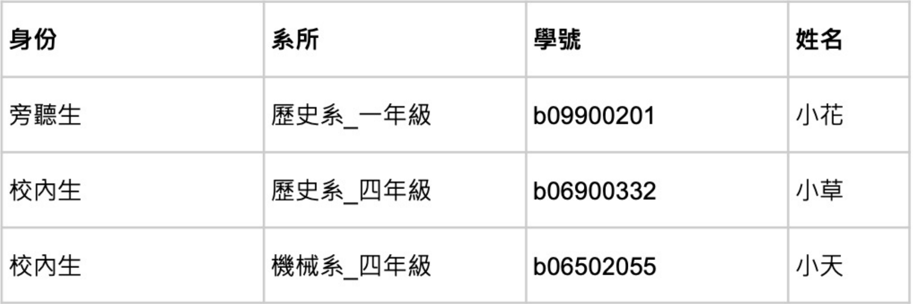
- In this homework, you need to write a Python program and write SQL statement inside the Python program to complete various tasks. You should need mysql.connector as your mySQL connection package.
- The only exception is task 1, where you are allowed to use "pandas" plus "sqlalchemy" package (or only sqlalchemy, or only mysql.connector.)
- Two sample code files are provided for your reference as starting point.

- Download DBMS_student_list.csv file in NTU COOL, and then input this data int a student table in your database(named "DB_class") in MySQL.
  - You can do this using Python (either just Python or Python+Pandas)

- 1. Take DBMS_student_list.csv as data input, and input the data into a "student" table in your database in MySQL. (**10%)**
- 2. Read the information about yourself from the student table (You can use either your name or your student ID to select out yourself.) (**5%)**
- 3. List your peer students. You need to select these students using department and year information. Do not use student ID or student name to complete this tasks. (**5%)**
  - The definition of "peer students" are those students in same department and same year as you (for undergrad student), or those in the same graduate program and same year as you (for graduate student.)

Part I (2)

- 4. Update your own value of the “身分" column from “校內生" to “特優生", then read the updated information about yourself from the database and print it out. (10%)
- 5. Insert three new students listed as below into the student table. (10%)



身份	系所	學號	姓名
旁聽生	歷史系_一年級	b09900201	小花
校內生	歷史系_四年級	b06900332	小草
校內生	機械系_四年級	b06502055	小天

- 6. Write a select statement to read back the new students you inserted. However, in this task you should prepare the statement. And then execute the prepared statement three times using their student ID as selection condition. (10%)
  Note: You may need to do a little bit research on your own to accomplish this task (look up how to write prepared statement with mysql.connector.)

Part II: Server-Side Programming

Based on the ER model and relational database you built in Homework 1 and 2 , write SQL statements from MySQL console to complete the tasks in this part. We will use ‘MySQL Command line client - Unicode’. For your homework, please design:

- Prepared statement: (10%) Use **prepared statement** to write a SELECT statement on a table that contains three or more conditions connected by AND, OR, and NOT comparison operators. You must use AND, OR, NOT each at least once (You can re-used the statement in homework #3) but leave selection condition value as “?”
- Prepared statement (cont.-) (5%)
  Use “set” statement to set the selection condition values, and run the prepared statement.
  Set the conditions to different value and run the prepared statement again.
- Stored-function (5%) Choose one of your tables that has a numerical column. Write a **stored-function** to convert the unit of that column. For example, convert USD to NTD, or Celsius temperature to Fahrenheit temperature degrees. Then write a select statement to list all original values and the converted values side-by-side.

Part II (2)

- Stored procedure (10%)
  Using the “student” table that you created in Part I of this homework, and write a **stored procedure** to select the number of students from each department or graduate program (系所) into a user variable @STCOUNT. The 系所 should be a parameter that can be filled in when the stored procedure is called. Call the procedure twice, once with your own 系所 and once with some other 系所.
- Trigger (10%) Find a column of numerical value of certain table that is of interest to you. Assign a variable and write a trigger to keep track of the total values of that column. Print the value of the variable, insert two new rows with new values in this column, and print the variable again to show effectiveness of your trigger.
- Trigger 2 (10%) Assume you have a table which is of high level of importance. Whenever someone inserts or delete a row, you want to know who does it and when it is done. Create an additional “record table” and write a trigger to record that information. (You may want to use the user() function call)
  After you finish writing the trigger, do a select to list all content of the “record table”. Then do three insertions and two deletions. List the the “record table” again to demonstrate the effectiveness of your trigger.

Homework 4 submission

- Deadline : 5/16 Mon. 23:59 (GMT +8)
- Submission : NTU COOL
- File name & format

  - 上傳檔案 → {學號}.zip, ex. **r09900001.zip**

  - (unzip後需有以下檔案，且不能有其他檔案，由於不同壓縮方式會導致部份人解壓縮時檔案不會在一個資料夾中，避免批改困難，**所以拜託以下檔名一定要加學號！**)

    → {學號}_part1.ipynb ,ex. **r09900001_part1.ipynb**

    → {學號}_part2.sql ,ex. **r09900001_part2.sql**

    → {學號}_report.pdf ,ex. **r09900001_report.pdf**

- 檔名錯誤或執行程式錯誤，一律各扣10分
- 說明：

  → {學號}_part1.ipynb : Part 1的 Python code

  → {學號}_part2.sql : Part 2的 SQL code

  → {學號}_report.pdf : Part1 & Part2 每題的code截圖 & results

- Version requirements: Python3 & MySQL 8

Homework 4 submission

- Delay
  - One day: original score * 0.8
  - More than two days: get no points
- **TA hour: Mon. 15:00 – 16:00 @ BL603(博理603)**
- **TA mail: ntu.dbms.ta@gmail.com**
- **Q&A : NTU COOL 討論區 || TA mail**