COMP3311 Assignment 4

(Implementing a simple information system)

Spring 2020

Due date: 12th May 2020

(11:59 am according to Canvas clock HK time)

Please check the time and date carefully !

Assignment Rules:

1) This is an individual assignment. The assignment solution you submit must be solely your own work; copying or letting others to copy are both considered cheating.

2) We will compile and test your submitted code by using Visual Studio 2019. Please configure your project according to the Lab slides (Lab 7 and Lab 8). If there are any compiling errors due to your submitted work when we run our testing, you will receive **0 mark** for this assignment. You are strongly advised to test your code before submission.

3) No partial marks will be given for each TODO and no negotiation on partial marks will be handled.

Assignment description

1) You are required to build a simple information system for the University according to the database schema described below. The system is to allow professors to retrieve useful information. You are required to complete a program using the C++ language and the ODBC interface (a skeleton of the C++ program will be provided to you). For your easy reference, the demo of the full mark program is provided (the assign4.exe file).

2) You are required to build the tables and insert the records to the Oracle server before you can run the information system. To do that you will need to log in Oracle using the SQLdeveloper, and run the following three script files: **drop_tables.sql, create_tables.sql, insert_records.sql** using SQLdeveloper. These files are available at the assignment page of the course website.

3) After running the script files, you should make sure the "commit;" command is executed at SQLdeveloper so that the data are physically written to the Oracle DBMS. You can then start your C++ program. It logs you into the Oracle server using your own Oracle account (i.e. comp3311stuxxx). This part has been done for you in the skeleton C++ program provided.

4) The system should allow a professor to log in with his/her password and perform queries regarding the following information:

TODO Part 1. Teaching information:

1) Display the course_ID, course_name, offering_no, classroom, and no_of_stds of all the courses he/she is teaching in the current semester (assume the current semester is 'Spring2020').

2) Display the student_id, first_name, last_name and phone number of this staff's preferred TA(s).

3) Group the prerequisites (course_IDs) by the course_IDs of the main courses and display the prerequisites (course_ID) in a list.

Hint: you may find the aggregate function LISTAGG() function useful. You can also refer to the following web site at URL: http://www.oracle-developer.net/display.php?id=515 for consulting the exact syntax of LISTAGG().

TODO Part2: Supervision information:

1) Display all the student_ID, first_name, last_name and phone number of all the students he/she supervises.

2) Group the students (student_ID, last_name, first_name) according to the supervisors'

staff_IDs and course_IDs and display the student information in a list in ascending order of the student_IDs, see the screen shot for the exact output.

Hint: you may find the LISTAGG() function and the concatenation operator "||" useful.

TODO Part3: Administrative information

1) Count phone number(s) of each staff.

2) Add a new phone number.

3) Displays the student_ID, last_name, first_name for each TA of the course offerings he/she teaches in the classroom 'ROOM322'.

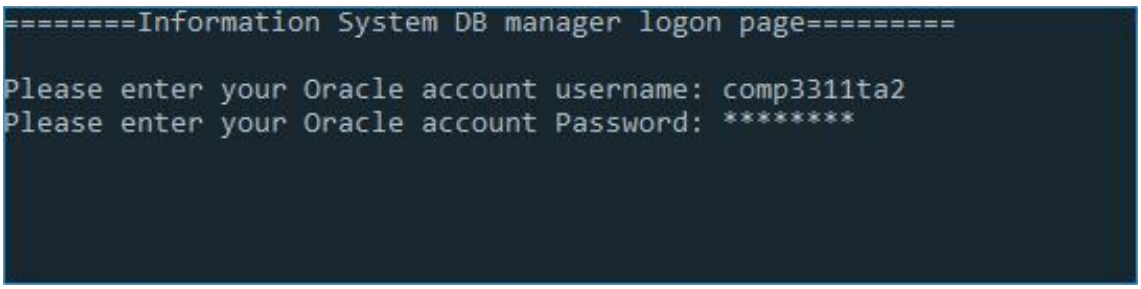
Hint: you may find the aggregate function LISTAGG() function useful.

Required assignment output:

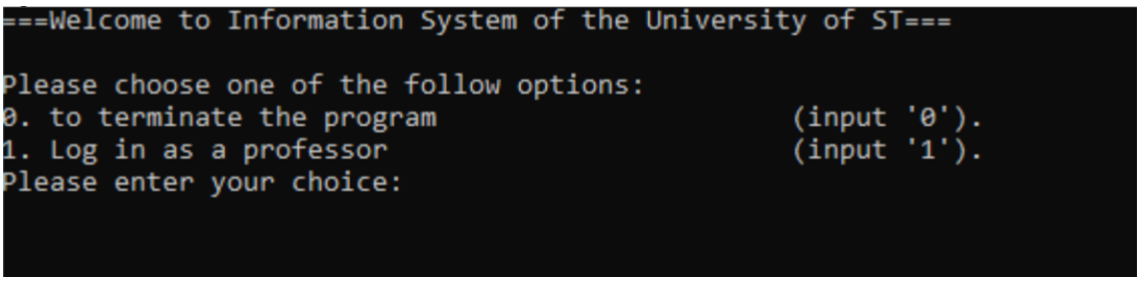
You are required to complete the **assign4.cpp** skeleton file provided at the assignment web page. You just need to fill out the ODBC code for the parts labeled **TODO** (i.e. the part "TODO: add your code here"). There are altogether **eight** TODOs. All the eight TODOs involve writing simple SQL statements using the ODBC functions. You can find everything needed in the slides of Lab7 and Lab8. For simplicity, you could use the "Direct Execute" method discussed in Lab 7 (instead of the "Prepared Statement" method) for the assignment.

To stay focused on SQL/ODBC programming, **we assume that users always enter valid inputs**. You do not need to check for the correctness of the inputs in the C++ program.

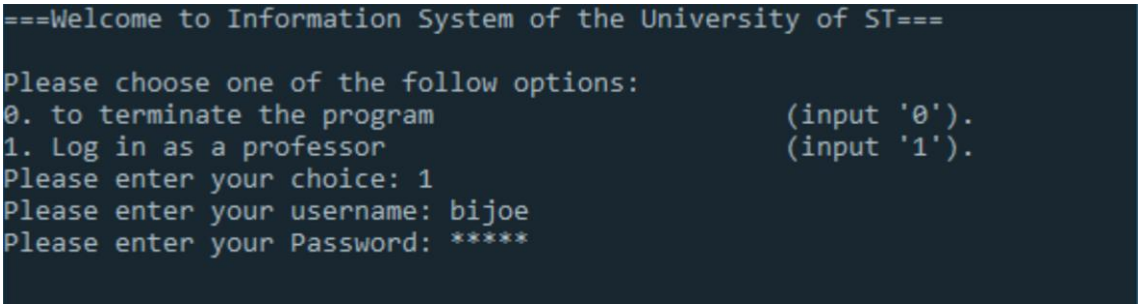
1. You are the database manager and you need to log in the information system with your Comp3311 Oracle account (comp3311stuxxx) before the system is ready to be used by the professors.



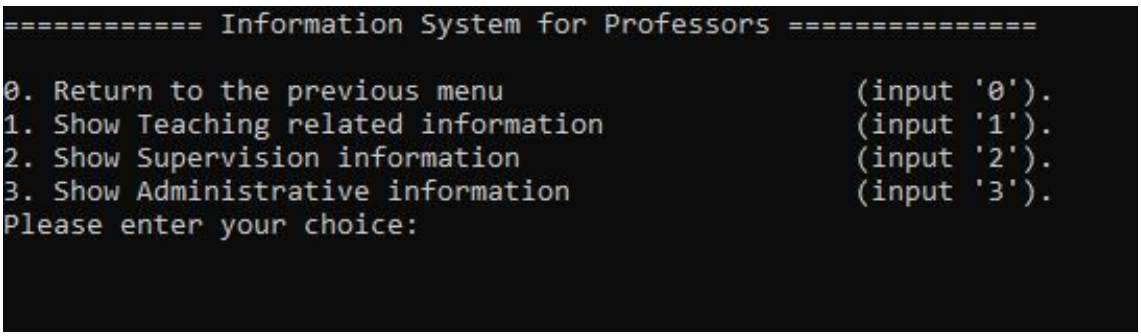
2. Once the DB manager has logged in successfully, the professors can start to use the information system.



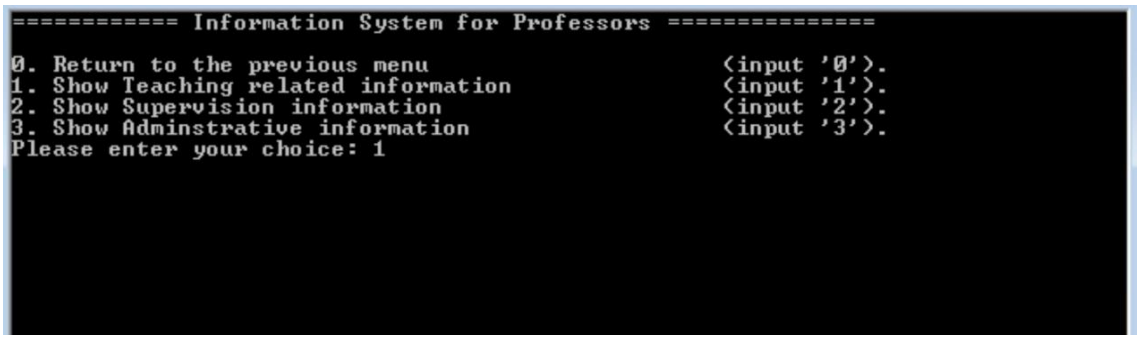
3. The following illustrates that a professor with the username “bijoe” is trying to log in.



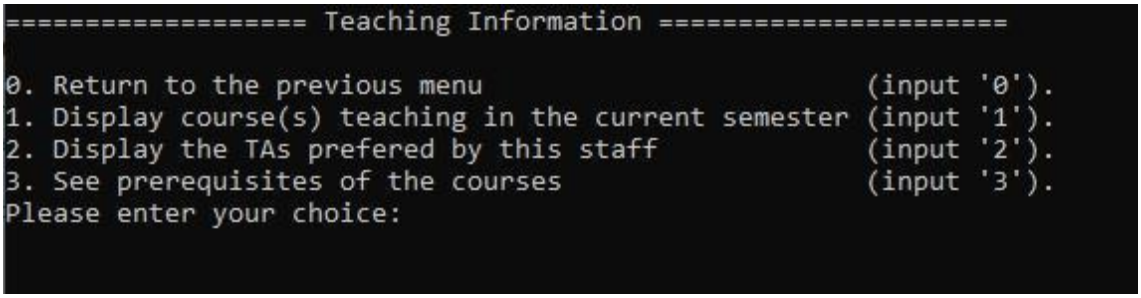
4. Once he has logged in successfully, he will see this main menu of the information system.



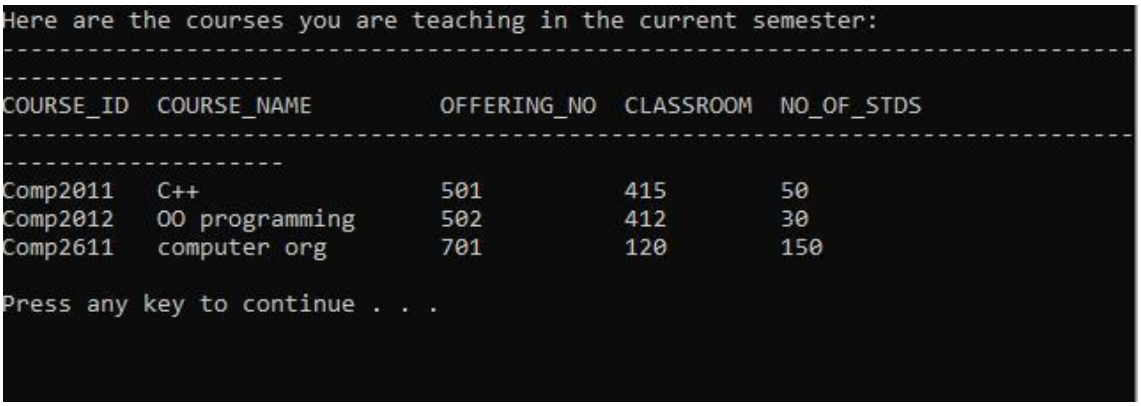
5. If he selects option "1. Show Teaching related information"



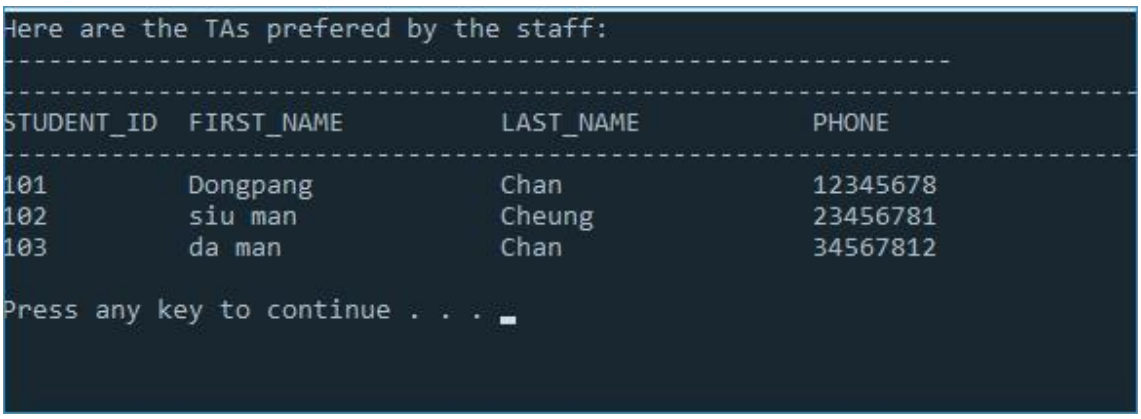
6. He will see the following sub-menu.



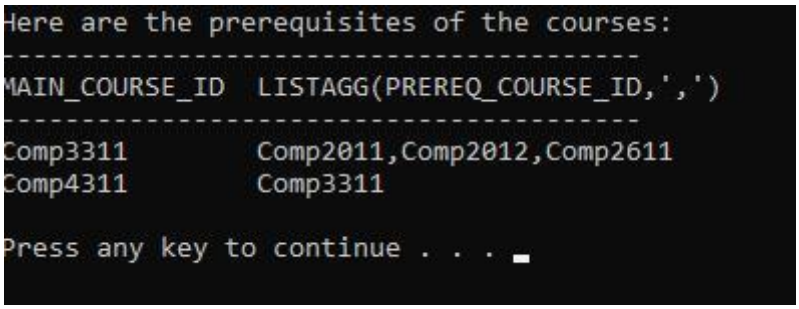
7. From there he can check the course(s) he is teaching.



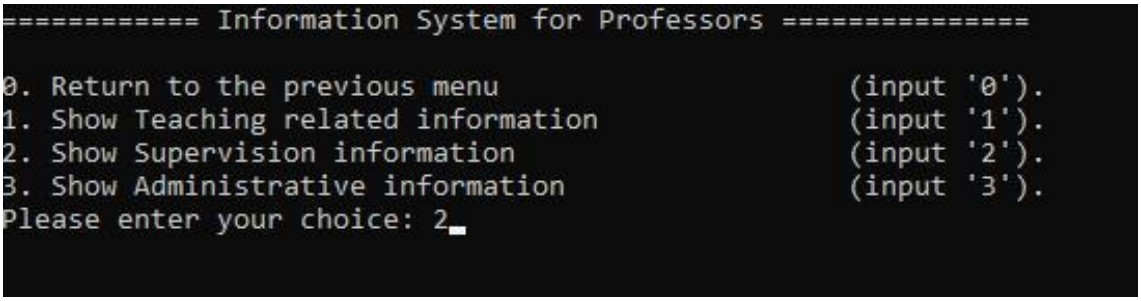
8. He can check his preferred TAs.



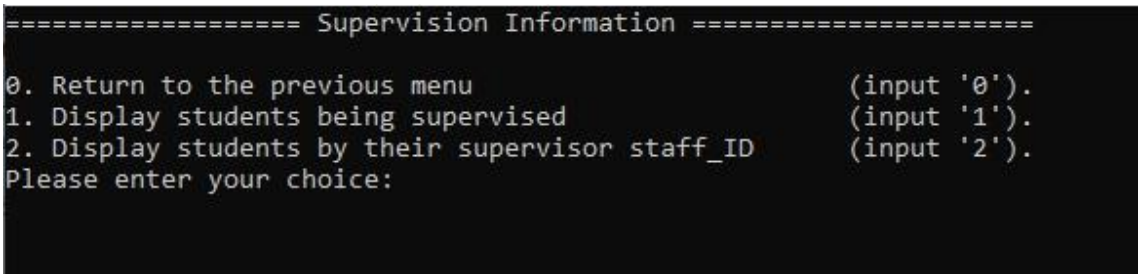
9. He can also check the prerequisites of all the courses.



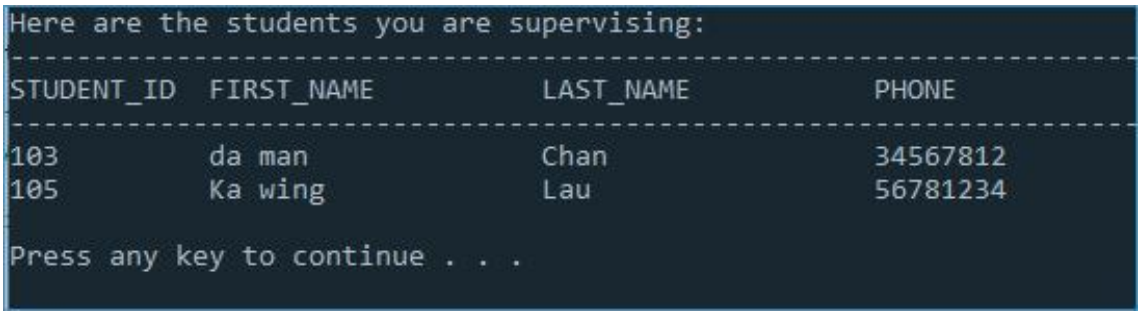
10. If he selects "2. Show Supervision information" from the main menu of the information system,



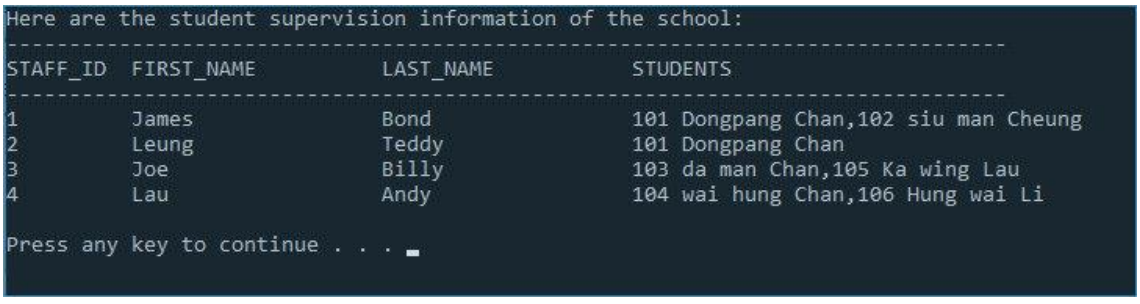
11. He will see the following sub-menu.



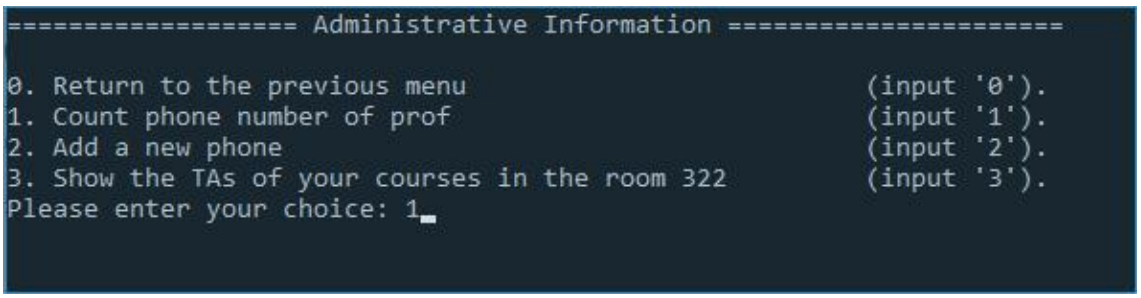
12. From there he can retrieve all the students he is supervising,



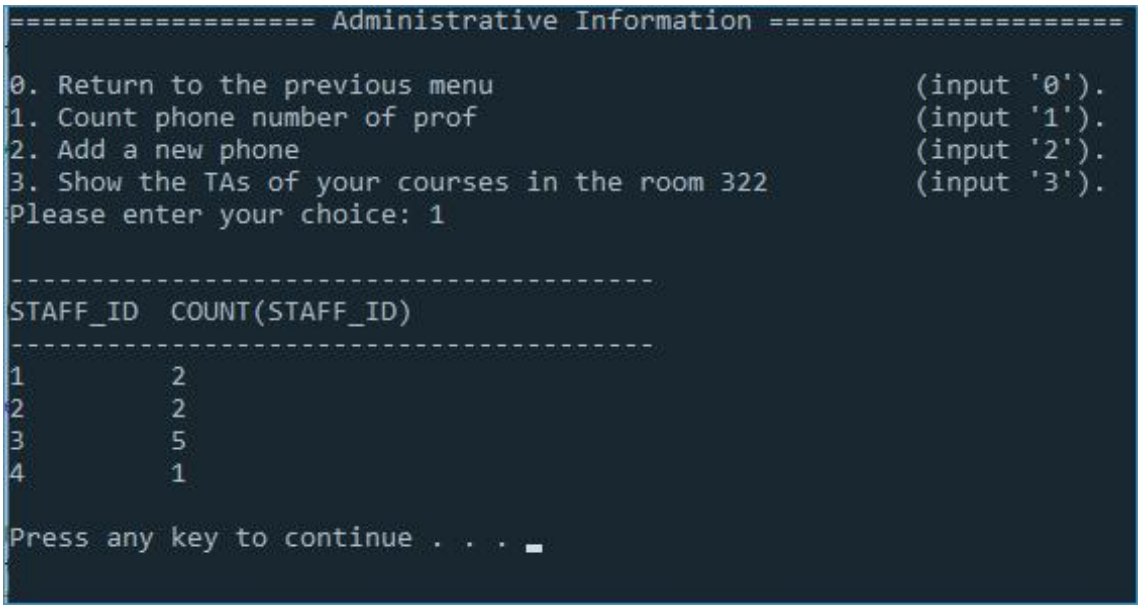
13. The supervising information of all the other professors.



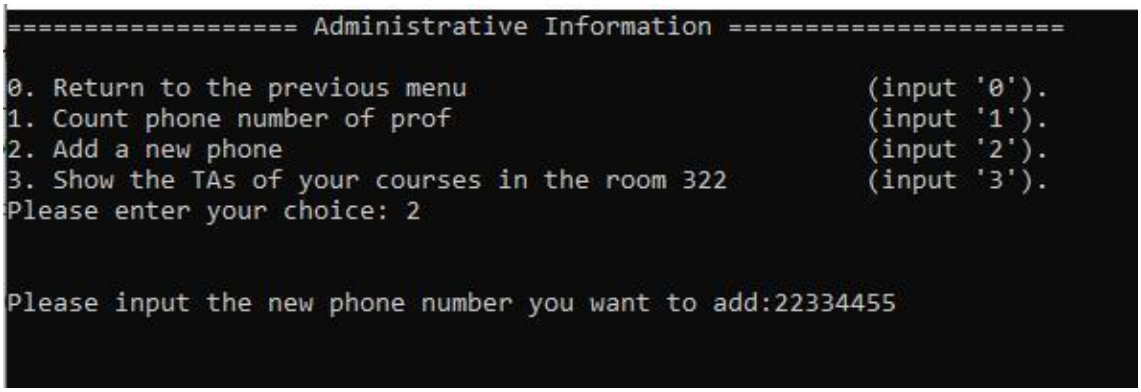
14. If he selects "3. Show Administrative information" from the main menu, he will see the following sub-menu.



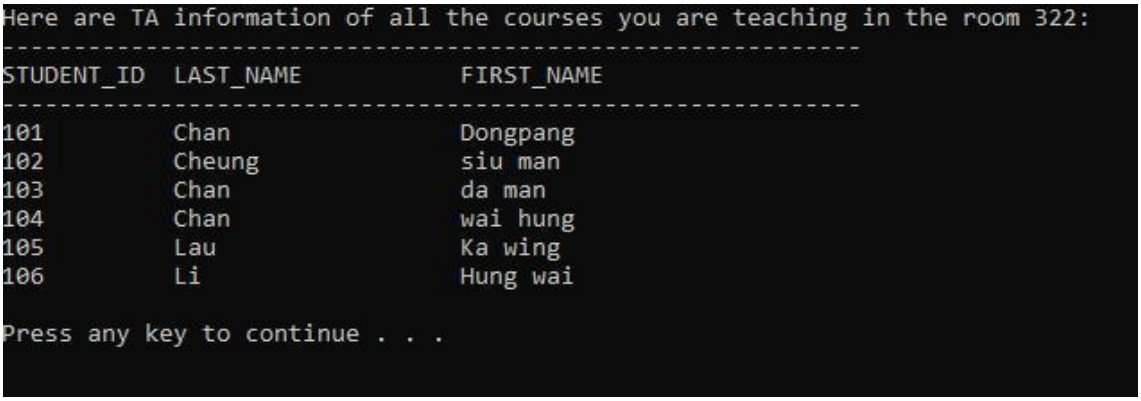
15. From there he can count phone number(s) of Professors.



16. He can add a new phone number.



17. He can check all the TA(s) of his courses in the room 322.



Disclaimer: The outputs in this section are merely showing some of the instances of the program. Please refer to the executable program provided at the assignment web page for the expected behaviors of the program under all the scenarios.

Further information/reminder about the assignment

1) A skeleton program will be provided to you. You need to complete it by filling all the "TODO" parts. For simplicity, you could use the "Direct Execute" method discussed in Lab 7 (instead of the "Prepared Statement" method) for the assignment.

2) You may **assume the users always enter valid inputs**, so you do not need to check the correctness of the inputs. You can focus more on the SQL/ODBC codes you need to add.

3) The detailed steps for compiling and running C++/ODBC codes are available in Lab7 and Lab8. Read also the appendices of Lab7 for setting up the data source and compiling the C++ program under Visual Studio.

4) We will compile and test your codes by using Visual Studio 2019. You are advised to refer to the slides of Lab7 how this is done. Make sure that your code runs correctly on the setting learnt from Lab 7 and Lab 8, otherwise you receive **no score** for your submission.

5) As the demo program is provided, you need to make sure that your program gives exactly the same output as that of the demo program before the submission. If your program results in different outputs as the demo program, **all** marks for the TODO will be deducted

Submission:

You need to submit the finished source code **“assign4.cpp”** file to Canvas. Do not submit any other file(s) or you risk losing all the scores. You should allow some time to transfer your file to Canvas Please check out detailed instructions in the following link:

https://canvas.ust.hk/courses/29896/assignments/108913