ICT2103: Information Management
Lab 3: Complex SQL Queries

Objectives

In this lab session, you are expected to learn complex SQL queries and execute them, e.g., handle duplicates, referential integrity, multiple relations and conditions, complex conditions, and union.

Deliverables

You are required to finish the lab questions listed below and submit a task completion report. All the questions shall be answered, and you can use the screenshot (note: not taking photos with your phone) to capture your queries and outputs.

Format: **ONE (1) report in PDF.**
Filename: <student id>_<name>_Lab3.pdf, e.g., 2002103_ZhangWei_Lab3.pdf.
Venue: Dropbox in xSiTe.
Deadline: the end of the week (Sunday, 23:59) when the lab is conducted.
Penalty: A penalty of 20% for wrong format or filename and 10% per day for late submission will be imposed. A penalty of 100% for this lab will be imposed for the 1st time plagiarism and a penalty of 100% for ALL the labs for the 2nd time plagiarism.

Background Problem Statement

SIT ONLINE BOOK EXCHANGE

Students at the Singapore Institute of Technology (SIT) need to buy books for their studies. They can also lend and borrow books from other students. You, as an IT professional, are commissioned by the university to design and implement an online book exchange system for its students. You need to design and implement a database application that records information about students, books they own, and books they borrow from other students.

The database records the name, email, degree programme, and student number of each student. Each student is identified in the system by his/her email address. The database also records the date at which the student joined the university. The database records the title, authors, publisher, year and edition and the ISBN-10 and ISBN-13 for each book. The International Standard Book Number, ISBN-10 or -13, is an industry-standard for the unique identification of books. It is possible that the database records books that are not owned by any students (because the owners of a copy graduated or because the book was advised by a lecturer for a course but not yet purchased by any student). The database records the date at which a book copy is borrowed and the date at which it is returned. We will refer to this information as a loan record.

For historical purposes, the following three situations may arise. First, the database records information about the copies and the owners if the owners are students or there are loan records for the copies. Second, the database records information about graduated students as long as there are loan records for books that they owned. Third, in order to keep the loan records for this book, the database records the case of a book that was owned and subsequently sold unless the copy was never borrowed.

Preparation Step

Download and run the SQL script (small_data.sql) for the creation of the relational schema and insertion of data from LMS.

Exercise: Queries in SQL.

(Note: Remember to save your work and screen capture your SQL queries and output for your lab submission.)

Q1. Find the emails of students. Above the SQL statement, please add a comment with your name and student identifier.

Q2. Find the different emails of students.

Q3. Print the names of students in descending alphabetical order.

Q4. Are there students with the same name?

Q5. Find the different names of students. Is the result sorted? If not, please sort it.

Q6. Find the names of students who owned a copy of the book ‘978-0321474049’.

Q7. Find the names of the students who owned a copy of a book with more than 100 pages and the book title contains the word ‘Photoshop’.

Q8. Find the number of A4 pages needed to photocopy the two books with ISBN-13 ‘978-0321474049’ and ‘978-0684801520’ (duplex printing or 2 pages of a book can be copied on one A4 page).

Q9. Find the different names of the students who owned a copy of a book other than ‘978-0321474049’.

Q10. Find the names of students who borrowed a copy of the book '978-0321474049'.

Q11. Find the names of students who owned or borrowed a copy of the book ‘978-0321474049’ using set operator UNION.

Q12. Find the names of students who owned or borrowed a copy of the book ‘978-0321474049’ using logical operator OR.

Q13. Delete all the data in the table loan.

Q14. Try the second last query again, and comment on the results with your name and student identifier.

Q15. (Optional) Display some statistical information like execution time to understand the queries at the system level.

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