CS2102 Database Systems
## AY 2014/2015 Semester I

SQL Lab Handout

The aim of the lab sessions is to familiarize students with Oracle, syntax of SQL commands and common error messages. Each student will be given an Oracle account. You would have received your Oracle userid and password by now. You can find information about using Oracle at

http://www.comp.nus.edu.sg/~oradoc

You can find some notes on the differences between Oracle SQL and standard SQL at

http://infolab.stanford.edu/~ullman/fcdb/oracle/or-nonstandard.html

Below is the ER diagram for the Online Book Exchange application (Application 2 in Tutorial 1).
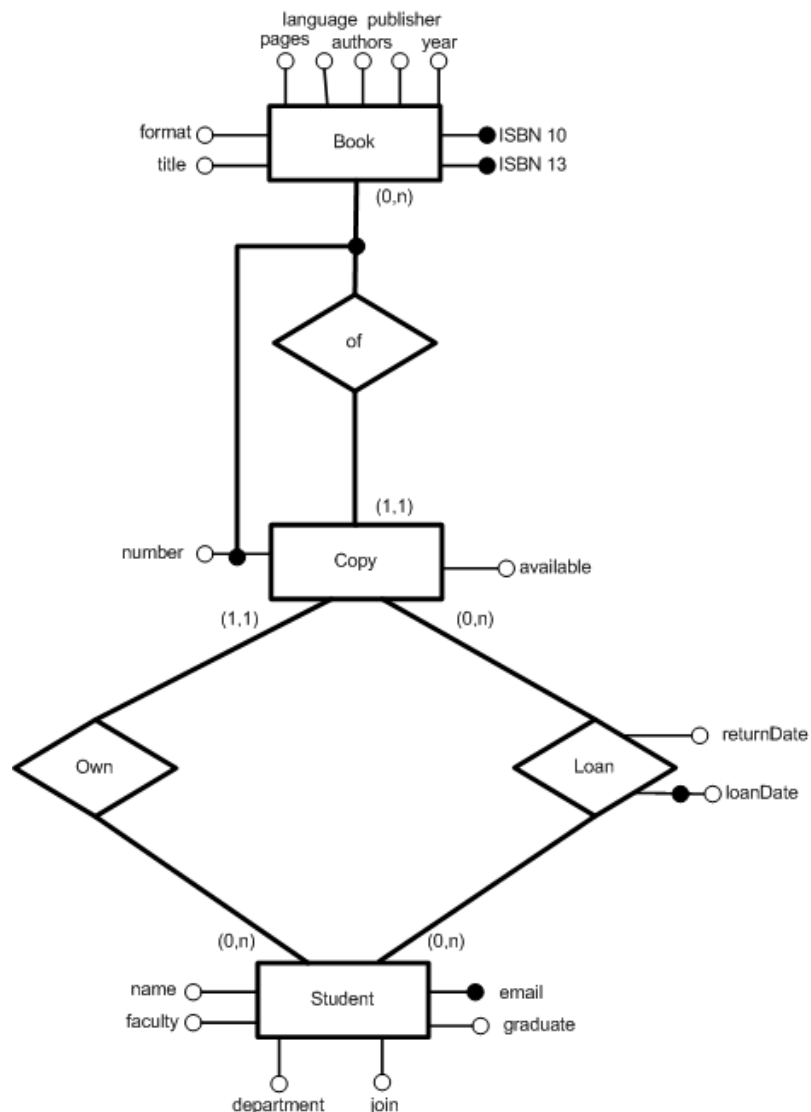
1. Translate the Entity-Relationship diagram of the online book exchange application to a relational schema. Give the SQL DDL statements to create this schema.

2. SQL Warm-up

   a. Create the table Book that contains the following information about books: title, format (paperback or hardcover), number of pages, authors, publisher, year, edition, ISBN-10 and -13. Choose a primary key.

   b. Insert a book called "Introduction to Database Systems". Go to the Web to find the actual details.

   c. Insert 3 books authored by C.J. Date. Go to the Web, for instance www.amazon.com, to find the details.

   d. Modify all the books authored by C.J. Date to mention his first name. You can find the author's first name from the Web.

   e. Print all the information about books.

   f. Add a new attribute Language to all the books and set the default language to English.

   g. Delete all the books authored by C.J. Date.

   h. Delete the Book table.

3. Create the tables for the remainder of this lab using the code in NUSStASchema.sql. You may need to rearrange the statements in the file if you encounter errors.
   Populate the tables using NUSStAData.sql.
   Check the foreign key constraints to decide in which order to insert the data.
   You can clean up data and tables anytime using the file NUSStAClean.sql.

4. Basic SQL queries

    a. Find the names and emails of students.

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

    c. Are there students with the same name?

    d. Find the names and emails of students who have borrowed some books on Database.

    e. Find the names of students who owned a copy of book 'Pride And Prejudice'.

    f. Find the different names of students who owned a copy of a book other than of '978-0262033848'.

    g. Find the number of A4 pages needed to photocopy the two books with ISBN-13 '978-0262033848' and '978-0321295354' (2 pages of a book can be copied on one A4 page).

    h. Find the names of the students who have borrowed some book by Jane Austen.

5. Queries involving set and aggregate operators, nested queries

    a. Find the names of students who owned or borrowed a copy of book '978-0262033848'. Use UNION.

    b. Find the names of students who owned or borrowed a copy of book '978-0262033848'. USE OR.

    c. Delete all the data in table Loan.

    d. Try again the last two queries.

e. Find the total number of copies.

f. Find, for each book, the corresponding number of copies. [Print the primary key of the book and the number of copies.]

g. Find the available books with the largest number of copies.

h. Find the names of students who owned a copy of a book with more than 100 pages whose title contains the word 'Computer'. Use nested queries.

i. Find the names of the different students who have borrowed all the books by 'Jane Austen'. Use aggregate functions.

j. Find the names of the different students who have borrowed all the books by 'Jane Austen'. Use NOT EXISTS. (You may also try with NOT IN and EXCEPT.)

6. Create and query views for the copies for which the owner is a Computer Science student.