ITCS 3160 Project Assignment (12 points + up to 3 bonus points)

General information:

This is a group project, each group consisting of 3-4 students. You will design, implement and query a database system for a virtual online bookstore using MySQL. You will need to implement the system as required by the attached specification and requirements (Appendix A). You can introduce more entities, relations, and functions which would not violate the given specification and requirements. You can find real enterprises such as amazon.com for examples.

Milestones:

* 10/22: by 4:45pm, each group submits a hardcopy of your EER diagram that capture the requirements. If you add extra business rules besides those in Appendix A, include them in your submission. Please list the full names of all group members in the submission (2 points)

The EER diagram should capture the entities, attributes, and business rules when possible. It is possible that your ER diagram can't capture all constraints from the business rule. Please specify the constraints that cannot be captured by the model.

* 10/29: by 4:45 pm, each group submits a hardcopy of the relation schema of the database (2 points). Please check the norm form of your tables and decompose if necessary (use the normalization process discussed in the class). It is possible that your relation schema can't capture all constraints from the ER diagram. Please specify the constraints that cannot be captured.

* 11/19: Submit SQL script (8 points) (submissions without comments will be rejected)

By 11/19 11:59pm, each group needs to submit a runnable MySQL script file (including comments). The script should (1) create a relational database according to the relational schema (2 points). Primary key and foreign key should be properly defined to ensure referential integrity (1). Use check to ensure legal_values integrity (1 point); (2) insert some example tuples into your relations so that you can run queries on them (1 point); (3) conduct queries and updates to the database to perform all the functions listed in Appendix A (4 points). It is important that your script file should contain comments so that the instructor can know the purpose of each statement. Note it is expected that all your implementation at this step is done through one script file. Script files that are not runnable will be rejected.

* 12:10: Win bonus points (up to 3 bonus points): You may implement a graphical user interface, e.g., by Java, C++, PHP, HTML, or any other appropriate approach to implement your system. This step is optional but highly recommended. Groups choosing this option will receive EXTRA credits. If you have a graphical interface, bring it to the instructor and give a demo by 12/12 (You can set up an appointment with the instructor through emails) (up to 3 bonus points).

* 12/10: Each group submits a hard copy of the final report at the beginning of the class. In addition, each student will submit a private contribution statement through Moodle 2 by 12/10. You won't receive your credits for the project without the final report and the contribution statement.

Prepare your final project report which may contain the revised version of all the previous reports. Specifically, your report should contain the following sections:

- Required and additional business rules
- ER diagram
- Relational schema
- MySQL script file
- GUI description and screenshot (optional)
- Conclusion and future work

For GUI, please describe concisely the techniques you applied and you need to include several snapshots of your system. In conclusion and future work, please discuss how to improve your work if this is a real-life project.

Each student will submit a one-page statement privately. Specify the responsibilities and contributions of your group members in detail in the one-page private statement. Your grades will be varied based on your contributions.

All due dates of the project must be strictly followed. No late project submission will be accepted. However, **you can update your submissions during the semester and I will change your grade if you improve them later in the semester.**

Appendix A: Online bookstore specification and requirements

New customers need to register first to get one account ID. The provided information includes: customer name, phone #, email address, and password. After registration, the customer will be assigned one account ID and he/she can login using account ID and password. One customer can only register one account and each account must belong to exact one customer.

The bookstore keeps a large amount of books. Each book is identified by ISBN. For each book, the bookstore also needs to record its authors' names, title, edition, year, category, publisher, quantity-in-stock, and price.

One customer can place any number of orders. For each order, the bookstore needs to record who places this order, when, the order status, total price, shipping address, payment method, bill address, and ordered books. Note there is only one shipping address and one billing address for each order though the shipping address may not be the same as the billing address. Currently for payment method, it only accepts credit card, hence the bookstore needs to record credit card information.

Customers can also manage their shopping carts. One customer can have any number of shopping carts. However, each shopping cart has exactly one customer. The shopping cart contains the following info: cart-ID, name, date-created, date-last-updated, books contained in this shopping cart, etc.

The bookstore also has a number of employees which are identified by employee ID. The bookstore also needs to record employee's name, address, salary. Some employees are ranked as manager.

To better serve customers, each order will be assigned to one employee who will monitor and handle the order. For the order with total amount is more than $1,000 dollars, one manager should be assigned to.

Functions for customers:

- New user account registration
- User login
- User can update password etc.
- Book search (by author name, title, category, year or combinations)
- Create one empty order or shopping cart
- Add/delete books from shopping cart
- Merge shopping carts
- Change shopping carts as orders (please note that once a shopping cart is changed to order, all of this shopping cart's info should be removed from database).

- Place the order
- Order trace

Functions for employees:

- List book information (e.g., title, author, price) and quantity-in-stock of some chosen books
- List information about those orders assigned to him/her
- Update order status
- Insert new books