COMP 440 - Course Project: Phase 1

Spring 2023

Description

Consider the design of a database for an online store. Each item is identified by a unique item ID, a title, a description of the item, the date the item is posted, price, and a list of categories (each category is a single word in lower cases). Only registered users can post, buy, and review an item. Each registered user is identified by a user ID or username (or both), a password, a first name, a last name, and an email address. A user can give at most one review for each item, and on a particular day, the user can post at most 3 items and 3 reviews. Meanwhile, an item can have no or many reviews. The review given by a user provides a score of "Excellent, Good, fair, or poor" and then a short remark. A user cannot modify an existing review that she/he gave earlier.
Some simple GUI interfaces are required for each functionality. **All functionality must be performed via the interface of your system. Direct SQL statement execution via any tools (MySQL Workbench) can only be used for debugging purposes.**

Part 1 – Deadline: Monday, 03/27, by midnight

Use Java/C#/PHP/Python/C++ and SQL to implement the following functionality:

1. (6.25 pts) Create a database schema and implement a user registration and login interface so only a registered user can login into the system. The schema of the user table should be:

   user(username, password, firstName, lastName, email)

   username is the primary key, and *email* should be unique. You have to prevent the SQL injection attack. There is an attached pdf file about SQL injection attacks.

2. (6.25 pts) Sign up for a new user with information such as: *username*, *password*, *password confirmed, first name, last name, email*. Duplicate *username*, and email should be detected and fail the signup. Unmatching passwords should be detected, as well.

3. (6.25 pts) Implement a button called **"Initialize Database."** When a user clicks it, all necessary tables will be created (or recreated) automatically. Each table will be populated with at least 5 tuples so that each query below will return some results.

How to submit:

1. The source code package. All files (source codes, class files, bat, and txt) should be contained in a war or zip file called comp440_teamNo_part1 for a team whose team number is teamNo submitted via Canvas.
2. A YouTube video. Use a recorder: https://www.apowersoft.com/free-online-screen-recorder. And upload your video to www.youtube.com. We only need you to record your screen and your voice for the project demo, not your face. You can add the YouTube URL to a readme file inside your project directory. You can create slides for your presentation if that is helpful, or you can use YouTube to record your video:

https://www.labnol.org/software/create-youtube-screencast/27936/

You need to come to the office hours or make an appointment with the instructor immediately if you fail to complete part 1 by the due date. Please send an email to me to list all the challenges of your project and where exactly you need help. Otherwise, you might not be able to do the remaining parts of this project.

Part 2: Deadline: Monday, 4/17, by midnight

Based on part 1, implement the following functionality using your selected programing language and SQL with necessary GUI interfaces. Part 2 emphasizes the programming of interfaces and design and their integration with database operations.

1. (6.25 pts) Implement a interface so that a user can insert an item, such as:

   Title: Smartphone
   Description: This is the new iPhone X
   Category: electronic, cellphone, apple
   Price: 1000

   The IDs of items should be generated automatically using autoincrement feature of MySQL. Make sure that a user can only post 3 items a day.
2. (6.25 pts) Implement a search interface as a form so that after one type in a category, all the items with that category are returned. The result needs to be shown as a table/list on a page.
3. (6.25 pts) Select an item from the above list, and one can write a review like the following:

   A dropdown menu to choose "excellent/good/fair/poor", and then a description such as "This is a cool phone.".

   Make sure that a user can give at most 3 reviews a day and cannot give a review to his own items.

How to submit:

1. The source code package. All files (source codes, class files, bat, and txt) should be contained in a war or zip file called comp440_teamNo_part2 for a team whose team number is teamNo submitted via Canvas. One of the files should be called readme.txt, which includes the information about the group members' contributions and any instructions to install, configure and run your project.
2. A YouTube video. Use a recorder: https://www.apowersoft.com/free-online-screen-recorder. And upload your video to www.youtube.com. We only need you to record your screen and your voice for the project demo, not your face. You can add the YouTube URL to a readme file inside your project directory. You can create slides for your presentation if that is helpful, or you can use YouTube to record your video:
   https://www.labnol.org/software/create-youtube-screencast/27936/

You need to come to the office hours or make an appointment with the instructor immediately if you fail to complete part 2 by the due date. Please send an email to me to list all the challenges of your project and where exactly you need help. Otherwise, you might not be able to do the remaining parts of this project.

Part 3: Deadline: Monday, 5/8, by midnight

Based on parts 1 & 2, implement the following functionality using your selected programing language and SQL with necessary GUI interfaces. Part 3 emphasizes both the interfaces and their integration with backend database operations. Each item has 6.25 points.

1. List the most expensive items in each category.
2. List the users who posted at least two items that are posted on the same day, one has a category of X, and another has a category of Y. In terms of the user interface, you will implement two text fields so that you can input one category into each text field, and the search will return the user (or users) who (the same user) posted two different items on the same day, such that one item has a category in the first text field and the other has a category in the second text field.
3. List all the items posted by user X, such that all the comments are "Excellent" or "good" for these items (in other words, these items must have comments, but these items don't have any other kinds of comments, such as "bad" or "fair" comments). User X is arbitrary and will be determined by the instructor.
4. List the users who posted the most number of items since 5/1/2020 (inclusive); if there is a tie, list all the users who have a tie.
5. List the other users who are favorited by both users X, and Y. Usernames X and Y will be selected from dropdown menus by the instructor. In other words, the user (or users) C are the favorite for both X and Y.
6. Display all the users who never posted any "excellent" items: an item is excellent if at least three reviews are excellent.
7. Display all the users who never posted a "poor" review.
8. Display all the users who posted some reviews, but each of them is "poor".
9. Display those users such that each item they posted so far never received any "poor" reviews. In other words, these users must have posted some items; however, these items have never received any poor reviews or have not received any reviews at all.
10. List a user pair (A, B) such that they always gave each other "excellent" reviews for every single item they posted.

How to submit:

1. The source code package. All files (source codes, class files, bat, and txt) should be contained in a war or zip file called COMP440_TeamN0_part3. Please upload the file to canvas. One of the files should be called readme.txt, which includes the information of the group members' contributions as well as any instructions to install, configure and run your project.
2. A YouTube video. Use a recorder: https://www.apowersoft.com/free-online-screen-recorder. And upload your video to www.youtube.com. We only need you to record your screen and your voice for the project demo, not your face. You can add the YouTube URL to a readme file inside your project directory. You can create slides for your presentation if that is helpful, or you can use YouTube to record your video: https://www.labnol.org/software/create-youtube-screencast/27936/

The project will be done by a team of a maximum of three students, but each student's contribution needs to be clearly stated in readme.txt. Start your project early and ask questions if you have doubts. Do not wait until the last minute.

Demo

You will be required to show a demo of your project right a few days after the submission of part 3. **Each group will have 20 minutes for the demo of their project. Please make sure you arrive at least 5 minutes before your appointment time. Make sure you always have a working version by archiving so that you avoid last-minute mistakes. Populate your database, so it is ready to answer all the queries in the project. We will need to see your database as well. All functionality must be performed via the interface of your system. Direct SQL statement execution via any tools (MySQL workbench) is not allowed during the demo.**

Examples of previous project:

- https://www.youtube.com/watch?v=J5rxAaTCcjU&feature=youtu.be