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CSCI 24000

Honors Contract Project Proposal

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**Summary:**

For my honors contract project, I will be creating a library management system. This would be a system intended to aid libraries in the organization and tracking of patron and material information. The program would include an SQLite database with two tables - patrons and materials. These would consist of the details about a patron (name, card number, email, materials, etc), and the different descriptors of materials (id, name, author, genre, status, etc). The baseline functionality would permit an authorized user login to change material status between checked in or out, and track which patrons have which materials. This program would be very expandable as there are many potential features including due dates, renewals, barcode scanning, and other options. I plan on writing the program in C++, because in order to deal with a highly expandable number of books, I would want dynamic memory management. As far as I understand, this would be better achieved through C++ as opposed to Java.

Overall, this project will provide an environment to explore the challenge of ensuring secure access with the SQLite database setup. While creating the system, I would want to ensure that the only user accessing information is an employee. So, this program needs to be capable of verifying that. At the same time, I would attempt to determine the positive and negative impacts of setting this authentication up in SQLite. If I discover through the project that this leads to significant issues, or that a better alternative exists, I can then compare the options and implement the best one.

Alternatively, I could explore the difficulties and techniques in developing a relational database to manage the data in this program. It would create a more complex data structure and force additional research into the methods for this setup.

**Timeline:**

End of February: Database Schema and UML Diagram and full project structure

End of March: Implement the design, and start creating the software system

End of April: “Test”, fix, clean up, and potentially add additional desired features.

**Milestones:**

1. Project structure and functionality, scope of everything
   1. Database schema, UML diagram
2. Building the actual program
   1. Creating the database
   2. Creating the login
   3. Creating the system
3. Testing and fixing
   1. Design prettiness

**Features:**

Console application

-Core-

1. Login
2. Create book/patron in database
3. Search for and read details about books/patrons
4. Update book/patron statuses (check in/out)
5. Delete book/patron from database
6. Logout

-Bonus-

* Due dates
  + When checked out, set the date
  + Set due date for a set # of weeks after that
  + After that date passes, set book status as overdue, patron status as delinquent
* Renewals
  + Reset due date as if it were checked out
  + Change the amount of times it has been renewed
* Email reminders
* Barcode scanner