**CS443 Project Report**

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Our initial design for our library database was a very simple design with a few flaws. We had excess keys and used unnecessary relationships. After reviewing with Dr. Wang we can up with the updated design and modified the ER diagram and schema to reflect these changes. You can view them in the attached files. These changes included removing an id for the borrow records and making the primary key for borrow records be the user + book being borrowed. Along with these changes to the initial design and relationships, we also had to properly implement functions in the website that went along with the proposed functions of the database which will talked about more later.

Moving on to the implementation of the database onto a website. Since we both have a significant amount of prior knowledge in Django, a Python web framework, the development, and integration went smoothly. We did struggle at first ensuring that we had a proper database design that would properly satisfy the project requirements, such as implementing an 3NF database. Making sure the ER Diagram and Relational Database Schema were properly created and that they followed the functionality of our website was also a learning experience.

We did have to make some slight changes to our initial ER Diagram due to some inaccuracies we initially had. Some of these inaccuracies included the absence of methods in our Borrow Records entity. This was inaccurate because we had no methods that showed how the website functioned. There were also some inaccuracies with the relationship types between entities.

There are no outstanding bugs or huge failures within the app as of writing. One note however is if you do run the website on your own and do not have the database created by making migrations, the database functionality will not work. For example, when trying to create a user, it will throw an error message. On top of this, you must run the python manage.py create superuser command to make an admin for the ability to do some of the DB features such as adding books to the library. These steps will be indicated within the user manual and on the GitHub repository.

Fortunately, we have implemented all the features we planned to, so no features went unrealized. Online recourses used the most during development included the official Django documentation as well as the SQLite database model documentation. LLM technology such as Cursor and ChatGPT were used to eliminated repetitive tasks and to create simple templates for web design, these resources were not used in creating or planning database designs or models.

We both worked on project documentation such as diagrams and presentations along with the coding implementation of our website database project. We both put in equal amounts of work and made sure to use proper git control to keep track of changes and what needed to be done. Teamwork makes the dream work!