Software Design and Engineering

Lab Document

High Level Purpose Statement:	The purpose of this lab is to learn how to use PostgreSQL. For this lab, I am going to create a database that stores data generated from a .CSV file containing courses from different semesters at UCA. I think it's important to note that this database may be used for my final project, which involves creating a schedule building / recommendation tool.
Experimental Design:	I am envisioning this project to be separated by the following tasks: • Establish database connection • Store data from .CSV into different tables/entities • Create prototype GUI to allow users to interact with database
Resources Available:	**PostgreSQL instructions** https://neon.tech/postgresql/postgresql-jdbc/connecting-to-postgresql-database **PostgreSQL documentation** https://www.postgresql.org/docs/current/sql-execute.html **DAO Design Pattern (I'm fascinated by separation of concerns…)** https://en.wikipedia.org/wiki/Data_access_object **My Go-To for Swing** https://web.mit.edu/6.005/www/sp14/psets/ps4/java-6-tutorial/components.html
Time Estimate:	I am estimating this project to take between 8-16 hours.
Experiment Notes:	**Establish database connection:** This was a tricky task. Having no experience with PostgreSQL, I had to spend some time researching how to install and connect to it. **Store data from .CSV into different tables/entities** This task was relatively easy. I only had to create one table, *courses*. I have some experience with SQL, so creating and navigating the table was not hard. **Create prototype GUI to allow users to interact with database** This was the hardest step. I had to figure out how I was going to make queries based on a user's interactions with the GUI. I did not want the user class to have direct access to the database, so I implemented the DAO design pattern, which abstracts the database and interactions. This task was still difficult due to the complexity of filtering data through multiple interfaces.

Results:	I have a working prototype that successfully navigates the database through a GUI. Users can view information about different courses to see what fits their needs.
Consequences for the Future:	There are still some features I would like to add in the future, including more filters (days, credit hours, method, etc.). I really enjoyed working with PostgreSQL and can see myself using it in the near future for other projects. I learned so much from this lab and look forward to applying the skills that I learned.