COSC-580 – Project 3: Database Management System Implementation

Spring 2022

By now we have learned ethical data practices (Project 1). We also have learned how to design and implement relational database applications (Project 2). It is time to learn how to implement the underlying structures and methods of relational database management systems. As such, to successfully complete this project, you will design, document, and implement an actual (simplified), single-user, relational database management system (RDBMS).

Your system implementation must include:

- A SQL parser;
- An indexing structure;
- An execution engine;
- A query optimizer (optional – but worthy of significant extra credit).

Groups

You are to work in a group of two or three. In this project, unlike the previous two, group members might receive different grades; individual grades depend on the member's assessed contributions. Each group member will evaluate their own performance as well as the performance of the other member(s).

Demonstration & Grading

You will demonstrate your project online (30 minutes total time allotment – any way you choose). Prior to your demonstration (at least 48 hours in advance), you will submit your system documentation (limited to 5 pages), one per group, that must include at least your design decisions, an itemization of your achievements as well as your deficiencies. Deficiencies not reported but found during the demo will result in reductions far exceeding those incurred had the deficiencies been noted in the writeup. Grading will be based on the sophistication of the design, features implemented (completeness), and the execution, including the efficiency, of the queries. Ad hoc queries will be asked during the demo. Proper user interface is nice but not required; all that is required is the ability to process SQL queries.