CSIT6910 Independent Project Proposal

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Project Title

Answering SQL Queries under Differential Privacy

Brief Description

Differential privacy is increasingly recognized as the gold standard for releasing sensitive data query results while preserving individual privacy. In this project, I will implement a recently developed algorithm designed to compute differentially private results for SQL queries. The focus will be on translating theoretical guarantees into practical performance, ensuring both accuracy and privacy preservation. The implementation will be carried out in C++ or Java, leveraging efficient data structures and query processing techniques. The final deliverable will include a functional prototype, comprehensive documentation, and an empirical evaluation on real-world datasets.

Scope and Workload (3 Credits)

- **Week 1–2:** Review differential privacy fundamentals and the specific algorithm to be implemented.
- **Week 3–6:** Design and implement the core algorithm in C++ or Java.
- **Week 7–9:** Integrate SQL parsing and query processing functionalities.
- **Week 10–11:** Conduct experiments on real datasets to evaluate accuracy, privacy loss (ε), and runtime efficiency.
- **Week 12:** Prepare final report, presentation slides, and demonstration.

Grading Criteria (Total 100%)

Component	Weight
Project Proposal	10%
Implementation Quality	40%
Final Report	30%
Presentation & Demo	20%

Deliverables

1. Source code (C++ or Java) and documentation.
2. Final report (10–15 pages) including meeting minutes.
3. 15-minute presentation with live demo.

Supervisor Meetings

At least four meetings will be scheduled to discuss progress, challenges, and future steps. Meeting minutes will be documented and attached to the final report.

Timeline

All milestones adhere to the one-semester duration, with weekly progress tracked via GitHub commits and shared with the supervisor.