**Independent Study Proposal Document**

*Title:* Streams Java 8: Simulation of Relational Algebra Operations

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*Faculty sponsor:* Dr. James Heliotis

INTRODUCTION

Java 8 SE provides a new API called Streams that allows to process data in a declarative way. Streams supports many operations such as filter, map, reduce, and iterate that can be combined to write data queries. The goal of this independent study is to evaluate the versatility of this class for simulating relational algebra operations. For that purpose, the student will develop a Java application that given a database and a SQL query, it will create a Stream object that after applying several operations, it will contains the same data as the result of executing the SQL query over the database.

Independent Study Outcomes:

* Student will be able to demonstrate an understanding of relational algebra operations.
* Student will be able to demonstrate an understanding of query execution plans.
* Student will be able to design, implement and explain a practical solution of processing data using Stream Java 8.

PLANNED WORK

The duration of this independent study is 10 weeks and the total hours are 140. The student and the faculty sponsor will have weekly meetings to discuss the project and its evolution.

*Weekly Schedule:*

*Week 1:* Analysis and design.

*Week 2:* Design and query plan execution processing.

*Week 3:* Query plan execution processing.

*Week 4:* Query plan execution.

*Week 4-8:* Relation algebra operations development.

*Week 9:* Unit tests.

*Week 10:* Final report, deliverables submission.

DELIVERABLES

- Final report.

- Software application.

- Test data, database and SQL queries.

EVALUATION

- Report: 40%.

- Software: 40%.

- Test data and environment: 20%.