Memorial University of Newfoundland **Fall Semester 2018**
Computer Science 3201 **Submitted November 9th**

Course Project Proposal

Design Goals: The goal of this project is to develop a fully functional evolutionary algorithm (EA) that will be capable of solving the travelling salesman problem (TSP) over three different datasets that vary in complexity; each data set representing a different country/location. In addition, this evolutionary algorithm will implement a novel and advanced technique that has previously been thoroughly researched to help increase the efficiency of the program.

Techniques: The main components of this evolutionary algorithm such as the main program and fitness, population and selection modules will be implemented using conventional means that have been covered during the instruction of this course. This evolutionary algorithm will implement the inver-over crossover stochastic mechanism. This method will essentially create offspring by combining unary crossover operators with the population driven characteristics of recombination [5]; based on the concept of simple inversion by picking two random loci from the first parent and inversing its components [7]. This process is then repeated with the resulting offspring and second parent until a condition is reached.

Runtime Optimization: According to the inver-over research that inspires the method used in this project, the number of times an individual is inversed along with the segments to be inverted (as they are based on other randomly selected individuals), would need to be optimized in order to boost the efficiency of the algorithm.

Team Management: Task allocation is as follows.

- Omar Mohamed (201501962): project management, project write-up, assist with conventional TSP implementation, assist with advanced technique implementation.
- Jacob House (201614260): technical management, assist with write ups and create graphs and tables, final code logic check and assertions, assist with advanced technique implementation.
- Hassan El-Khatib (201504396): code documentation, implement runtime optimization, assist with project write-ups, assist with advanced technique implementation.
- Nabil Miri (201547429): basic conventional TSP implementation, assist with runtime optimization, assist with project write-ups, assist with advanced technique implementation.

References

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