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Constrained String Enumeration

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Abstract

Constrained String Enumeration is an Optimization problem motivated by prolog rules evaluation, where the ordering of the inner predicates is essential to optimize the time efficiency of the evaluation. Given the set of variables used in a certain rule, tuples of the related variables in each inner predicate and the maximum number of instances to be used of each tuple, the maximum number of instances for such rule should be calculated.

Tasks

- Implementing an efficient search-based algorithm
- Implementing an approximation algorithm
- Implementing another approximation algorithm
- Designing and Implementing more efficient exact/approxtimaion algorithms
- Invistigating the class of the problem

Timeline

Week 1: Invistigating the problem, read the paper and the master thesis of previous work.
Week 2: Implement an efficient exact algorithm and the first approximation algorithm.
Week 3: Design and implement a new algorithm.
Week 4: Design and implement a new algorithm, improve the first approximation algorithm.
Week 5: Design and implement a new algorithm.
Week 6: Design and implement a new algorithm.
Week 7: Implement the second approximation algorithm.
Week 8: Try to prove an optimal algorithm.
Week 9: Invistigate the problem class.
Week 10: Testing and Debugging.
Week 11: Testing and Debugging.
Week 12: Testing and Debugging.

Thesis Outline

- Introduction
- Problem Definition
- Previous Work
- Better Exact Algorithms
- Refined Approximation Algorithms
- Tests
- Future Work