Undergraduate Research Opportunity Program
(UROP) Project Report

Design and Implementation of an Algorithm for a Problem

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Abstract

In this report, we study a problem and design an efficient algorithm to solve the problem. We implemented the algorithm and evaluated its performance against previous proposed algorithms that solves the same problem. Our results show that our algorithm runs faster.

Subject Descriptors:
    C5 Computer System Implementation
    G2.2 Graph Algorithms

Keywords:
    Problem, algorithm, implementation

Implementation Software and Hardware:
    Solaris 10, g++ 3.3, Tcl/Tk 8.4.7

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Chapter 1

Introduction

Many problems exist in computer science. In this project, we studied one particular important problem and propose a solution for it.

1.1 Background

In this section, we briefly discuss the history and background of the problem. A detail literature survey is presented in Chapter 2.

The problem we study in this report is an important one. This problem is first proposed in 1990 in the context of graph theory (3). Zhang gives the first algorithm to the problem and applied it to solve several problems in artificial intelligence (54). More recently, a slightly different formulation of the problem is studied independently (21). None of the previous work uses the technique that we propose in this project. Thus, we believe that our algorithm is novel.

1.2 The Problem

In this section, we formally defined the problem. We adopt the definition given by Kovsky (2).

1.3 Our Solution

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References

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Appendix A

Code

Appendix B

Proof

In this appendix, we present alternate, longer, but more interesting proof of correctness of our algorithm. This proof is based on induction and proof by contradiction.