

Algorithm Analysis Project

Discrete I

Fall 2015

Learning Objectives

- Analyze real algorithms
- Get experience researching relevant information

Project Description

In this project you will need to find three algorithms, each of which must have a specified runtime. The algorithms must be applicable to the real world and not designed specifically for this project. For each algorithm, you will need to:

- Give an explanation as to what the algorithm does.
- Give an explanation as to why it has the specified runtime. You may include pseudocode or actual code to refer to, but it is not necessary.
- Give an explanation as to why this algorithm would actually be used, and who might use it.
- Cite at least one reference where you found information about the algorithm.

Algorithm Runtimes

- Algorithm 1 should be $\Theta(n^3)$ in the worst case.
- Algorithm 2 should be $\Theta(n \cdot \log(n))$ in the worst case.
- Algorithm 3 should be $\Theta(2^n)$ or $\Theta(n!)$ in the worst case.
- You *cannot* choose algorithms covered in this course; you must do research to find them elsewhere.

Other Specifications

- The write-up for each algorithm should be at least $3/4^{\text{th}}$ of a page, but not longer than 2 pages.
- You may work in groups (max 4 people) or alone.
- Once you have determined your group, choose a group leader who will then e-mail Dr. Beyerl a list of your group members. The group leader is responsible for organizing group meetings and submitting the final project.
- The project is due on Blackboard Friday December 4th at midnight. Assignments submitted late will receive a late penalty of 0.2% per hour. (The submission link will not open until December 1st)
- Class on Monday, November 23rd will be cancelled to give your group time to work on the assignment. You are encouraged to use this time to meet with your group to work on the project.