

Graph Theory Project

Discrete II

Spring 2015

Learning Objectives

- Analyze Dijkstra's algorithm
- Compare different implementations of Dijkstra's algorithm
- Explain the algorithm conceptually

Project Description

In this project you will need to describe three different implementations of Dijkstra's algorithm. For each description you should explain how it works and why it has the given runtime. Below n is the number of vertices in the graph and m is the number of edges.

- An implementation that has runtime $\Theta(nm)$
- An implementation that has runtime $\Theta(n^2)$
- An implementation that has runtime $\Theta(m) + o(n^2)$

Other Specifications

- The write-up for each algorithm should be not more than $\frac{1}{2}$ page. This does not include any figures, diagrams, or code that you might include. The explanation should be conceptual and complete – in particular if you choose to include any figures, diagrams, or code, you shouldn't expect them to explain themselves.
- 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. If the group changes, the group leader will update Dr. Beyerl via e-mail.
- The project should be typed and saved as a PDF, then submitted on Blackboard. The penalty for incorrect submission format is 10% of the maximum score.
- Cite any sources that you use – plagiarism will result in a 0% grade.
- The project is due on Blackboard Thursday February 25th at midnight. Assignments submitted late will receive a late penalty of 0.2% per hour. (The submission link will not open until February 23rd)