

Single Shortest Path Algorithms

Dijkstra's Algorithm and Floyd Warshall's Algorithm

OVERVIEW

One of the most popular problems in Graph Theory is a Shortest Path Problem. It is the objective of finding the shortest path in a weighted graph from one node to another. This project will dive into the use and efficiency popular Single Shortest Path algorithms: Dijkstra's Algorithm and Floyd Warshall's Algorithm. Time complexities between the two algorithms will also be researched. Min heaps will also be researched to a lesser degree in order to keep track of which vertex has the lowest tentative distance. Despite Warshall's Algorithm allowing for the weights of the graph to be negative, Dijkstra's Algorithm does not. Therefore, for comparison's sake only nonnegative numbers will be used. The same graph for both algorithms will be used and when both algorithms are implemented, the appropriate use over the other will be determined using speed and complexities in C++ code.

GOALS

1. Look at the historical factors of Dijkstra's Algorithm and Floyd Warshall's Algorithm.
2. Give an overview of the ideas of Dijkstra's Algorithm and Floyd Warshall's Algorithm.
3. Briefly explain the concept of Min heaps.
4. Compare the time and application complexities between the two algorithms in a C++ implementation.
5. Conclude each algorithm's benefits over the other and appropriate use.

REFERENCES

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