Lesson 3: Shortest-path Problems

Notes

Book acknowledgment:

Goals

- Shortest path

1 Try it on your own

Given some graph $G = (V, E)$, how would you systematically go about exploring all the connected nodes in V?

2 Problem Definition

Single-source shortest-paths problem: Given a graph $G = (V, E)$, we want to find a shortest path from a given **source** node $s \in V$ to each vertex $v \in V$.

The algorithm for solving the shortest-paths problem typically relies on the property that a shortest path btween any two vertices contains other shortest paths within it.

3 Dijkstra's Algorithm

4 What could go wrong?

5 Bellman-Ford Algorithm