Design and Analysis of Algorithms

4.3 Dijkstra's Algorithm

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4.3.2

> What does this even mean? Any examples of real-world graph with negative edges?

Say we're hiking and rather than only examining distance between nodes, we include elevation. Perhaps we could say positive weights are downhill or flat and negative weights are uphill. Uphill actively works against you and downhill is a lot easier.

4.3.4

> Does Dijkstra's algorithm work when there are negative edges? If yes, explain. If no, give a counterexample.

No, Dijkstra's algorithm does not work with negative edges because with Dijkstra's, we must go through nodes that are between u and v. We derived Dijkstra's from assuming that a weighted path could be represented as a series of several weight=1 paths. How can we insert a negative number of nodes along a path that has a negative weight? I don't think we can..