CS170 — Fall 2017— Homework 3 Solutions

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0. Who Did You Work With?

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1. Minimal Positive Valued Function

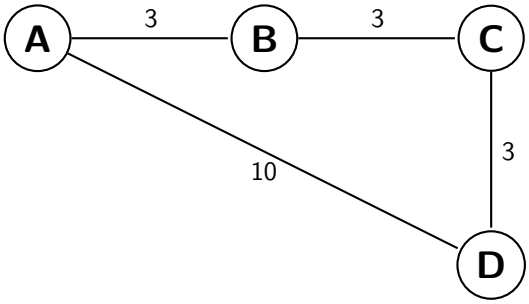
Main Idea:
ok

Run Time:
ok

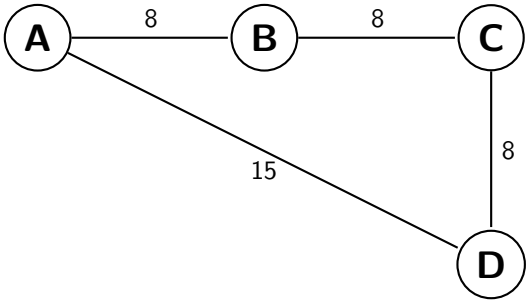
2. Graph Basics

(a) Yes. The algorithm to find the shortest path between s and t may have terminated before hitting t' or t' was never going to be hit in the first place when going from s to t'.

(b) No. The algorithm will not be guaranteed to return the same solution because of the following counterexample:



Running Dijkstra's algorithm from A to D will return A, B, C, D. However, adding 5 to the lengths of all edges gives us:



Running Dijkstra's algorithm from A to D will return A, D instead of A, B, C, D.

(c) No. If an edge length becomes negative, then Dijkstras algorithm will not work.

(d) Yes.

3. Peak Element

4. Exact Change

5. Local Maxima

6. DNA Sequence Alignment