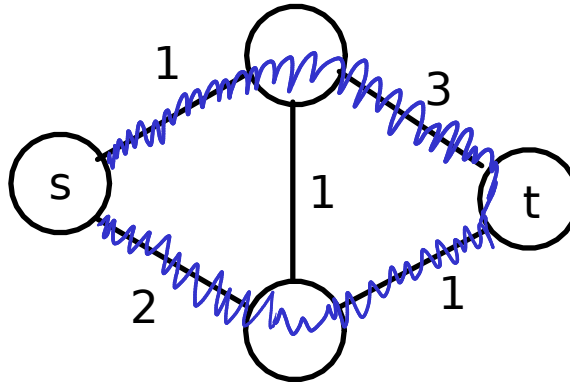


Problem Set 9

CS 331

Due Friday, April 15

1. Given an undirected graph with positive edge weights, a source s , and a sink t , find the shortest path from s to t and back to s that uses each edge at most once. $O(EV)$ time will receive full credit, but (for optional pride points) you can get $O(E \log V)$.



Hints: Start with the shortest $s \rightarrow t$ path, then look for an “augmenting path” on a “residual graph”, inspired by Ford-Fulkerson but slightly different. (More hints, rot13) Vqrnyyl, lbh pna pbzovar gur fubegrfg cngu ba lbhe erfvdhny tencu jvgu lbhe svefg fubegrfg cngu gb svaq gur nafjre. Lbhe erfvdhny tencu jvvy cebonoyl unir artngvir rqrtrf. Naq gb trg gur bcvgbany ehagvzr, lbh znl arrq gb hfr n cbgragvny shapgvba.

2. See the Jupyter notebook on the website.