Homework 3

Due Friday, August 3

1. In the shortest-path algorithm we are concerned with the total length of the path between a source, s, and every other node. Suppose instead that we are concerned with the length of the longest edge between the source and every node. That is, the bottleneck of a path is defined to be the length of the longest edge in the path. Design an efficient algorithm to solve the single source smallest bottleneck problem; i.e. find the paths from a source to every other node such that each path has the smallest possible bottleneck.
2. Exercise 5 on p.190 of Kleinberg and Tardos. Prove that your algorithm achieves the goal.
3. Exercise 8 on p.192 of Kleinberg and Tardos.
4. Exercise 15 on p.196 of Kleinberg and Tardos. Prove that your algorithm finds the smallest committee.
5. Exercise 28 on p.203 of Kleinberg and Tardos. Just give the algorithm, you dont need to prove its correctness.