

Homework 3, Due Monday, January 28, 2013

Problem 1 (10 points):

Page 112, Exercise 12.

Problem 2 (10 points):

Page 189, Exercise 3.

Problem 3 (10 points):

Page 191, Exercise 6

Problem 4 (10 points):

Page 195, Exercise 14.

Problem 5 (10 points):

Let $G = (V, E)$ be a directed graph, where each edge $e = (u, v)$ has a value r_e with $0 \leq r_e \leq 1$ that represents the reliability of a communication channel from u to v . We interpret r_e as the probability that the channel from u to v will not fail, and we assume that these probabilities are independent. Give an efficient algorithm to find the most reliable path from vertex s to vertex t .

Problem 6 (10 points):

Let $G = (V, E)$ be a directed graph with integer edge weights in the range $0, \dots, 10$. Modify Dijkstra's algorithm to compute the shortest paths from a given source vertex s in $O(n + m)$ time where $n = |V|$ and $m = |E|$.