College of Computer & Information Science
Northeastern University
CS7800: Advanced Algorithms

Fall 2014
Handout 13
25 October 2014

Problems of the Week – 9 and 10

9. Decomposition of flows

Given a flow network G and a flow f in G, show that it can be decomposed into at most m path flows, where m is the number of edges in G. Give a polynomial-time algorithm for this task. (A path flow is a flow in the network in which all the positive flow occurs along a simple path from source to sink, and each edge in the path carries the same amount of flow.)

10. Finding a minimum cut with minimum number of edges

Given a flow network G, suppose you are interested in finding, among all minimum cuts in G, one that contains the fewest number of edges in G. Show how to create a new flow network G' in which any minimum cut is a minimum cut in G with the minimum number of edges.