Problem 1: Maxcut, Greedy Approximation Algorithm

Consider the cardinality maxcut problem, as defined in Vazirani Exercise 2.1 (page 22), and the greedy algorithm given also in Vazirani Exercise 2.1 (Algorithm 2.13, page 22.) In class (lecture 1-18-11) we showed that Algorithm 2.13 is a factor 1/2 approximation algorithm.
(a) Give a class of graphs for which the 1/2 approximation factor is tight.
(b) Generalize the problem, the algorithm and its analysis to weighted graphs.

Problem 2: Maxcut, Local Search Approximation Algorithm

Vazirani Exercise 2.2 (page 23).

Problem 3: Vertex Coloring

Vazirani Problem 2.16 (pages 22 and 23). Note: Widgerson’s original paper on this problem is reference 265 (page 372) in Vazirani’s book.