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Approximation Algorithms

Fall 2001

Assignment 2

Problem 4 (2 points)**:**
Show that GreedyCol has an absolute deviation of $\Delta(G) - 1$. (Hint: extend the graph in Figure 1 of Section 2 to an infinite family.)

Problem 5 (3 points)**:**
Show that for every graph $G = (V, E)$ there is a node coloring that uses at most $2\sqrt{|E|}$ colors.

Problem 6 (3 points)**:**
Show that it can be decided in polynomial time whether a graph is node-2-colorable.

Problem 7 (2 points)**:**
One can show that every planar graph must have a node of degree at most 5. Use this to develop a polynomial time algorithm that finds for every planar graph a node coloring that uses at most 6 colors.