1056-05-142 **Sandra James*** (jamess@csp.edu), Mathematics Department, 275 Syndicate Street North, Concordia University - St. Paul, St. Paul, MN 55104, and **Andrew Zemke** (drew.zemke@gmail.com), School of Mathematical Sciences, 85 Lomb Memorial Drive, Rochester Institute of Technology, Rochester, NY 14623. *Greedy Algorithms for Generalized k-rankings of graphs.*

A k-ranking of a graph is a labeling of the vertices with positive integers $1, 2, \cdots, k$ so that every path connecting two vertices with the same label contains a vertex of larger label. An optimal ranking is one in which k is minimized. Let G be a graph containing a Hamiltonian path on vertices $v_1, v_2, \cdots, v_n$ but no Hamiltonian cycle. We use a greedy algorithm to successively label the vertices assigning each vertex with the smallest possible label that preserves the ranking property. We show that when G is a path the greedy algorithm generates an optimal k-ranking. We then investigate two generalizations of rankings. We first consider bounded (k, s)-rankings in which the number of times a label can be used is bounded by a predetermined integer s. We then consider k_t-rankings where any path connecting two vertices with the same label contains t vertices with larger labels. We show for both generalizations that when G is a path, the analogous greedy algorithms generate optimal k-rankings. (Received August 31, 2009)