Greedy-type-resistance of Combinatorial Problems

Gareth Bendall\textsuperscript{1} François Margot\textsuperscript{2}

July 2005

Abstract

This paper gives a sufficient condition for a combinatorial problem to be greedy-type-resistant, i.e. such that, on some instances of the problem, any greedy-type algorithm will output the unique worst possible solution. The condition is used to show that the Equipartition, the \( k \)-Clique, the Asymmetric Traveling Salesman, the Hamiltonian Path, the Min-Max Matching, and the Assignment Problems are all greedy-type-resistant.

Keywords: Greedy algorithms, greedy-resistance, domination analysis.

To appear in \textit{Discrete Optimization}.

\textsuperscript{1}Department of Mathematics, University of Kentucky, 715 POT, Lexington, KY 40506. Present address: Dept. of Mathematics, Physics, and Computer Science, Georgetown College, Georgetown KY 40324. Email: Gareth.Bendall@georgetowncollege.edu .

\textsuperscript{2}Department of Mathematics, University of Kentucky, 715 POT, Lexington, KY 40506. Present address: Tepper School of Business, Carnegie Mellon University, Pittsburgh, PA 15213. Email: fmargot@andrew.cmu.edu .