Testing Rationality of Collective Household Consumption

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The purpose of this paper is to derive algorithms for testing rationality of collective household consumption on large data sets. We consider both the extension of the Generalized Axiom of Revealed Preference and the extension of the Strong Axiom of Revealed Preference to collective households with two decision makers or members. We establish that testing these extensions is NP-complete. We present exact algorithms based on mixed-integer programming formulations of the axioms, and we propose simulated annealing heuristics for the solution of global optimization formulations.