

# On maximizing welfare when utility functions are subadditive

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## Abstract

We consider the problem of maximizing welfare when allocating  $m$  items to  $n$  players with subadditive utility functions. Our main result is a way of rounding any fractional solution to a linear programming relaxation to this problem so as to give a feasible solution of welfare at least half that of the value of the fractional solution. This approximation ratio of  $\frac{1}{2}$  is best possible, and improves over an  $\Omega(1/\log m)$  ratio of Dobzinski, Nisan and Schapira [STOC 2005]. The randomized rounding technique that we use is *oblivious* in the sense that it only uses the primal solution to the linear program relaxation, but has no access to the actual utility functions of the players.