The Allocation of Indivisible Objects via Rounding

Thanh Nguyen
Rakesh Vohra

Northwestern University

April 4, 2013

ABSTRACT

The problem of allocating indivisible objects arises in the allocation courses, spectrum licenses, landing slots at airports and assigning students to schools. We propose a technique for making such allocations that is based on rounding a fractional allocation. Under the assumption that no agent wants to consume more than k items, the rounding technique can be interpreted as giving agents lotteries over approximately feasible integral allocations that preserve the ex-ante efficiency and fairness properties of the initial fractional allocation. The integral allocations are only approximately feasible in the sense that up to k-1 more units than the available supply of any good is allocated.