

Algorithmic Game Theory

Summer Term 2023

Tutorial Session - Week 7

As last week, please find yourself in groups of up to three students. Start with a quick introduction. Afterwards, you are supposed to discuss the exercises on this sheet and in addition talk about definitions, proof ideas and techniques used in the lecture. Also, feel free to open the lecture notes and have a look if you don't remember a certain definition or theorem by hard.

Exercise 1:

Consider the following *Procurement Auction*. It's being attempted to buy a certain item. There are n vendors who are able to manufacture the wanted item. Vendor i incurs a cost of c_i for crafting the item. Now, the vendors are asked to state their costs for crafting the item and a vendor with lowest cost shall be chosen. The latter potentially gets a payment for it. The stated problem can be formalized by the general model of the lecture: Each vendor i is interpreted as a bidder who has negative valuation v_i , if he/she is chosen to craft the item, that is, $v_i(x) = -c_i$, if i is chosen in x .

The results of the lecture concerning VCG are applicable in this situation. Make use of them in order to state a truthful mechanism.