Algorithmic game theory — Homework 3[1]

Nash equilibria

assigned 3.12.2018, deadline 17.12.2018

If you wish to see your score on the web page, please choose a nickname and write it on the paper with your solutions (as well as your name), or send it by e-mail. Without the nickname I will not make your score public.

Homework 1. *Consider a single-item auction with at least three bidders. Prove that selling the item to the highest bidder at a price equal to the third-highest bid, yields an auction that is not dominant-strategy incentive compatible (DSIC).* **[2]**

Homework 2. *Assume there are k identical items and $n > k$ bidders. Also assume that each bidder can receive at most one item. What is the analog of the second-price auction? Prove that your auction is DSIC.* **[2]**

Homework 3. *Use Myerson's Lemma to prove that the Vickrey auction is the unique single-item auction that is DSIC, always awards the good to the highest bidder, and charges the other bidders 0.* **[2]**

[1] Information about the course can be found at http://kam.mff.cuni.cz/~balko/