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Algorithmic Game Theory

Summer Term 2025

Tutorial Session - Week 6

You are supposed to work on these tasks in class together with your fellow students. Please find groups of 2 or 3 students!

Exercise 1:
Consider the following single-item auction: Each bidder reports a bid $b_i \geq 0$. The bidder i with the highest bid wins the item and pays *half* their bid b_i.

(a) Show that if we only consider two bidders and valuations are drawn uniformly from $[0, 1]$, then truthful bidding is a Bayes-Nash equilibrium.

(b) Show that this mechanism is not dominant-strategy incentive compatible.

(c) Show that this mechanism is $(\frac{1}{2}, 1)$-smooth.