Computational Game Theory

Exercises on Auctions

1. Auctions and Dominant Strategies

Which of the following auctions have dominant strategies?

i. First-price ii. Japanese iii. Second-price

2. Second-price Auctions

The second-price auction is a special case of...?

i. The Vickrey-Clarke-Groves mechanism
ii. The Gibbard-Satterthwaite mechanism
iii. The Borda mechanism
iv. None of the above

3. First-price Auctions and symmetric Bayes-Nash equilibrium

Consider a first-price auction with 3 bidders with valuations drawn from uniform [0,1] distributions. Suppose they bid according to the symmetric Bayes-Nash equilibrium, and actually have valuations 0.2,0.5,0.9 respectively. Who wins and what does she pay?

4. Auction Revenue

Of the following auctions, which has the greatest revenue?

i. Dutch ii. First-price iii. Japanese iv. Second-price

5. Bidding in second-price auctions

Suppose you're planning to bid in a second-price auction and have a valuation 10 for the good. Because the second-price auction is dominant-strategy truthful, you plan to bid 10. When you arrive, the auctioneer has added a reserve price of 5. How should you change your bid b?

i. $b = 5$ ii. $5 < b < 10$ iii. $b = 10$ iv. $b > 10$

6. Price of anarchy

Does the second-price auction has a price of anarchy of 1.0 (i.e., it is always efficient in every Nash equilibrium)?