

Problem Set 3: Auction

ECON 532

Due Feb 27 11:59pm

Late submission is not accepted

Auction

1. Download the the dataset `ascending data.dat` from the course web page. This is an ascii file with two columns: the first gives the number of bidders, the second gives the price paid. The data come from 600 simulated auctions. Write a program to nonparametrically estimate the underlying distribution of valuations from data on the number of bidders and the prices paid in a sample of ascending auctions, assuming symmetric independent private values, no reserve price, and the button auction model of Milgrom and Weber (1982). Run your program on the simulated data. Turn in a printout of your code and a graph showing a plot of your estimated CDF of bidders private values. Be sure to choose the scaling of the plot so that the graph is informative.
2. Using the same data, estimate bounds on the CDF using the approach in Haile and Tamer (2003), assuming a minimum bid increment of 1.
3. Download the data set `fpa.dat` from the course web page. This is an ascii file with 4 columns, representing the bids of the 4 bidders in 500 first-price sealed bid auctions of identical goods.
 - (a) Write a program to nonparametrically estimate the underlying distribution of valuations, assuming symmetric private values and no reserve price. Run your program on the downloaded data. Turn in a printout of your code and output showing the estimated value of $F_U(u_1; u_2; u_3; u_4)$ at all vectors $(u_1; u_2; u_3; u_4)$ for which each u_i is either the 25th percentile or 75th percentile of the marginal distribution $F_U(r)$ (this will be easier if you remember that bids are strictly increasing functions of the valuations, so that quantiles of the bid distribution map through the inverse equilibrium bid function to the same quantiles of the value distribution). This means reporting your estimate of $F_U(u_1; u_2; u_3; u_4)$ for 2^4 different vectors $(u_1; u_2; u_3; u_4)$. Do your estimates appear to be consistent with the

symmetry assumption? Does it appear that independence (which was not assumed) holds?

- (b) Using the same data, re-estimate under the assumption of symmetric independent private values. Turn in your code and a graph showing a plot of your estimated CDF of bidder's private values.