Logistics

• Mailing list and archives
Logistics

- Mailing list and archives
- Presentation dates to be assigned soon
Logistics

- Mailing list and archives
- Presentation dates to be assigned soon
- Change to the readings
Logistics

- Mailing list and archives
- Presentation dates to be assigned soon
- Change to the readings
- Any questions?
Some Terms/Concepts

- Marginal revenue view
Some Terms/Concepts

- Marginal revenue view
- Dominant strategy equilibrium vs. Nash equilibrium
  - Nash always exists!
Some Terms/Concepts

- Marginal revenue view
- Dominant strategy equilibrium vs. Nash equilibrium
  - Nash always exists!
- Surplus: auction’s vs. bidder’s
Some Terms/Concepts

- Marginal revenue view
- Dominant strategy equilibrium vs. Nash equilibrium
  - Nash always exists!
- Surplus: auction’s vs. bidder’s
- Social welfare, efficiency
Some Terms/Concepts

- Marginal revenue view
- Dominant strategy equilibrium vs. Nash equilibrium
  - Nash always exists!
- Surplus: auction’s vs. bidder’s
- Social welfare, efficiency
- Entry costs
- Linkage principle, higher prices in English with affiliation
Still More Terms

- Collusion: bidding rings
  - Sidepayments
Still More Terms

• Collusion: bidding rings
  – Sidepayments

• Multiunit auctions
  – Simultaneous vs. sequential auctions
Still More Terms

- Collusion: bidding rings
  - Sidepayments

- Multiunit auctions
  - Simultaneous vs. sequential auctions

- Budget constraints

- Jump bids

- Revelation principle
Auction Efficiency (from Milgrom)

In the asymmetric case, first-bid auctions aren’t necessarily efficient in equilibrium.
Auction Efficiency (from Milgrom)

In the asymmetric case, first-bid auctions aren’t necessarily efficient in equilibrium.

- Bidder 1 has value of $101
- Bidder 2 has value of $50 4/5 of time, $75 1/5 of time
Auction Efficiency (from Milgrom)

In the asymmetric case, first-bid auctions aren’t necessarily efficient in equilibrium.

- Bidder 1 has value of $101

- Bidder 2 has value of $50 4/5 of time, $75 1/5 of time

- Bidder 1 bids $51 gives $50 profit 4/5 of the time, so expected profit of $40
Auction Efficiency (from Milgrom)

In the asymmetric case, first-bid auctions aren’t necessarily efficient in equilibrium.

- Bidder 1 has value of $101
- Bidder 2 has value of $50 4/5 of time, $75 1/5 of time
- Bidder 1 bids $51 gives $50 profit 4/5 of the time, so expected profit of $40
- Bidder 1 bids more than $62 gives less profit even if he wins
Auction Efficiency (from Milgrom)

In the asymmetric case, first-bid auctions aren’t necessarily efficient in equilibrium.

- Bidder 1 has value of $101
- Bidder 2 has value of $50 $4/5$ of time, $75 \frac{1}{5}$ of time
- Bidder 1 bids $51$ gives $50$ profit $4/5$ of the time, so expected profit of $40$
- Bidder 1 bids more than $62$ gives less profit even if he wins
- So if bidder 2 has value of $75$, she can win by bidding $62$. 

Peter Stone
Auction Efficiency (from Milgrom)

In the asymmetric case, first-bid auctions aren’t necessarily efficient in equilibrium.

- Bidder 1 has value of $101
- Bidder 2 has value of $50 4/5 of time, $75 1/5 of time
- Bidder 1 bids $51 gives $50 profit 4/5 of the time, so expected profit of $40
- Bidder 1 bids more than $62 gives less profit even if he wins
- So if bidder 2 has value of $75, she can win by bidding $62.
- That’s an inefficient outcome
Problem (from Klemperer on-line)

An auctioneer of a single object faces $n$ risk-neutral bidders with private valuations for the object that are independently drawn from a uniform distribution $[0, \bar{v}]$. 
Problem (from Klemperer on-line)

An auctioneer of a single object faces $n$ risk-neutral bidders with private valuations for the object that are independently drawn from a uniform distribution $[0, \bar{v}]$.

Consider an “all pay” first-price auction (sealed-bid auction in which high bidder wins, but every bidder pays her bid). What should a bidder with value $v$ bid?
Problem (from Klemperer on-line)

An auctioneer of a single object faces $n$ risk-neutral bidders with private valuations for the object that are independently drawn from a uniform distribution $[0, \bar{v}]$.

Consider an “all pay” first-price auction (sealed-bid auction in which high bidder wins, but every bidder pays her bid). What should a bidder with value $v$ bid?

Hint: Expected $k$th highest of $n$ random draws from a uniform distribution $[0, 1]$ is $\frac{n+1-k}{n+1}$.
Answer

• In a 2nd-price auction, $v_i$ expects to pay 2nd highest value $= \frac{n-1}{n} \times v_i$ if she wins.
Answer

• In a 2nd-price auction, $v_i$ expects to pay 2nd highest value $= \frac{n-1}{n} \times v_i$ if she wins.

• $v_i$ wins with probability $\left(\frac{v_i}{v}\right)^{n-1}$ (probability that all the other values are lower)
Answer

- In a 2nd-price auction, $v_i$ expects to pay 2nd highest value $= \frac{n-1}{n} \times v_i$ if she wins.

- $v_i$ wins with probability $\left(\frac{v_i}{v}\right)^{n-1}$ (probability that all the other values are lower)

- So expected payment in 2nd price auction is $\left(\frac{n-1}{n}\right)\left(\frac{v_i^n}{v^{n-1}}\right)$
In a 2nd-price auction, $v_i$ expects to pay 2nd highest value $= \frac{n-1}{n} \times v_i$ if she wins.

$v_i$ wins with probability $\left( \frac{v_i}{\bar{v}} \right)^{n-1}$ (probability that all the other values are lower)

So expected payment in 2nd price auction is $\left( \frac{n-1}{n} \right) \left( \frac{v_i^n}{\bar{v}^{n-1}} \right)$

In an all pay auction, win in exactly same cases, but always pay, so make the same expected payment — that’s the bid.