



AUCTION GAMES: RULES

CSCI 1440/2440
31 January 2024

VALUATIONS

You will be given a set of four valuations that you will use to play the auction games. The valuations are labelled for each of the four auctions you will play.

These valuations were drawn uniformly at random from $[0, 10]$

AUCTION A2

- ❖ You have been given a valuation A_2 on a good. This valuation is known only to you and is picked uniformly at random from $[0, 10]$
- ❖ This is your value for the good being auctioned
- ❖ In this auction, you will be randomly allotted to groups of 2
- ❖ The player with the higher* bid wins and pays the amount they bid
- ❖ If you win the auction, your utility is the difference between your assigned valuation and the amount you pay. $Utility = Valuation - Payment$
- ❖ If you lose the auction, your utility will be 0

*ties will be broken at random

AUCTION A4

- ❖ You have been given a valuation A_4 on a good. This valuation is known only to you and is picked uniformly at random from $[0, 10]$
- ❖ This is your value for the good being auctioned
- ❖ In this auction, you will be randomly allotted to groups of 4
- ❖ The player with the **highest*** bid wins and pays the amount they bid
- ❖ If you win the auction, your utility is the difference between your assigned valuation and the amount you pay. $Utility = Valuation - Payment$
- ❖ If you lose the auction, your utility will be 0

*ties will be broken at random

AUCTION B2

- ❖ You have been given a valuation B_2 on a good. This valuation is known only to you and is picked uniformly at random from $[0, 10]$
- ❖ This is your value for the good being auctioned
- ❖ In this auction, you will be randomly allotted to groups of 2
- ❖ The player with the higher bid wins and pays the **second-highest bid**
- ❖ If you win the auction, your utility is the difference between your assigned valuation and the amount you pay. $Utility = Valuation - Payment$
- ❖ If you lose the auction, your utility will be 0

AUCTION B4

- ❖ You have been given a valuation B_4 on a good. This valuation is known only to you and is picked uniformly at random from $[0, 10]$
- ❖ This is your value for the good being auctioned
- ❖ In this auction, you will be randomly allotted to groups of 4
- ❖ The player with the highest bid wins and pays the **second-highest bid**
- ❖ If you win the auction, your utility is the difference between your assigned valuation and the amount you pay. $Utility = Valuation - Payment$
- ❖ If you lose the auction, your utility will be 0

TIME TO BID!

AUCTION A2, A4

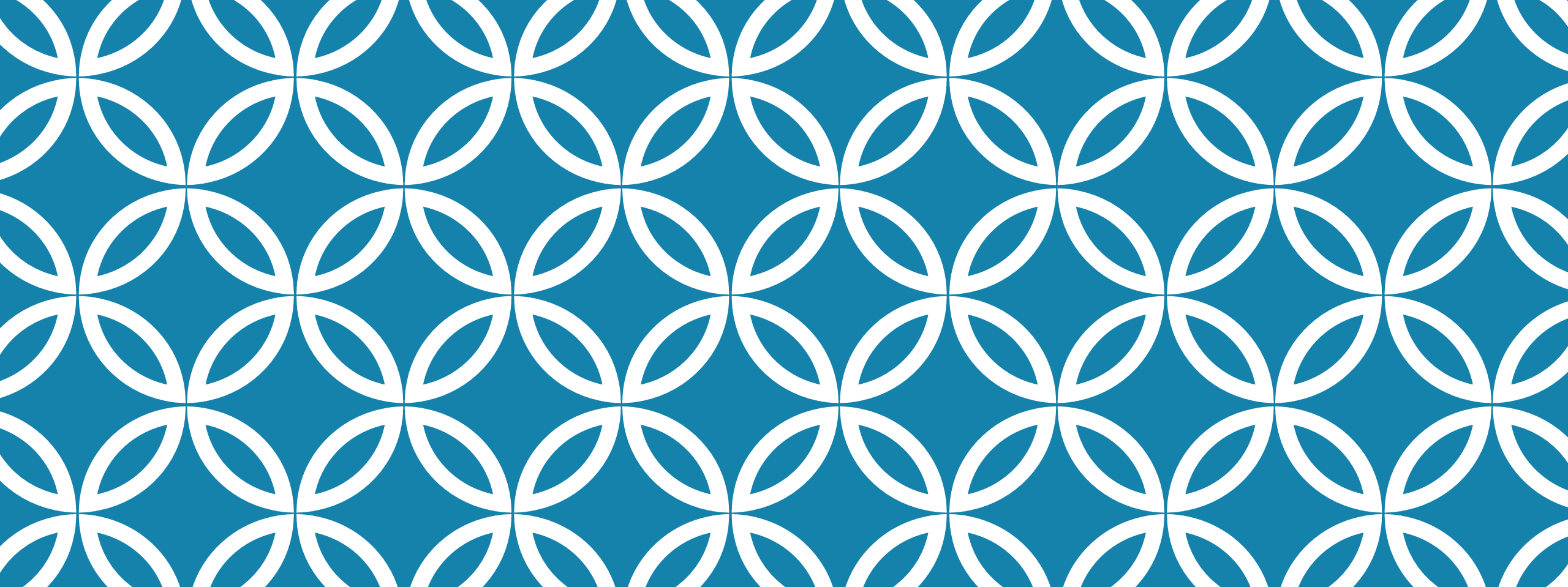
- ❖ Highest bid wins, pays their bid
- ❖ If you win, utility = valuation – payment;
else 0

AUCTION B2, B4

- ❖ Highest bid wins, pays second-highest bid
- ❖ If you win, utility = valuation – payment;
else 0

Google Form:

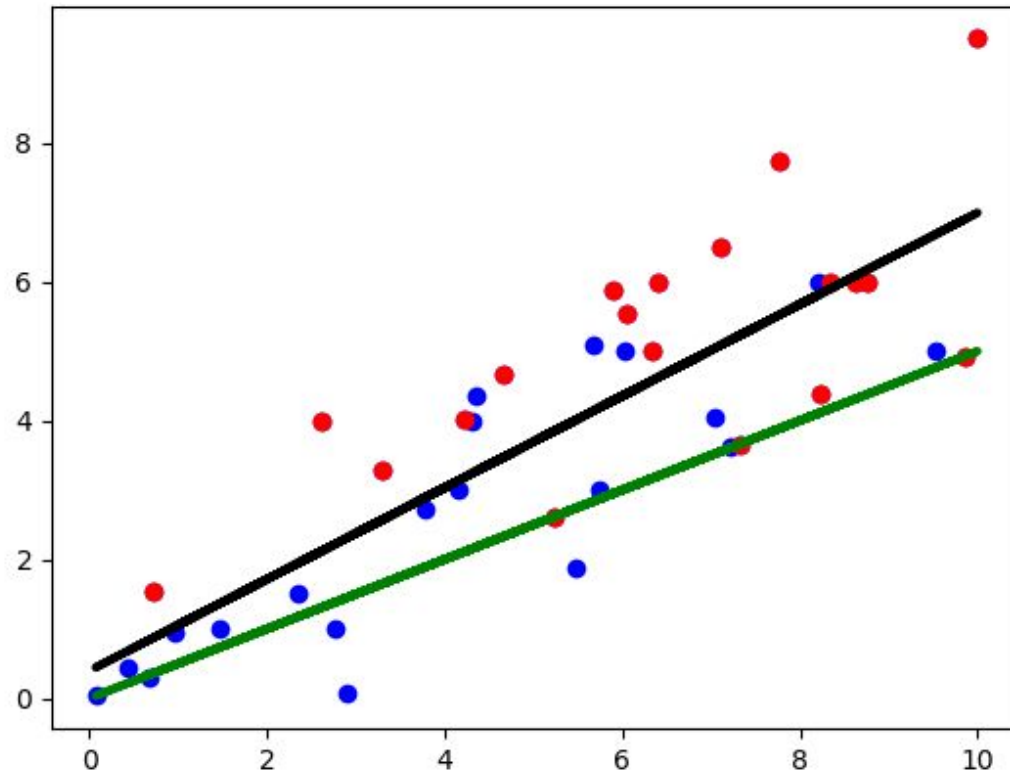
<https://forms.gle/rKMiWh6LnAwdfEgC7>



AUCTION GAMES: RESULTS

CSCI 1440/2440
31 January 2024

FIRST PRICE AUCTION N=2

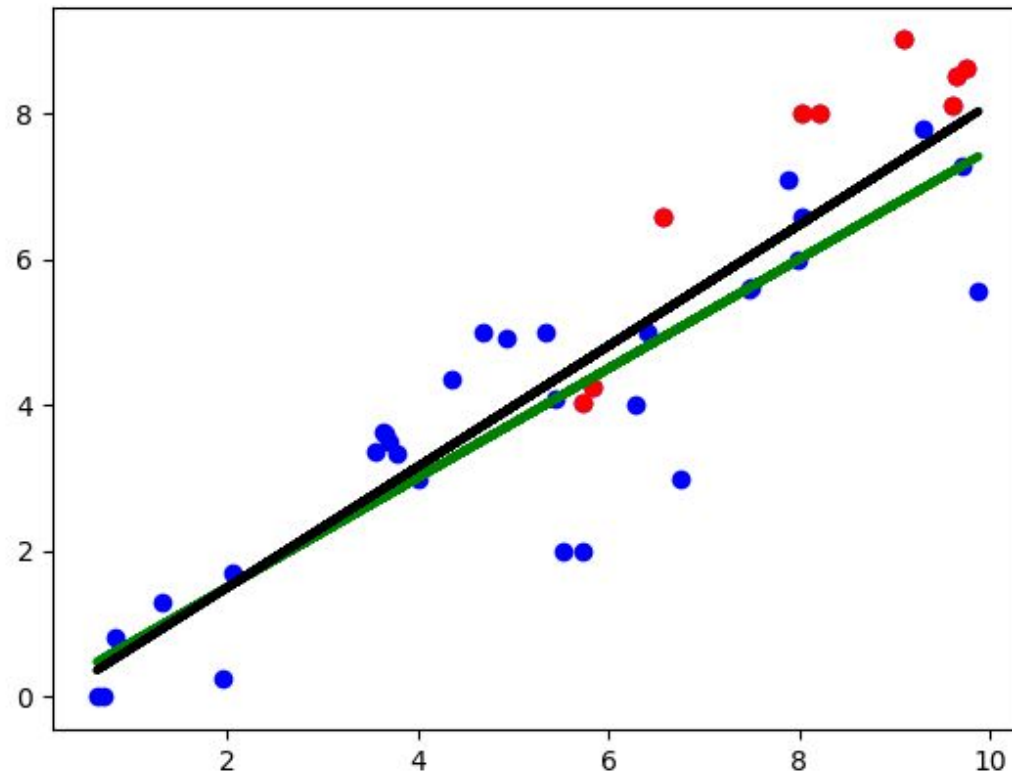


- Bid
- Winning Bid
- BNE Bid ($v/2$)
- Actual Bid

- Expected maximum value = 6.67
- Expected highest bid = 3.33
- Expected revenue = 3.33
- Expected utility of the winner = 3.34

- Average maximum value = 6.76
- Average highest bid = 4.98
- Average revenue = 4.98
- Average utility of the winner = 1.23

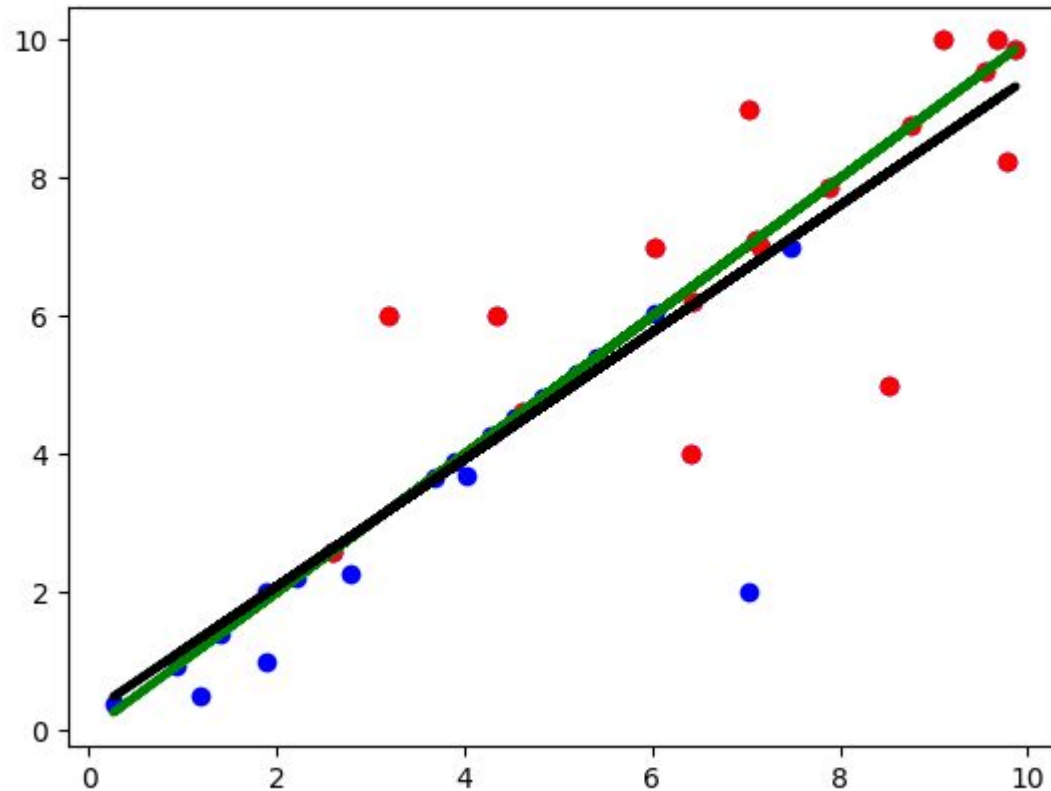
FIRST PRICE AUCTION N=4



- Bid
- Winning Bid
- BNE Bid ($3v/4$)
- Actual Bid

- Expected maximum value = 8
- Expected highest bid = 6
- Expected revenue = 6
- Expected utility of the winner = 2
- Average maximum value = 7.66
- Average highest bid = 6.68
- Average revenue = 6.68
- Average utility of the winner = 0.75

SECOND PRICE AUCTION N=2

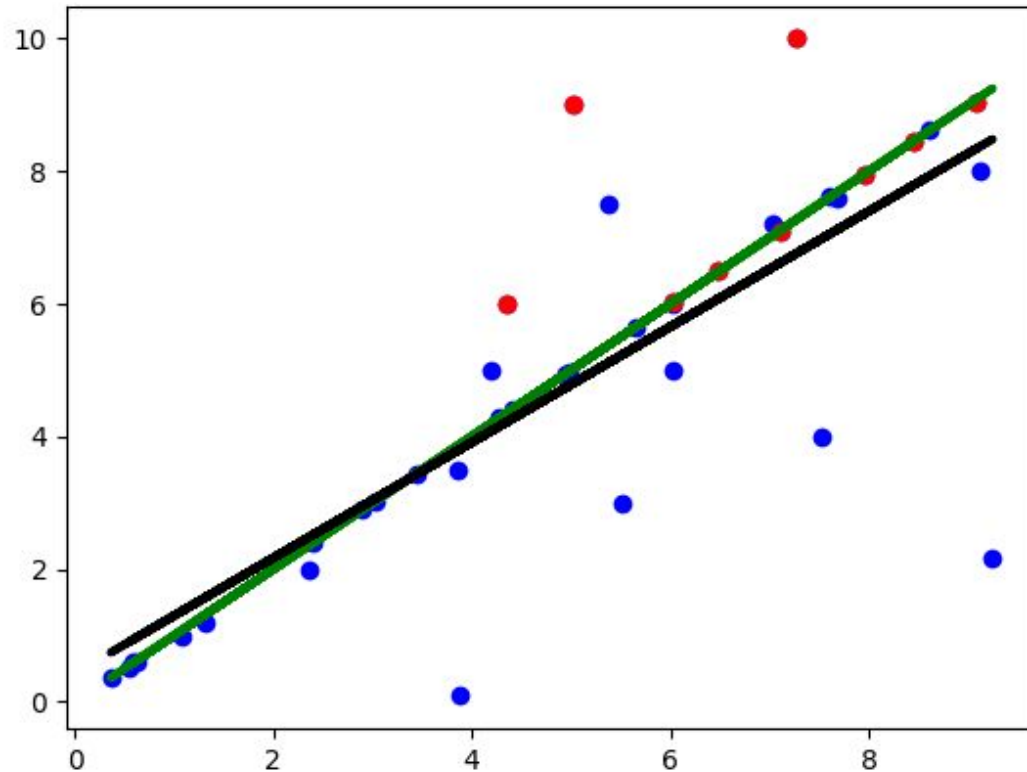


- Bid
- Winning Bid
- BNE Bid ($v/2$)
- Actual Bid

- Expected maximum value = 6.67
- Expected highest bid = 6.67
- Expected 2nd highest bid = 3.33
- Expected revenue = 3.33
- Expected utility of the winner = 3.34

- Actual maximum value = 6.94
- Average highest bid = 6.96
- Average 2nd highest bid = 3.17
- Average revenue = 3.17
- Average utility of the winner = 3.75

SECOND PRICE AUCTION N=4



- Bid
- Winning Bid
- BNE Bid ($v/2$)
- Actual Bid

- Expected maximum value = 8
- Expected highest bid = 8
- Expected 2nd highest bid = 6
- Expected revenue = 6
- Expected utility of the winner = 2
- Actual maximum value = 7.28
- Average highest bid = 7.18
- Average 2nd highest bid = 5.74
- Average revenue = 5.74
- Average utility of the winner = 0.59

HIGHEST UTILITY EARNERS

- ❖ First price N=2: caitlin_rowlings@brown.edu
- ❖ First price N=4: david_chu1@brown.edu
- ❖ Second price N=2: halleluiah_girum@brown.edu
- ❖ Second price N=4: evan_lu@brown.edu
- ❖ Overall: zitian_tang@brown.edu