Some practice questions

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Matching pennies to decide who is player 1

• In the poker game discussed in class, it matters who is player 1.

• Suppose two players first play a round of “matching pennies” to determine who gets to be player 1, and then play the game.

• Model the whole game as an extensive-form game and solve for subgame-perfect equilibrium.
Many equilibria

• Can you create an $n \times n$ game that has $2^n - 1$ Nash equilibria?
Can you create a game that has
- a unique Nash equilibrium, which is a pure-strategy equilibrium, and
- another correlated equilibrium that is better for both players.
Confusing profiles of votes

• For an arbitrary number $n$ of alternatives, can you come up with a profile of votes such that…
  • The Borda ranking is the opposite of the plurality ranking?
  • The Copeland ranking is the opposite of the plurality ranking?
  • Etc.
Generous Groves

• For a combinatorial auction, can you create a Groves mechanism so that every bidder always receives a nonnegative payment?
False-name bidding

• Suppose there are three bids already: 
  (\{A,B\}, 1) (\{A,C\}, 1) (\{C,D\}, 1)
  The auction mechanism is the GVA. 
  Can you win everything for free with only two bids?

• Now suppose there are four bids 
  (\{A,B\}, 1) (\{A,C\}, 1) (\{A,D\}, 1) (\{C,D\}, 1)
  Can you win everything for free with only two bids?
Mixing necessary to get commitment benefit

• Can you create a game where
  • committing to a pure strategy hurts (is strictly worse than the simultaneous-move solution), but
  • committing to a mixed strategy helps (is strictly better than the simultaneous-move solution)?