Mechanism Design

• **Incentives**: Design the rules so that participants (in the house example, bidders) are incentivized to reveal their private information.

• Are all mechanism incentive compatible? For example: are first-price auctions incentive compatible?
2012 Olympics, Badminton

• Example of a tournament design that did not thoroughly considered incentives.

• What are the incentives of the participants?
  – To win, of course! (or at least get a medal).

• What are the incentives of the tournament designer?
  – To identify the best team, which should mean every team should try their hardest.
2012 Olympics, Badminton

- Women’s Doubles (similar to World Cup)

- Four groups: A, B, C, D; of four teams each.
  - **Phase 1**: Round robin, within group
  - **Phase 2**: Knockout
    - Four quarterfinals
    - Two Semifinals
    - Finals
What could go wrong?

A first
C second
B first
D second
C first
A second
D first
B second

Quarter-Finals
Semi-Finals
Final

Winner!
What could go wrong?

• There was a shocking upset in group D:
  – The *strongest team* of the tournament Qing and Yunlei (QY) lost to team Pedersen and Juhl (PJ).

• As a result, PJ were first in group D, QY second.

• Meanwhile, in group A, teams: Xiaoli and Yang (XY), and Kyung-eun and Ha-na (KH) both had a record of 2-0, before playing each other.

• As team XY or KH, what would you do?
What could go wrong?

This team **might meet** QY in semi-finals!
Bronze medal at best.

This team **does not meet** QY in semi-finals!
Silver medal at worst.

This team could win QY in the final!
What is the point?

In a system with strategic participants, the rules matter!

See the difference:

The 2012 Women's Doubles Badminton finals:

https://www.youtube.com/watch?v=1SzxRALSBf8

Team XY, KH trying to deliberately lose their match:

https://www.youtube.com/watch?v=cMqmKm6vrd0