Iterative Combinatorial Auctions

November 11/20

Clarifications

- CE (Competitive equilibrium)

$$\pi_i(S_i^*, p) = \max_{S \subseteq \mathcal{G}} [v_i(S) - p_i(S), 0] \quad \text{, for every agent } i$$

$$\Pi(S^*, p) = \max_{S \in \Gamma} \sum_i p_i(S_i)$$

Clarifications

- GS (Gross-substitutes)

  - When price of some items go up, bidders will continue to demand items that do not change.

- AAS (Agents are substitutes)

$$w(\mathcal{I}) - w(\mathcal{I} \setminus K) \geq \sum_{i \in K} [w(\mathcal{I}) - w(\mathcal{I} \setminus i)], \quad \forall K \subseteq \mathcal{I} \qquad \text{(AAS)}$$

Clarifications

- BSM (Buyer submodular)

$$w(L) - w(L \setminus K) \geq \sum_{i \in K} \left[w(L) - w(L \setminus i) \right], \quad \forall K \subset L, \forall L \subseteq \mathcal{I} \qquad \text{(BSM)}$$

Clarifications

- Minimal CE
  - The CE with minimum revenue of all the CEs
- UCE (Universal CE)
  - If it's CE and also all (p,S_{-i}) are CE

Activity 1: iBundle(2)

- Valuations : …
- Bid straightforward and safe
- 3 Items, A, B, C
- $\alpha = 1.00$ \$ (minimum bid increment)

iBundle(2)

- What would happen if someone bid strategically?

A1BA

- Your previous valuations..

iBundle(2) and A1BA

- What was the differences?

Discussion

- Why we need Iterative CA instead of CA (Strong and weak points of ICA)

- Which price structure is most favorable?
  - Linear prices
  - None-Linear but anonymous prices
  - None-Linear, None-anonymous prices

Discussion (cont.)

- Which Valuations is most favorable?
  - General
  - AAS
  - BSM
  - GS
- Minimal, LP-based or greedy updates?

Discussion (cont.)

- Bid Structure?
  - Single
  - OR
  - XOR
- Outcome?
  - CE
  - VCG
  - Min CE

Discussion (cont.)

- Difference between iBundle(2) and iBundle(3)?

- Can we use iBundle(3)?

- * Price-based vs. Proxied Auctions

- * Price-based vs. AUSM design

- * AUS?

Discussion (cont.)

- Staged proxy vs. continuous proxy
- Direct elicitation vs. indirect elicitation
- Should we care about anomalies? (Karen)
- Why asynchronous iterative auctions minimize information revelation? (Alex)
- Collusion in AUS? (Alex)

Discussion (cont.)

- In iBundle why ties are broken first in favor of previous allocation and then maximize number of winning bidders?