

CS344M

Autonomous Multiagent Systems

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Good Afternoon, Colleagues

Are there any questions?

Logistics

- Next week's readings

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- Progress reports due in 2 weeks

Logistics

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- FAI talk on Friday - Andrew McCallum - NLP

Game Theory

- Multiagent systems
- Economics
- Social science, law, etc.

Goals for Today

- Understand premises of game theory
- Understand the notion of *utility*
- Understand solution concepts

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 - Dominant strategy
 - Nash equilibrium
 - Pareto optimality
 - Maximum social welfare
 - Maximin strategy

Prisoner's Dilemma

| | | Column | |
|-----|------|--------|------|
| | | C(1) | D(2) |
| Row | C(1) | 3, 3 | 0, 5 |
| | D(2) | 5, 0 | 1, 1 |

Game Theory Premises

- Simultaneous actions
- No communication
- Outcome depends on **combination** of actions

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- Outcome depends on **combination** of actions
- Utility (payoff) encapsulates **everything** about preferences over outcomes

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- Loss aversion
- Friendliness/vindictiveness

Solution Concepts

- Dominant strategy

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Chicken

| | | Column | |
|-----|------|--------|------|
| | | C(1) | D(2) |
| Row | C(1) | 3, 3 | 1, 5 |
| | D(2) | 5, 1 | 0, 0 |