Reading Questions

Wednesday, September 7th, 2011

1 Preamble

The following questions are to be answered informally in your comments on the website. Good faith answers will be awarded full participation credits. No or grossly incomplete answers will be awarded no credit. Going beyond these questions in your comments is always encouraged, as they are designed to facilitate class discussion.

Early sets of reading questions will resemble informal, quick problem sets to assist in understanding the presented material, while later questions will be designed to encourage discussion.

2 Questions

2.1 A Beautiful Nash Equilibrium?

In the movie "A Beautiful Mind," Russel Crowe, playing John Nash, appears to discover Nash equilibrium while out dancing with some friends. He and his four friends watch as five women enter. One woman is considered prettier, and every man would like to dance with her (for purposes of this discussion, let the other women be described as "average looking"). Nash says the following:

> If you all ask out the prettiest woman she'll be overwhelmed and refuse you all. Her friends will feel snubbed, and no one will dance with any woman.
>
> If, instead, you each ask out one average-looking woman they will agree to dance, and you'll all have dancing partners.

We can consider this situation as a simultaneous normal-form game. Each man has five actions, corresponding to asking each of the five women to dance. If a man asks a woman not asked by any other man, the woman agrees to dance with them and they receive some positive payoff. If the pretty woman agrees to dance with them they receive an even higher payoff. If a woman is asked to dance by two or more men, she refuses and they receive a payoff of zero.

- Are either of the strategies Nash described a Nash equilibirum? Why or why not?
- Are there Nash equilibrium of this game? Describe one.
- What additional information would be necessary to know to describe a mixed strategy NE?
- What is an interested correlated equilibrium of this game?

2.2 Extensive-form Games

- Describe a real-world problem that might be modeled as a perfect information extensive-form game.
- Consider two people sitting down to play the Prisoner's Dilemma five times in a row:
  - What does backward induction imply they'll do?
  - What if they play an infinite number of times (in a row), can you use backward induction then?