Plan for Dynamic Class

Philosophy 444

7 October, 2019

Information sets

- Sets of nodes that player doesn't know which they are at
- Gotta have same choices available
- None is predecessor of the other
- Perfect recall: her prior moves are same at each node
- See violations of this on page 120

How to represent choice followed by strategic game

- Would like to draw grids in the game, but we can't do that.
- Instead we use a hack - pretend the moves are sequential, but unrevealed
- Feels like a hack, and sort of is

Strategies

- A choice for each information set
- This is a generalisation of what we previously had

Subgame

- Only singleton nodes launch subgames
- Every successor of the launch node must not 'cut' info set
- That is, no successor is in info set with non-successor
- See example on page 127
- This matters for definition of SPE

SPE

- Strategy set is Nash in whole game and every subgame
- Incredible threats are not SPEs

SPE and sequential rationality

- Consider a game where A moves, then B, but B isn't told A's move
- And what B would do is dominated (draw example of this b4 class)
- Well, B is irrational
- But that could be SPE (if A never goes where B dominated)
- Feels like we need more
- We'll get to this
- The basic way to generate these games is to take an incredible threat game, and then make the move that would be responded irrationally to into a pair of moves.

- So simple game is that I choose attack/defend, and then if attack you choose counter/retreat. And one of the Nash equilibria is Defend/Counter, but Counter is not backwards induction reliable.
- Now complicate the game so I have three choices - Attack+Coffee/Attack+Tea/Defend, and you're told whether Attack or Not, but not whether Coffee or Tea
- Now Defend/Counter could be a subgame perfect equilibrium, because there isn't a subgame.
- But this is obviously silly - so we need yet more detail
- See also page 241 for another example

Chance moves

- Need a basic story about probability
- Additive to 1
- Maybe talk through lemon example

Lemon example outcomes

- Get and keep good car: 10, 0
- Get and keep lemon: -5, 0
- Get high price for good car: 5, 5
- Get high price for lemon: 5, -5
- Get low price for good car: 0, 10
- Get low price for lemon: 0, 5
- In equilibrium, accept all offers for lemon, reject for good car
- So (roughly) would only ever make low offers
- So would only offer to sell lemons
- How does this extend to 3rd party buyer?