

444 Lecture 2.1 - What are Games

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Plan

- To introduce games!

Associated Reading

Bonanno, section 2.1.

Games

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- If this seems really general, it is!

Formal games

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- How many moves they each have.
- What order those moves get made in.
- How many options they have at each move.
- What the payoff is for each player for each possible combination of moves by the players and 'moves' by nature.

Two Main Types

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- Players take turns making moves, and every move is revealed to all players when they are made.



An example of a turn taking game



An example of a one move game



A more familiar one move game

Other Types

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- Nature gets involved and their move is only revealed to one of the players.
- A move made by a player is not revealed to the other player(s) straight away.
- Multiple sequential moves.



How nature can get involved in a public way.



How nature can get involved in a private way.



Moves that are not revealed



Multiple simultaneous moves

Positive Sum Game

- These instances are a bit non-representative in one crucial respect.
- They are all **zero-sum**.
- That is, someone doing well means someone else must be doing worse.
- This is not the general case.

Positive Sum Game

Most of the games we're going to look at have the following characteristic.

- There is a pair of possible outcomes such that every player is better off in the first outcome than the second.

For Next Time

We're going to get a bit clearer on what this last claim means, and how it affects how we write up games.