A Game Theory Path To Quantitative Literacy

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Who Are We? Why Are We Here?

- Rick Gillman is at Valparaiso University
  - 4000 students
  - Northwest Indiana
  - Primarily undergraduate
  - 15 person mathematics and computer science department

- David Housman is at Goshen College
  - 900 students
  - Northcentral Indiana
  - Primarily undergraduate
  - 3 person mathematics and computer science department
Mathematical Modeling

The process of mathematical modeling involves:

- Scenario: The real-world situation to be modeled.
- Assumptions: The simplifications made to the scenario.
- Model: The mathematical representation of the assumptions.
- Techniques: The methods used to derive the model.
- Interpretation: Understanding what the model means.
- Prediction: Using the model to make forecasts.
- Result: The outcomes predicted by the model.
- Verification: Checking the model against real-world data.

This cycle is continuous, with results from one step informing assumptions for the next cycle.
Models of Conflict and Cooperation

1. Deterministic Games
2. Player Preferences
3. Strategic Games
4. Probablistic Strategies
5. Strategic Game Cooperation
6. Negotiation and Arbitration
7. Coalition Games
8. Fair Division
Policy comparison games (cap and trade versus carbon tax)
Experimental games with a different goal
Treaty negotiation games