

Games and Computation Homework #1:

Game Classifications

For each of the following games, classify each as a **combinatorial game**, a **game of chance**, or a **strategic game** according to its most natural game model (i.e. mathematical representation). Enter your answers online in the HW1 Moodle quiz.

Assumptions:

- Assume that chance events that occur *before the start of the game play* (e.g. a face-up deal of card pack, the choice of a secret word) are not part of the game play model. Classify according to play *after this event*.
- Assume that chance events that occur *during the game* (e.g. rolling dice, drawing face-down cards) are part of the probabilistic game model.
- Strategic games may have chance events. What differentiates a game of chance from a strategic game with chance is whether it is a game of perfect or imperfect information, respectively.
- In all games marked “(solitaire)”, do not treat other non-choice-making players (e.g. constrained clue givers) as active players in the game model.

Games:

1. [Amazons \(El Juego de las Amazonas\)](#)
2. [Breakthrough](#)
3. [Can't Stop](#)
4. [Connect6](#)
5. [Dudo \(a.k.a. Liar's Dice, Bluff, Call My Bluff, Perudo, etc.\)](#)
6. [Freecell \(solitaire\)](#)
7. [Gin Rummy](#)
8. [Goofspiel \(a.k.a. GOPS\)](#)
9. [Halma](#)
10. [Hex](#)
11. [Jotto \(solitaire\)](#)
12. [Pentominoes \(Golomb's Game\)](#)
13. [Poker Squares \(solitaire\)](#)
14. [President](#)
15. [Yahtzee](#)

Ask yourself these questions about each game:

- Is there perfect information? That is, does each active player have all of the relevant information of all other active players¹ for making the best decision? If not, it is a **strategic game**.
- If so, are there chance events *during play*? If so, it is a **game of chance**.
- If not, then it is a deterministic game of perfect information and is thus a **combinatorial game**.

¹ Chance or “nature” players in models are not considered as being active players. They serve as random number generators.