

# Extensive Form Games and Backward Induction

ISCI 330 Lecture 11

February 13, 2007

# Lecture Overview

Recap

Perfect-Information Extensive-Form Games

# Introduction

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- ▶ The **extensive form** is an alternative representation that makes the temporal structure explicit.
- ▶ Two variants:
  - ▶ **perfect information** extensive-form games
  - ▶ **imperfect-information** extensive-form games

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  - ▶ Internal nodes (including the root) are labeled with player identifiers

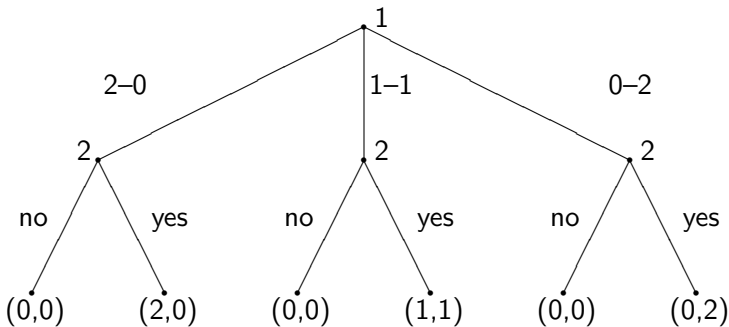
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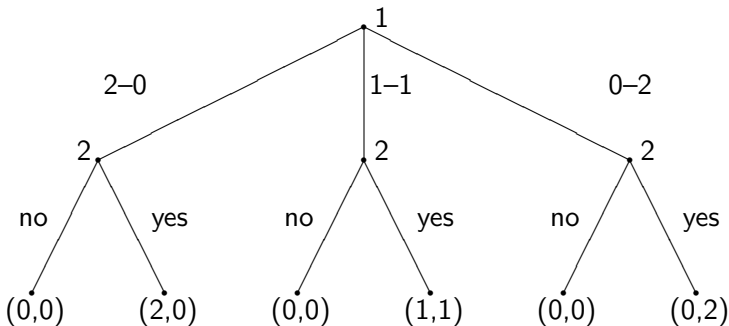
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  - ▶ Terminal nodes are labeled with utility outcomes

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Get with a partner and decide on a simple sequential game (e.g. tic-tac-toe) and represent it in extended form

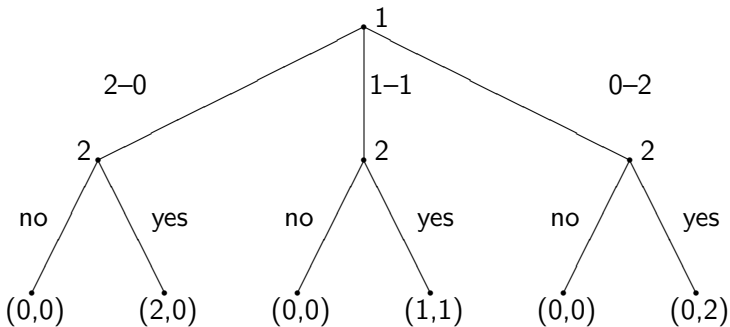
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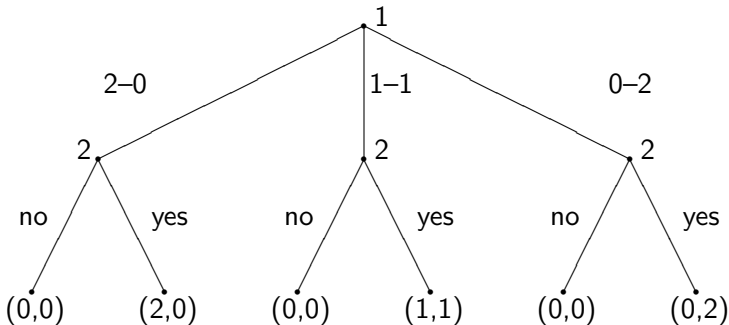
Perfect-Information Extensive-Form Games



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Play as a fun game, dividing 100 dollar coins. (Play each partner only once.)

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# Pure Strategies

- ▶ In the sharing game (splitting 2 coins) how many pure strategies does each player have?
  - ▶ player 1: 3; player 2: 8
- ▶ Overall, a pure strategy for a player in a perfect-information game is a complete specification of which deterministic action to take at every node belonging to that player.
- ▶ Can think of a strategy as a complete set of instructions for a proxy who will play for the player in their absence