

# Strategies in Extensive Form Games

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# Strategies

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- A strategy: How to participate/act in a strategic interaction.
- In normal form games: Strategy = Action
- In extensive form games: Strategy?
- Examples (Two variants of Prisoners' Dilemma)

Player 2

$\Rightarrow$  Play C if Player 1 plays C  
 $\times$

$\Rightarrow$  Play C if Player 1 plays D  
 $\times$

$\Rightarrow$  Play C if Player 1 plays C & Play D if Player 1 plays D.  
 $\times$

$\Rightarrow$

# Strategies (Cont..)

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- A strategy is a complete plan of actions for playing a game (Strategic Interaction)
- A strategy of a player is basically a rule that describes what action he is supposed to take at each decision node belonging to him; in other words: what to do under every contingency, no matter how unlikely a situation is.

# Strategies

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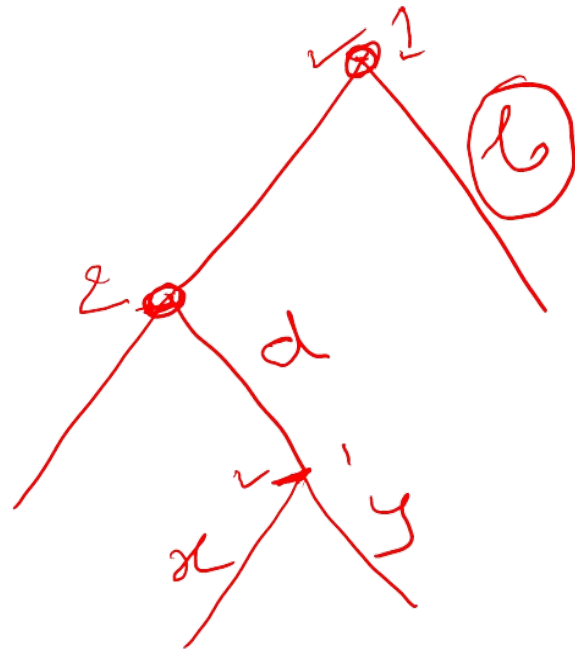
- In the prisoners' dilemma, each player has two strategies: confess (C) and do not confess (D)
- In the variant, the prisoner who moves first still has the same two strategies, but the prisoner who moves later has 4 different strategies.
- What are those 4 strategies?

# One more example

Player 2 has

1) C

2) D



Player 1 has

1) a at the initial node  
and play x at the later  
node & a x  
↑ ↑

2) ay

3) bx } →

4) by } →

# Strategies and Plans of Action

- Strategies contain actions specified for situations which may look implausible
- Why should a player worry about the need of making choices at later stage after taking an action which would end the game at early stage.
  - Other players' beliefs
  - what will happen if by mistake the player chooses some other action which would take the game to the stage where his action is not specified.

