Games and Information

MEPS Course

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Karl-Josef Koch

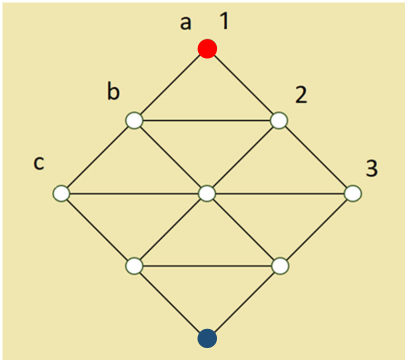
School of Economic Disciplines,
University of Siegen

A First Glimpse

0.1 Chinese Checkers

Chinese Checkers is a popular board game in many countries. There are many variations of this game. Simple ones are suitable for developing some basic concepts of game theory.

- The picture below shows a simplified game board of *Chinese Checkers* with the starting positions of the pieces of player Blue and player Red.



- Despite the simplification, the rules of *Chinese Checkers* you find in the Internet are also applicable here.

- When it is a player's turn, he can
  - move a piece along a line to a neighboring empty spot, or
  - jump in the direction of a line over one of their own or their opponent's stones to an empty spot right behind this piece, or
  - perform several such jumps in succession with a single stone and can also change direction after each jump.

- The aim of each player is to be the first to move all their pieces into the opponent's starting positions .

- It is obvious what a move is, or a series of moves.
  - But what is a strategy?
  - And what is the best response to a strategy?
  - Can there be a best strategy?
  - And what's more, can there be such a thing as balance or equilibrium in a game like this?

0.2 Bayesball

The following puzzle could be called a Bayesian puzzle with draws of balls, or *B*ayesball for short.

There is a big basin with 100 table tennis balls of different colors. 20 are red, 35 yellow and 45 green. The game master takes out a ball without you being able to see the color.

- What color is the ball most likely to be? What is your probability of guessing wrong?
- The game master draws a ball and calls out "not red". In response, you have to guess what color the ball actually is. What is your response? What is your probability of being wrong now?
- Suppose the game master had called "not green" instead. What difference does that make?
- The game master draws a ball and calls out "the ball is not red with a probability of 60%". Guess what color the ball probably is now? What is your probability of being wrong now?

0.3 Employment Contracts

A large company is looking for employees for a specific area of responsibility. Whether high revenues can be achieved in the business area depends on random factors such as fluctuations in demand as well as the management of the employees. Company management can only control and influence the latter to a limited extent.

Company management can only control and influence the latter to a limited extent. In particular, company management and employees have different attitudes towards the business risk associated with random fluctuations.

- In your opinion, who is more willing and able to bear the risk?
- How can this be taken into account in the employment contract?

The company cannot control in depth how the employees behave in their job.

- How can the company implement incentives in the employment contract that lead to high employee commitment?

0.4 Signaling

A used car dealer wants to sell a car of a certain quality. He knows that the car is in an above-average condition and places a corresponding advertisement in the newspaper. The typical potential buyer, on the other hand, does not have the expertise to value the car accurately.

The seller asks for a price that he thinks is reasonable and offers to take care of any repairs for certain damage that may occur within the first six months after the sale at his own expense.

- In what sense is the buyer's risk in this case of a different nature than in the employment contract example above?
- What does the seller's warranty do? What would the potential buyer probably do without the warranty offer?