Bernoullis Tafelrunde

Graduate Student Seminar

Thursday, 17 November 2016, 12:15-13:00
Seminarraum 00.003, Spiegelgasse 1

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A generalization of the beer mats puzzle

Abstract

In this talk I want to present a generalization of the beer mats puzzle (including proofs of (un-)solvability) involving abstract algebra. People willing to attend the talk are encouraged to think about a solution to the puzzle (i.e. a winning strategy) in advance.

The beer mats puzzle is a pub game played between a blindfolded player B and an adversary A.

Game positions: Four beer mats in a square arrangement on a tray, each facing "up" or "down".

Single round: A may rotate the tray with the beer mats through any multiple of $90°$ (without telling). B flips some of the beer mats. If all face up after that, B has won and the game is over.

Winning strategy: Any fixed finite sequence of flipping moves that guarantees B a win within a certain number of rounds, no matter what the starting position[1] and the perturbations by the adversary.

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[1] The starting position where all beer mats face up is considered to be won immediately by B without a single move.