

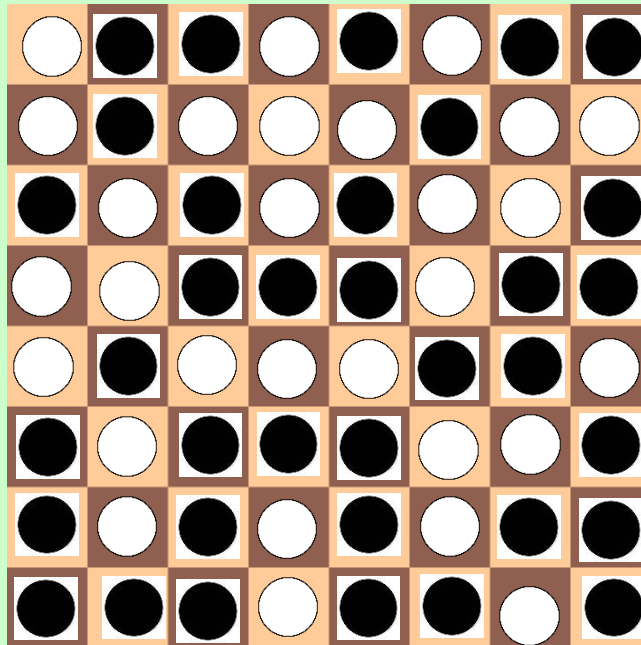


# Coin Flipping Puzzle

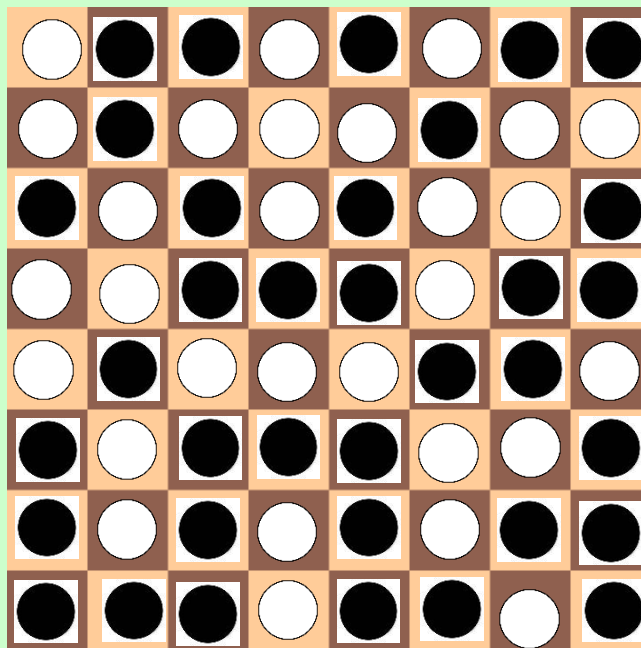
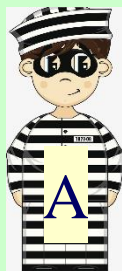
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There is an  $8 \times 8$  chessboard in a room and each square is occupied by a coin with random face up or tail up. Prisoner A enters the room and sees the Warden points to one of the squares. Prisoner A chooses any one of the 64 coins (same or different with what Warden has chosen) and flips the coin. Then Prisoner A leaves the room without any communication with Prisoner B. Now Prisoner B enters the room and guesses the square that the Warden has pointed to by looking at the chessboard. How did the Prisoners make it possible?

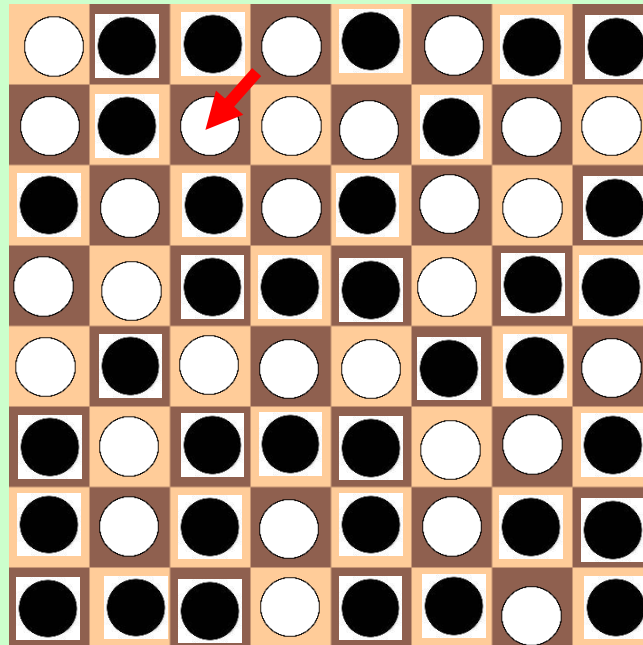
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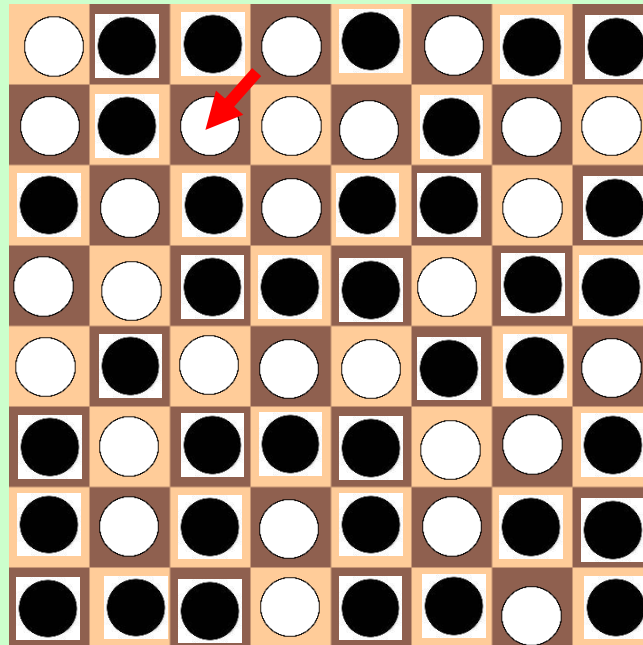
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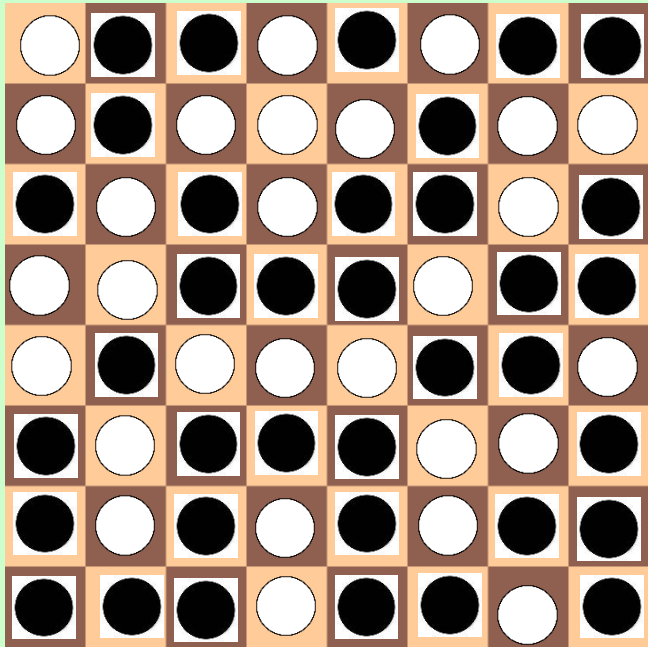
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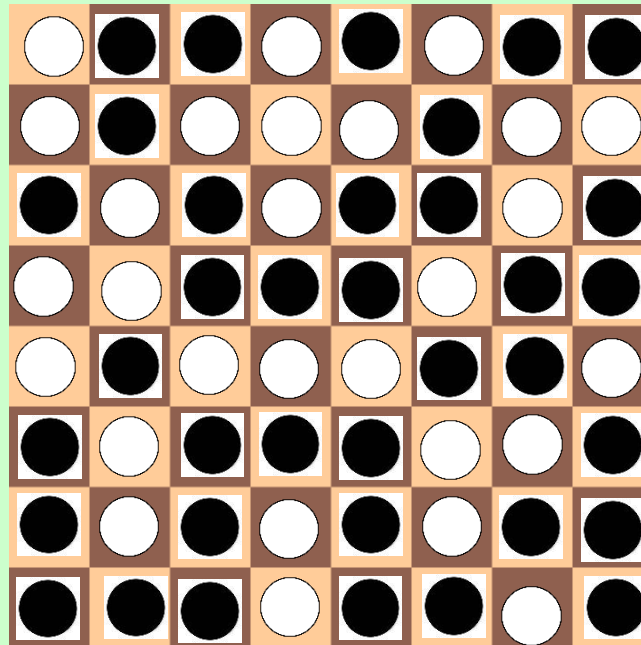
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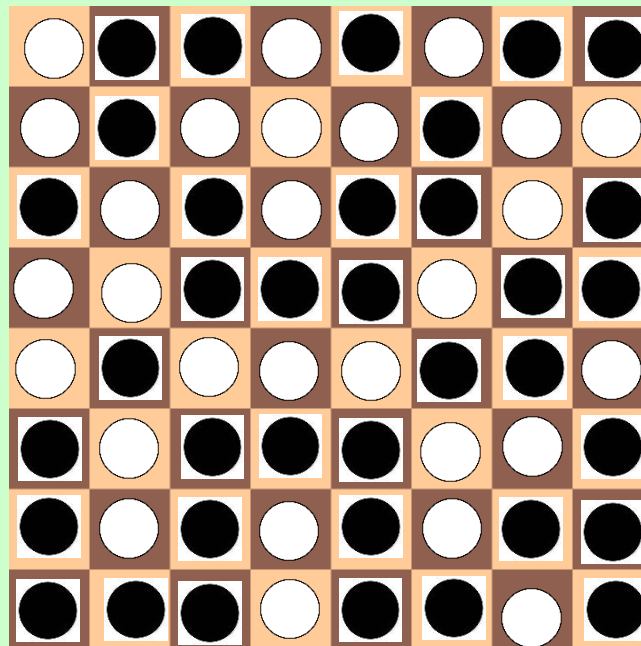


# Coin Flipping Puzzle



# Coin Flipping Puzzle

Which coin did I point to or you both die?







# Coin Flipping Puzzle Solution

Number the squares with 0 to 63.

Let  $b_1, b_2, \dots, b_k$  be the numbers associated with black squares.

Let  $s$  be the number associated with the square chosen by the Warden.

Prisoner A flips the coin with number

$$s \oplus b_1 \oplus b_2 \oplus \dots \oplus b_k$$

Prisoner B answers the square associated with the nim sum of the numbers associated with black squares.