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IEEEXtreme 10.0 &gt; Game of Stones 1

# Game of Stones 1

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 by IEEEXtreme

Problem

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Intended complexity  $O(N)$  per game,  $O(\text{Sum of } N)$  in total.

Solution:

The key observation is that in the losing configuration all the piles have 1 stone, and there will be exactly the "sum of stones in every pile in every game" such piles. Let's say that before a split there are  $X$  piles in total and after the split there will be  $X+2$  piles.

In the example, there are  $2 + 1 + 3 = 6$  piles and the losing configuration has  $3 + 5 + 5 + 3 + 3 + 7 = 26$  piles. The number of splits will be  $(26 - 6) / 2 = 10$ . As Alice starts, she will split on turns 1, 3, 5, 7 and 9 and Bob on 2, 4, 6, 8, 10. After Bob's last split all the piles will only have 1 stone, so Alice loses.

## Statistics

**Difficulty:** Hard**Publish Date:** Sep 05 2016

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