

Problem 486: Predict the Winner

Problem Information

Difficulty: Medium

Acceptance Rate: 55.96%

Paid Only: No

Tags: Array, Math, Dynamic Programming, Recursion, Game Theory

Problem Description

You are given an integer array `nums`. Two players are playing a game with this array: player 1 and player 2.

Player 1 and player 2 take turns, with player 1 starting first. Both players start the game with a score of `0`. At each turn, the player takes one of the numbers from either end of the array (i.e., `nums[0]` or `nums[nums.length - 1]`) which reduces the size of the array by `1`. The player adds the chosen number to their score. The game ends when there are no more elements in the array.

Return `true` if Player 1 can win the game. If the scores of both players are equal, then player 1 is still the winner, and you should also return `true`. You may assume that both players are playing optimally.

Example 1:

Input: `nums = [1,5,2]` **Output:** `false` **Explanation:** Initially, player 1 can choose between 1 and 2. If he chooses 2 (or 1), then player 2 can choose from 1 (or 2) and 5. If player 2 chooses 5, then player 1 will be left with 1 (or 2). So, final score of player 1 is $1 + 2 = 3$, and player 2 is 5. Hence, player 1 will never be the winner and you need to return false.

Example 2:

Input: `nums = [1,5,233,7]` **Output:** `true` **Explanation:** Player 1 first chooses 1. Then player 2 has to choose between 5 and 7. No matter which number player 2 choose, player 1 can choose 233. Finally, player 1 has more score (234) than player 2 (12), so you need to return True representing player1 can win.

****Constraints:****

`*`1` <= nums.length <= 20` *`0` <= nums[i] <= 107``

Code Snippets

C++:

```
class Solution {  
public:  
    bool predictTheWinner(vector<int>& nums) {  
  
    }  
};
```

Java:

```
class Solution {  
    public boolean predictTheWinner(int[] nums) {  
  
    }  
}
```

Python3:

```
class Solution:  
    def predictTheWinner(self, nums: List[int]) -> bool:
```