

# 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:
```