D. The Balanced Caravans of Samarkand (caravans)

Time limit: 1 seconds
Memory limit: 512 MiB

In the golden age of Ulugh Beg, merchants from all over the world gather in Samarkand. A massive caravan, consisting of N consecutive wagons, is about to enter the city. The weight of the cargo carried by each wagon is represented by the array $W_1, W_2, \ldots, W_N$.

To safely navigate the treacherous mountain passes, the caravan leader must divide this long caravan into interconnected **contiguous sub-caravans**. However, a sub-caravan is only considered safe if it is "Balanced".

A sub-caravan $W[L \ldots R]$ is considered **Balanced** if and only if it contains a **"Leader Wagon"**. A leader wagon is a wagon whose weight is **strictly greater than the sum of the weights of all other wagons** in that specific sub-caravan. Mathematically, there must exist an index k ($L \le k \le R$) such that:

$$W_k > \sum_{\substack{i=L \\ i \ne k}}^{R} W_i$$

Your task is to find the total number of valid ways the caravan leader can partition the entire caravan from beginning to end into contiguous sub-caravans such that every sub-caravan is balanced. Since the answer can be extremely large, print the result modulo $10^9 + 7$.

Input

The first line contains a single integer N — representing the number of wagons in the caravan.

The second line contains N positive integers: $W_1, W_2, \ldots, W_N$, where W_i denotes the weight of the i-th wagon.

Output

Output a single integer representing the total number of valid ways to partition the caravan into balanced sub-caravans, modulo $10^9 + 7$.

Constraints

- $1 \le N \le 3 \cdot 10^5$
- $1 \le W_i \le 10^9$

Scoring

- **Subtask 1 (9 points):** $N \leq 20$
- **Subtask 2 (14 points):** $N \leq 500$
- **Subtask 3 (21 points):** $N \leq 5000$
- **Subtask 4 (15 points):** The wagon weights are strictly increasing ($W_1 < W_2 < \cdots < W_N$).
- **Subtask 5 (41 points):** No additional constraints.

Examples

standard input	standard output
4 2 1 4 2	7

Explanation

Example 1: There are $2^{4-1} = 8$ possible ways to partition the array of 4 elements into contiguous segments. Exactly 7 of these partitions are valid:

1. $[2], [1], [4], [2]$ (4 sub-caravans. Every wagon is the leader of its own sub-caravan, as $W_i > 0$).
2. $[2, 1], [4], [2]$ (3 sub-caravans. Leaders are 2, 4, and 2 respectively).
3. $[2], [1, 4], [2]$ (3 sub-caravans. Leaders are 2, 4, and 2 respectively).
4. $[2], [1], [4, 2]$ (3 sub-caravans. Leaders are 2, 1, and 4 respectively).
5. $[2, 1], [4, 2]$ (2 sub-caravans. Leaders are 2 and 4 respectively).
6. $[2, 1, 4], [2]$ (2 sub-caravans. In the first one, $4 > 2 + 1$).
7. $[2], [1, 4, 2]$ (2 sub-caravans. In the second one, $4 > 1 + 2$).

The only invalid partition is leaving the entire array as a single segment $[2, 1, 4, 2]$. In this case, the maximum element is 4, which is not strictly greater than the sum of the remaining elements ($2 + 1 + 2 = 5$). Thus, $8 - 1 = 7$ valid partitions exist.