

## Problem B

# Moon and Sun

Let  $S$  be a non-empty sequence of integers and  $K$  be a positive integer. The functions  $moon()$  and  $sun()$  are defined as follows.

$$moon(S_{1..|S|}) = \begin{cases} S & \text{if } |S| = 1 \\ [S_2 - S_1, S_3 - S_2, \dots, S_{|S|} - S_{|S|-1}] & \text{if } |S| > 1 \end{cases}$$

$$sun(S_{1..|S|}, K) = \begin{cases} S & \text{if } K = 1 \\ sun(moon(S_{1..|S|}), K - 1) & \text{if } K > 1 \end{cases}$$

For example,

- $moon([2, 7]) = [5]$ .
- $moon([4, 1, 0, 7, 2]) = [-3, -1, 7, -5]$ .
- $sun([4, 1, 0, 7, 2], 5) = sun([-3, -1, 7, -5], 4) = sun([2, 8, -12], 3) = sun([6, -20], 2) = sun([-26], 1) = [-26]$ .

Observe that  $sun(S_{1..|S|}, |S|)$  is always a sequence with exactly one element.

You are given a sequence of  $N$  integers  $A_{1..N}$ . An index  $i = [1..N]$  is **hot** if and only if there exists a sequence  $A'_{1..N}$  satisfying the following conditions.

- $A'_i \neq A_i$  and  $A'_i$  is an integer between  $-100\,000$  and  $100\,000$ , inclusive;
- $A'_j = A_j$  for all  $j \neq i$ ;
- The only element in  $sun(A'_{1..N}, N)$  is a multiple of  $235\,813$ .

Your task in this problem is to count the number of hot indices in a given  $A_{1..N}$ .

For example, there are 3 hot indices in  $A_{1..5} = [4, 1, 0, 7, 2]$ , which are  $\{1, 3, 5\}$ .

- $i = 1$   $A'_1 = 30$        $\rightarrow$   $A'_{1..5} = [30, 1, 0, 7, 2]$        $\rightarrow$   $sun([30, 1, 0, 7, 2], 5) = [0]$
- $i = 3$   $A'_1 = -78\,600$        $\rightarrow$   $A'_{1..5} = [4, 1, -78\,600, 7, 2]$        $\rightarrow$   $sun([4, 1, -78\,600, 7, 2], 5) = [-471\,626]$
- $i = 5$   $A'_1 = 28$        $\rightarrow$   $A'_{1..5} = [4, 1, 0, 7, 28]$        $\rightarrow$   $sun([4, 1, 0, 7, 28], 5) = [0]$

Note that both  $0$  and  $-471\,626$  are multiples of  $235\,813$ . On the other hand, the index  $i = 2$  is not hot as there does not exist an integer  $A'_2 \neq A_2$  between  $-100\,000$  and  $100\,000$ , such that the only element in  $sun(A'_{1..5}, 5)$  is a multiple of  $235\,813$ . The index  $i = 4$  is also not hot for a similar reason.

### Input

Input begins with a line containing an integer:  $N$  ( $1 \leq N \leq 100\,000$ ) representing the number of integers in  $A$ . The next line contains  $N$  integers:  $A_i$  ( $-100\,000 \leq A_i \leq 100\,000$ ) representing the sequence of integers.

### Output

Output in a line an integer representing the number of hot indices in the given  $A_{1..N}$ .

### Sample Input #1

```
5
4 1 0 7 2
```

### Sample Output #1

```
3
```

*Explanation for the sample input/output #1*

This is the example from the problem description.

### Sample Input #2

```
4
10 20 30 -40
```

### Sample Output #2

```
4
```

*Explanation for the sample input/output #2*

- $i = 1$   $A'_1 = -70$  →  $A'_{1..4} = [-70, 20, 30, -40]$  →  $sun([-70, 20, 30, -40], 4) = [0]$
- $i = 2$   $A'_2 = 78\,651$  →  $A'_{1..4} = [10, 78\,651, 30, -40]$  →  $sun([10, 78\,651, 30, -40], 4) = [235\,813]$
- $i = 3$   $A'_3 = -78\,601$  →  $A'_{1..4} = [10, 20, -78\,601, -40]$  →  $sun([10, 20, -78\,601, -40], 4) = [235\,813]$
- $i = 4$   $A'_4 = 40$  →  $A'_{1..4} = [10, 20, 30, 40]$  →  $sun([10, 20, 30, 40], 4) = [0]$

### Sample Input #3

```
2
100 100
```

### Sample Output #3

```
0
```