Problem E. Easiest Sum

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

The function $f(a_1, a_2, \ldots, a_n)$ represents the largest sum of elements on a non-empty subsegment in the array $a_1, a_2, \ldots, a_n$.

You are given an array $a_1, a_2, \ldots, a_n$.

You can spend one coin and decrease any element of a by 1.

Another function, $g(k)$, represents the smallest value of $f(a_1, a_2, \ldots, a_n)$ you can achieve by spending at most k coins.

Find $g(1) + g(2) + \ldots + g(k)$. As this value may be very large, find it modulo $998\,244\,353$.

Input

The first line of input contains one integer, n $(1 \le n \le 100\,000)$: the number of elements in a.

The second line contains n integers $a_1, a_2, \ldots, a_n$ $(-10^8 \le a_i \le 10^8)$.

The third line contains one integer k $(1 \le k \le 10^{13})$.

Output

Print $g(1) + g(2) + \ldots + g(k)$, modulo $998\,244\,353$.

Examples

standard input	standard output
5 1 -1 2 -2 3 3	5
3 -3 -5 -35 1	998244349

Note

In the first example, $g(1) = 2, g(2) = 2, g(3) = 1$.

In the second example, $g(1) = -4$.