

## Problem B. Mercurialist

- Time Limit: 2 sec

### Problem Statement

This country has a medicine for immortality. Alice got  $X + Y + Z$  bottles from the *Hatter*.

$X$  bottles contain *elixir*. If Alice drinks it, she will immediately become immortal.

$Y$  bottles contain mercury, and each has a different toxicity. If she drinks the  $i$ -th bottle, the following event  $i$  will occur after  $K + i - 0.5$  days.

- Event  $i$ : Alice will immediately die if she has not drunk the elixir before event  $i$ . If she has drunk the elixir, she won't die.

The remaining  $Z$  bottles contain yogurt. Nothing will happen when Alice drinks it.

At the same time every morning, Alice chooses one non-empty bottle with equal probability and drinks it. If all bottles are empty, she does nothing.

Answer the probability that Alice will be alive  $10^{10}$  days after the first day she starts drinking bottles. Note that Alice won't die other than events.

The probability can be expressed as  $\frac{P}{Q}$  using coprime integers  $P$  and  $Q$ . Output a non-negative integer  $R$  less than 998244353 such that  $R \times Q \equiv P \pmod{998244353}$ . It can be proven that the probability is a rational number, and  $R$  is uniquely determined under the conditions of this problem.

### Input

$X Y Z K$

The input satisfies the following constraints.

- All inputs consist of integers.
- $1 \leq X, Y, Z, K \leq 10^5$

### Output

Output  $R$  defined in the statement. Add a new line at the end of the output.

Sample Input 1	Sample Output 1
1 1 1 1	831870295
Sample Input 2	Sample Output 2
1 1 1 100	1
Sample Input 3	Sample Output 3
2 2 1 2	565671801
Sample Input 4	Sample Output 4
12912 83717 73177 1920	685360162

In Sample Input 1, Alice will only die if she drinks mercury on day 1 and yogurt on day 2. The probability of death is  $1/3 \times 1/2 = 1/6$ , therefore the answer is  $5/6$ .

In Sample Input 2, Alice never dies.