5_賭博遊戲 (Gamble)

(15 分)

時間限制: 1 second

記憶體限制: 256 MB

題目敘述

在一個熱鬧的賭場裡，Alice 和 Bob 兩位勇敢的賭徒坐下來進行一場刺激的賭博。他們面對著賭桌上的籌碼，心跳加速，期待著下一局的結果。 Alice 目光炯炯，手中的籌碼穩穩地擺放在賭桌上，而 Bob 則神情凝重，帶著一絲不安地等待著。這場賭局的結果將決定誰能笑到最後，誰將空著口袋離開這裡。

現在，Alice 和 Bob 各自持有一定數量的賭注。Alice 手中擁有 m 元，而 Bob 則擁有 n 元。他們決定將這些賭注全部拿出來進行一場刺激的對決。然而，這並不僅僅是一場賭博，更是一場關於勇氣、智慧和運氣的角逐。

賭局開始了。Alice 和 Bob 交替進行著他們的下注，每一輪都緊張刺激。已知 Alice 在每一場贏的機率為 $p\%$，Bob 贏的機率則為 $q\%$，其中 $q = 100 - p$。在每一次的賭注中，如果 Alice 贏了，Bob 就得支付給 Alice 一元；反之，Alice 則支付給 Bob 一元。這樣的規則讓整個賭場都充滿了緊張與刺激的氣氛。

當雙方其中一個輸光所有賭注，則賭博結束。舉例來說，Alice 贏光了 Bob，也就是 Alice 拿到 $m + n$ 元，Bob 則剩下 0 元，該場賭博結束。

現在已知 Alice 和 Bob 分別有多少賭注，請問 Alice 把 Bob 贏光的機率是多少？可以證明答案可以用最簡分數 $\frac{a}{b}$ 表示，請以 $a \times b^{-1} \mod 998244353$ 的格式輸出，其中 b^{-1} 為 b 在 998244353 的模逆元。

輸入格式

輸入僅一行，包含三個正整數 m、n、p，分別代表 Alice 和 Bob 的賭注以及 Alice 獲勝的機率。

輸出格式

輸出一個數字如題目所述。

資料範圍

- $1 \leq m, n \leq 3 \times 10^5$。
- $0 \leq p \leq 100$。

測試範例

輸入範例 1

```
1 1 40
```

輸出範例 1

```
199648871
```

輸入範例 2

```
5 5 0
```

輸出範例 2

```
0
```

輸入範例 3

```
5 5 40
```

輸出範例 3

```
747775770
```

範例說明

在範例 1 中，很明顯可以得到 Alice 贏光 Bob 的機率是 40%（贏一場即贏光且 Alice 在一場中獲勝的機率為 40%），也就是 $\frac{2}{5}$。所以在 998244353 的模數中，$2 \times 5^{-1} \mod 998244353$ 的結果為 199648871。

在範例 2 中，Alice 每一場的獲勝機率為 $0\% = 0$，因此贏光 Bob 的機率也就是 $0\% = 0$。在 998244353 的模數中，結果是 0。

5_Gamble

(15 points)

Time Limit: 1 second

Memory Limit: 256 MB

Statement

In a bustling casino, Alice and Bob, two brave gamblers, sit down for an exciting gamble. Facing the chips on the gambling table, their hearts beat faster, anticipating the outcome of the next round. Alice's gaze is sharp, her chips placed steadily on the table, while Bob looks serious, waiting with a hint of anxiety. The outcome of this gamble will determine who can laugh last and who will leave with empty pockets.

Now, Alice and Bob each hold a certain amount of money. Alice has m dollars in hand, while Bob has n dollars. They decide to put all these money on the line for an exciting showdown. However, this is not just a gamble, but a contest of courage, intelligence, and luck.

The gamble begins. Alice and Bob take turns placing their money, each round nerve-wracking. It is known that Alice's probability of winning each round is $p\%$, and Bob's probability of winning is $q\%$, where $q = 100 - p$. In each bet, if Alice wins, Bob pays Alice one dollar; conversely, if Bob wins, Alice pays Bob one dollar. This rule fills the entire casino with tension and excitement.

When one side loses all their money, the gamble ends. For example, if Alice wins all of Bob's money, Alice gets $m + n$ dollars, and Bob is left with 0 dollars, and the gamble ends.

Now, knowing the number of money Alice and Bob have respectively, what is the probability that Alice will win all of Bob's money? It can be proven that the answer can be represented by the irreducible fraction $\frac{a}{b}$, and please output it in the format $a \times b^{-1} \mod 998244353$, where b^{-1} is the modular inverse of b modulo 998244353.

Input Format

The input consists of a single line containing three positive integers m, n, and p, representing the bets of Alice and Bob, and the probability of Alice winning, respectively.

Output Format

Output a number as described in the problem statement.

Constraints

- $1 \leq m, n \leq 3 \times 10^5$.
- $0 \leq p \leq 100$.

Test Cases

Input 1

```
1 1 40
```

Output 1

```
199648871
```

Input 2

```
5 5 0
```

Output 2

```
0
```

Input 3

```
5 5 40
```

Output 3

```
747775770
```

Illustrations

In Example 1, it is obvious that the probability of Alice winning all of Bob's money is 40% (winning a game means winning all, and Alice's probability of winning a game is 40%), which is $\frac{2}{5}$. So, the result of $2 \times 5^{-1} \mod 998244353$ is 199648871 modulo 998244353.

In Example 2, Alice's probability of winning each round is $0\% = 0$, so the probability of winning all of Bob's money is also $0\% = 0$. The result modulo 998244353 is 0.