# Sugar Sweet 3

| | |
|---|---|
| Input file: | `standard input` |
| Output file: | `standard output` |
| Time limit: | 3 seconds |
| Memory limit: | 1024 megabytes |

*Which problem was the Moore vote problem again?*

— Anonymous Apiad, problem verifier

Pibi, Prof. Peng and Emperor Bie are playing a game. The three players hold three different types of cards. Pibi holds $A$ cards of type 1, Prof. Peng holds $B$ cards of type 2, and Emperor Bie holds $C$ cards of type 3. The three players play this game with a card pile which is initially empty.

The Game lasts for $A + B + C$ Rounds, in each round:

- One player with at least 1 card left plays his card.
- If the card pile is empty, or all the cards in the card pile is of the same type as his card, the player put this card into the card pile.
- Otherwise, he takes away one card from the card pile, and throw it away, along with the card he has played.

For example, assume Pibi holds 1 card of type 1, Prof. Peng holds 3 cards of type 2, and Emperor Bie holds 2 cards of type 3. The order in which the players play their cards is [Pibi, Prof. Peng, Prof. Peng, Emperor Bie, Emperor Bie, Prof. Peng]. The cards in the card pile after each round is :

After the first round: [1] (Pibi put his card into the card pile)

After the second round :[] (Prof. Peng plays his card, and throws away one card from the card pile, along with the card he has played).

After the third round : [2] (Prof. Peng put his card into the card pile)

After the fourth round: [] (Emperor Bie plays his card, and throws away one card from the card pile, along with the card he has played)

After the fifth round: [3] (Emperor Bie put his card into the card pile)

After the sixth round: [] (Prof. Peng plays his card, and throws away one card from the card pile, along with the card he has played)

Now, assume that there're $m$ moments that the card pile is empty, and the pile is empty at the last moment. Formally, there exist a list $t_1, t_2 \dots t_m$ $(1 \leq t_1 < t_2 \cdots < t_m = A + B + C)$ containing all the integers $t_i$ such that after the $t_i$-th $(1 \leq i \leq m)$ round, the card pile is empty. The three players will gain $m^x$ bags of sugar. Here, $x$ is a constant decided before the game. If the pile is not empty after the game, the three players will not gain any sugar.

Now the three players want to know, what's the sum of bags of sugar they can get in all possible games. Two games are considered different if and only if there exists $i$, such that the player of the $i$-th round is different. Output it modulo $10^9 + 7$.

## Input

The only line contains four integers $A, B, C, x$ $(1 \leq A, B, C \leq 1000, 1 \leq A + B + C \leq 1000, 1 \leq x \leq 10^9)$, denoting the number of cards in Pibi's hand, the number of cards in Prof. Peng's hand, and the number of cards in Emperor Bie's hand.

## Output

Output a single integer, representing the sum of bags of sugar in all possible games, modulo $10^9 + 7$.

## Examples

| standard input | standard output |
|---|---|
| 1 2 3 1 | 110 |
| 4 5 7 12 | 881078346 |

## Note

For the first example, there are 6 possible valid games with $m = 1$, 16 possible games with $m = 2$, and 24 possible games with $m = 3$, so the answer is $6 \times 1^1 + 16 \times 2^1 + 24 \times 3^1 = 110$.