Problem A. Task and Penalty

Time limit:	please refer to DOM Judge
Memory limit:	please refer to DOM Judge

Abihc is an ICPC contestant. He's is participated in the world final. He is so strong that he can solve every problem at a first glance. Moreover, he can also accurately estimate the time he needs for each problem. Please help Abihc to arrange an order to solve the problem so that the penalty can be as small as possible.

The penalty for a single problem is the time Abihc get AC plus 20 multiplied by the number of rejected submission. The total penalty is the sum of the penalty for each problem.

Note that once Abihc decides to work on a problem, he can't work on other problems until he solves it. Because Abihc is too strong to make a mistake, he won't have any rejected submissions.

Input

The first line contains an integer $N(1 \leq N \leq 2 \times 10^5)$ representing the number of problems. Next line contains N integers $a_i(1 \leq a_i \leq 10^9)$ representing the amount of time to solve the i-th problem.

Output

Please output the minimum total penalty after solving N problems.

Examples

Standard Input	Standard Output
5 20 40 10 10 71	301

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Problem B. Counting Rooms

Time limit:	please refer to DOM Judge
Memory limit:	please refer to DOM Judge

You are given a map of a building, and your task is to count the number of its rooms. The size of the map is $n \times m$ squares, and each square is either floor or wall. You can walk left, right, up, and down through the floor squares.

Input

The first input line has two integers n and m: the height and width of the map.

Then there are n lines of m characters describing the map. Each character is either . (floor) or # (wall).

- $1 \le n, m \le 1000$

Output

Print one integer: the number of rooms.

Examples

Standard Input	Standard Output
5 8 ######## #..#...# ####.#.# #..#...# ########	3

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Problem C. Sum of Three Values

Time limit:	please refer to DOM Judge
Memory limit:	please refer to DOM Judge

You are given an array of n integers. Your task is to find three values at distinct positions whose sum is x.

Input

The first input line has two integers n and x: the array size and the target sum.

The second line has n integers $a_1, a_2, \cdots, a_n$: the array values.

- $1 \le n \le 5000$

- $1 \le x, a_i \le 10^9$

Output

Print three integers: the positions of the values. If there are several solutions, you may print any of them. If there are no solutions, print "IMPOSSIBLE" (without quotation marks).

Examples

Standard Input	Standard Output
4 8 2 7 5 1	1 3 4
4 8763 4 8 7 63	IMPOSSIBLE

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Problem D. LR insertion

Time limit: please refer to DOM Judge
Memory limit: please refer to DOM Judge

You are given a string $S = s_1 s_2 \cdots s_N$ consisting only 'L' and 'R'.

You want to build an integer sequence A. Initially A contains one 0, i.e. $A = (0)$.

Then for $i = 1, 2, \cdots, N$, the following will be done.

- If s_i is 'L', insert number i to the left of number $i - 1$ in A.

- If s_i is 'R', insert number i to the right of number $i - 1$ in A.

Please print the final contents of A.

Input

The first line contains an integer N: the length of the string S.

The second line contains string S.

- $1 \le N \le 5 \times 10^5$

Output

Please print the contents of A, separated by spaces.

Examples

Standard Input	Standard Output
5 LRRLR	1 2 4 5 3 0
7 LLLLLLL	7 6 5 4 3 2 1 0

Note

In the first example:

- Initially $A = (0)$.

- s_1 is 'L', which makes $A = (1, 0)$.

- s_2 is 'R', which makes $A = (1, 2, 0)$.

- s_3 is 'R', which makes $A = (1, 2, 3, 0)$.

- s_4 is 'L', which makes $A = (1, 2, 4, 3, 0)$.

- s_5 is 'R', which makes $A = (1, 2, 4, 5, 3, 0)$.

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Problem E. Second Day in Aincrad

Time limit: please refer to DOM Judge
Memory limit: please refer to DOM Judge

Today is November 7th, the second day since Kirito entered the death game - Sword Art Online. As the beta tester of the game, Kirito knows a mission that provides special award. The mission is "Cows' Counter Attack":

Initially there was a simple math equation in the form $A + B = C$ or $A - B = C$, where A, B, C are positive integers less than 10^8. However, cows in the first floor of Aincrad hate math. They spilled mud over the equation so that some digits became unreadable. The mission objective is to fill in the unreadable digits to recover the equation.

Kirito distributed all his skill points into attack and agility so he is pretty bad in math. Can you help him out?

Note that the integers in the recovered equation should not contains trailing zeros. That is, A, B, C in the recovered equation should not start with zero.

Input

The input has only one line which contains five strings S_A, OP, S_B, EQ, S_C separated with spaces.

S_A, S_B, S_C denotes integers A, B, C in the equation, while the unreadable digits are shown with 'X'.

OP is the operator in the equation, which is either a plus '+' or a minus '-'.

EQ is a equal '='.

- $1 \leq |S_A|, |S_B|, |S_C| \leq 8$

- $0 \leq$ number of unreadable digits in the equation ≤ 8

It is guaranteed that there exists at least one way to recover the equation.

Output

Please output three integers A, B, C separated by space, being the three numbers in the recovered equation. If there are multiple solutions, print any of them.

Examples

Standard Input	Standard Output
4XX47 + 1X16 = 4X7X3	47747 1016 48763
XXX - X = XXX	713 1 712

Note

You can print any solution. For example, $A = 48147, B = 1616, C = 49763$ is also a valid solution for the first sample.

Note that in the second example, $A = 123, B = 0, C = 123$ is not a valid answer, since A, B, C should be positive.

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Problem F. Circular Nearest Smaller Values

Time limit:	please refer to DOM Judge
Memory limit:	please refer to DOM Judge

Given a circular array A, index is from 1 to n. Your task is to find for each array position the nearest position to its left side having a smaller or equal value.

Since it's an circular array, the left element of A_1 is A_n.

Input

The first input line has an integer n representing the size of the array. The second input line has n integers representing $A_1, A_2, ..., A_n$

- $1 \leq n \leq 2 \times 10^5$

- $1 \leq A_i \leq 10^9$

Output

Print n integers: for each array position from 1 to n, the nearest position with a smaller or equal value.

Examples

Standard Input	Standard Output
8 2 5 1 4 8 3 2 1	7 5 2 2 5 5 6 7

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Problem G. Gluttony

Time limit:	please refer to DOM Judge
Memory limit:	please refer to DOM Judge

Takahashi will take part in an eating contest. Teams of N members will compete in this contest, and Takahashi's team consists of N players numbered 1 through N from youngest to oldest. The consumption coefficient of Member i is A_i.

In the contest, N foods numbered 1 through N will be presented, and the difficulty of Food i is F_i. The details of the contest are as follows:

- A team should assign one member to each food, and should not assign the same member to multiple foods.

- It will take $x \times y$ seconds for a member to finish the food, where X is the consumption coefficient of the member and y is the difficulty of the dish.

- The score of a team is the longest time it takes for an individual member to finish the food.

Before the contest, Takahashi's team decided to do some training. In one set of training, a member can reduce his/her consumption coefficient by 1, as long as it does not go below 0. However, for financial reasons, the N members can do at most K sets of training in total.

What is the minimum possible score of the team, achieved by choosing the amounts of members' training and allocating the dishes optimally?

Input

First line input two integers N and K.

Next, input N integers represents $A_1, A_2, ...A_N$.

Last, input N integers represents $F_1, F_2, ...F_N$.

- All values in input are integers.
- $1 \le N \le 2 \times 10^5$
- $0 \le K \le 10^{18}$
- $1 \le A_i \le 10^6 (1 \le i \le N)$
- $1 \le F_i \le 10^6 (1 \le i \le N)$

Output

Print the minimum possible score of the team.

Examples

Standard Input	Standard Output
3 5 4 2 1 2 3 1	2
3 8 4 2 1 2 3 1	0
11 14 3 1 4 1 5 9 2 6 5 3 5 8 9 7 9 3 2 3 8 4 6 2	12

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Problem H. Sticks

Time limit: please refer to DOM Judg
Memory limit: please refer to DOM Judge

George took sticks of the same length and cut them randomly into small parts. Now he wants to return sticks to the original state, but he forgot how many sticks he had originally and how long they were originally. Please help him and design a program which computes the smallest possible original length of those sticks.

Input

The input file contains several blocks of 2 lines, each block represent a test case. The first line contains an integer n, which is the number of sticks parts after cutting. The second line contains n integer a_i, which are the lengths of those parts.

The last line of the file contains a single 0.

- $1 \le n \le 64$

- $1 \le a_i \le 50$

- $1 \le$ number of test cases ≤ 150

Output

The output file contains the smallest possible length of original sticks, one per line.

Examples

Standard Input	Standard Output
9	6
5 2 1 5 2 1 5 2 1	5
4	
1 2 3 4	
0	

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