Problem A

September 8, 2019

Problem Statement

Sam likes transformations and is given a task of transforming one positive integer into another positive integer. In order to do so, he is given the starting integer, ending integer and a set S containing N positive integers. At each step, Sam can convert the current integer X to either $\phi(X)$ or X^2, provided that the new integer belongs to set S. $\phi(X)$ is the number of integers less than X that are co-prime to X.

A number x is said to be co-prime to y if the greatest common divisor of x and y is 1, i.e., $\gcd(x, y) = 1$

Sam being lazy wants to do the transformation from the starting integer to ending integer in minimum number conversions. If there are multiple ways to transform the number with the least number of conversions number, then Sam will chose the transform with least *value*, where, *value* of a transformation is defined as the sum of all the integers used in the transformation from starting integer to ending integer including the starting and ending integers. For example, consider the following transform $5 \rightarrow 4 \rightarrow 16 \rightarrow 8$, the *value* of this transform is $5 + 4 + 16 + 8 = 33$.

Note: It is guaranteed that a transformation exists.

INPUT

The first line of the input contains three space separated integers N, the starting integer and the ending integer ($1 \leq N \leq 10^5$, $1 <$ starting integer $\leq 10^5$, $1 \leq$ ending integer $\leq 10^5$). The second line contains N space separated integers, $s_1, s_2, \ldots, s_N$, that represent the set $S = \{s_1, s_2, \ldots, s_N\}$ from the problem. ($0 \leq s_i \leq 10^5$).

OUTPUT

Print a single line with two space separated integers Num and Sum, where, Num is the minimum number of conversions that Sam has to do to transform the starting integer to the ending integer and Sum is minimum value of the transformation among all the transformations that takes Num conversions.

Examples

Input 1

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2 3 1
2 1
```

Output 1

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2 6
```

Input 2

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3 5 16
1 4 16
```

Output 2

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2 25
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