Codeforces Round #213 (Div. 2)

A. Good Number

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Let's call a number k-good if it contains all digits not exceeding k ($0, ..., k$). You've got a number k and an array a containing n numbers. Find out how many k-good numbers are in a (count each number every time it occurs in array a).

Input

The first line contains integers n and k ($1 \le n \le 100$, $0 \le k \le 9$). The i-th of the following n lines contains integer a_i without leading zeroes ($1 \le a_i \le 10^9$).

Output

Print a single integer — the number of k-good numbers in a.

Sample test(s)

input
10 6 1234560 1234560 1234560 1234560 1234560 1234560 1234560 1234560 1234560 1234560
output
10

input
2 1 1 10
output
1

B. The Fibonacci Segment

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You have array $a_1, a_2, ..., a_n$. Segment $[l, r]$ $(1 \le l \le r \le n)$ is good if $a_i = a_{i-1} + a_{i-2}$, for all i $(l + 2 \le i \le r)$.

Let's define $len([l, r]) = r - l + 1$, $len([l, r])$ is the length of the segment $[l, r]$. Segment $[l_1, r_1]$, is longer than segment $[l_2, r_2]$, if $len([l_1, r_1]) > len([l_2, r_2])$.

Your task is to find a good segment of the maximum length in array a. Note that a segment of length 1 or 2 is always good.

Input

The first line contains a single integer n $(1 \le n \le 10^5)$ — the number of elements in the array. The second line contains integers: $a_1, a_2, ..., a_n$ $(0 \le a_i \le 10^9)$.

Output

Print the length of the longest good segment in array a.

Sample test(s)

input
10 1 2 3 5 8 13 21 34 55 89
output
10

input
5 1 1 1 1 1
output
2

C. Matrix

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You have a string of decimal digits s. Let's define $b_{ij} = s_i \cdot s_j$. Find in matrix b the number of such rectangles that the sum b_{ij} for all cells (i, j) that are the elements of the rectangle equals a in each rectangle.

A rectangle in a matrix is a group of four integers (x, y, z, t) $(x \le y, z \le t)$. The elements of the rectangle are all cells (i, j) such that $x \le i \le y, z \le j \le t$.

Input

The first line contains integer a ($0 \le a \le 10^9$), the second line contains a string of decimal integers s ($1 \le |s| \le 4000$).

Output

Print a single integer — the answer to a problem.

Please, do not write the `%lld` specifier to read or write 64-bit integers in C++. It is preferred to use the `cin`, `cout` streams or the `%I64d` specifier.

Sample test(s)

input
10 12345
output
6

input
16 4398738936934956234982639847 65
output
40

D. Free Market

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

John Doe has recently found a "Free Market" in his city — that is the place where you can exchange some of your possessions for other things for free.

John knows that his city has n items in total (each item is unique). You can bring any number of items to the market and exchange them for any other one. Note that each item is one of a kind and that means that you cannot exchange set $\{a, b\}$ for set $\{v, a\}$. However, you can always exchange set x for any set y, unless there is item p, such that p occurs in x and p occurs in y.

For each item, John knows its value c_i. John's sense of justice doesn't let him exchange a set of items x for a set of items y, if $s(x) + d < s(y)$ ($s(x)$ is the total price of items in the set x).

During one day John can exchange only one set of items for something else. Initially, he has no items. John wants to get a set of items with the maximum total price. Find the cost of such set and the minimum number of days John can get it in.

Input

The first line contains two space-separated integers n, d ($1 \le n \le 50$, $1 \le d \le 10^4$) — the number of items on the market and John's sense of justice value, correspondingly. The second line contains n space-separated integers c_i ($1 \le c_i \le 10^4$).

Output

Print two space-separated integers: the maximum possible price in the set of items John can get and the minimum number of days needed to get such set.

Sample test(s)

input
3 2 1 3 10
output
4 3

input
3 5 1 2 3
output
6 2

input
10 10000 10000 9999 1 10000 10000 10000 1 2 3 4
output
50010 6

Note

In the first sample John can act like this:

- Take the first item ($1 - 0 \le 2$).
- Exchange the first item for the second one ($3 - 1 \le 2$).
- Take the first item ($1 - 0 \le 2$).

E. Beautiful Set

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

We'll call a set of positive integers a beautiful if the following condition fulfills: for any prime p, if $\exists x \in a, x \equiv 0 \mod p$, then $|\{y \in a | y \equiv 0 \mod p\}| \geq \frac{|a|}{2}$. In other words, if one number from the set is divisible by prime p, then at least half of numbers from the set is divisible by p.

Your task is to find any beautiful set, where the number of elements is equal to k and each element doesn't exceed $2k^2$.

Input

The first line contains integer k ($10 \leq k \leq 5000$) that shows how many numbers the required beautiful set should have.

Output

In the first line print k space-separated integers that are a beautiful set. If there are multiple such sets, you are allowed to print any of them.

Sample test(s)

input
10
output
16 18 24 27 36 48 54 72 108 144