Codeforces Round #267 (Div. 2)

A. George and Accommodation

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

George has recently entered the BSUCP (Berland State University for Cool Programmers). George has a friend Alex who has also entered the university. Now they are moving into a dormitory.

George and Alex want to live in the same room. The dormitory has n rooms in total. At the moment the i-th room has p_i people living in it and the room can accommodate q_i people in total ($p_i \le q_i$). Your task is to count how many rooms has free place for both George and Alex.

Input

The first line contains a single integer n $(1 \le n \le 100)$ — the number of rooms.

The i-th of the next n lines contains two integers p_i and q_i $(0 \le p_i \le q_i \le 100)$ — the number of people who already live in the i-th room and the room's capacity.

Output

Print a single integer — the number of rooms where George and Alex can move in.

Sample test(s)

input
3 1 1 2 2 3 3
output
0

input
3 1 10 0 10 10 10
output
2

B. Fedor and New Game

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

After you had helped George and Alex to move in the dorm, they went to help their friend Fedor play a new computer game «Call of Soldiers 3».

The game has $(m + 1)$ players and n types of soldiers in total. Players «Call of Soldiers 3» are numbered form 1 to $(m + 1)$. Types of soldiers are numbered from 0 to n - 1. Each player has an army. Army of the i-th player can be described by non-negative integer x_i. Consider binary representation of x_i: if the j-th bit of number x_i equal to one, then the army of the i-th player has soldiers of the j-th type.

Fedor is the $(m + 1)$-th player of the game. He assume that two players can become friends if their armies differ in at most k types of soldiers (in other words, binary representations of the corresponding numbers differ in at most k bits). Help Fedor and count how many players can become his friends.

Input

The first line contains three integers n, m, k $(1 \le k \le n \le 20; 1 \le m \le 1000)$.

The i-th of the next $(m + 1)$ lines contains a single integer x_i $(1 \le x_i \le 2^n$ - $1)$, that describes the i-th player's army. We remind you that Fedor is the $(m + 1)$-th player.

Output

Print a single integer — the number of Fedor's potential friends.

Sample test(s)

input
7 3 1 8 5 111 17

output
0

input
3 3 3 1 2 3 4

output
3

C. George and Job

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

The new ITone 6 has been released recently and George got really keen to buy it. Unfortunately, he didn't have enough money, so George was going to work as a programmer. Now he faced the following problem at the work.

Given a sequence of n integers $p_1, p_2, ..., p_n$. You are to choose k pairs of integers:

$$[l_1, r_1], [l_2, r_2], ..., [l_k, r_k] \ (1 \le l_1 \le r_1 < l_2 \le r_2 < ... < l_k \le r_k \le n; \ r_i - l_i + 1 = m),$$

in such a way that the value of sum $\sum_{i=1}^{k} \sum_{j=l_i}^{r_i} p_j$ is maximal possible. Help George to cope with the task.

Input

The first line contains three integers n, m and k $(1 \le (m \times k) \le n \le 5000)$. The second line contains n integers $p_1, p_2, ..., p_n$ $(0 \le p_i \le 10^9)$.

Output

Print an integer in a single line — the maximum possible value of sum.

Sample test(s)

input
5 2 1 1 2 3 4 5
output
9

input
7 1 3 2 10 7 18 5 33 0
output
61

D. Fedor and Essay

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

After you had helped Fedor to find friends in the «Call of Soldiers 3» game, he stopped studying completely. Today, the English teacher told him to prepare an essay. Fedor didn't want to prepare the essay, so he asked Alex for help. Alex came to help and wrote the essay for Fedor. But Fedor didn't like the essay at all. Now Fedor is going to change the essay using the synonym dictionary of the English language.

Fedor does not want to change the meaning of the essay. So the only change he would do: change a word from essay to one of its synonyms, basing on a replacement rule from the dictionary. Fedor may perform this operation any number of times.

As a result, Fedor wants to get an essay which contains as little letters «R» (the case doesn't matter) as possible. If there are multiple essays with minimum number of «R»s he wants to get the one with minimum length (length of essay is the sum of the lengths of all the words in it). Help Fedor get the required essay.

Please note that in this problem **the case of letters doesn't matter**. For example, if the synonym dictionary says that word `cat` can be replaced with word `DOG`, then it is allowed to replace the word `Cat` with the word `doG`.

Input

The first line contains a single integer m $(1 \le m \le 10^5)$ — the number of words in the initial essay. The second line contains words of the essay. The words are separated by a single space. It is guaranteed that the total length of the words won't exceed 10^5 characters.

The next line contains a single integer n $(0 \le n \le 10^5)$ — the number of pairs of words in synonym dictionary. The i-th of the next n lines contains two space-separated non-empty words x_i and y_i. They mean that word x_i can be replaced with word y_i (but not vise versa). It is guaranteed that the total length of all pairs of synonyms doesn't exceed $5 \cdot 10^5$ characters.

All the words at input can only consist of uppercase and lowercase letters of the English alphabet.

Output

Print two integers — the minimum number of letters «R» in an optimal essay and the minimum length of an optimal essay.

Sample test(s)

input

```
3
AbRb r Zz
4
xR abRb
aA xr
zz Z
xr y
```

output

```
2 6
```

input

```
2
RuruRu fedya
1
ruruRU fedor
```

output

```
1 10
```

E. Alex and Complicated Task

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

After you have read all the problems, probably, you think Alex is genius person. That's true! One day he came up with the following task.

Given a sequence of integer numbers $a_1, a_2, ..., a_n$. You are to find a longest sequence $b_1, b_2, ..., b_{4m}$, that satisfies the following conditions:

- $b_{4k+1} = b_{4k+3}$ for all valid integer k;
- $b_{4k+2} = b_{4k+4}$ for all valid integer k;
- sequence b is subsequence of a (not necessarily contiguous subsequence).

And finally... Alex had given this complicated task to George, and George gave it to you. Help George to cope with the task.

Input

The first line contains a single integer n $(1 \le n \le 5 \cdot 10^5)$. The next line contains n integers $a_1, a_2, ..., a_n$ $(1 \le a_i \le 10^9)$.

Output

In the first line print a single integer $4m$ — the maximal possible length of required sequence b. In the second line print $4m$ integers $b_1, b_2, ..., b_{4m}$, that is required sequence.

If there are multiple optimal answers you may print any of them.

Sample test(s)

input
4 3 5 3 5

output
4 3 5 3 5

input
10 35 1 2 1 2 35 100 200 100 200

output
8 1 2 1 2 100 200 100 200