



## Problem A. Sudoku

Time limit: 1 second

Memory limit: 256 megabytes

input: standard input

output: standard output

Sudoku(数独) is a logic-based combinatorial number-placement puzzle, which appeals to Patricky.

In classic Sudoku, the objective is to fill a  $9 \times 9$  grid with digits so that each column, each row, and each of the nine  $3 \times 3$  subgrids that compose the grid (also called “boxes”, “blocks”, or “regions”) contain all of the digits from 1 to 9. The puzzle setter provides a partially completed grid, which for a well-posed puzzle has a single solution.

Patricky didn't mean to make you solve sudoku for some given puzzles. He will show you some sudoku puzzles he completed recently. Your task is to determine whether Patricky won.

### Input

9 rows, each of them contains 9 numbers between 1 and 9, separated by spaces.

### Output

Print “YES” in one line if Patricky won, or “NO” to report he failed (**with no quotation marks**).

### Example

standard input	standard output
5 3 4 6 7 8 9 1 2 6 7 2 1 9 5 3 4 8 1 9 8 3 4 2 5 6 7 8 5 9 7 6 1 4 2 3 4 2 6 8 5 3 7 9 1 7 1 3 9 2 4 8 5 6 9 6 1 5 3 7 2 8 4 2 8 7 4 1 9 6 3 5 3 4 5 2 8 6 1 7 9	YES

### Note

5	3	4	6	7	8	9	1	2
6	7	2	1	9	5	3	4	8
1	9	8	3	4	2	5	6	7
8	5	9	7	6	1	4	2	3
4	2	6	8	5	3	7	9	1
7	1	3	9	2	4	8	5	6
9	6	1	5	3	7	2	8	4
2	8	7	4	1	9	6	3	5
3	4	5	2	8	6	1	7	9

Numbers 1 ~ 9 are in any one row / column / block.



## Problem B. Where is the Maximum

Time limit: 1 second

Memory limit: 256 megabytes

output: standard output

You will **NOT** be given an integer  $n$  along with a sequence  $a_1, a_2, \dots, a_n$  and you don't need to find where the maximum is. All you need to do is to print the longest word in this paragraph. You may wonder why this problem so simple and become extremely frustrated. Well, there is no reason but love. Good luck to you!

Another paragraph starts, but the problem doesn't change. Do you wonder why the statements are written in English instead of 中文? Is it just for international? – The answer is 100% **NO**. Actually it's beacuse that the standard ICPC problems are written in English. You just graduated from high school. I think this won't be hard for you. Oh, have you already found the answer? So easy, isn't it?

### Example

standard input	standard output
No input	●●●●●●●●●●●●●●●●



## Problem C. Print World to Hello

Time limit: 1 second  
Memory limit: 256 megabytes  
input: standard input  
output: standard output

When someone say “Hello” to you, you should reply him/her with “World”.

### Input

You are given many words(no more than 54 words and each of them is no more than 10 letters) consisting of uppercase(大写) and lowercase(小写) letters separated by spaces and **EOL**(end of line)s, until **EOF**(End of File).

### Output

If there are any “Hello”s(case sensitive) given, you should print “World” (**with no quotation marks**). Otherwise you should print “Hello” (**with no quotation marks**).

### Examples

standard input	standard output
Hello World the programmer typed	World
World	Hello
I have had my invitation to this worlds festival and thus my life has been blessed Early in the day it was whispered that we should sail in a boat only thou and I and never a soul in the world would know of this our pilgrimage to no country and to no end	Hello

### Note

EOF:

```
// main.c
while ( scanf("???" ) != EOF ) {
    // do something
}
```

我接过此间的请柬，得获世界之庇佑。  
破晓轻吟密语：“卿卿伴我泛舟游”万籁俱寂，无人晓二人漫漫长途。



## Problem D. Unique Element

Time limit: 1 second  
Memory limit: 256 megabytes  
input: standard input  
output: standard output

You are given an **odd** integer  $n$  along with a sequence  $a_1, a_2, \dots, a_n$ . There is unique element occurs only once. Your task is to find it.

### Input

The first line contains one odd integer  $n$  ( $1 \leq n < 10^5$ ).

The second line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $-1000 \leq a_i \leq 1000$ ), indicating the given sequence.

### Output

Print the unique element.

### Example

standard input	standard output
5 1 1 1 2 1	2



## Problem E. Amazing Pairs

Time limit: 1 second  
Memory limit: 256 megabytes  
input: standard input  
output: standard output

You are given two integers  $n, k$ , along with a sequence  $a_1, a_2, \dots, a_n$ .

A pair  $\langle i, j \rangle$  ( $i < j$ ) is considered as an **Amazing Pair** if  $a_i \oplus a_j = k$ . Your task is to calculate how many **Amazing Pairs** there are in  $\{a\}$ . Formally, calculate  $\sum_{i=1}^n \sum_{j>i}^n [a_i \oplus a_j = k]$  where the sign  $[a = b] = 1$  if  $a = b$ , otherwise it's 0.

Here the operation  $\oplus$  means **Exclusive Or**(异或). It is a logical operation that is true **if and only if** its arguments differ (one is true, the other is false).

It's a bitwise(按位的,不同位之间不相干的) operation. For example,  $9 \oplus 13$ :  $1001_{(2)} \oplus 1101_{(2)} = 0100_{(2)} = 4_{(10)}$ .

### Input

The first line contains two integers  $n, k$  ( $1 \leq n \leq 10^5, 0 \leq k \leq 10^5$ ).

The second line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $1 \leq a_i \leq 10^5$ ), indicating the given sequence. It is also guaranteed that  $\max\{a_i \oplus a_j\} \leq 10^5$ .

### Output

Print an integer — the number of Amazing Pairs.

Since your answer may be too large, you'd better use `long long` data type to carry it.

### Examples

standard input	standard output
2 3 1 2	1
6 1 5 1 2 3 4 1	2

### Note

In example 1, there are only 2 numbers meet  $1 \oplus 2 = 3$ .

In example 2, the 2 pairs are  $\langle i, j \rangle = \langle 1, 5 \rangle, \langle 3, 4 \rangle$ .

By the way, you may use the xor operator `^` in C/C++:

```
// main.c
#include <stdio.h>
int main() {
    printf("%d\n", 9 ^ 13); // 4

    long long ans = 1000000000 ^ 999999999LL;
    printf("ans = %lld\n", ans);

    return 0;
}
```



## Problem F. Constructive Problem

Time limit: 1 second

Memory limit: 256 megabytes

input: standard input

output: standard output

Patricky has been loving the **F5 coffees** lately, which are packaged like some keys, quite endearing:



Now Patricky has collected  $n$  each of  $n$  flavors of coffee, he wants to arrange them into a  $n \times n$  matrix so that **NO** two same flavors are next to each other. To make this matrix more interesting, initially there is one coffee placed in the first column of each row.

### Input

The first line contains an integer  $n$  ( $1 \leq n \leq 10^3$ ).

The second line contains  $n$  integers  $f_1, f_2, \dots, f_n$  ( $1 \leq f_i \leq n$ ), indicating flavors put in the first column. No two coffees given with same flavor share an edge.

### Output

Output a matrix with  $n \times n$  elements, indicating the way you put coffee.

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

### Example

standard input	standard output
3	1 2 1
1 2 3	2 3 2
	3 1 3



## Problem G. Made in Heaven

Time limit: 1 second  
Memory limit: 256 megabytes  
input: standard input  
output: standard output

A **Stand** is a physical manifestation of a person's "life energy". It is a power unique to the *JoJo's Bizarre Adventure* series. The Stand is created from someone's psyche, which includes not only humans but also other living creatures. That individual is referred to as the Stand User. The User then gives their Stand a name and uses it for various purposes.

**Made in Heaven** is a Stand belonging to Enrico Pucci. It was considered by *DIO* to be the ultimate Stand and the key to achieving "heaven". Made in Heaven is an extremely powerful close-range time controlling Stand. Although its physical abilities may not be remarkable, its control over time grants it an overwhelming speed advantage.

Made in Heaven is just one of many Stands in *JoJo's Bizarre Adventure*. Each of them has a 6-equal parted graph Stat(数据) to show its 6 abilities: Destructive Power, Speed, Range, Stamina(持久), Precision and Development Potential. Patricky thinks the area of Stand Stats is the power of Stand and he's going to calculate it.

### Input

The input contains 6 letters consisting of only X, A, B, C, D, E, O, representing the level of Stand given by clockwise direction starting with Destructive Power. The letter 'O' means number 0 and 'X' is for  $\infty$ . The width between adjacent(相邻) two levels is a unit length.

### Output

Print a real number — the area.

Your answer will be considered correct if its absolute or relative error does not exceed  $10^{-6}$ . Formally, let your answer be  $a$ , the jury's answer be  $b$ . Your answer will be considered correct if  $\frac{|a - b|}{\max(1, |b|)} \leq 10^{-6}$ .

### Examples

standard input	standard output
BXCACA	46.332359
EEEEEE	2.59808
AACABB	48.06441
AACAAA	56.29165

### Note

The shape of **EEEEEE** is a regular hexagon, with area  $\frac{3\sqrt{3}}{2} \doteq 2.598076211$ .

The Stand with Stats **AACABB** is *DIO's The World*!

The Stand with Stats **AACAAA** is *Star Platinum*.

