A. Timon and Pumbaa

time limit per test: 1 second
memory limit per test: 256 megabytes

Timon has a candies and his friend, Pumbaa, has b candies, so Pumbaa asked Timon to tell him the value of $a - b$. However, Timon will tell him the value of $a - b$ if the value is ≥ 0; otherwise, he will lie and say 0. Since it was a hard task for Timon, he's asking for your help.

Given two numbers a and b, find the answer.

Input

Only one line containing two numbers a, b ($1 \leq a, b \leq 10^9$).

Output

Print the answer as specified in the statement.

Examples

input	Copy
9 1	
output	Copy
8	

input	Copy
1 9	
output	Copy
0	

B. Drawing 'X'

time limit per test: 1 second
memory limit per test: 256 megabytes

Some day, an artist wanted to draw an **X** mark on the wall in a fashionable way.

He wanted to do so by grouping snippets of slashes */*, backslashes \, asterisks * and a capital **X** letter in an $N \times N$ square as shown in the sample. Can you help him?

Input

Only one line containing one odd number N ($3 \leq N \leq 49$).

Output

Print the fashionable drawing.

Example

input Copy

```
5
```

output Copy

```
\***/
*\*/*
**X**
*/*\*
/***\
```

C. Finding Minimums

time limit per test: 1 second

memory limit per test: 256 megabytes

You are given N numbers, and you should divide them into consecutive groups of size K, then print the minimum among each group. If the last group is of size $< K$, print the minimum number found just after the last number received.

For more explanation, see the **notes**.

Input

First line contains two numbers N, K ($1 \le K \le N \le 10^5$) – the number of values, and the range length after which you should print the minimum.

Second line contains N numbers ($-10^9 \le x \le 10^9$).

Output

Print the answer in a single line.

Examples

input Copy

```
8 3
4 -1 2 3 5 0 2 7
```

output Copy

```
-1 0 2
```

input Copy

```
8 4
4 -1 2 3 5 0 2 7
```

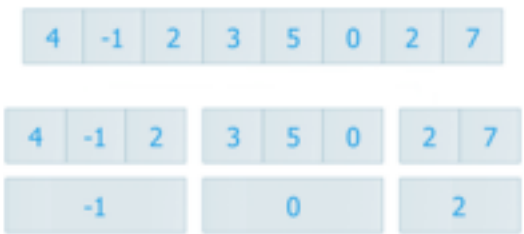
output Copy

```
-1 0
```

Note

In the **first** test case:

1. The minimum number among $[4, -1, 2]$ is -1.
2. The minimum number among $[3, 5, 0]$ is 0.
3. The minimum number among $[2, 7]$ is 2.



In the **second** test case:

1. The minimum number among $[4, -1, 2, 3]$ is -1.
2. The minimum number among $[5, 0, 2, 7]$ is 0.

D. Range Sum

time limit per test: 1 second

memory limit per test: 256 megabytes

You are given a range represented by two integers L and R, and you should find the sum of the numbers in the range between L and R inclusive.

Input

First line contains a number T ($1 \leq T \leq 10^5$) – the number of test cases.

Each of the next T lines contains two numbers L, R ($1 \leq L, R \leq 10^9$).

Output

For each test case, print the sum.

Example

input Copy

```
4
3 6
2 11
4 16
7 17
```

output Copy

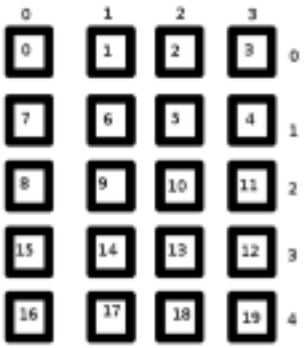
```
18
65
130
132
```

E. Hady Rides the Train

time limit per test: 0.5 seconds

memory limit per test: 256 megabytes

Hady wants to ride a train. He knows his seat number, but he doesn't know the corresponding row or column number of his seat. However, he knows that each row consists of exactly **4** seats. The train seats are numbered from zero as shown in the figure:



Given the seat number, can you find the corresponding row and column numbers of the seat?

Input

Only one line containing id ($0 \leq id \leq 10^{18}$) – the seat number.

Output

The row and column numbers of the seat.

Examples

input	Copy
5	

output	Copy
1 2	

input	Copy
2	

output	Copy
0 2	

input	Copy
0	

output	Copy
0 0	

input	Copy
13	

output	Copy
3 1	

F. Break Number

time limit per test: 1 second
memory limit per test: 256 megabytes

Let's define $f(x)$ as the number of times at which the integer x can be divided by 2.

You are given N numbers, and you should print the maximum $f(x)$ among all these numbers.

Input

The first line contains one number N ($1 \leq N \leq 10^5$).

The second line contains N space-separated numbers where each number is between 1 and 10^{18} (inclusive).

Output

Print the maximum $f(x)$ among all numbers.

Examples

input	Copy
3 18 24 7	
output	Copy
3	

input	Copy
4 14 7 9 5	
output	Copy
1	

Note

In the first test case:

1. $f(18)$ is equal to 1; because we can divide 18 by 2 resulting in 9, but we cannot divide 9 by 2 (9 is not divisible by 2).
2. $f(24)$ is equal to 3; because we can divide 24 by 2 resulting in 12; again we can divide 12 by 2 (12 is divisible by 2) resulting in 6; again we can divide 6 by 2 (6 is divisible by 2) resulting in 3, but we cannot divide 3 by 2 (3 is not divisible by 2); so we could divide 24 three times.
3. $f(7)$ is equal to 0; because we cannot divide 7 by 2.

G. Construct the Sum

time limit per test: 1 second
memory limit per test: 256 megabytes

You are given two integers n and s, and you have to find distinct positive integers, such that each of them is $\leq n$, and their summation $= s$. Otherwise, state that this is impossible.

Input

The first line contains a number T $(1 \leq T \leq 100)$ – number of test cases.

Each of the next T lines contains two space-separated integers n, s $(1 \leq n \leq 10^5, 1 \leq s \leq 10^{18})$.

Output

For each test case, if there is no possible answer, print -1 on a single line. Otherwise, print the set of numbers that satisfy the above condition on a single line. You can print the numbers in any order. If there are multiple answers, you can print any of them.

Example

input Copy

```
4
5 3
7 10
6 4
2 10
```

output Copy

```
2 1
4 3 2 1
3 1
-1
```

H. Simple Mod

time limit per test: 1 second
memory limit per test: 256 megabytes

Hady has a positive number N and a simple equation:

$$(X^2 + Y^2) \bmod N = 0$$

Your task is to find any values for X, Y that satisfy the equation, such that X and Y are non-negative integers.

Input

Only one integer N ($1 \leq N \leq 10^{100}$).

Output

If you can find any two non-negative integers such that $(X, Y \leq 10^9)$, print them. Otherwise, print "No solutions".

Examples

input	Copy
5	
output	Copy
4 3	

input	Copy
100000100	
output	Copy
10 10000	

input	Copy
50	
output	Copy
5 5	