Problem A. Streamer Takahashi

Time Limit 2000 ms

Problem Statement

Streamer Takahashi has decided to stream from L o'clock to R o'clock (using the 24-hour clock).

He has N listeners, and the i-th listener can watch the stream from X_i o'clock to Y_i o'clock.

How many listeners can watch Takahashi's stream from beginning to end?

Constraints

- $1 \leq N \leq 100$
- $0 \leq L < R \leq 23$
- $0 \leq X_i < Y_i \leq 23$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$
\begin{array}{l}
N\ \ L\ \ R \\
X_1\ \ Y_1 \\
X_2\ \ Y_2 \\
\vdots \\
X_N\ \ Y_N
\end{array}
$$

Output

Output the number of listeners who can watch Takahashi's stream from beginning to end.

Sample 1

Input	Output
5 19 22 17 23 20 23 19 22 0 23 12 20	3

The listeners who can watch Takahashi's stream from beginning to end are the 1st, 3rd, and 4th listeners.

Sample 2

Input	Output
3 12 13 0 1 0 1 0 1	0

No listeners can watch Takahashi's stream from beginning to end.

Sample 3

Input	Output
10 8 14 5 20 14 21 9 21 5 23 8 10 0 14 3 8 2 6 0 16 5 20	5

Problem B. String Too Long

Time Limit 2000 ms

Problem Statement

> Restore run-length encoding. If the result is too long, output `Too Long`.

You are given N pairs of characters and integers $(c_1, l_1), (c_2, l_2), \ldots, (c_N, l_N)$.

Let S be the string formed by concatenating l_1 characters c_1, l_2 characters c_2, ..., and l_N characters c_N in this order.

Output S. However, if the length of S exceeds 100, output `Too Long` instead.

Constraints

- $1 \leq N \leq 100$
- $1 \leq l_i \leq 10^{18}$
- N and l_i are integers.
- Each c_i is a lowercase English letter.
- $c_i \neq c_{i+1}$

Input

The input is given from Standard Input in the following format:

$$
\begin{aligned}
&N \\
&c_1 \ \ l_1 \\
&c_2 \ \ l_2 \\
&\vdots \\
&c_N \ \ l_N
\end{aligned}
$$

Output

If the length of S is at most 100, output S; otherwise, output `Too Long`.

Sample 1

Input	Output
8 m 1 i 1 s 2 i 1 s 2 i 1 p 2 i 1	mississippi

S is `mississippi`. Since the length of S is not greater than 100, output S.

Sample 2

Input	Output
7 a 1000000000000000000 t 1000000000000000000 c 1000000000000000000 o 1000000000000000000 d 1000000000000000000 e 1000000000000000000 r 1000000000000000000	Too Long

The length of S is 7×10^{18}, so output `Too Long`.

Sample 3

Input	Output
1 a 100	aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa aaaaaaaaaaaaaaaaa

Sample 4

Input	Output
6 g 4 j 1 m 4 e 4 d 3 i 4	ggggjmmmmeeeedddiiii

Problem C. Palindromic in Both Bases

Time Limit 3000 ms

Problem Statement

The decimal representation of 414 is `414`, which is a palindrome. Also, the octal representation of 414 is `636`, which is also a palindrome. Based on this, solve the following problem.

You are given positive integers A and N. Find the sum of all integers between 1 and N, inclusive, whose decimal representation and base-A representation are both palindromes.

Under the constraints of this problem, it can be proved that the answer is less than 2^{63}.

Constraints

- $2 \leq A \leq 9$
- $1 \leq N \leq 10^{12}$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
A
N
```

Output

Output the answer in one line.

Sample 1

Input	Output
8 1000	2155

The integers satisfying the condition are $1, 2, 3, 4, 5, 6, 7, 9, 121, 292, 333, 373, 414, 585$ (14 integers), and their sum is 2155.

Sample 2

Input	Output
8 999999999999	914703021014

Sample 3

Input	Output
6 999999999999	283958331810

Problem D. Transmission Mission

Time Limit 2000 ms

Problem Statement

There are N houses numbered from 1 to N on a number line. House i is located at coordinate X_i. Multiple houses may be located at the same coordinate.

You place M base stations at arbitrary real coordinates on the number line. Then, you set a non-negative integer **signal strength** for each base station.

When the signal strength of a base station is set to x, The signal from that base station reaches a house if and only if the distance between the base station and the house is at most $\frac{x}{2}$. Particularly, when $x = 0$, the signal reaches only houses located at the same coordinate as the base station.

Find the minimum possible sum of signal strengths when the positions and signal strengths of the base stations are set such that at least one base station's signal reaches every house.

It can be proved that the answer is an integer for any input satisfying the constraints.

Constraints

- $1 \leq M \leq N \leq 5 \times 10^5$
- $1 \leq X_i \leq 10^{12}$ $(1 \leq i \leq N)$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
N M
X_1 ... X_N
```

Output

Output the answer as an integer in one line.

Sample 1

Input	Output
7 3 5 10 15 20 8 14 15	6

By placing three base stations as follows, signals reach all houses.

- Place a base station with signal strength 5 at coordinate 7.5. This base station reaches houses $1, 2, 5$.
- Place a base station with signal strength 1 at coordinate 14.5. This base station reaches houses $3, 6, 7$.
- Place a base station with signal strength 0 at coordinate 20. This base station reaches house 4.

The sum of signal strengths in this case is 6.

It is impossible to satisfy the condition with an arrangement where the sum of signal strengths is smaller than 6, so output 6.

Sample 2

Input	Output
7 7 5 10 15 20 8 14 15	0

Sample 3

Input	Output
7 1 5 10 15 20 8 14 15	15