

AtCoder Beginner Contest 106

Problema C: *To Infinity*

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AtCoder Beginner Contest 106 – Problem C: To Infinity

Problema

Mr. Infinity has a string S consisting of digits from 1 to 9. Each time the date changes, this string changes as follows:

- Each occurrence of '2' in S is replaced with '22'. Similarly, each '3' becomes '333', '4' becomes '4444', '5' becomes '55555', '6' becomes '666666', '7' becomes '7777777', '8' becomes '88888888' and '9' becomes '999999999'. '1' remains as '1'.

For example, if S is '1324', it becomes '1333224444' the next day, and it becomes '13333333332222444444444444444444' the day after next. You are interested in what the string looks like after 5×10^{15} days. What is the K -th character from the left in the string after 5×10^{15} days?

Constraints

- S is a string of length between 1 and 100 (inclusive).
- K is an integer between 1 and 10^{18} (inclusive).
- The length of the string after 5×10^{15} days is at least K .

Input

Input is given from Standard Input in the following format:

$$S$$
$$K$$

Output

Print the K -th character from the left in Mr. Infinity's string after 5×10^{15} days.

Exemplo de entradas e saídas

Exemplo de Entrada

1214

4

3

157

299792458

9460730472580800

Exemplo de Saída

2

3

2

- O primeiro fato a ser observado é, se o número inicial x da string for diferente de 1, ele será replicado $x^{5 \times 10^{15}}$ vezes, de modo que a resposta será o próprio x
- O caso especial ocorre quando a string é prefixada por uma sequência de 1s
- Se a quantidade de uns for maior ou igual a K , a resposta será igual a 1
- Caso contrário, a resposta será igual ao primeiro caractere da string diferente de 1

```
1 #include <iostream>
2
3 using namespace std;
4 using ll = long long;
5
6 char solve(const string& S, ll K)
7 {
8     for (const auto& c : S)
9     {
10         if (c != '1')
11             return c;
12
13         if (not (--K))
14             break;
15     }
16
17     return '1';
18 }
19
```

```
20 int main()
21 {
22     ios::sync_with_stdio(false);
23
24     string S;
25     ll K;
26
27     cin >> S >> K;
28
29     cout << solve(S, K) << '\n';
30
31     return 0;
32 }
```