Easy Generating Function

Description

Here's a cool generating function $f(n) = g(1, 2, \ldots, n)$, where g is a join function that simply concatenate all its arguments into a single string. For example, $f(14) = g(1, 2, \ldots, 14) =$ `1234567891011121314`.

What? You say the function f is not cool? No problem, we are considering a much cooler generating function $X(n)$ which is related to $f(n)$. The steps of X are as following:

1. Pick up a positive number n and write down $f(n)$ where the length of $f(n)$ should be even.
2. Convert the digit string to consecutive pairs P_k, where $P_k = (f(n)_{2k}, f(n)_{2k+1})$.
3. Consider for each pair $P_k = (a, b)$, write down b on the paper in a times.
4. Magic! The string on the paper is the output of $X(n)$.

For example, $X(2) =$ `2`, $X(4) =$ `2444`, $X(8) =$ `2444666668888888`.

Now Eddy picks two integers n, m. Can you tell him what the m-th digit in $X(n)$ is?

Input

The first line contains a integer T indicating the total number of test cases. Each test case contains two integers n, m in one line. It's guaranteed that the length of $f(n)$ is even.

- $1 \leq T \leq 100000$
- $1 \leq n \leq 100000$
- $1 \leq m \leq 1200000$

Output

For each test case, print the m-th digit in $X(n)$ in one line. If the m-th digit is not exist, please output `-1`.

Sample Input

```
6
2 1
2 2
4 2
100 1
100 8
100 11
```

Sample Output

```
2
-1
4
2
6
8
```