Save Me Please, Doctor! (Points: 100)

Mr. Bean drinks from a water bottle that he carried for a long time without refilling, and the stale water has resulted in him suffering from mild dysentery. He goes to a nearby nursing home and gets diagnosed with *Amoebiasis.* The doctor identifies the pathogen to be a particular kind of amoeba that has two variants, namely *Asperdabrum* (a) and *Bostonostrum* (b). Each amoeba reproduces every hour by splitting into two, $a \rightarrow ab$, and $b \rightarrow ba$, and they stick together in a chain in that particular sequence. At every step of reproduction, all the present amoeba undergo binary fission. For e.g. starting with type a, after 1st step the chain is ab, after 2nd step the chain is $abba$, after the 3rd step the chain is $abbabaab$ and so on. Mr. Bean was infected n hours ago by a single amoeba and the doctor needs to know the type of the kth amoeba in the chain present now to be able to find a cure. Help the doctor cure him.

Input Format:

First line contains the number of test cases **T**. For each test case, there will be a single line of input that starts with a character denoting the type of amoeba, ξ, that infected him initially (a or b) followed by two integers, n - the number of hours that have passed since he was infected, and k - the position at which the doctor needs to know the type of amoeba.

Limits: $1 \le \mathbf{T} \le 1000000$, $1 \le \mathbf{N} \le 4100$, $1 \le \mathbf{K} \le 2^N$.

Moreover, for the first test file you can assume **N**, **K** lie within integer range (32 bits).

Output Format:

For each test case, output on a separate line the type of the kth amoeba in the current chain.

Sample Input:

```
2
a 3 3
b 4 6
```

Sample Output:

```
b
b
```

Instructions

- Your program should not print anything other than what is specified in the output format. A program with extraneous output (even a single space) will be treated as incorrect!

- While submitting your code, please select the language carefully *gcc/g++.* Using the wrong language will lead to compiler error.

- The only input/output functions allowed are `printf, scanf, cin, cout`. Perform all read/write operations through stdin/stdout. The solutions will be checked using command line redirection only.

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