

CCSC:MW Programming Competition

Integer Bounces

Assume that we can make a ball that bounces to a height of h/d when dropped from a height of h inches. Write a program to determine how many consecutive times a ball with a given d would bounce to an integer height after being dropped from a given initial integer height h .

For example, a ball with $d = 2$ dropped from $h = 12$ would bounce to a height of 6 after the first bounce and a height of 3 after the second bounce, and both of those heights are integers. However, the third bounce would bounce to a height of 1.5, which is no longer an integer, so it can bounce to an integer height 2 times.

Input

The first line of the input contains the number of test cases n . The next n lines contain the integers d and h separated by a space.

$$1 \leq n \leq 100, 2 \leq d \leq 10, \text{ and } 1 \leq h \leq 10^6$$

Output

For each test case, print the number of times the ball will bounce to an integer height on its own line.

Example

Input:

```
4
2 12
3 27
5 1875
6 5
```

Output:

```
2
3
4
0
```