David's Room Number

Filename: `room`

David, along with a couple of colleagues, has recently travelled outside the country to participate in a programming contest! When he arrived at the hotel, he asked the hotel receptionist for a specific room number. The problem is the receptionist didn't care and gave him a random room. David was outraged, and immediately went online to write a bad Yelp review!

You, a trusted friend of David, noticed his outrage, and asked him what was wrong. After David explained the situation, you looked back at the numbers, and realized that by changing the base of the room number, he could change what value it represented in base 10. So, in an attempt to calm David down, you decided to figure out what base you needed to represent the room number such that it equaled the room number he desired in base 10.

The Problem:

Find a number base *b* such that David's room number in base *b* represents the desired room number.

The Input:

The first line contains a single, positive integer, *t*, representing the number of hotel visits David makes. Each of the next *t* lines will contain two integers, *g* ($10 \leq g \leq 10^6$) and *d* ($10 \leq d \leq 10^{18}$), representing the room number David was given and the room number he desired, respectively.

The Output:

For each hotel visit, output "`Hotel Visit #`*i*`: Base `*b*" each on a separate line, where *i* represents the hotel visit in the input (starting with 1), and *b* represents the base for which David's given room number is equal to his desired room number. A solution is always guaranteed to exist, and *b* is guaranteed to be at least 10.

Sample Input:

```
2
15 18
45 89
```

Sample Output:

```
Hotel Visit #1: Base 13
Hotel Visit #2: Base 21
```