Problem C: Power Eggs

Benedict bought *K* identical power eggs from Dropeggs.com, and now he wants to test them by dropping them from different floors of his building. His building has *N* floors numbered 1 to *N*. *F* is an unknown number in the range from 0 to *N*, inclusive. Each egg will break if dropped from floor *F+1* or above, but will not break if dropped from floor *F* or below. Benedict can drop each egg as many times as he wants from any floor until it breaks. He wants to know the minimum number of egg drops necessary to ensure that he can determine *F*.

For example, if there are three floors and Benedict has only one egg, then he has to first throw the egg from the first floor, then from the second floor (if the egg survived), and then from the third floor (if the egg survived). Therefore, three drops are required in the worst case.

Input Specification

The first line contains one number *T* (1 ≤ *T* ≤ 10000) which is the number of test cases, followed by *T* lines. Each of the next *T* lines contains two numbers: *N*, the number of floors (1 ≤ *N* ≤ 2000000007) and *K*, the number of eggs (1 ≤ *K* ≤ 32).

Output Specification

For each of the *T* lines, print the minimal number of drops required, or if it's greater than 32, print the word `Impossible`. After that many drops, Benedict gets too tired and cannot continue.

Sample Input

```
4
10 1
100 2
30 30
2000000000 2
```

Output for Sample Input

```
10
14
```

5
Impossible

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