

Palindromic Sequence

Problem

Hannah is working on a new language which consists only of first L lowercase letters of the English alphabet. She is obsessed with palindromes, which are words that read the same forward and backward, e.g. `hannah` and `civic`. She has written down all of the words in her language of length at most N , that are also palindromes.

Now, she is interested in finding the length of the word that is lexicographically K^{th} smallest among all the words she has written. A word composed of ordered letters a_1, a_2, \dots, a_p is lexicographically smaller than word b_1, b_2, \dots, b_q if $a_i < b_i$, where i is the first index where characters differ in the two words. Also, a prefix of a word is considered lexicographically smaller than the word itself. For example, the following words are arranged in lexicographically increasing order: `a`, `aa`, `aba`, `cabac`, `d`.

Input

The first line of the input gives the number of test cases, T . T test cases follow. Each test case consists of one line containing three integers L , N , and K , as described above.

Output

For each test case, output one line containing `Case #x: y`, where x is the test case number (starting from 1) and y is the length of the lexicographically K^{th} smallest palindromic word among all palindromic words of length at most N in Hannah's language. If no such word exists, output 0.

Limits

$$1 \leq T \leq 100.$$

Time limit: 20 seconds per test set.

Memory limit: 1 GB.

$$1 \leq L \leq 26.$$

$$1 \leq K \leq 10^{12}.$$

Small dataset (Test set 1 - Visible)

$$1 \leq N \leq 100.$$

Large dataset (Test set 2 - Hidden)

$$1 \leq N \leq 10^{12}.$$

Sample

Sample Input

Sample Output

```
2
2 3 4
2 3 9
```

```
Case #1: 3
Case #2: 0
```

In Sample Cases #1 and #2, Hannah's language consists only of the letters `a` and `b`. All the palindromic words of length at most 3 in her language, in lexicographic order, are: `a`, `aa`, `aaa`, `aba`, `b`, `bab`, `bb` and `bbb`.

In Sample Case #1, the fourth-smallest word is `aba`, which is 3 characters long, so we output 3.

In Sample Case #2, **K** exceeds the total number of possible words, and hence we output 0.