# **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.

### 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

 $1 \le T \le 100$ . Time limit: 20 seconds per test set. Memory limit: 1 GB.  $1 \le L \le 26$ .  $1 \le K \le 10^{12}$ .

Small dataset (Test set 1 - Visible)

 $1 \le N \le 100$ .

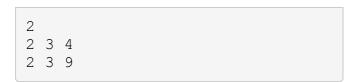
Large dataset (Test set 2 - Hidden)

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

## Sample

Sample Input

Sample Output



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.