**Coding Competitions Farewell Rounds - Round A**

# ASCII Art

## Problem

Cody-Jamal has heard about generative artificial intelligence producing art. He is excited about the new art opportunities, but also worried about human-created art being displaced. He thought a good compromise would be to use computers to create art that humans simply cannot.

Since Cody-Jamal is just beginning at computer-generated art, he started simple. He wants to create an immense string that shows the English alphabet in a doubly-repeated way, to represent its ubiquity and permanence.

Cody-Jamal wrote the following program:

```
for i = 1 to 1e100:
  for letter = A to Z:
    print letter i times
```

Here `1e100` represents the integer $10^{100}$. For example:

- When $i = 1$, the program prints `ABCD....XYZ`.
- When $i = 2$, the program prints `AABBCC...XXYYZZ`.
- When $i = 3$, the program prints `AAABBBCCC...XXXYYYZZZ`.

Of course, Cody-Jamal's program takes a long time to finish. Can you help him know what the $\mathbf{N}$-th printed letter will be without waiting for it to be printed?

## Input

The first line of the input gives the number of test cases, $\mathbf{T}$. $\mathbf{T}$ test cases follow.
Each test case consists of a single line with an integer $\mathbf{N}$.

## 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 $\mathbf{N}$-th character printed by Cody-Jamal's program.

## Limits

Time limit: 20 seconds.
Memory limit: 2 GB.
$1 \leq \mathbf{T} \leq 100$.

### Test Set 1 (Visible Verdict)

$1 \leq \mathbf{N} \leq 10^6$.

### Test Set 2 (Visible Verdict)

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

## Sample

| Sample Input | Sample Output |
| --- | --- |
| 2<br>5<br>31 | Case #1: E<br>Case #2: C |

The first $35$ letters printed by Cody-Jamal's program are `ABCDEFGHIJKLMNOPQRSTUVWXYZAABBCCDDE...`. Therefore, the $5$th printed character is `E` and the $31$st is `C`.