Questions asked 3

Submissions

Diwali lightings

5pt	Not attempted **1615/2160 users** correct (75%)
8pt	Not attempted **1262/1580 users** correct (80%)

Beautiful Numbers

6pt	Not attempted **1429/1592 users** correct (90%)
15pt	Not attempted **211/1189 users** correct (18%)

Partioning Number

9pt	Not attempted **646/851 users** correct (76%)
17pt	Not attempted **193/470 users** correct (41%)

Sorting Array

13pt	Not attempted **5/65 users** correct (8%)
27pt	Not attempted **2/2 users** correct (100%)

Top Scores

AngryBacon	100
LittleBuger	100
wcwswsws	78
legedexinshi	73
TheTerminalGuy	71
Shaon	71
ajs97	65
thonsi	65
john0312	65
rossSJTU	65

Problem B. Beautiful Numbers

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 6 points	Solve B-small
Large input 15 points	Solve B-large

Problem

We consider a number to be *beautiful* if it consists only of the digit 1 repeated one or more times. Not all numbers are beautiful, but we can make any base 10 positive integer beautiful by writing it in another base.

Given an integer **N**, can you find a base B (with $B > 1$) to write it in such that all of its digits become 1? If there are multiple bases that satisfy this property, choose the one that maximizes the number of 1 digits.

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 with an integer **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 base described in the problem statement.

Limits

$1 \leq \mathbf{T} \leq 100$.

Small dataset

$3 \leq \mathbf{N} \leq 1000$.

Large dataset

$3 \leq \mathbf{N} \leq 10^{18}$.

Sample

Input	Output
2 3 13	Case #1: 2 Case #2: 3

In case #1, the optimal solution is to write 3 as 11 in base 2.

In case #2, the optimal solution is to write 13 as 111 in base 3. Note that we could also write 13 as 11 in base 12, but neither of those representations has as many 1s.