

Kickstart Practice Round 2
2017[A. Diwali lightings](#)[B. Safe Squares](#)**[C. Beautiful Numbers](#)**[D. Watson and Intervals](#)[Questions asked](#)

Submissions

Diwali lightings

5pt	Not attempted 89/141 users correct (63%)
8pt	Not attempted 62/87 users correct (71%)

Safe Squares

6pt	Not attempted 55/58 users correct (95%)
13pt	Not attempted 25/53 users correct (47%)

Beautiful Numbers

6pt	Not attempted 51/63 users correct (81%)
15pt	Not attempted 14/39 users correct (36%)

Watson and Intervals

8pt	Not attempted 12/15 users correct (80%)
17pt	Not attempted 7/10 users correct (70%)

Top Scores

Benq	78
1717374	78
yubowenok	78
gridnevvvit	78
LiCode	65
Yash....	53
YourRatzon	53
brncos.billy	53
cmroz	53
sam1373	50

Problem C. 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 C-small

Large input
15 points

Solve C-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 $1 \leq T \leq 100$.**Small dataset** $3 \leq N \leq 1000$.**Large dataset** $3 \leq N \leq 10^{18}$.**Sample**

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

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.

