

Round 1A 2008

[A. Minimum Scalar Product](#)[B. Milkshakes](#)**C. Numbers**[Contest Analysis](#)[Questions asked](#) **3**

Submissions

Minimum Scalar Product

5pt Not attempted
2352/2567 users
correct (92%)10pt Not attempted
1048/2336 users
correct (45%)

Milkshakes

10pt Not attempted
655/1042 users
correct (63%)25pt Not attempted
312/432 users
correct (72%)

Numbers

15pt Not attempted
577/1925 users
correct (30%)35pt Not attempted
96/364 users
correct (26%)

Top Scores

Bohua	100
yuhch123	100
neal.wu	100
newman	100
Plagapong	100
Ahyangyi	100
Reid	100
Qingchun	100
ploh	100
kubus	100

Problem C. 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
15 points

Solve C-small

Large input
35 points

Solve C-large

Problem

In this problem, you have to find the last three digits before the decimal point for the number $(3 + \sqrt{5})^n$.

For example, when $n = 5$, $(3 + \sqrt{5})^5 = 3935.73982\dots$ The answer is 935.

For $n = 2$, $(3 + \sqrt{5})^2 = 27.4164079\dots$ The answer is 027.

Input

The first line of input gives the number of cases, T . T test cases follow, each on a separate line. Each test case contains one positive integer n .

Output

For each input case, you should output:

Case #X: Y

where X is the number of the test case and Y is the last three integer digits of the number $(3 + \sqrt{5})^n$. In case that number has fewer than three integer digits, add leading zeros so that your output contains exactly three digits.

Limits

 $1 \leq T \leq 100$

Small dataset

 $2 \leq n \leq 30$

Large dataset

 $2 \leq n \leq 2000000000$

Sample

Input	Output
2	Case #1: 935
5	Case #2: 027
2	

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