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

For $n = 2$, $(3 + \sqrt{5})^2 = 27.4164079...$ 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 <= **T** <= 100

Small dataset

2 <= **n** <= 30

Large dataset

2 <= **n** <= 2000000000

Sample

Input	Output

```
2        Case #1: 935
5        Case #2: 027
2
```