# Batting Average

Lea recently visited a baseball match. There she got interested in baseball statistics and wanted to use them to evaluate the players. Some statistics that are used there are the number of *bats* (the number of times a player has been at the bats as a batter against the pitcher) and the number of *hits* (the number of times a player has hit a ball while being at the bats).

Additionally, the *batting average* of a player is given, which is defined by the number of hits divided by the number of bats. The batting average is always given as a decimal with a fixed number of digits after the decimal point. If the decimal number for the batting average has more digits, it is rounded to the last digit with the usual tie-breaker of rounding half up. If it has less digits, the remaining digits are filled with trailing zeros. For example, with three digits after the decimal point, a player with 7 hits and $25$ bats has a batting average of $0.280$, while a player with $10$ hits and $24$ bats has a batting average of $0.417$ (the exact decimal is $0.41\overline{6}$).

Now, in one statistic, Lea notices that the number of hits and number of bats is missing, and only the batting average is given. However, Lea also wants to take the number of bats into account, as a higher number of bats gives a higher confidence in the batting average. For example, a player might have a perfect batting average of $1.0$ by having a single hit in a single bat, but a player with a batting average of $0.9$ needs to have at least 6 hits in at least 7 bats, as every smaller number of bats leads to a different batting average, for any number of hits.

Lea wants to compute the minimum number of bats any player needs to achieve a certain batting average with a given precision. However, this is not as easy as it seems. Can you help Lea compute this number?

## Input

The first line of the input contains an integer $t$. $t$ test cases follow.

Each test case consists of a single decimal number $a$, describing the batting average. Batting averages are always given with a number of digits after the decimal point equal to the precision, even if they have trailing zeros.

## Output

For each test case, output one line containing "Case #$i$: $x$" where $i$ is its number, starting at 1, and $x$ is the minimum number of bats required to have the given batting average with the given precision. Each line of the output should end with a line break.

You can assume that the minimum number of bats is at least $1$, as a batter would not have a well-defined batting average otherwise.

## Constraints

- $1 \leq t \leq 1000$
- $0.0 \leq a \leq 1.0$
- $a$ always has a $0$ or a $1$ before the decimal point.
- $a$ has at least $1$ and at most $9$ digits after the decimal point.

**Sample Input 1**

```
12
0.2
0.5
0.9
0.12
0.90
0.200
0.283
0.300
0.316
0.7183
0.141593
0.618033989
```

**Sample Output 1**

```
Case #1: 5
Case #2: 2
Case #3: 7
Case #4: 17
Case #5: 10
Case #6: 5
Case #7: 46
Case #8: 10
Case #9: 19
Case #10: 71
Case #11: 113
Case #12: 46368
```

**Sample Input 2**

```
30
0.2840
0.5886
0.6692
0.8172
0.9653
0.07580
0.15513
0.18264
0.18756
0.21458
0.45975
0.47124
0.47715
0.52708
0.54999
0.57746
0.80738
0.95077
0.98626
0.095775
0.255835
0.288045
0.350711
0.544728
0.616231
0.632462
0.640373
0.852078
0.872801
0.970116
```

**Sample Output 2**

```
Case #1: 81
Case #2: 158
Case #3: 130
Case #4: 93
Case #5: 144
Case #6: 343
Case #7: 419
Case #8: 553
Case #9: 965
Case #10: 480
Case #11: 472
Case #12: 452
Case #13: 547
Case #14: 277
Case #15: 3351
Case #16: 71
Case #17: 244
Case #18: 325
Case #19: 364
Case #20: 355
Case #21: 1114
Case #22: 2819
Case #23: 211
Case #24: 626
Case #25: 727
Case #26: 2027
Case #27: 1179
Case #28: 818
Case #29: 739
Case #30: 1807
```