Submissions

Snapper Chain

10pt	Not attempted **9461/11212 users** correct (84%)
23pt	Not attempted **7957/9406 users** correct (85%)

Fair Warning

10pt	Not attempted **3312/4340 users** correct (76%)
23pt	Not attempted **2469/3001 users** correct (82%)

Theme Park

10pt	Not attempted **8033/8501 users** correct (94%)
23pt	Not attempted **3050/7644 users** correct (40%)

Top Scores

neal.wu	99
LayCurse	99
eireksten	99
agus.mw	99
lympanda	99
pmnox	99
levlam	99
ZhukovDmitry	99
kmod	99
stubbscroll	99

Problem B. Fair Warning

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 10 points	Solve B-small
Large input 23 points	Solve B-large

Problem

On our planet, Jamcode IX, three Great Events occurred. They happened 26000, 11000 and 6000 slarboseconds ago. In 4000 slarboseconds, the amount of time since all of those events will be multiples of 5000 slarboseconds, the largest possible amount... and the apocalypse will come.

Luckily for you, you live on Jamcode X! The apocalypse came on Jamcode IX less than a year ago. But Jamcode X has a worrying prophecy: "After the moment of reckoning, on the first *optimum anniversary* of the **N** Great Events, the apocalypse will come. 64 bits will not save you. You have been warned."

The people of Jamcode X are very concerned by this prophecy. All of the Great Events have already happened, and their times have been measured to the nearest slarbosecond; but nobody knows when their *optimum anniversary* will occur. After studying the diary of a scientist from Jamcode IX, scientists working on the problem have come up with a theory:

The *moment of reckoning* is now, the moment you solve this problem. At some time $y \geq 0$ slarboseconds from now, the number of slarboseconds since each of the Great Events will be divisible by some maximum number **T**. If you can find the smallest value of **y** that gives this largest possible **T**, that will give you the *optimum anniversary* when the apocalypse will come.

On Jamcode IX, for example, there were 3 Great Events and they happened 26000, 11000 and 6000 slarboseconds before the moment of reckoning. 4000 slarboseconds later, the amount of time since each event was a multiple of T=5000 slarboseconds, and the apocalypse came.

Your job is to compute the amount of time until the apocalypse comes. But remember the prophecy: even though the people of Jamcode X have been solving problems for two years, and 64-bit integers have always been enough, they might not always be enough now or in the future.

Input

The first line of the input gives the number of test cases, **C**. **C** lines follow. Each starts with a single integer **N**, which is followed by a space and then **N** space-separated integers t_i, the number of slarboseconds since Great Event **i** occurred.

Output

For each test case, output one line containing "Case #x: y", where x is the case number (starting from 1) and **y** is the minimum number of slarboseconds until $t_i + y$ is a multiple of the largest possible integer factor **T** for all **i**.

Limits

$1 \leq C \leq 100$.
$t_i \neq t_j$ for some **i**, **j**.

Small dataset

$2 \leq N \leq 3$.
$1 \leq t_i \leq 10^8$.

Large dataset

$2 \leq N \leq 1000$.
$1 \leq t_i \leq 10^{50}$.

Sample

```
Input

3
3 26000000 11000000 6000000
3 1 10 11
2 800000000000000000000001 900000000000000000000001
```

```
Output

Case #1: 4000000
Case #2: 0
Case #3: 9999999999999999999
```

Epilogue

Fortunately for the peoples of the Jamcode system, "the apocalypse" turned
out to be a mistranslation of "the giant party." Nobody from Jamcode IX
bothered to pass this along, because they were having so much fun.