

Round D APAC Test 2016

[A. Dynamic Grid](#)

[B. gBalloon](#)

[C. IP Address Summarization](#)

D. Virtual Rabbit

Questions asked 1

Submissions

Dynamic Grid

6pt	Not attempted 1392/1881 users correct (74%)
8pt	Not attempted 1288/1368 users correct (94%)

gBalloon

9pt	Not attempted 353/666 users correct (53%)
17pt	Not attempted 266/338 users correct (79%)

IP Address Summarization

10pt	Not attempted 123/236 users correct (52%)
19pt	Not attempted 73/118 users correct (62%)

Virtual Rabbit

11pt	Not attempted 18/166 users correct (11%)
20pt	Not attempted 3/8 users correct (38%)

Top Scores

nhho	100
sundar95	80
Shaon	80
ajkrish95	80
ojas.deshpande	80
NAFIS	69
JunoYu	69
wcswswws	69
karanaggarwal	69
VotBear	69

Problem D. Virtual Rabbit

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
11 points

Solve D-small

Large input
20 points

Solve D-large

Problem

Alice just bought a virtual pet rabbit. The rabbit hops around on a screen and can be "fed" by pressing a button. Alice is fond of the rabbit, but she is also busy, and doesn't want to spend too much time taking care of it. However, if the rabbit goes without "food" for too long, it "dies" and Alice loses the game.

Every day, Alice gets up at time **G**, goes to work at time **W**, returns home at time **H**, and goes to bed at time **B**. Alice cannot feed the rabbit while she is at work or asleep -- that is, in the intervals **[W, H)** and **[B, G)**. Note that times **W** and **B** themselves are not valid feeding times, whereas times **H** and **G** are. In any other second, Alice can either push a button to instantly feed the rabbit, or not push the button. Between every two seconds, the rabbit determines the number of consecutive seconds in which it has not been fed, and "dies" if that duration is equal to **X**.

It is currently 00:00:00 on Day 0, and the rabbit has just been delivered to Alice's house by the mail service. (The mail carrier pushes the button at 00:00:00, even if Alice is asleep, and then leaves.) Alice wants to make sure the rabbit is still "alive" at 00:00:00 on day **D**. What is the minimal number of times that she needs to feed the rabbit, if she can keep the rabbit "alive" at all?

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow; each consists of 6 lines. The first 5 lines represent the times **G**, **W**, **H**, **B**, and **X** in "hh:mm:ss" format. The last line consists of one integer **D**.

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 minimal number of times Alice needs to feed the rabbit. If it's impossible for the rabbit to be alive at 00:00:00 on day **D**, output -1.

Limits

$1 \leq T \leq 100$.

It's guaranteed that Alice always goes to bed before midnight and gets up at or after midnight. **G**, **W**, **H**, and **B** are in strictly increasing order within the same day.

$00:00:00 \leq G < W < H < B \leq 23:59:59$.

$00:00:00 < X \leq 23:59:59$.

Small dataset

$1 \leq D \leq 1000$.

Large dataset

$1 \leq D \leq 10^{14}$.

Sample

Input	Output
3	Case #1: 200
08:00:00	Case #2: -1
09:00:00	Case #3: 86401
18:00:00	
22:00:00	
12:00:00	
100	
08:00:00	
09:00:00	
18:00:00	
22:00:00	
01:00:00	
1	
00:00:00	
12:00:00	

```
12:00:01
23:59:59
00:00:02
2
```

In sample case #1, Alice could feed the rabbit at 08:00:00 and 20:00:00 every day.

In sample case #2, the poor rabbit will be "dead" before Alice even wakes up on Day 0.

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