

World Finals 2010

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Submissions

Letter Stamper

8pt	Not attempted 20/22 users correct (91%)
19pt	Not attempted 5/10 users correct (50%)

City Tour

4pt	Not attempted 21/21 users correct (100%)
23pt	Not attempted 19/21 users correct (90%)

Candy Store

7pt	Not attempted 21/21 users correct (100%)
20pt	Not attempted 12/13 users correct (92%)

Travel Plan

3pt	Not attempted 22/23 users correct (96%)
30pt	Not attempted 17/18 users correct (94%)

Ninjutsu

11pt	Not attempted 6/8 users correct (75%)
23pt	Not attempted 0/2 users correct (0%)

The Paths of Yin Yang

17pt	Not attempted 1/2 users correct (50%)
35pt	Not attempted

Top Scores

Egor	125
krijgertje	114
Burunduk1	112
ACRush	106
marek.cygan	95
meret	95
rng..58	95
pashka	95
iwi	95
eatmore	94

Problem D. Travel Plan

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
3 points

Solve D-small

Large input
30 points

Solve D-large

Problem

In a yet-to-be-announced and rechecked discovery by Antarctic astronomers, it is written that there are **N** inhabited planets in space, all lying along the same straight line, with the *i*-th planet lying at coordinate **X_i** along the line (*i* = 1, 2, ..., **N**). Earth is the first planet, lying at coordinate zero, so **X₁** will always be equal to 0.

Being very excited about this fact, you start planning a trip to visit all the planets. Since unknown planets can be dangerous, you want to visit each planet exactly once before returning to Earth. You have **F** units of fuel, and you want to spend as much of it on this trip as possible so that your final landing on Earth is safer. Your spaceship is pretty basic and can only fly along a straight line from any planet *i* to any other planet *j*, consuming **|X_i-X_j|** units of fuel along the way. It can't turn without landing.

So you need to create a travel plan that requires at most **F** units of fuel, starts from Earth, visits each of the other planets exactly once, and then returns to Earth. If there are several such plans, you should find the one that consumes most fuel. Output the amount of fuel consumed.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each test case description starts with a line containing the number of planets **N**. The next line contains **N** numbers **X_i**, the coordinates of the planets. The next line contains the amount of fuel **F** that you have.

Output

For each test case, output one line containing either "Case #x: NO SOLUTION", when there's no such travel plan, or "Case #x: y", where x is the case number (starting from 1) and y is the maximum amount of fuel consumed.

Limits

1 ≤ **F** ≤ 10¹⁷.
-10¹⁵ ≤ **X_i** ≤ 10¹⁵.
X₁ = 0.
All **X_i** are different.

Small dataset

1 ≤ **T** ≤ 100.
2 ≤ **N** ≤ 10.

Large dataset

1 ≤ **T** ≤ 20.
2 ≤ **N** ≤ 30.

Sample

Input	Output
3	Case #1: 40
3	Case #2: 12
0 10 -10	Case #3: NO SOLUTION
40	
5	
0 1 2 3 4	
13	
5	
0 1 2 3 4	
7	

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