

Submissions

File Fix-it

12pt	Not attempted 3049/3404 users correct (90%)
14pt	Not attempted 2909/3047 users correct (95%)

Picking Up Chicks

13pt	Not attempted 1430/1965 users correct (73%)
17pt	Not attempted 1393/1424 users correct (98%)

Your Rank is Pure

14pt	Not attempted 1036/1705 users correct (61%)
30pt	Not attempted 502/827 users correct (61%)

Top Scores

Gluk	100
yuhch123	100
Gennady.Korotkevich	100
SergeyRogulenko	100
andrewzta	100
vepifanov	100
burunduk3	100
nika	100
mystic	100
Vasyl	100

Problem B. Picking Up Chicks

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
13 points

Solve B-small

Large input
17 points

Solve B-large

Problem

A flock of chickens are running east along a straight, narrow road. Each one is running with its own constant speed. Whenever a chick catches up to the one in front of it, it has to slow down and follow at the speed of the other chick. You are in a mobile crane behind the flock, chasing the chicks towards the barn at the end of the road. The arm of the crane allows you to pick up any chick momentarily, let the chick behind it pass underneath and place the picked up chick back down. This operation takes no time and can only be performed on a pair of chicks that are immediately next to each other, even if 3 or more chicks are in a row, one after the other.

Given the initial locations (X_i) at time 0 and natural speeds (V_i) of the chicks, as well as the location of the barn (B), what is the minimum number of swaps you need to perform with your crane in order to have at least K of the N chicks arrive at the barn no later than time T ?

You may think of the chicks as points moving along a line. Even if 3 or more chicks are at the same location, next to each other, picking up one of them will only let one of the other two pass through. Any swap is instantaneous, which means that you may perform multiple swaps at the same time, but each one will count as a separate swap.

Input

The first line of the input gives the number of test cases, C . C test cases follow. Each test case starts with 4 integers on a line -- N , K , B and T . The next line contains the N different integers X_i , in increasing order. The line after that contains the N integers V_i . All distances are in meters; all speeds are in meters per second; all times are in seconds.

Output

For each test case, output one line containing "Case #x: S ", where x is the case number (starting from 1) and S is the smallest number of required swaps, or the word "IMPOSSIBLE".

Limits

$1 \leq C \leq 100$;
 $1 \leq B \leq 1,000,000,000$;
 $1 \leq T \leq 1,000$;
 $0 \leq X_i < B$;
 $1 \leq V_i \leq 100$;
All the X_i 's will be distinct and in increasing order.

Small dataset

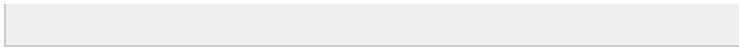
$1 \leq N \leq 10$;
 $0 \leq K \leq \min(3, N)$;

Large dataset

$1 \leq N \leq 50$;
 $0 \leq K \leq N$;

Sample

Input	Output
3	Case #1: 0
5 3 10 5	Case #2: 2
0 2 5 6 7	Case #3: IMPOSSIBLE
1 1 1 1 4	
5 3 10 5	
0 2 3 5 7	
2 1 1 1 4	
5 3 10 5	
0 2 3 4 7	
2 1 1 1 4	



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