

Submissions

Counter Culture

11pt	Not attempted 3091/5308 users correct (58%)
14pt	Not attempted 955/1400 users correct (68%)

Noisy Neighbors

12pt	Not attempted 2316/3171 users correct (73%)
15pt	Not attempted 556/772 users correct (72%)

Hiking Deer

13pt	Not attempted 647/1158 users correct (56%)
16pt	Not attempted 132/237 users correct (56%)
19pt	Not attempted 52/88 users correct (59%)

Top Scores

vepifanov	100
Belonogov	100
Xhark	100
Zlobober	100
peter50216	100
Vasyl	100
SnapDragon	100
Gassa	100
PavelKunyavskiy	100
rowdark	100

Problem B. Noisy Neighbors

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
12 points

Solve B-small

Large input
15 points

Solve B-large

Problem

You are a landlord who owns a building that is an **R** x **C** grid of apartments; each apartment is a unit square cell with four walls. You want to rent out **N** of these apartments to tenants, with exactly one tenant per apartment, and leave the others empty. Unfortunately, all of your potential tenants are noisy, so whenever any two occupied apartments share a wall (and not just a corner), this will add one point of *unhappiness* to the building. For example, a 2x2 building in which every apartment is occupied has four walls that are shared by neighboring tenants, and so the building's unhappiness score is 4.

If you place your **N** tenants optimally, what is the minimum unhappiness value for your building?

Input

The first line of the input gives the number of test cases, **T**. **T** lines follow; each contains three space-separated integers: **R**, **C**, and **N**.

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 minimum possible unhappiness for the building.

Limits

1 ≤ **T** ≤ 1000.
0 ≤ **N** ≤ **R*****C**.

Small dataset

1 ≤ **R*****C** ≤ 16.

Large dataset

1 ≤ **R*****C** ≤ 10000.

Sample

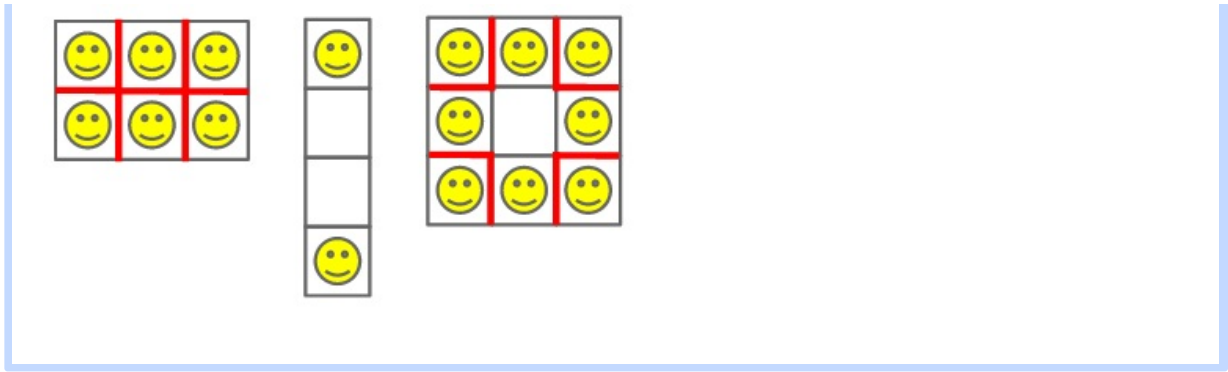
Input	Output
4	Case #1: 7
2 3 6	Case #2: 0
4 1 2	Case #3: 8
3 3 8	Case #4: 0
5 2 0	

In Case #1, every room is occupied by a tenant and all seven internal walls have tenants on either side.

In Case #2, there are various ways to place the two tenants so that they do not share a wall. One is illustrated below.

In Case #3, the optimal strategy is to place the eight tenants in a ring, leaving the middle apartment unoccupied.

Here are illustrations of sample cases 1-3. Each red wall adds a point of unhappiness.



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