Galaxy Search

The Hubble Telescope has taken a massive panoramic picture of space. NASA plans to study this picture to locate potential galaxies. Basically, they have divided the panorama into a (N x 3) grid of cells, and in each cell they have measured the average light intensity caused by the stars. Now, they wish to completely tile the Nx3 grid using a set of N blocks of one of the following 2 forms:

a 3x1 linear piece:
XXX
or, a 3-tiled L-shaped piece:
L
LL

Note that the above two forms can be rotated and flipped as desired. This tiling would then be used to identify potential locations of galaxies. The basic idea behind a good tiling, is that the intensities as represented within the 3 covered cells of the tile, remains roughly the same.

Thus, they decided upon the following cost metric: the cost of placing a single tile = the range of values among the cells covered = max(values in cells covered) - min(values in cells covered). They wish to minimise the total cost of placing all N tiles. Help them calculate the minimum cost over all possible tilings.

Input Format:
The first line consists of the number of test cases: T. Each test case is then formatted as follows:
The first line of a test case consists of the single integer: N.
This is followed by N lines, each consisting of 3 integers, denoting the intensity of light in each cell.

Output Format:
For each test-case, output the minimum cost of tiling the grid.

Constraints:
1 <= T <= 100
1 <= N <= 300
All grid numbers are between 1 and 10000 (inclusive).

Sample Input:
```
2
3
1 1 2
3 2 4
3 3 3
4
1 1 1
2 3 4
2 3 4
2 3 4
```

Sample Output:
```
3
0
```

Explanation:
There are many ways to get 3 as the cost of tiling, one such:
```
--- : cost (2 - 1) = 1
--- : cost (4 - 2) = 2
--- : cost (3 - 3) = 0
```

The second case gives 0 through the tiling:
```
---
|||
|||
|||
```