CABBAGE, n.
A familiar kitchen-garden vegetable about as large and wise as a man's head.

`Ambrose Bierce`

Scientists from the planet Zeelich have figured out a way to grow cabbages in space. They have constructed a huge 3-dimensional steel grid upon which they plant said cabbages. Each cabbage is attached to a corner in the grid, where 6 steel cables meet and is assigned Cartesian coordinates. A cosmic ant wants to crawl from cabbage X to cabbage Y along the cables that make the grid. The cosmic ant always chooses the shortest possible path along the grid lines while going from cabbage X to cabbage Y. This distance is called the cosmic distance between two cabbages. Given a collection of cabbages what is the maximum distance between any two of the cabbages?

Input

The first line of input gives the number of cases, N ($0 < N < 21$). N test cases follow. Each one starts with a line containing n ($2 \leq n \leq 10^5$). The next n lines will each give the 3-dimensional coordinates of a cosmic cabbage (integers in the range $[-10^8, 10^8]$).

Output

For each test case, output one line containing '`Case #`x`:`' followed by the largest cosmic distance between cabbages X and Y, out of all possible choices of X and Y.

Sample Input

```
4
2
1 1 1
2 2 2
3
0 0 0
0 0 1
1 1 0
4
0 1 2
3 4 5
6 7 8
9 10 11
6
0 0 0
1 1 1
2 2 2
0 0 1
1 0 0
0 1 0
```

Sample Output

```
Case #1: 3
Case #2: 3
Case #3: 27
Case #4: 6
```