Space Travel

Lea lives in exciting times: It will soon be possible to travel to space via galactic tunnels! There is only one thing that is delaying the development: Space tunnels are very costly. In fact, building a tunnel of length n costs exactly n space dollar. The company that is building them wants to create a network between multiple planets such that every planet can be reached from every other planet (possibly via other planets). They know the exact (3-dimensional) coordinates of each planet but they cannot figure out how expensive it will be to build the network. The main problem is that distance in space is measured differently: To connect two planets, the tunnel must have length $dX + dY + dZ$ where dX, dY and dZ are the absolute values of the differences of the planets' x, y and z coordinates. Can you help them?

Input

The input starts with a number t, t test cases follow, each of them separated by a blank line.

Each test case starts with an integer n, the number of planets, n lines follow. Each line contains three integers x_i, y_i, z_i, the x, y and z-coordinate of the i-th planet.

Output

For each test case, print a line containing "Case #i: c" where i is its number, starting at 1, and c is the minimum cost for building the network.

Constraints

- $1 \le t \le 20$

- $1 \le n \le 1000$

- $0 \le x_i, y_i, z_i \le 100000$ for all $1 \le i \le n$

- No two planets have the same coordinates

Sample Input 1

```
2
2
0 0 0
1 1 1

4
0 0 0
1 0 0
0 1 0
0 0 1
```

Sample Output 1

```
Case #1: 3
Case #2: 3
```

Sample Input 2

```
8
4
7 6 5
9 9 7
4 1 9
4 9 2

4
4 10 9
9 10 10
0 1 10
2 9 2

3
6 8 2
8 4 9
3 6 2

2
7 5 1
0 10 9

2
2 10 10
0 5 3

3
1 6 5
9 7 5
10 8 10

5
7 6 2
7 5 2
8 7 4
3 0 7
6 2 10

4
3 8 7
2 5 7
7 10 8
7 0 8
```

Sample Output 2

```
Case #1: 28
Case #2: 30
Case #3: 18
Case #4: 20
Case #5: 14
Case #6: 16
Case #7: 25
Case #8: 21
```