

# 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

- $1 \leq t \leq 20$
- $1 \leq n \leq 1000$
- $0 \leq x_i, y_i, z_i \leq 100000$  for all  $1 \leq i \leq n$
- 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
```