# Jungle Network

On the flight home after her last holidays, Lea's plane crashed somewhere in the jungle. Luckily, everybody on board survived, but they have no food except for what they found in the wreckage of the aircraft (which is not that good since Lea chose a very cheap airline).

The radio set which is built into the plane and some batteries are the only thing they have left to call for help. It turns out there are lots of radio sets in the jungle run by the tribes living there, but their supply of batteries is limited and they therefore don't use them often. It would be great if each village was able to pass messages to each other village. The people there love to help each other and forward messages through the radio network until they reach their recipients. Help the people in the jungle to create such a network by telling them which villages need to establish a radio connection in a way that the power consumption is minimal. In return the villages' inhabitants promised to forward your emergency call out of the jungle.

You will be given the coordinates of all villages owning a radio device. To establish a connection between two villages, each of them needs power equal to the square of their distance. Note that the power consumption is not depending on the number of messages sent. To make it even worse, some of the devices are not in best condition, so the inhabitants also tell you the maximum amount of power the devices may use without breaking. Note that each device may establish several connections, each of them using at most the maximum power level. You will join the network as each village will do, too. Your plane has crashed at coordinates $(0, 0)$ and since you have a very modern device it has no limits in power consumption as long as the recipient is located in the jungle. All villages and the plane have enough batteries remaining to power as many connections with their device as they want, but they want to minimize the total power consumption.

## Input

The first line of the input contains an integer $t$. $t$ test cases follow, each of them separated by a blank line.

Each test case starts with a single line containing $n$, the number of villages. $n$ lines follow. The $i$-th line consists of three integers $x_i$, $y_i$, and $c_i$ where $x_i$ and $y_i$ are the village's coordinates and $c_i$ is the maximum power level their radio device can consume.

## Output

For each test case, print a line containing "Case #$i$: $x$" where $i$ is its number, starting at 1, and $x$ is the minimum total power all radio sets consume to set up the network, or the string "impossible" if there is no way to connect all villages.

## Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 1000$
- $-100 \leq x_i, y_i \leq 100$ for all $1 \leq i \leq n$
- $0 \leq c_i \leq 40000$ for all $1 \leq i \leq n$
- There won't be two distinct villages at the same position and no village will be at position $(0, 0)$.

**Sample Input 1**

```
11
1
1 1 10

2
0 1 1
0 2 10

1
1 1 1

7
-32 -44 25382
-7 -63 19323
28 95 12389
-56 36 17439
-21 -4 2197
76 95 36065
48 -58 23070

3
30 -94 5076
-39 98 9331
-41 11 9577

5
-46 -31 24927
-66 -48 6370
-46 -49 12710
5 15 38589
-92 88 23578

2
-24 -80 8210
-10 88 36990

2
-86 -83 31777
-80 39 23565

6
19 -73 21839
62 -20 4721
-94 -47 5502
-97 71 37975
-89 -55 35212
-68 -1 22005

6
-37 95 6703
29 -71 28837
-77 -17 15139
-14 31 23199
46 99 23871
-43 -91 247

4
75 -57 35800
66 -25 18198
-43 -16 37936
-1 -47 38088
```

**Sample Output 1**

```
Case #1: 4
Case #2: 4
Case #3: impossible
Case #4: 45518
Case #5: impossible
Case #6: 37580
Case #7: 29640
Case #8: 44412
Case #9: 44866
Case #10: impossible
Case #11: 20786
```