3179　Desert

The Gobi Desert is the second largest desert in the world. It lies north of Huang He (Yellow River) on the border of China and Mongolia, extending some 500 km into both countries. Unlike the Sahara, only 5% of the Gobi Desert is covered by sand dunes, thus it is capable of supporting a wide variety of wild life, such as wild sheep, wild ass, and the Gobi bear. The desert is also home to nomadie tribes. The oases in the Gobi Desert are often rich and fertile. However, life is a bit boring there, and you may have to walk hundreds of kilometers to find a movie or theater. To bring some entertainment to the people, we will install three television stations in the desert. According to the standards of the Gobi Desert Broadcasting Company, we have the following requirements:

- A station can be installed only in an oasis.

- Two stations cannot be in the same oasis.

- A station broadcasts in a given direction, and an oasis receives the program only if its direction differs by at most 45 degrees from the direction of the station. Example: a station at coordinates $(10, 10)$ can broadcast to the oases at $(10, 11)$ and $(11, 10)$ at the same time. It can also broadcast to the oases at $(10, 11)$ and $(9, 11)$ at the same time. However, it cannot broadcast to all three oases at $(10, 11)$, $(11, 10)$, and $(9, 11)$ at the same time.

- We have to install three stations such that all three of them can be received in *every oasis*.

- We assume that if a station is installed in an oasis, then this oasis can receive the program regardless of the direction of the station.

Input

The input contains several blocks of test cases. Each case begins with a line containing an integer $1 \le n \le 20000$, the number of cases. The next n lines contain three integers each, the coordinates of the cases and the cost of installing a station there. The coordinates are between -25000 and 25000, and the cost is between 1 and 10000000.

The input is terminated by a block with $n = 0$.

Output

For each test case, you have to output a separate line containing three integers: the cases where the stations are installed. The cases are numbered from 1 to n. The three numbers should be printed in increasing order. If there are multiple solutions, then select the solution where the cost of installing the three stations is minimal (there will be at most one minimal solution). If it is not possible to place the stations such that all the requirements are satisfied, then write 'Impossible' (without quotes).

Sample Input

```
8
0 5 1
5 0 2
10 5 3
5 10 4
0 0 5
```

```
10 10 6
0 10 7
10 0 8
4
0 0 1
1 1 10
2 0 2
1 5 20
0
```

Sample Output

```
5 6 7
1 3 4
```