P11

The government of Nova Mareterrania requires that various legal documents have stamps attached to them so that the government can derive revenue from them. In terms of recent legislation, each class of document is limited in the number of stamps that may be attached to it. The government wishes to know how many different stamps, and of what values, they need to print to allow the widest choice of values to be made up under these conditions. Stamps are always valued in units of $1.

This has been analysed by government mathematicians who have derived a formula for $n(h, k)$, where h is the number of stamps that may be attached to a document, k is the number of denominations of stamps available, and n is the largest attainable value in a continuous sequence starting from $1. For instance, if $h = 3$, $k = 2$ and the denominations are $1 and $4, we can make all the values from $1 to $6 (as well as $8, $9 and $12). However with the same values of h and k, but using $1 and $3 stamps we can make all the values from $1 to $7 (as well as $9). This is maximal, so $n(3, 2) = 7$.

Unfortunately the formula relating $n(h, k)$ to h, k and the values of the stamps has been lost — it was published in one of the government reports but no-one can remember which one, and of the three researchers who started to search for the formula, two died of boredom and the third took a job as a lighthouse keeper because it provided more social stimulation.

The task has now been passed on to you. You doubt the existence of a formula in the first place so you decide to write a program that, for given values of h and k, will determine an optimum set of stamps and the value of $n(h, k)$.

Input

Input will consist of several lines, each containing a value for h and k. The file will be terminated by two zeroes (0 0). For technical reasons the sum of h and k is limited to 9. (The President lost his little finger in a shooting accident and cannot count past 9).

Output

Output will consist of a line for each value of h and k consisting of the k stamp values in ascending order right justified in fields 3 characters wide, followed by a space and an arrow (`->`) and the value of $n(h, k)$ right justified in a field 3 characters wide.

Sample Input

```
3 2
0 0
```

Sample Output

```
  1  3 ->  7
```

P12

During the Warring States Period of ancient China(476 BC to 221 BC), there were seven kingdoms in China — they were Qi, Chu, Yan, Han, Zhao, Wei and Qin. Ying Zheng was the king of the kingdom Qin. Through 9 years of wars, he finally conquered all six other kingdoms and became the first emperor of a unified China in 221 BC. That was Qin dynasty — the first imperial dynasty of China(not to be confused with the Qing Dynasty, the last dynasty of China). So Ying Zheng named himself "Qin Shi Huang" because "Shi Huang" means "the first emperor " in Chinese.

Qin Shi Huang undertook gigantic projects, including the first version of the Great Wall of China, the now famous city-sized mausoleum guarded by a life-sized Terracotta Army, and a massive national road system. There is a story about the road system:

There were n cities in China and Qin Shi Huang wanted them all be connected by $n-1$ roads, in order that he could go to every city from the capital city Xianyang. Although Qin Shi Huang was a tyrant, he wanted the total length of all roads to be minimum,so that the road system may not cost too many people's life. A daoshi (some kind of monk) named Xu Fu told Qin Shi Huang that he could build a road by magic and that magic road would cost no money and no labor. But Xu Fu could only build ONE magic road for Qin Shi Huang. So Qin Shi Huang had to decide where to build the magic road. Qin Shi Huang wanted the total length of all none magic roads to be as small as possible, but Xu Fu wanted the magic road to benefit as many people as possible — So Qin Shi Huang decided that the value of A/B (the ratio of A to B) must be the maximum, which A is the total population of the two cites connected by the magic road, and B is the total length of none magic roads.

Would you help Qin Shi Huang?

A city can be considered as a point, and a road can be considered as a line segment connecting two points.

Input

The first line contains an integer t meaning that there are t test cases ($t \leq 10$).

For each test case:

The first line is an integer n meaning that there are n cities ($2 < n \leq 1000$).

Then n lines follow. Each line contains three integers X, Y and P ($0 \leq X, Y \leq 1000, 0 < P < 100000$). (X, Y) is the coordinate of a city and P is the population of that city.

It is guaranteed that each city has a distinct location.

Output

For each test case, print a line indicating the above mentioned maximum ratio A/B. The result should be rounded to 2 digits after decimal point.

Sample Input

```
2
4
1 1 20
1 2 30
200 2 80
200 1 100
3
1 1 20
1 2 30
2 2 40
```

Sample Output

```
65.00
70.00
```