HELPBOB - Help Bob

no tags

Bob loves Pizza but is always out of money. One day he reads in the newspapers that his favorite pizza restaurant, Alfredo's Pizza Restaurant, is running a competition: they will donate a big pizza to the first person who will tell them the lowest price per area that can be achieved by buying any of the pizzas at most once. "That task is easy!", thinks Bob, "For each pizza I just calculate the average price and the lowest quotient will be the answer.".

Unfortunately the problem is a bit more complicated: with some pizzas Alberto gives out discount coupons for getting another pizza cheaper and even worse, those coupons can be combined. The pizzas have to be bought one after the other, and it is not possible to use a coupon to get a discount retrospectively for a pizza which has already been bought. Can you help Bob to become the first to solve this task and to get a pizza for free?

Input

The input file contains several test cases. Each test case starts with a number m, the number of pizzas Alfredo offers. Input is terminated by $m=0$. Otherwise, $1 \le m \le 15$. Then follow m lines describing the pizzas. Each of those following lines describes pizza i ($1 \le i \le m$) and starts with 3 integer numbers p_i, a_i and n_i specifying the price of the pizza, its area and the number of discount coupons you get when buying it, $1 \le p_i \le 10000$, $1 \le a_i \le 10000$ and $0 \le n_i < m$. Then follow n_i pairs of integer numbers $x_{i,j}$ and $y_{i,j}$ specifying the index $x_{i,j}$ ($1 \le x_{i,j} \le m$, $x_{i,j} \ne i$) of the pizza you get a discount coupon for and the discount in percentage terms $y_{i,j}$ ($1 \le y_{i,j} \le 50$) you get when buying pizza $x_{i,j}$. You may assume that for each i the values $x_{i,j}$ are pairwise distinct.

Output

For each test case print one line containing the lowest price per area that can be achieved by buying any of the pizzas at most once. Round this number to 4 places after the decimal point. Note that you can combine an arbitrary number of discount coupons: for a pizza with price 10 and two rabatt coupons for that pizza with a 50 and a 20 on it, you would only have to pay 10 * 0.8 * 0.5 = 4 monetary units.

Example

```
Input:
1
80 30 0
2
200 100 1 2 50
200 100 0
5
100 100 2 3 50 2 50
100 100 1 4 50
100 100 1 2 40
600 600 1 5 10
1000 10 1 1 50
0
Output:
2.6667
1.5000
0.5333
```

Submit solution! (/submit/HELPBOB/)

Added by:	Adrian Kuegel (/users/ak15)
Date:	2008-07-12
Time limit:	1.783s
Source limit:	50000B
Memory limit:	1536MB
Cluster:	Cube (Intel Pentium G860 3GHz) (/clusters/)
Languages:	All except: ERL JS NODEJS PERL 6 SCM chicken VB.net
Resource:	University of Ulm Local Contest 2008

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Sudharsansai (/users/sudharsansai): 2015-03-22 06:13:42
O(n*n*(2^n)) with printf and scanf in C++ can get AC easily

Last edit: 2015-03-22 06:15:05

Varun Vohra (/users/v2v4): 2014-10-28 15:43:28
my O(n * n * 2^n) complexity giving TLE..
Is this complexity fine or i have to do some opimizations in my algo?

Aditya Paliwal (/users/vastolorde95): 2014-10-15 23:23:17
Got AC! Had to write iteratively rather than recursively. Learnt sooo much from this problem :D AWESOME! Also can anybody tell me how best solution is 1 sec? I barely made it thought the time limit!

Last edit: 2014-10-16 00:05:27

PubLic_AvenGeR (/users/slayer_x): 2014-01-22 10:01:06
Nice Problem !!
I needed to lower the constant factor to get accepted.

Ghost Of Perdition (/users/megadeth_code): 2013-12-31 03:30:54

can anyone please explain the third case in the sample
i think buying the first four pizzas in orded 1 3 2 4 will give better answer

Ravi Kiran (/users/coders1122): 2011-09-15 05:20:21
@Adrian:
I agree. Tried again, with a solution of better constant and scanf usage, and made a much better time.
Hope it helps.

Adrian Kuegel (/users/ak15): 2010-08-23 10:51:50
I think your other optimizations were more important. Even scanner in Java is fast enough to solve this problem!

Manukranth (/users/how2code): 2010-08-19 13:49:43
Needed Fast IO to get in time!

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Submit solution! (/submit/HELPBOB/)

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- ✔ be spoj user for at least 5 days
- ✖ solved 6 from 15 needed problems
- ✔ solve this problem

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