Please help You-Know-Who

Background

Poor You-Know-Who was out of business for quite some time, being neither dead, nor alive. He would like to get rich so that he can run for the post of Minister of Magic. From there he could unfold at least some of his evil plots even if he lost most of his magical powers. You are fed up with all this Harry Potter business and decide to help You-Know-Who make some dough. You-Know-Who inherited lots of magic powder that increases one's sense of smell for a short period of time if inhaled. He will sell it and you'll help him maximize the profit.

Problem

You-Know-Who has C clients. Client i will buy $a[i]-b[i]*p$ powder if the unit price is p. That is, if You-Know-Who shows a certificate issued by the Minister saying that the asked price is the correct price. Getting one such certificate involves paying a bribe B. To maximize the profit he may buy several such certificates and use for each client the one that maximizes his profit. You must tell You-Know-Who what certificates he should get. With some luck, Harry Potter is out!

Input

The first line contains the number of testcases, which shall be less than 20. The testcases follow. (Possible empty lines between testcases should be ignored.)

The first line of each testcase input contains two non-negative integers: the bribe B and the number of clients C. The next C lines describe each client by two positive integers $a[i]$ and $b[i]$ (on line i). You are guaranteed that all numbers in the input are at most 2000.

Output

For each testcase the output is a single number, the maximum profit of You-Know-Who, and it should be written on a line by itself. The answer should have either an absolute or a relative error less than 1e-6.

Example

Input:
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2
10 2
10 1
20 3
100 1
5 1
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Output:
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46.25
0
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First testcase: If YKW would have only the first client then he should choose to get a certificate for the price 5. This way he will sell 5 grams of powder for a profit of 5x5-10=15. Analogously, for the

second client the optimal price would be 3.(3), which would make the client buy 10 grams of magic powder. Choosing the optimal price for each client means that two bribes must be payed, which leads to a profit of 5x5+10x3.(3)-2x10=38.(3). Nevertheless, YKW can win more money by getting only one certificate for the price 3.75. This way the profit is 6.25x3.75+8.75x3.75-10=46.25.

The second testcase shows that sometimes it's better to not sell magic powder to some clients.