

Minimum Diaper Cost

Diapers are expensive! Arup has noticed that if he always changes his daughter's diapers right when they get a bit wet, he might be wasting money because often times, a few minutes later, Arup has to change the diaper he just changed! Thus, it might be more effective to change a diaper only when it's been filled closer to capacity, so to speak.¹ In this program, you'll help Arup determine the minimum amount of money he must spend on diapers, given a list of the size of his daughter's waste, in the order produced. In order to solve this problem, you must know the capacity of each diaper in milliliters, as well as the cost of diapers. Diapers may only be bought in boxes and not individually. Thus, if a box has 108 diapers and costs \$32.99 and you only need 135 diapers, your cost would be \$65.98, the cost of two boxes, since you must buy an integer number of boxes.

In order to simplify the problem, we'll assume that we want the minimum cost given that only one type of box of diapers will be bought, since it's too confusing to buy some boxes of one type and other boxes of another type.

Input

The first line of input will contain a single positive integer, T ($T \leq 50$), the number of input cases. The first line of input of each test case will contain a positive integer, N ($1 < N < 10000$), representing the number of different items of waste, followed by a positive integer D ($D \leq 10$), representing the number of different types of boxes of diapers. The next D lines of each test case will contain information about one box of diapers each. Each of these lines will contain three values separated by spaces: the number of diapers in that type of box (a positive integer ≤ 300), the price for that type of box in dollars (a positive real number to two decimal places ≤ 100) and the capacity of the diaper in milliliters (a positive integer ≤ 500). The last line of each test case will contain N positive integer representing the sizes of waste produced, in milliliters. Note: Each of the values on this last line will be less than or equal to the capacities of at least one of the boxes of diapers available for the case, ensuring that at least one type of diaper can handle the waste produced.

Output

For each test case, start the output a single line with the following format:

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Diaper Scenario #k: Buying box B, you spend $X.
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where k is the number of the test case, starting with 1, B is the box number (in between 1 and D , inclusive), and X is the cost of diapers buying box number B to handle the given diaper situation. X should be printed to two decimal places.

¹ In reality, Arup does NOT condone leaving dirty diapers on children to minimize the cost of diapers!!!

Sample Input

```
2
10 2
3 3.99 100
5 5.99 90
50 50 50 50 50 50 50 50 50 50
10 2
10 1.99 40
2 9.99 200
5 5 5 5 5 5 5 5 5 10 200
```

Sample Output

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Diaper Scenario #1: Buying box 1, you spend $7.98.
Diaper Scenario #2: Buying box 2, you spend $9.99.
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Note: In the first example, you would need 5 diapers from box 1, which means you would have to buy two of these boxes, OR you would need 10 diapers from box 2, which means you would have to buy two of these boxes. In the second example, the capacity of the first diaper can not handle the last item of waste, so by default, the only possible option is box 2.