Problem D: Selling Widgets

Filename: *dsmall, dlarge*
Time Limit: *3 seconds*

Brianna sells widgets on the website sellucf.com. Each week, she buys n widgets from a wholesale store. She can choose whichever widgets she wants to buy. During the week, she sells these widgets on sellucf.com at a profit (or breaks even). Luckily, whenever she buys widgets from the wholesaler, she knows in advance how much profit each of the widgets she buys from them will make her, and she always sells all the widgets she buys from the wholesaler each week. Based on what the wholesaler has in stock, she makes her selection of which widgets to buy. If they have fewer than n in stock, she just buys everything they have. Any widgets she doesn't buy in one week, remain in stock the following week. So, for the purposes of this problem, no one else buys widgets from this wholesaler. Naturally, Brianna wants to maximize her profit over the course of several weeks. Help her do so!

The Problem

Given the initial stock of the wholesaler, the number of widgets Brianna can buy each week, the number of weeks she'll be buying widgets from the wholesaler, and the incoming shipments each week to the wholesaler, determine the maximum profit she can make over the interval of time described.

The Input

The first line of input will consist of a single positive integer, c ($c \leq 25$), representing the number of input cases to process. The first line of each input case will contain three positive integers, n ($1 \leq n \leq 10^9$), representing the number of widgets Brianna can buy each week, w ($1 \leq w \leq 10^3$), the number of weeks she will be buying and selling widgets, and k ($1 \leq k \leq 10^3$), representing the number of types of widgets in stock at the beginning of the simulation. The following k lines of each input case store information about each of the types of widgets initially in stock. In particular, the i^{th} of these lines contains two space separated integers, f_i ($1 \leq f_i \leq 10^9$) and p_i ($0 \leq p_i \leq 10^6$), representing the number of the i^{th} widget in stock as well as the profit each of those widgets will earn Brianna, if she bought them. The following w lines of each input case store information about the type of widget that the wholesaler gets in stock each week. Note that she visits the wholesaler right AFTER each of the weeks described in this portion of the input. Each of these lines contains two space separated integers wf_i ($1 \leq wf_i \leq 10^9$) and wp_i ($0 \leq wp_i \leq 10^6$), representing the number of the new type of widget arriving at the end of week i, and the profit Brianna would make for selling each one of those widgets.

Partial Credit Input (60%)

Here are the different bounds for partial credit:

$c \leq 10$
$1 \leq n,w,k \leq 10$
$1 \leq f_i, wf_i, wp_i \leq 1000$, $0 \leq p_i, wp_i \leq 1000$

The Output

For each input case, output a single integer on a line by itself, representing the maximum profit Brianna can make.

Sample Input

```
2
10 2 2
2 2
4 5
8 1
7 3
5 4 1
3 8
1 2
3 7
12 1
2 4
```

Sample Output

```
52
63
```

Note: In the first sample, there are originally 2 items which give profit 2 and 4 items which give profit 5. At the end of the first week, a shipment of 8 items which give profit 1 arrive. Of these items, it's best for Brianna to buy the original 6 items (value 24), along with 4 of the new item, for a total profit of 28 at the end of week 1. Four items with value 1 remain in stock. At the end of the second week, a shipment of 7 items arrives with value 3. It's best for Brianna to buy all 7 of these items and 3 of the items with profit 1, for a profit of 7 x 3 + 3 = 24 in week 2. Thus, the total profit is 28 + 24 = 52.

In the second example, after the end of week 1, there are 3 items in stock with value 8 and 1 item with value 2. Thus, even though Brianna can buy 5 items, there are only 4 items in stock. Brianna buys all of these, earning a profit of 26. In the second week, 3 items with value 7 are in stock. Again, Briana buys all of these for a profit of 21 in week 2. In week 3, Brianna buys 5 of the new items in stock, with profit 5. Finally, in week 4, there are 7 items with profit 1 and 2 items with profit 4. It's best for Brianna to get both items with profit 4 as well as three items with profit 1, for a total profit of 11 in week 4. The overall total profit is 26 + 21 + 5 + 11 = 63.