UCF Local Contest — August 25, 2007

Wall Street Monopoly

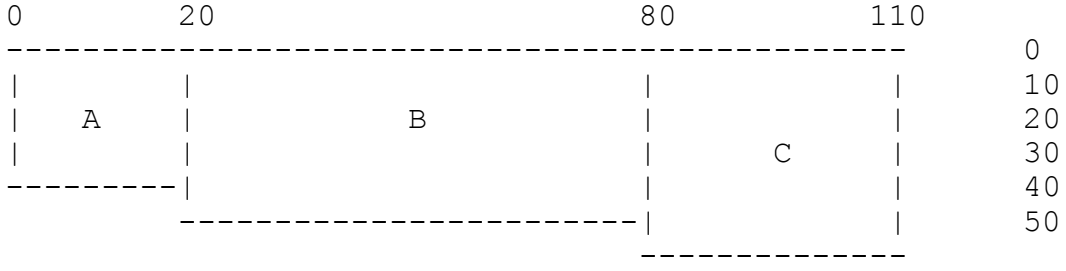
filename: `wallst`

Arup enjoys hanging out in downtown Orlando and realizes that it would be much more fun if he were making money instead of spending money. He gets the brilliant idea of trying to buy separate pieces of adjacent property. Ultimately, he wants to fuse all of these adjacent spaces into one so that he can own one mega-club that absolutely everyone wants to go to. Unfortunately, he finds out that the city charges him money every single time he "fuses" adjacent lots. It turns out that the way in which they charge him depends on the order in which he fuses his lots together. In particular, if lots A, B and C are contiguous but separate initially, the cost of fusing A and B, followed by fusing the lot AB with the lot C, could be different than the cost of fusing B and C, followed by fusing the lot A with the lot BC (note that fusing A and C first is not an option since A and C are not adjacent). Given the method in which Arup is charged for fusing lots (which is based on the dimensions of each lot), as well as the dimensions of each of his lots, you are to determine his minimum cost in fusing the lots.

The Problem:

We will refer to a lot's size as *length* x *depth*, i.e., the first dimension represents the length of the lot on the street and the second dimension represents the depth of the lot.

Given two lots, the cost of fusing those two lots is 100 dollars times the product of the minimum (smaller) dimensions of each lot (in feet). Thus, if one lot is 20' x 30' and its adjacent lot is '60 x 40', then the cost of fusing the two lots is $100x20x40 = $80,000 (20 is the smaller dimension of the first lot and 40 is the smaller dimension of the second lot). Also, the size of the newly fused lot will be the sum of the length of each lot by the maximum (larger) of the depth of both lots. In this case, the fused lot would be 80' x 40' (80 feet long and 40 feet deep; 80 is the sum of the lengths and 40 is the larger of the depths). Three adjacent lots with the following dimensions: A - 20'x30', B - 60'x40', and C - 30'x50', are shown below:



Given the dimensions (lengths and depths) of several adjacent lots, determine the minimum cost of fusing the separate lots into one.

The Input:

The first line of the input consists of a single positive integer, *n*, representing the number of test cases in the input file (i.e., the number of data sets to be processed). The following *n* lines contain the input cases, one per line. For each input test case, the first integer, *k (0 < k < 20)*, represents the number of lots to be fused. This is followed by *k* pairs of positive integers less than 101 representing the dimensions (length and depth) of each of the lots in feet, in the order in which they are located.

The Output:

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

`The minimum cost for lot #`*m* `is $`*X*`.`

where *m* ($1 \leq m \leq n$) is the input case number (starting with 1) and *X* is the integer dollar amount corresponding to the minimum cost to fuse all of the separate lots for that particular input case.

Leave a blank line after the output for each data set. Follow the format illustrated in Sample Output.

Sample Input:

```
2
3 20 30 60 40 30 50
2 10 90 30 40
```

Sample Output:

```
The minimum cost for lot #1 is $200000.

The minimum cost for lot #2 is $30000.
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