British Informatics Olympiad Final

31 March – 2 April, 2006

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Past

Where now stands that small knot of villages known as The Endians, a mighty forest once stood. Indeed, legend has it that you could have stood on the edge of the wood and seen it stretch out for miles, were it not for the trees getting in the way.

In one section of the forest, the trees stood in a row and were of height from 1 to n, each height occurring once and once only. A tree was only visible if there were no higher trees before it in the row. For example, if the heights were 3 2 4 1 6 5 the only visible trees would have been those of heights 3, 4 & 6.

Write a program that, given the number of trees, the positions of some trees, and the number of visible trees, determines the number of possible orderings for the trees. The first line will contain three integers: the number of trees n ($1 \leq n \leq 20$), then the number of fixed trees p ($0 \leq p \leq n$), and finally the number of visible trees v ($1 \leq v \leq n$). The next p lines will each contain a pair of integers, the height of a fixed tree followed by its position; the first position, on the left, is position 1 (not 0).

You should output a single integer, the number of possible arrangements of the n trees, with the given restrictions, with exactly v visible trees. No test will require output above 2^{31}.

Sample Input

```
6 2 4
3 2
5 4
```

Sample Output

```
4
```

(The following 4 orderings are valid: 132564, 132546, 231564 and 231546)

There is significant credit for a program that can solve tests, within the bounds, with 0 fixed trees, or where all the fixed trees are adjacent to the edges of the row.