MIUP'14

MARATONA INTER-UNIVERSITÁRIA DE PROGRAMAÇÃO

http://miup2014.github.io/

Problem C: Team Formations

Mr. John "The Master" Doe is the coach of CSFC (Computer Science Football Club), the new shining star in world's football. John is very worried about which tactics he should use. Should he play with a team formation of 4-3-3, or should he go with a classical 4-4-2? Thinking about it, he saw that there were many more possible formations!

In football there are 11 players in the field. One of them is the goalkeeper and the other 10 players are traditionally distributed on the field along three major roles: defenders, midfielders and forwards. John is certain that he wants at least 3 defenders, at least 2 midfielders, and at most 3 forwards. Picking up a piece of paper, he quickly saw that there were 18 possible formations respecting these conditions:

```
3-4-3   3-5-2   3-6-1   3-7-0   4-3-3   4-4-2
4-5-1   4-6-0   5-2-3   5-3-2   5-4-1   5-5-0
6-2-2   6-3-1   6-4-0   7-2-1   7-3-0   8-2-0
```

John thought about how this counting could be done for other conditions and even for other sports, with a different number of players and roles. Can you help him?

Task

Given a number of players **P**, a number of roles **R**, and a series of conditions indicating, for each role, a minimum or maximum number of players, your task is to determine how many valid formations exist, that is, using all the players and obeying the given conditions.

Input

The first line of input contains a single number **P**, the number of players.

The second line contains a single number **R**, the number of roles to consider. The next **R** lines describe the conditions for each role, with the i-th line describing the condition for role i. Each of these lines comes in the format `MIN X` (the respective role must have at least X players) or `MAX X` (the respective role must have at most X players). X is always larger or equal than zero and smaller or equal than **P**.

For better understanding, note that the first example input corresponds to the example given in the problem statement, with 18 possible formations.

Output

The output is a line containing the number of valid team formations using all the players and respecting the conditions, that is, the number of ways to distribute the players among the roles while not breaking any of the given restrictions.

It may be the case that there are no team formations respecting the conditions, in which case your answer should be zero. It is also guaranteed that, for the given inputs, the result will fit in a normal signed 64 bit integer.

Constraints

$1 \leq \mathbf{P} \leq 50$ Number of players
$1 \leq \mathbf{R} \leq 20$ Number of team roles

Input example 1

```
10
3
MIN 3
MIN 2
MAX 3
```

Output example 1

```
18
```

Input example 2

```
12
4
MAX 4
MIN 2
MAX 3
MIN 1
```

Output example 2

```
130
```

Input example 3

```
8
3
MIN 3
MIN 3
MIN 3
```

Output example 3

```
0
```