



Task 4: Walking

Consider a road of length ℓ . There are n persons. The i th person, $i = 1, \dots, n$, will start walking from the beginning of the road at time t_i and will move at a constant speed v_i until arrival at the end of the road. We assume no two persons start walking at the same time, and no two persons arrive at the same time.

If the i th and j th person meet each other on the road, they will become friends. Mathematically, for the i th and j th persons where $t_i < t_j$, they will become friends if and only if $\ell/v_i + t_i > \ell/v_j + t_j$.

Your task is to find the size of the maximum set of persons who are friends of each other.

Example 1

Suppose the length of the road is $\ell = 1000$, there are 4 persons who start walking at time $t_1 = 0$, $t_2 = 1$, $t_3 = 2$ and $t_4 = 3$ respectively, and their walking speeds are $v_1 = 2$, $v_2 = 3$, $v_3 = 1$ and $v_4 = 4$ respectively.

Then, the 1st person will meet with the 2nd person since $1000/2+0 > 1000/3+1$. Similarly, we have the following table.

	1st	2nd	3rd	4th
1st		friend	not friend	friend
2nd			not friend	friend
3rd				friend

Hence, the 1st, 2nd and 4th persons are friends of each other. In fact, this is the maximum set. We report 3 to be the size of the maximum set of persons who are friends of each other.

Example 2

Suppose the length of the road is $\ell = 1000$, there are 4 persons who start walking at time $t_1 = 0$, $t_2 = 1$, $t_3 = 2$ and $t_4 = 3$ respectively and their walking speeds are $v_1 = 1$, $v_2 = 1$, $v_3 = 1$ and $v_4 = 1$ respectively.

Then, none of them will meet each other. Hence, we report 1 to be the size of the maximum set of persons who are friends of each other.



Input format

Your program must read from the standard input. The input consists of $n + 1$ lines. The first line contains two integers ℓ and n separated by space, where $100 \leq \ell \leq 10000$ and $1 \leq n \leq 500$. Each of the next n lines contains two integers. For the $(i + 1)$ -th line, it contains the two integers t_i and v_i separated by space, where $0 \leq t_i \leq 1000$ and $1 \leq v_i \leq 100$. For example 1, the input file looks like:

```
1000 4
1 3
2 1
0 2
3 4
```

For example 2, the input file looks like:

```
1000 4
0 1
2 1
1 1
3 1
```

Output format

Your program must write to the standard output an integer which is the size of the maximum set of persons who are friends of each other. For example 1, the output will be:

```
3
```

For example 2, the output will be:

```
1
```

Input instances

Your program will be tested on 5 sets of input instances as follow:

1. (3 marks) The number of persons is at most 40. The output, that is the size of the maximum set of persons who are friends of each other, will be at most 6.
2. (3 marks) The number of persons is at most 150. The output will be at most 12.
3. (5 marks) The number of persons is at most 250. The output will be at most 16.
4. (7 marks) The number of persons is at most 350. The output will be at most 22.
5. (7 marks) The number of persons is at most 500. The output can be any value ranges from 1 to 500.