

Whiteboard Markers

time limit per test: 1 second (5 seconds for Python)

memory limit per test: 256 megabytes

input: standard input

output: standard output

points: 100 · problem code: whiteboardmarkers · author: cherryblossom

As a TA, Lauren uses a lot of whiteboard markers. She has a collection of n markers in k different colours. Each marker $1 \leq i \leq n$ has a particular amount of ink left, x_i , and has a particular colour, c_i .

Since whiteboard markers get worse as they run out of ink, when choosing a whiteboard marker of a particular colour to use next, Lauren always wants to choose the one with the most amount of ink first. If there are multiple markers of that colour with the greatest amount of ink, she will choose the marker with the lower index. After using a marker, it will consume some amount of ink.

More precisely, after Lauren uses y units of ink from marker i , the new value of x_i will be $x_i - y$. If there are no markers of the desired colour with enough ink left, she will not use any marker (and will be sad). Note that Lauren can only use one marker at a time.

Help Lauren determine which marker to use, given the colour and amount of ink she needs to use.

Input

Your first line will contain n and m as space-separated integers, representing the number of whiteboard markers Lauren has the number of queries she will make.

Your next n lines will contain an integer x_i and a string c_i , separated by a space, representing the amount of ink left in the i th marker and the colour of the i th marker respectively.

Your next m lines will contain an integer y_j and a string d_j , separated by a space, representing that Lauren needs to use y_j units of ink of colour d_j .

Output

For each query, output the index (i) of the marker that Lauren should use. If there are no markers of the desired colour with enough ink left, output 0.

Constraints

- $1 \leq k \leq 10$
- $1 \leq x_i, y_j \leq 1000$ for all $1 \leq i \leq n$ and for all $1 \leq j \leq m$

Subtask 1

- $1 \leq n \leq 500$
- $1 \leq m \leq 500$

Subtask 2

- $1 \leq n \leq 10^5$
- $1 \leq m \leq 10^5$

Example 1

Input

```
7 9
10 black
8 blue
5 black
10 black
9 blue
4 red
3 red
2 blue
10 black
3 blue
10 black
6 black
3 red
2 red
1 red
2 red
```

Output

```
5
1
2
4
0
6
7
6
0
```

Explanation

The initial whiteboard markers are:

```
10 black
8 blue
5 black
10 black
9 blue
4 red
3 red
```

The queries are:

```
2 blue
10 black
3 blue
10 black
6 black
3 red
2 red
1 red
2 red
```

- The output of query 1, `2 blue`, is `5`. There are 2 blue markers, marker 2 with 8 ink and marker 5 with 9 ink, so we choose marker 5. Marker 5 now has 7 ink remaining.

- The output of query 2, `10 black`, is `1`. There are 3 black markers, marker 1 with 10 ink, marker 3 with 5 ink, and marker 4 with 10 ink. Markers 1 and 4 both have 10 ink, so we choose the one with the lower index, marker 1. Marker 1 now has 0 ink remaining.
- The output of query 3, `3 blue`, is `2`. There are 2 blue markers, marker 2 with 8 ink and marker 5 with 7 ink, so we choose marker 2. Marker 2 now has 5 ink remaining.

Example 2

Input

```
1 3
10 black
1 black
10 black
1 black
```

Output

```
1
0
1
```

Explanation

- The output of query 1, `1 black`, is `1`. The only black marker has 10 ink. Marker 1 now has 9 ink remaining.
- The output of query 2, `10 black`, is `0`. The only black marker only has 9 ink, which is not enough, and no markers are used. Marker 1 still has 9 ink remaining.
- The output of query 3, `1 black`, is `1`. The only black marker has 9 ink. Marker 1 now has 8 ink remaining.

Example 3

Input

```
1 1
10 black
1 blue
```

Output

```
0
```

Explanation

- The output of query 1, `1 blue`, is `0`. There are no blue markers in the collection, so we cannot use any markers.