
Swimming pool (2)**P44496_en**

There are plenty of guided activities in a certain swimming pool. Therefore, the usage rules are very strict:

- The free time slots are only one minute long.
- After using a free slot, we must wait for at least x seconds before using another slot.

You have the list of free slots, and you want to swim for at least m minutes. What is the maximum x that allows it?

Input

Input consists of several cases. Every case begins with the number of minutes m and the number of slots n , followed by n triples $H:M:S$, indicating that there is a lane that is free for one minute starting at $H:M:S$. Assume $2 \leq m \leq n \leq 1000$, that the hours are between 00:00:00 and 23:59:00, and that there are no overlaps between time slots. The final entry is marked with a special case with $m = n = 0$.

Output

For every case, print the maximum x that permits a total bath time of m or more minutes.

Sample input 1

```
2 2
00:00:00 00:01:00
2 2
00:00:00 00:10:03
2 3
10:10:00 00:10:00 00:20:00
3 4
23:00:00 22:00:00 21:00:00 20:00:00
4 8
00:10:40 00:35:30 01:00:00 01:55:00
02:10:00 03:15:00 12:00:20 23:59:00
0 0
```

Sample output 1

```
0
543
35940
3540
11000
```

Problem information

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