

Equatorial Bonfire

Some great ideas are never implemented. This was the case with the equatorial bonfire planned for the millennial celebration. Maybe the plan will be rediscovered for the next turn of millenia. Before it is completely forgotten we will tell you about it: The idea was to put tarred logs and gun powder contiguously along the equator and then ignite bonfires at various points of this gun powder belt at various times. The fire would spread in both directions along the equator and in the end, the whole equator would burn.

One concern of the architects of this celebration was what would be the last place to catch fire and when would it happen?

Input

The input file consists of at most 10 blocks, each specifying a separate proposal for the equatorial bonfire. The first line of each block specifies the speed of fire's advance in the degrees of longitude per hour. The next line contains the number of bonfires $N \leq 5000$ along the equator. Each of the next N lines contains two numbers specifying the time and the location of a bonfire.

The time is given in hours from 12:00am GMT (all times are positive), the location is given in the degrees of longitude (greater than -180 and less than or equal to 180). All numbers except N are given with precision of at most 2 decimal places. Every block is followed by an empty line. The last block is followed by an empty line and then a line containing -1.

Output

For every block in the input file, output a single line containing the time and coordinate of the last place to catch fire. The time and the coordinate should be in the same units and from the same range as input, but with precision of 3 decimal places. If there are multiple solutions, output the one which is the closest if you travel from the zero meridian east (i.e. in the positive direction).

Example

Input:

```
2
2
1 90
1 -90
```

```
10.0
3
1 40
2 45
6 -80
```

```
-1
```

Output:

```
46.000 0.000
15.500 -175.000
```

Note that in the second case, the fire at 45 degrees actually starts 1.5 hours after 12:00am. This of course does not prevent anybody from igniting it again 2 hours after 12:00am.