If you think participating in a programming contest is stressful, imagine being an air traffic controller. With human lives at stake, an air traffic controller has to focus on tasks while working under constantly changing conditions as well as dealing with unforeseen events.

Consider the task of scheduling the airplanes that are landing at an airport. Incoming airplanes report their positions, directions, and speeds, and then the controller has to devise a landing schedule that brings all airplanes safely to the ground. Generally, the more time there is between successive landings, the "safer" a landing schedule is. This extra time gives pilots the opportunity to react to changing weather and other surprises.

Luckily, part of this scheduling task can be automated - this is where you come in. You will be given scenarios of airplane landings. Each airplane has a time window during which it can safely land. You must compute an order for landing all airplanes that respects these time windows. Furthermore, the airplane landings should be stretched out as much as possible so that the minimum time gap between successive landings is as large as possible. For example, if three airplanes land at 10:00am, 10:05am, and 10:15am, then the smallest gap is five minutes, which occurs between the first two airplanes. Not all gaps have to be the same, but the smallest gap should be as large as possible.

Input

The input file contains several test cases consisting of descriptions of landing scenarios. Each test case starts with a line containing a single integer n ($2 \leq n \leq 8$), which is the number of airplanes in the scenario. This is followed by n lines, each containing two integers a_i, b_i, which give the beginning and end of the closed interval $[a_i, b_i]$ during which the i-th plane can land safely. The numbers a_i and b_i are specified in minutes and satisfy $0 \leq a_i \leq b_i \leq 1440$.

The input is terminated with a line containing the single integer zero.

Output

For each test case in the input, print its case number (starting with 1) followed by the minimum achievable time gap between successive landings. Print the time split into minutes and seconds, rounded to the closest second. Follow the format of the sample output.

Sample Input

```
3
0 10
5 15
10 15
2
0 10
10 20
0
```

Sample Output

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Case 1: 7:30
Case 2: 20:00
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