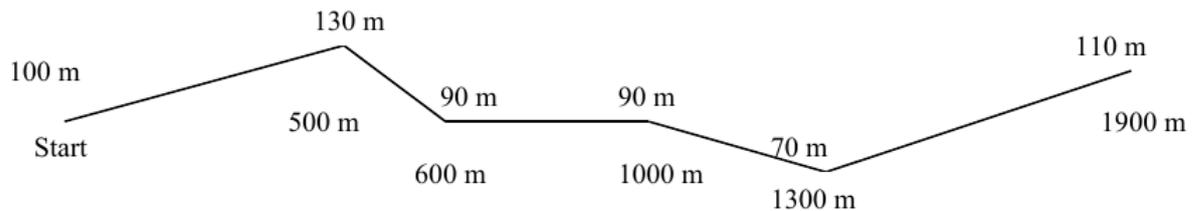


## 3317 Making the Grade

American Contour Mapping, ACM, is a company that determines the grade (or slope) of different hiking paths. They want to find the largest slope, either up or downhill, on each portion of a trail so they can warn hikers of the difficulty of the path. ACM has lists of checkpoints along each path and their altitudes. Each checkpoint is given as its horizontal distance from the start. Consider the path shown below, with altitudes listed above the line and checkpoint distance listed below:



Here, the path starts at 100 meters of altitude. It climbs to 130 meters at the 500 meter checkpoint. It then drops to 90 meters at the 600 meter checkpoint. The steepest segment of this path is from the 500 meter checkpoint to the 600 meter checkpoint with a slope of  $-0.4$  (which is the change in the altitude,  $-40$  meters, divided by the change in the distance,  $100$  meters).

Write a program to find the steepest segment for each of a group of paths.

### Input

The input to this program will be information about one or more paths. The first line of data for each path will contain one integer,  $n$ ,  $2 \leq n \leq 100$ , where  $n$  represents the number of checkpoints on the path. There will then be  $n$  lines of input, each with two integers, representing the checkpoints. The two integers will be separated by at least one space and may have extra spaces before and/or after the values. The first integer will be non-negative and represents the horizontal distance from the start to the checkpoint and the second represents the altitude of the checkpoint. No two checkpoints will be the same distance from the start. The checkpoints will be listed in ascending order, based on distance from start. The first checkpoint will always be 0 meters from the start.

End of input will be marked by a path with '0' as the number of checkpoints. This path should not be processed.

### Output

For each path, you should find the segment with the slope with the largest magnitude. You may assume no two segments of the path will have the same slope. For each path, print the line:

Path  $n$  has steepest slope of  $slope$  between checkpoints  $start$  and  $end$

where  $n$  is the path number starting with 1,  $slope$  is the slope of the segment, printed with exactly two digits after the decimal point, rounded to the last digit, and  $start$  and  $end$  are the checkpoint distances of the starting and ending of the segment.

### Sample Input

```
6
0 100
```

```
500 130
600 90
1000 90
1300 70
1900 110
3
0 0
1000 10
2000 30
0
```

### Sample Output

Path 1 has steepest slope of  $-0.40$  between checkpoints 500 and 600

Path 2 has steepest slope of  $0.02$  between checkpoints 1000 and 2000