UESTC 2016 Summer Training #12 Div.2

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Time Limit:2000MS **Memory Limit:**65536KB **64bit IO Format:**%I64d & %I64u

Submit Status

Description

standard input/output
Statements
It is raining again! Youssef really forgot that there is a chance of rain in March, so he didn't fix the roof of his house. Youssef's roof is 1-D, and it contains n holes that make the water flow into the house, the position of hole i is denoted as x_i where ($0 \le i < n$). Youssef has to put strips at the bottoms of those holes in order to prevent the water from flowing. Let's say there is a hole in position 4 and another hole in position 6, and Youssef decided to use a strip of length 3 to cover those two holes, then he places the strip from position 4 to 6 (it covers positions 4,5,6) and it covers the two holes. He can buy exactly k strips, and he must pay a price equal to the longest strip he buys. What is the minimum length l he can choose as the longest strip in order to keep his house safe?

Input

The input consists of several test cases. The first line of the input contains a single integer T, the number of the test cases. Each test case consists of two lines: the first line contains two space-separated integers, n and k ($1 \le k < n \le 100000$), denoting the number of the holes in the roof, and the number of the strips he can buy respectively. The second line of the test case contains n integers ($x_0, x_1, \ldots, x_{n-1}$): ($0 \le x_i \le 10^9$), denoting the positions of holes (these numbers are given in an increasing order).

Output

For each test case print a single line containing a single integer denoting the minimum length l he can choose in order to buy k strips (the longest of them is of length l) and cover all the holes in his house using them.

Sample Input

Input
3 5 2 1 2 3 4 5 7 3 1 3 8 9 10 14 17 5 3 1 2 3 4 20
Output
3 4 2

Anything about the OJ, please ask in the forum, or contact author:Isun
Server Time: 2016-07-24 12:36:33