

F. Editorial for Two

time limit per test: 4 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Berland Intercollegiate Contest has just finished. Monocarp and Polycarp, as the jury, are going to conduct an editorial. Unfortunately, the time is limited, since they have to finish before the closing ceremony.

There were n problems in the contest. The problems are numbered from 1 to n . The editorial for the i -th problem takes a_i minutes. Monocarp and Polycarp are going to conduct an editorial for exactly k of the problems.

The editorial goes as follows. They have a full problemset of n problems before them, in order. They remove $n - k$ problems without changing the order of the remaining k problems. Then, Monocarp takes some prefix of these k problems (possibly, an empty one or all problems). Polycarp takes the remaining suffix of them. After that, they go to different rooms and conduct editorials for their problems in parallel. So, the editorial takes as much time as the longer of these two does.

Please, help Monocarp and Polycarp to choose the problems and the split in such a way that the editorial finishes as early as possible. Print the duration of the editorial.

Input

The first line contains a single integer t ($1 \leq t \leq 10^4$) — the number of testcases.

The first line of each testcase contains two integers n and k ($1 \leq k \leq n \leq 3 \cdot 10^5$) — the number of problems in the full problemset and the number of problems Monocarp and Polycarp are going to conduct an editorial for.

The second line contains n integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq 10^9$) — the time each editorial takes.

The sum of n over all testcases doesn't exceed $3 \cdot 10^5$.

Output

For each testcase, print a single integer — the smallest amount of time the editorial takes, if Monocarp and Polycarp can choose which k of n problems to conduct an editorial for and how to split them among themselves.


Example

input	Copy
6 5 4 1 10 1 1 1 5 3 1 20 5 15 3 5 3 1 20 3 15 5 10 6 10 8 20 14 3 8 6 4 16 11 10 5 9 9 2 13 15 19 4 9 13 12 1 1 1	
output	Copy
2 6 5 21 18 1	

Educational Codeforces Round 149 (Rated for Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++17 7.3.0

Choose file: Choose File No file chosen

Submit

→ Problem tags

binary search data structures greedy

implementation ternary search

No tag edit access

→ Contest materials

Announcement

Tutorial

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The only programming contests Web 2.0 platform
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