

Class Rank

CITS3001 Advanced Algorithms — Time limit: 3s

Given the marks of a (possibly enormous) cohort, find the k -th smallest mark: the mark that would appear in position k if the whole list were sorted.

Sorting the entire list works, but recall from lectures that a single order statistic can be found in expected — or even worst-case — linear time.

Input

The first line contains two integers n and k ($1 \leq k \leq n \leq 10^6$). The second line contains n integers $x_1, \dots, x_n$ ($0 \leq x_i \leq 10^9$), the marks.

Output

Output the k -th smallest mark.

Sample Input 1

```
5 3
7 1 5 3 9
```

Sample Output 1

```
5
```

Sample Input 2

```
4 1
4 4 2 4
```

Sample Output 2

```
2
```