

Calculating Quantiles

Problem

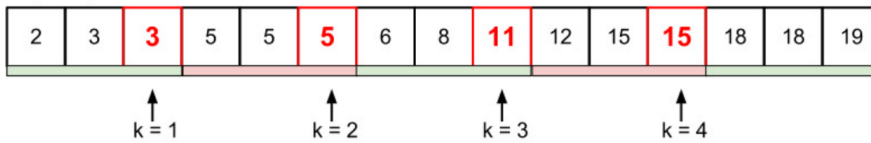
In this problem, you will need to find quantiles for a population of N values. These values are indexed $1, \dots, N$ from lowest to highest. The k^{th} Q -quantile of such population is determined by computing the index $I_k = N * k / Q$ and taking the value found at index I_k . If I_k is not an integer, then it is rounded up to the next integer to get the index. For a given value of Q , there will be $(Q - 1)$ quantiles.

For example, for $Q=2$ the 1st (and only) quantile of the population $\{3, 5, 6\}$ is 5. This is also known as a median.

Explanation: $N=3$, $Q=2$, $k=1$, which means $I_1 = \text{ceiling}(3 * 1 / 2) = 2$. Value at index 2 is 5.

Here is a graphical example to illustrate this:

15 values
q = 5-quantiles



Input Format

Your solution should read input from Standard Input in the following format:

```
Q
M
V1 c1
V2 c2
...
VM cM
```

Here Q is the Q -quantile, M is the number of v_i/c_i pairs, v_i is a value in the population, and c_i is its count, i.e. the number of times v_i appears in the population. Values of v_i are guaranteed to be distinct, but may not necessarily appear in order.

For example:

```
2
3
1 1
2 3
3 1
```

...means that the population of numbers is $\{ 1, 2, 2, 2, 3 \}$ and we need to calculate the single 2-quantile (aka median) of this population.

Sample Input #2:

```
3
3
7 2
6 2
5 2
```

Sample Output #2:

```
5
6
```

Constraints

$1 \leq N \leq 10^{12}$.

$2 \leq Q$. However, Q is not guaranteed to be less than N .

$1 \leq M \leq 100000$

$1 \leq c_i$

v_i and c_i values are integers