## Problem A: Moustapha And The Mex

The *Mex* of the subarray $a[l],\ a[l+1],\ \ldots,\ a[r]$ is the min value of the remaining of the array. It is the min value of the two subarrays $a[0],\ a[1],\ \ldots,\ a[l-1]$ and $a[r+1],\ a[r+2],\ \ldots,\ a[n-1]$. It can be computed in $O(log(n))$ with a segment tree.

## Problem B: Extremely Basic

For each test case, compute the sum of the two numbers in the input.

## Problem C: Stone Piles

Given n piles numbered from 1 to $n$ in a row, each pile have $x_i$ stones, from each pile $i$ you can remove at most $a_i$ stones, can you make the piles sorted in a "strictly" increasing order ? To do this, you have to take each value in the array $x$ starting from the end. Compare each value $x_i$ to the previous value $x_{i-1}$. If $x_i > x_{i-1}$, that is good. Otherwise you have to remove at least $k = x_{i-1} - x_i + 1$ from $x_{i-1}$ in order to keep things in order. This can be done iff $a_{i-1} >= k$.

## Problem D: Why Omani Sings

Sort the array and compute the product of the last five numbers of the sorted array. Use 64-bit integers, or it won't work.

## Problem E: Stars

Given two years $a$ and $b$, you have to find the number of leap years between them. This requires to find the number of leap years up to a given year $y$. This is given by the function

$$f(y) = \left\lfloor \frac{a}{400} \right\rfloor + \left\lfloor \frac{a}{4} \right\rfloor - \left\lfloor \frac{a}{100} \right\rfloor$$

We also need the function

$$l(y) = \begin{cases} 1, & \text{if y is leap year} \\ 0 & \text{otherwise} \end{cases} \tag{1}$$

The answer to the problem is then $f(b) - f(a) + l(a)$.

## Problem F: A String

Just output the string given as input. But if you really want to ouptut a different string, swap two differents characters or sort the string (Note that if the string is already sorted, this will be useless).