Competitive Programming

Lec 15
Math

Bhavik Dhandhalya

Factorization

Print all factors of number N.

What will be time complexity ?

Solution

Prime

Given a number N, verify if N is prime or not.

What will be time complexity ?

Solution

Prime

Find all primes up to number N.

What will be time complexity ?

Can we do better ?

Yes, use Sieve of Eratosthenes.

Solution

GCD

Given two numbers, find GCD.

Use

```
__gcd(a, b)
```

Solution

Vanya and Table

Vanya has a table consisting of 100 rows, each row contains 100 cells. The rows are numbered by integers from 1 to 100 from bottom to top, the columns are numbered from 1 to 100 from left to right.

In this table, Vanya chose n rectangles with sides that go along borders of squares (some rectangles probably occur multiple times). After that for each cell of the table he counted the number of rectangles it belongs to and wrote this number into it. Now he wants to find the sum of values in all cells of the table and as the table is too large, he asks you to help him find the result.

input 2 1 1 2 3 2 2 3 3	Output 10
Input 2 1 1 3 3 1 1 3 3	output 18

Solution

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Trailing Zeros in Factorial

Given an integer n, return the number of trailing zeroes in n!.

Note: Your solution should be in logarithmic time complexity.

Example :

n = 5
n! = 120
Number of trailing zeros = 1
So, return 1

Solution

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Largest Coprime Divisor

You are given two positive numbers A and B. You need to find the maximum valued integer X such that:

X divides A i.e. A % X = 0
X and B are co-prime i.e. gcd(X, B) = 1

For example,

A = 30
B = 12
We return
X = 5

Solution

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Excel Column Number

Given a column title as appears in an Excel sheet, return its corresponding column number.

Example:

A -> 1

B -> 2

C -> 3

...

Z -> 26

AA -> 27

AB -> 28

Solution

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Homework

FizzBuzz	Easy
The Abominable Bride	Medium
Reverse integer	Easy ?, Try AC in 1 go
Excel Column Title	Medium
Sorted Permutation Rank	Hard