L50
Number Theory Problem Solving - 1

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# RECAP

Before we begin, let's look at something called the SPF array.

# Let's get going

```
for(i=2; i<=n; ++i) {
    if (spf[i] > 0)
        continue;
    spf[i] = i;
    for(j = i*i; j<=n; j += 2*i)
        if(spf[j] == 0)
            spf[j] = i;
}
```

# 1. Counting Divisors

sbf $\Rightarrow 10^6$

600

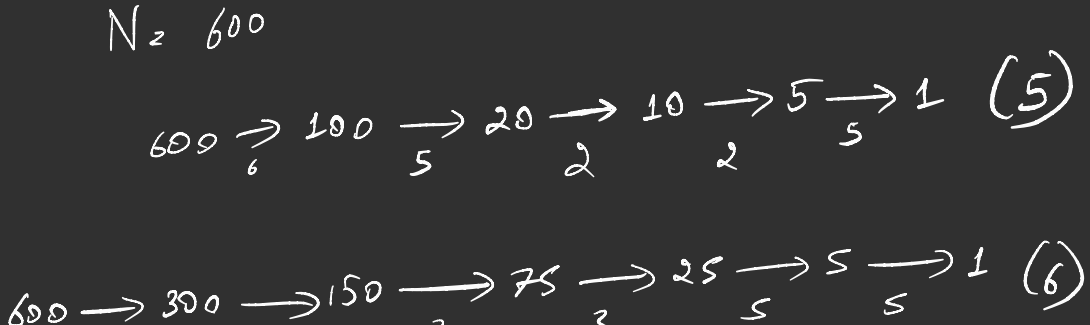
ans = 24

pf = 5, c = $0^{X^2}$

~~600~~
~~300~~
~~150~~
~~75~~
~~25~~
5
1

2. N-Factorful

# 3. Soldier and Number Game (interesting)



$$600 = 2^3 * 3^1 * 5^2$$

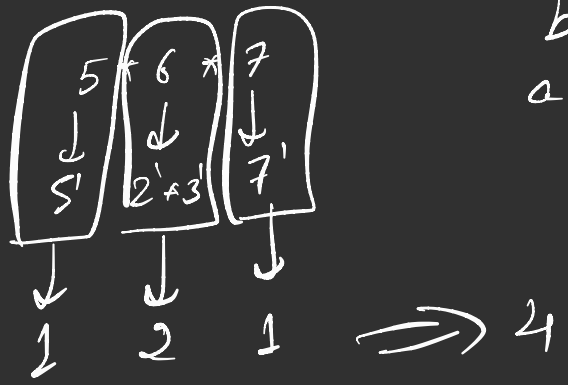
$$N = p_1^{\alpha_1} * p_2^{\alpha_2} * p_3^{\alpha_3} - \cdots - p_k^{\alpha_k}$$

$$\sum_{i=1}^{k} \alpha_i \Longrightarrow$$

$a \Rightarrow r(a)$

$\frac{a!}{b!}$

$\Rightarrow (b+1) * (b+2) * (b+3) \cdots \cdots * a$



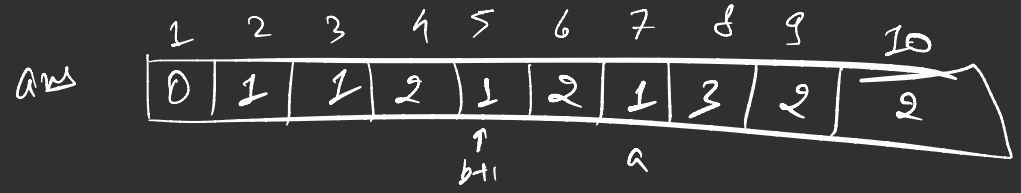

b = 7

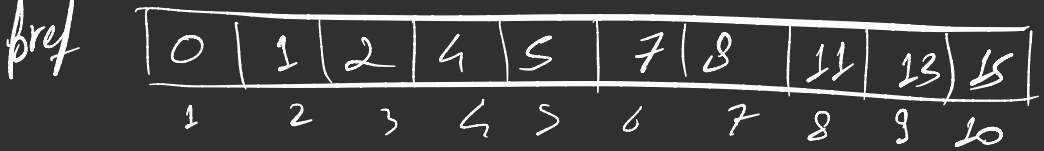
a = 4

ans[b+1] + ans[b+2] + ans[b+3] . . . . . ans[a]

pref[a] − pref[b]

a = 7, b = 4



# *Thank You!*

Reminder: Going to the gym & observing the trainer work out can help you know the right technique, but you'll muscle up only if you lift some weights yourself.

So, PRACTICE, PRACTICE, PRACTICE!