## Number Theory

$\hookrightarrow$ Primality Testing          2, 3, 5, 7,      11, 13, 17

$\hookrightarrow$ Divisors Finding

```
bool isPrime (int n)
{   if (n < 2) return false;
    for (int i = 2; i < n; i++)
    {   if (n % i == 0)
            return false;
    }
    return true;
}
```

1, 2, 3, 5, 6, 10, 15, 30

$$n = 30$$

| $\frac{a}{1}$ | $\times$ | $\frac{n/a}{30}$ | 29 $\longmapsto$ |
| 2 | $\times$ | 15 | 13 $\longmapsto$ |
| 3 | $\times$ | 10 | 7 $\mapsto$ |
| 5 | $\times$ | 6 | 1 $\cdot$ |

$$n = 4$$

| $\frac{a}{1}$ | $\times$ | $\frac{n/a}{4}$ | 3 $\mapsto$ |
| 2 | $\times$ | 2 | 0 |

| $\frac{a}{a_1}$ | $\frac{n/a}{b_1}$ |
| $a_2$ | $b_2$ |
| $\vdots$ | $\vdots$ |
| $\sqrt{n}$ | $\sqrt{n}$ |

$a \times a = n$

$\Rightarrow a^2 = n$

$\therefore a = \sqrt{n}$

$$n - 192$$

| $\frac{a}{1}$ | $\times$ | 192 $\uparrow$ |

| $\frac{a}{1}$ | $\frac{n/a}{n}$ |

$n = 192$

$i \leq \sqrt{n}$

$\Rightarrow i^2 \leq n$

$i \times i \leq n$

| $a$ | | $n/a$ |
|---|---|---|
| 1 | × | 192 |
| 2 | × | 96 |
| 3 | × | 64 |
| 4 | × | 48 |
| 6 | × | 32 |
| 8 | × | 24 |
| 12 | × | 16 |

$\dfrac{a}{1} \qquad \dfrac{n/a}{n}$

— · —

①   ②   ③ → OFF
/       /       / → ON
        /       / → OFF

$N = 3 \rightarrow$ NO
$n = 6 \rightarrow$ ON

① ② ③ ④ ⑤ ⑥

①
②
③

⑥

$\boxed{n \% i == 0}$