

GCD / GCD

20

50

$$\begin{array}{r} 20 \overline{) 50} \quad 2 \\ \underline{40} \\ 10 \overline{) 20} \quad 2 \\ \underline{20} \\ 0 \end{array}$$

$$\begin{array}{r} 50 \overline{) 20} \quad 0 \\ \underline{0} \\ 20 \overline{) 50} \end{array}$$

$\text{gcd}(\text{int } a, \text{int } b)$

$\text{gcd}(b, a \% b)$

$$\text{lcm} * \text{hcf} / \text{gcd} = a * b$$

$$\text{lcm} = a * b / \text{gcd}$$

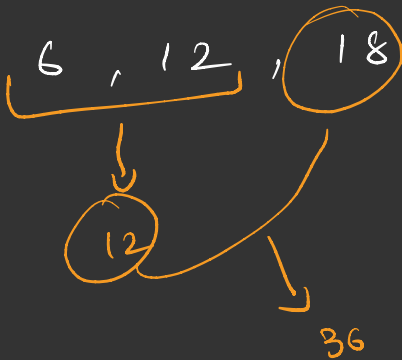
LCM \Rightarrow Least common multiple

(a, b)

Ques Evenly divisible number

$\Rightarrow \text{LCM}(1, \dots, n)$

$\Rightarrow \text{LCM}(a, b, c) \Rightarrow \text{LCM}(\text{LCM}(a, b), c)$



$1, \dots, n \Rightarrow \text{LCM}$

$(1, 2) \rightarrow 2, 3$
 $\rightarrow 4, 5$
 $\rightarrow \dots$

Ques Toggle bulb

$n = 10$

$\Rightarrow 3$

	1	2	3	4	5	6	7	8	9	10
R ₁										
R ₂										
R ₃										
R ₄										
R ₅										
R ₆										
R ₇										
R ₈										
R ₉										
R ₁₀										

B₁ $\Rightarrow 1$

B₄ 1, 2, 4

B₉ 1, 3, 9

B₆ 1, 2, 3, 6

B₈ 1, 2, 4, 8

B₅ = 1, 5

B₁₀ = 1, 2, 5, 10

$$0 \rightarrow 1 \rightarrow 0 \rightarrow 1$$

$$\begin{array}{r|l} 2 & 14 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$14 \Rightarrow 2, 7$$

$$\begin{array}{r|l} 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

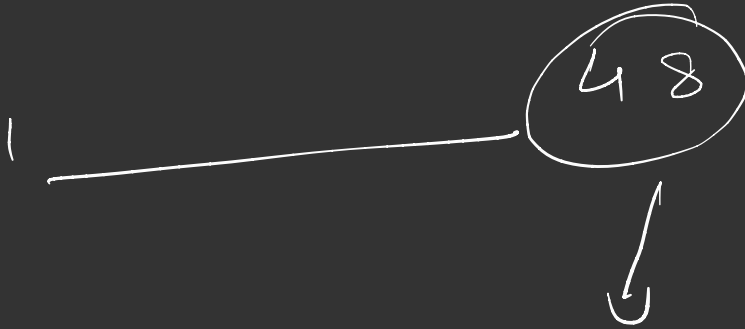
$$3, 5$$

$$\begin{array}{r|l} 7 & 29 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$(7)$$

$$6^2 \Rightarrow 36$$

$$7^2 \Rightarrow 49$$



$$\sqrt{48} \Rightarrow \underbrace{6.9 \dots}$$

1, 2, 3, 4, 5, 6,

1 4 9 16 25 36

Ques

$n \rightarrow$ 2 prime numbers whose sum is n

$$2 \rightarrow 1, 1$$

$$6 \rightarrow 1, 5$$

Sieve $\rightarrow O(n)$

70

$$1 \rightarrow 69$$

$$2 \rightarrow 68$$

$$3 \rightarrow 67$$

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for (i = 1; i <= n/2; i++) {
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    if (sieve[i] == T && sieve[n-i] == T) {
```

```
        syso(i, n-i);
```

```
    }
```

```
}
```

$$n \times \log_2(\log_2 n)$$

$$n = 10^9$$

$$10^9 \times \log_2 \log 10^9$$

$$10^9 \times \log_2 \log 2^{30}$$

$$10^9 \times \log_2 30$$

$$5 \times 10^9$$

$$32 \approx 2^5 \approx 30$$

$$10^9 \approx 2^{30}$$

$$10^3 \Rightarrow 1000 \approx 2^{10} \Rightarrow 1024$$