

Ques GCD

↳ greatest Common Divisor  
→ HCF

a, b

$$\begin{array}{r} 24, 36 \\ \hline 12 \end{array}$$

2, 3, 4, 6, 12

2, smaller(a, b)

$$24 \rightarrow 2$$

1st no that divides both  
a and b will be GCD

Euclid's theorem

36, 24

$$\text{rem} = a \% b;$$

$$a = b;$$

$$b = \text{rem};$$

$$\begin{array}{r} \cancel{36} 12 \\ a = \cancel{24} 12 \\ b = \cancel{36} \cancel{24} \\ \text{rem} = 24 \\ 12 \end{array}$$

$$\begin{array}{r} 36 \overline{) 24} 0 \\ \underline{0} \end{array}$$

$$\begin{array}{r} 24 \overline{) 36} 1 \\ \underline{-24} \end{array}$$

$$\begin{array}{r} 12 \overline{) 24} 2 \\ \underline{24} \\ 0 \end{array}$$

LCM  $\rightarrow$  Least Common Multiple

$a, b$

$$\text{LCM}(a, b) \times \text{GCD}(a, b) = a \times b$$

$$\text{LCM} = \frac{a \times b}{\text{GCD}(a, b)}$$

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Prime number

2, 3, 5, 7, 11, 13

Ques  $n$  is Prime

$$2 - n-1$$

$$2 - n/2$$

$$2 - \sqrt{n}$$

$$\begin{aligned} 2-9 \\ 2-5 \\ 2-3 \end{aligned}$$

$$\begin{array}{r} 13 \\ \textcircled{2-12} \\ 10 \\ \times \\ 3 \dots \end{array}$$

$$\begin{aligned} i &\leq \sqrt{n} \\ i \times i &\leq n \end{aligned}$$

Ques Print all the numbers from 1-n which are prime

②

```
for ( i = 2 ; i <= n ; i++ ) {  
    if ( isPrime ( i ) ) {  
        syso ( i ) ;  
    }  
}
```

## SIEVE OF ERATOSTHENES

12	0	1	2	3	4	5	6	7	8	9	10	11	12
	F	F	T	T	F	T	F	T	F	F	T	F	F

  

13	14	15	16	17	18	19	20	21	22	23	24	25
T	F	F	F	T	F	T	F	F	F	T	F	F

```
public static boolean[] sieveOfEratosthenes(int n) {  
    boolean sieve[] = new boolean[n + 1];  
    Arrays.fill(sieve, true);  
  
    sieve[0] = false;  
    sieve[1] = false;  
  
    for (int i = 2; i * i <= n; i++) {  
        // work only if true  
        if (sieve[i]) { // work only if true  
            for (int j = i * 2; j <= n; j += i) {  
                sieve[j] = false;  
            }  
        }  
    }  
    return sieve;  
}
```