Class 19

Sunday, January 3, 2021 10:01 PM

Prime Number
মৌলিক সংখ্যা

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, ...

isPrime(N) → true / false

```
for(i=2; i<N; i++)
{
    if(N%i==0)
        return false;
}
return true;
```

—o—

$\frac{N}{d_1} = d_2$

$\frac{12}{3} = 4$

3.4

$\frac{N}{d_1} = d_2$

$\Rightarrow \frac{N}{d_2} = d_1$

$\Rightarrow N = d_1 \times d_2$

$12 = 1 \times 12 \Rightarrow 11$

$= 2 \times 6 \Rightarrow 4$

$= 3 \times 4 \Rightarrow 1$

$N = d_1 \times d_1 = d \times d$

$\Rightarrow N = d_1^2$

$\Rightarrow N = d^2$

$\therefore d = \sqrt{N}$

$16 = 1 \times 16 \rightarrow 15$

$2 \times 8 \rightarrow 6$

$4 \times 4 \rightarrow 0$

$N = 1 \times N$

$2 \times N/2$

⋮

for(i=2 ; $i \le \sqrt{N}$; i++) ⓩ, ⓩ

if(N % i == 0)

↳ 0

$i > \sqrt{N}$

$i^2 > N$

↳ 1

$\frac{N}{d_1} = d_1$ $N = d_1 \times d_1$

N ⟶ count = c

square?

25 → ③ → 1, 5, 25

$N = P_1^{a_1} \times P_2^{a_2} \times P_3^{a_3} \times \dots \times P_k^{a_k}$

$(a_1+1)(a_2+1)(a_3+1)\dots(a_k+1)$

$12 = 2^{②} \times 3^{①}$ 1, 2, 3, 4, 6, 12

$(2+1)(1+1) = 3 \times 2 = 6$

$6 = 2 \times 3$

$N =$

$36 = (6)^2 = (2\times 3)^2 = 2^2 \times 3^2$

$N = (n)^2 = (p_1^{a_1} \times p_2^{a_2} \times \cdots \times p_k^{a_k})^2$

$= p_1^{2a_1} \times p_2^{2a_2} \times \cdots \times p_k^{2a_k}$

$(2a_1+1)(2a_2+1)\cdots(2a_k+1)$

N যদি বর্গসংখ্যা হয়, তাহলে divCount (N) % 2 == 1 হবে।

$10^{12} \longrightarrow 10^6 \times 10^5 = \frac{10^{11}}{10^8} \simeq 10^3$

$N = (n)^2$ ← prime

$N \rightarrow$ বর্গসংখ্যা

$\rightarrow \sqrt{N}$ prime

$25 = 5^2$

$2+1=3$

$\sqrt{\sqrt{N}} = N^{1/4}$

$N \geq 10^{12}$

$\sqrt{\sqrt{N}} = N$ $\quad N \approx 10^{12}$

$10^5 \times 10^3 \approx 10^8$ $\quad N^{1/4} = 10^3$

$2^2 \rightarrow$ YES

3^2

5^2

7^2

11^2

$4 \rightarrow 2$

$9 \rightarrow 3$

$25 \rightarrow 5$

$49 \rightarrow 7$

$121 \rightarrow 11$