Topics

GCD LCM

Prime

Divisors

"Everybody should learn to program a computer... because it teaches you how to think."

—Steve Jobs

Divisors :

When one No. divides completly (Reminder should be Zero), then that No. is a divisors.

(12) = 1, 2, 4, 3, 6, 12

(15) = 1, 3, 5, 15

(8) = 1, 2, 4, 8

12 % 1 = 0

12 % 2 = 0

12 % 4 = 0

12 % 3 = 0

12 % 6 = 0

12 % 12 = 0

12 % 5 = 2

12 % 7 = 5

12 % 8 = 4

N

check: (1 ..... N)

N % i = 0 = (i = 1, 2, 3 .... N)

(i = Divisors)

```
int N
cin >> N

for ( i=1 ; i<=N ; i++)
{
    if ( N % i == 0)
    {
        cout << i
    }
}
```

1 2 4 8

N = 8

i = ~~1 2 3 4 5 6 7 8~~ 9

8 % 1 = 0

8 % 2 = 0

✗ 8 % 3 = 2

8 % 4 = 0

✗ 8 % 5 = 3

✗ 8 % 6 = 2

✗ 8 % 7 = 1

8 % 8 = 0

Prime No.

(8) = 1 2 4 8

(6) = 1 2 3 6

9 = 1, 3, 9

(5) = 1 5

(7) = 1 7

(11) = 1 11

(2) $\leq$ 1 < N

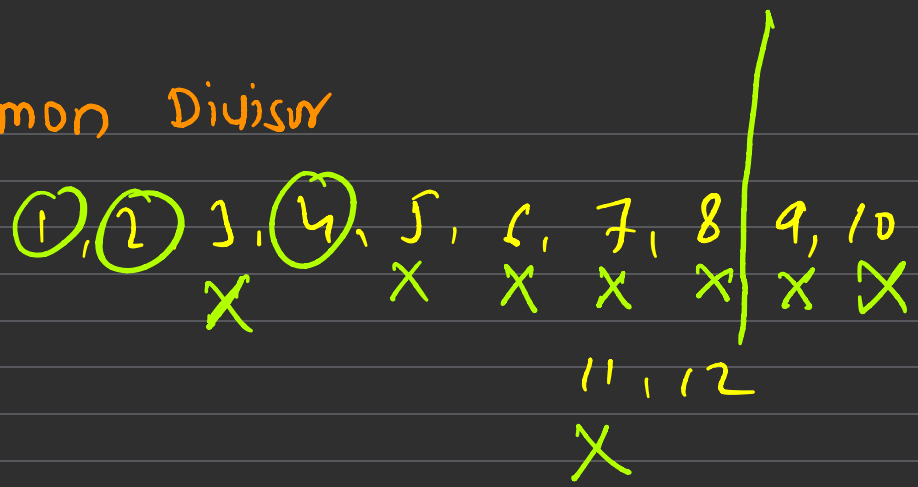
N = prime No. ?

```
int N
cin>> N

for (i=1 ; i<=N ; i++)
{
    if ( N % i == 0)
    {
        cnt++
    }
}
if (cnt == 2) prime
else Not Prime
```

GCD: Greatest common Divisor

1. GCD (12, 8) = 4
2. GCD (15, 10) = 5
3. GCD (10, 20) = 10
4. GCD (7, 10) = 1



$$GCD(A, B) \leq \min(A, B)$$

```
int A , B
cin >> A >> B

int n = min(A,B)

for(i=1 ; i<=min ; i++)
{
    if ( A %. i ==0 && B %. i ==0)
    {   ans = i

    }

}
cout << ans
```

ans = 4

A = 12

B = 8

N = 8

i = 1 2 3 4 5 6 7 8 9

12 %. 1 = 0 8 %. 1 = 0

12 %. 2 = 0 8 %. 2 = 0

✗ 12 %. 3 = 0 8 %. 3 = 2

12 %. 4 = 0 8 %. 4 = 0

✗ 12 %. 5 = 2 8 %. 5 = 3

✗ 12 %. 6 = 0 8 %. 6 = 2

✗ 12 %. 7 = 5 8 %. 7 = 1

LCM : Least Common Multiple

LCM (2, 10) = 10

LCM (8, 10) = 40

LCM (10, 20) = 20

$$LCM(A, B) \geq Max(A, B)$$

A		B	GCD		LCM
12	X	8	4	X	24
10	X	20	10	X	20
8	X	4	4	X	8
2	X	10	2	X	10

$$A \times B = GCD(A,B) \times LCM(A,B)$$

$$\frac{(A \times B)}{GCD(A,B)} = LCM(A,B)$$