05 July 2025 10:37

Loop

```
for(int i=0;i<5;i++){
    SOP(i);
}
```

0 1 2 3 4

i:0 0<5 → ✓ i:1
i:1 1<5 → ✓ i:2
i:2 2<5 → ✓ i:3
i:3 3<5 → ✓ i:4
i:4 4<5 → ✓ i:5
i:5 5<5 → ×

Prime number

16 → ? → 1, 2, 4, 8, 16

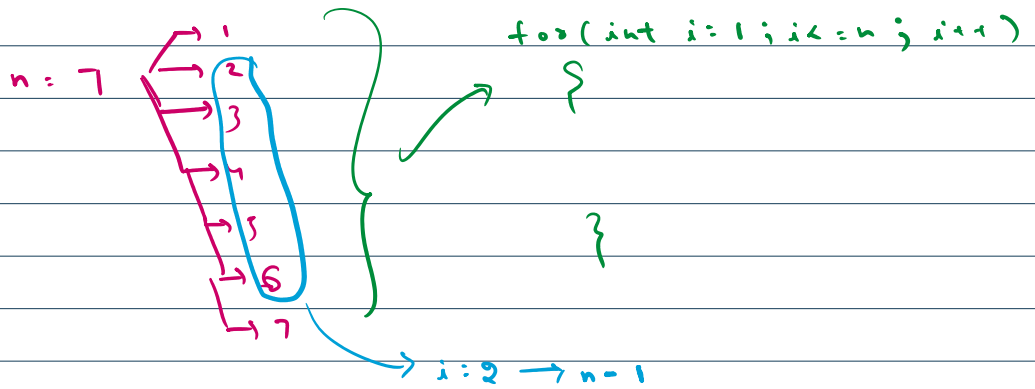
A no. which is divisible by 1 or itself.

n = 10

n : 10 is divisible by 5

10 % 5 == 0

modulus → rem.



A no. is prime only when it is not divisible by any number in the range of 2 to n-1.

int n = 7;

i:2 2<7 → ✓

```
int n = 7;
for (int i = 2; i < n; i++) {
    if (n % i == 0) {
        sop ("Not prime");
    }
    else {
        Sop ("prime");
    }
}
```

i = 2 2 < 7 → ✓

7 % 2 == 0

i = 3 3 < 7 → ✓

7 % 3 == 0

prime
prime

```
int n = 7;
int count = 0;
for (int i = 2; i < n; i++) {
    if (n % i == 0) {
        count++;
    }
}
```

divisible by how many times

i = 2 2 < 7 → ✓

7 % 2 == 0 → ✗

i = 3 3 < 7 → ✓

7 % 3 == 0 → ✗

i = 4 4 < 7 → ✓

7 % 4 == 0 → ✗

```
if(count == 0) {
    Sop("prime");
}
else {
    sop("not prime");
}
```

i = 5 5 < 7 → ✓

7 % 5 == 0 → ✗

i = 6 6 < 7 → ✓

7 % 6 == 0 → ✗

i = 7 7 < 7 → ✗

```
int n = 4;
int count = 0;

for(int i=2;i<n;i++){
    if(n%i==0){
        count++;
    }
}

if(count==0){
    System.out.println("prime");
}
else{
    System.out.println("not prime");
}
```

i = 2 2 < 4 → ✓

4 % 2 == 0 ⇒ 0 == 0 → ✓

i = 3 3 < 4 → ✓

4 % 3 == 0 ⇒ 1 == 0 → ✗

i = 4 4 < 4 → ✗

count = 1

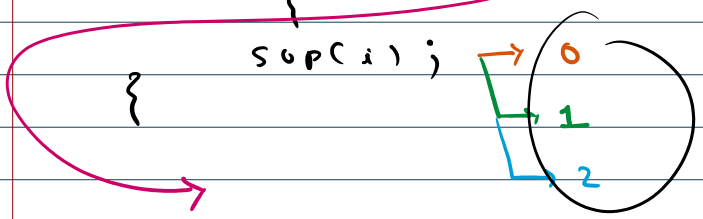
count == 0 → false

Break statement

363

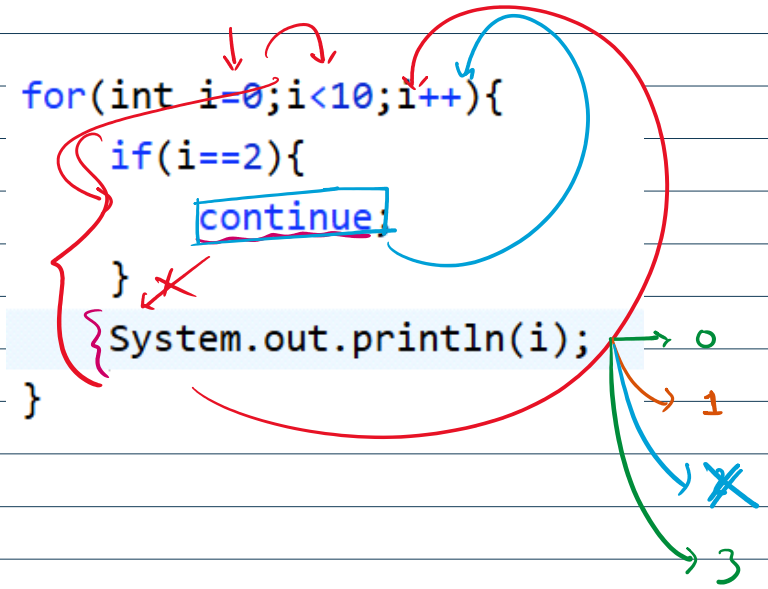
```
for (int i = 0 ; i < 9870; i++ ) {
        if (i == 363 ) {
            break ;
        }
        sop(i) ;
}
```

```
for(int i = 0; i < 7 ; i++ ) {
        if (i == 3 ) { true
            break ;
        }
        sop(i) ;
}
```



i:0 0<7 → ✓
0==3 → ×
i:1 1<7 → ✓
1==3 → ×
i:2 2<7 → ✓
2==3 → ×
i:3 3<7 → ✓
3==3 → ✓

```
for(int i=0;i<10;i++){
    if(i==2){
        continue;
    }
    System.out.println(i);
}
```



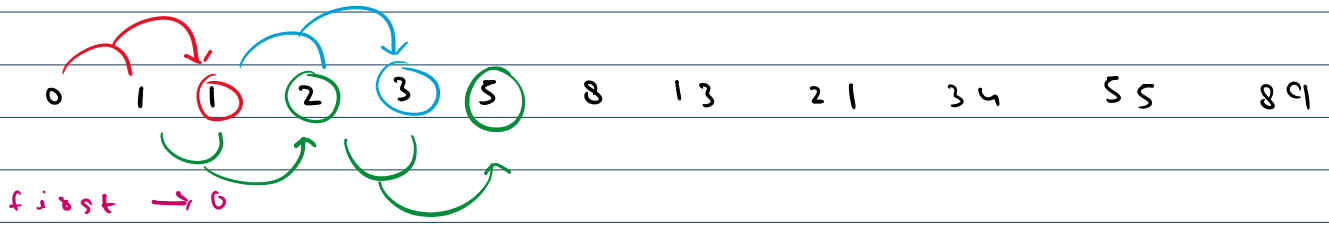
i:0 0<10 → ✓
0==2 → ×
i:1 1<10 → ✓
1==2 → ×
i:2 2<10 → ✓
2==2 → ✓
i:3 3<10 → ✓
3==3 → ×

Print all numbers from 1 to 100, which are not divisible by 3.

```
for(int i=1;i<=100;i++){
    if(i%3==0){
        continue;
    }
    sop(i);
}
```

```
for(int i=1;i<=100;i++){
    if(i%3!=0){
        sop(i);
    }
}
```

Fibonacci Series



first → 0

second → 1

a b

0 1 1 2 3 5 8

a ~~b~~ ~~c~~

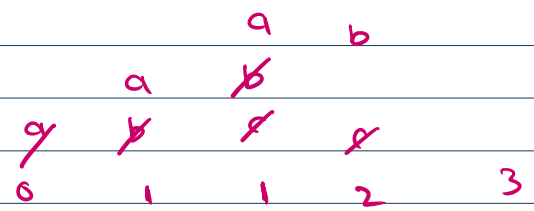
a ~~b~~ ~~c~~

→ a = b

b = c

c = a + b

```
a = 0
b = 1
c = a+b
    0+1
  = 1
```



```
a = 0 ;  → first
b = 1 ;  → second
```

fib(4) = ?

fib(3) + fib(2)

```
for (int i=0 ; i<=n-2 ; i++) {
        c = a + b ;  → third
        SOP(c) ;

        a = b ;
        b = c ;
}
```

Greatest common Divisor (GCD)

(60, 36)

→ Dividend

```
36 ) 60 ( 1
     36
     --
     24 ) 36 ( 1
          24
          --
          12 ) 24 ( 2
               24
               --
               0
```

Divisor ↙

GCD.

Find gcd of (140, 34)

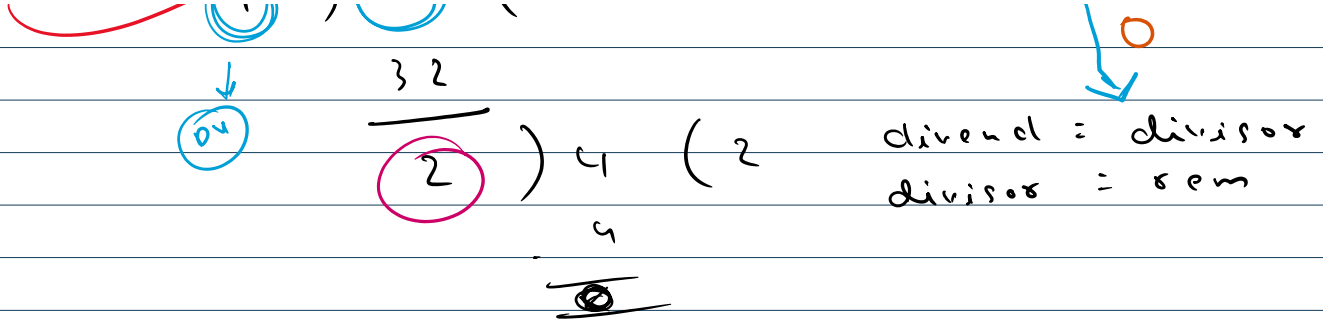
→ Dividend

```
34 ) 140 ( 4
     136
     ---
     4 ) 34 ( 8
         32
         --
         2 ) 4 ( 2
             4
             -
             0
```

Divisor ↙

=> Loop

↳ dividend % divisor


0
32
2
4
2
dividend : divisor
divisor : rem