Print 0 to n

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    int i = 0;
    while ( i <= n ) {
        System.out.println(i);
        i++;
    }
}
```

Printing 5 to N(While Loop)

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    int i = 5;
    while ( i <= n ) {
        System.out.println(i);
        i++;
    }
}
```

Print 4,13,22,31.....n

one liner :- from 4 to n by +9

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    int i = 4;
    while ( i < n ) {
        System.out.println(i);
        i += 9;
    }
}
```

Print n, n-k, n-2k, n-3k.... till l

one liner :- from n to l by -k

```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int N = scn.nextInt();
    int K = scn.nextInt();
    int L = scn.nextInt();

    int i = N;
    while ( i >= L ) {
        System.out.println(i);
        i -= K;
    }
}
```

N = 50
K = 5
L = 19

i = 50, (50 >= 19) ✓
i = 45, (45 >= 19) ✓
i = 40, (40 >= 19) ✓
i = 35, (35 >= 19) ✓
i = 30, (30 >= 19) ✓
i = 25, (25 >= 19) ✓
i = 20, (20 >= 19) ✓
i = 15, (15 >= 19) ×

o/p :- 50, 45, 40, 35, 30, 25, 20

Running Sum for loop

↳ Prefix Sum :- Sum of all the elements on the left side including itself

Ex:- n = 7

sum = 0	2	5	-2	-7	10	0	4
running sum	2	7	5	-2	8	8	12

dry run

```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    int sum = 0;
    for (int i = 0; i < n; i++) { // n times
        int val = scn.nextInt();
        sum = sum + val;
        System.out.print(sum + " ");
    }

}
```

n = 5

sum = 0 + 3 + 4 + (-2) + 10 + (-5)

i = 0, (0 < 5) ✓ val = 3

i = 1, (1 < 5) ✓ val = 4

i = 2, (2 < 5) ✓ val = -2

i = 3, (3 < 5) ✓ val = 10

i = 4, (4 < 5) ✓ val = -5

i = 5, (5 < 5) ✗

print 3 7 5 15 10

Fibonacci Series :-

↳ every term is sum of last 2 terms

series :- 0, 1, 1, 2, 3, 5, 8, 13, 21, ...

Nth Fibonacci Number 7

(M. Imp)

$F(1) = 1$

$F(2) = 1$

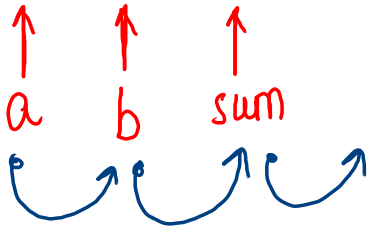
series = 1 (1), 1 (2), 2 (3), 3 (4), 5 (5), 8 (6), ---

i/p

n = 4 , ans = 3

series:- 1, 1, 2, 3, 5, 8, 13, 21, 34, ----

1 2 3 4 5 6 7 8 9 - - -



1st time → 3rd term

2nd time → 4th term

3rd time → 5th term

⋮

(n-2) times → nth term

a = 1

b = 1

loop

```
sum = a+b ;
a = b;
b = sum ;
```

Code

```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    if ( n == 1 ) {
        System.out.println(1);
    } else if (n == 2) {
        System.out.println(1);
    } else {
        int a = 1;
        int b = 1;
        int sum = 0;
        for (int i = 3; i <= n; i++) {
            sum = a + b;
            a = b;
            b = sum;
        }
        System.out.println(sum);
    }
}
```

n = 6

a = 1 1 2 3 5

b = 1 2 3 5 8

sum = 0

i = 3, sum = 2

i = 4, sum = 3

i = 5, sum = 5

i = 6, sum = 8

print(sum) = 8

Fibonacci number 12

n = 6 , ans = 0 1 1 2 3 5

(1) (2) (3) (4) (5) (6)

a b sum

code

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();

    int a = 0;
    int b = 1;
    int sum = 0;
    for (int i = 0; i < n; i++) {
        System.out.print(a + " ");
        sum = a + b;
        a = b;
        b = sum;
    }
}
```