

## ⇒ Inbuilt function

- 1) `Arrays.sort(arr);`  
// sort array in ↑ing order by default
- 2) `Arrays.sort(arr, Collections.reverseOrder());`  
// sort array in ↓ing order by default

# decreasing order using inbuilt sort

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int n = scn.nextInt();  
    Integer[] arr = new Integer[n];  
    for (int i = 0; i < n; i++) {  
        arr[i] = scn.nextInt();  
    }  
    //logic  
    Arrays.sort(arr, Collections.reverseOrder());  
  
    // print  
    for (int i = 0; i < n; i++) {  
        System.out.print(arr[i] + " ");  
    }  
}
```

# → Primitive Data Type

int →

boolean →

float →

char →

double →

object classes

Integer

Boolean

Float

Character

Double

(String)

Note :-

It can store  
an extra  
parameter  
called as  
null

⇒ Custom sort (alters the properties of inbuilt function)

arr =

0	1	2	3	4
-5	3	-2	8	0
(25)	(9)	(4)	(64)	(0)

⇒ 0   -2   3   -5   8

Note:- Custom sort never effect time complexity

# Syntax

Arrays.sort(arr, new myComparator());  
↳ declaration

---

→ implementation

```
public static class myComparator implements Comparator<Integer> {  
    @Override  
    public int compare(Integer a, Integer b) {  
        return a - b;   
    }  
}
```

← logic based on which elements of array will be arranged

meaning

return  $a - b$ ; // arrange elements of  
array in  $\uparrow$ ing order

return  $b - a$ ; // arrange elements of  
array in  $\downarrow$ ing order

Note:-  $a = \text{myself}$  ,  $b = \text{other}$

# → Comparator & Comparable

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int n = scn.nextInt();  
    Integer[] arr = new Integer[n];  
    for (int i = 0; i < n; i++) {  
        arr[i] = scn.nextInt();  
    }  
    //logic  
    Arrays.sort(arr, new myComparator());  
  
    // print  
    for (int i = 0; i < n; i++) {  
        System.out.print(arr[i] + " ");  
    }  
}
```

```
public static class myComparator implements Comparator<Integer> {  
    @Override  
    public int compare(Integer a, Integer b) {  
        return b - a;  
    }  
}
```

# Sort the array according to their Square of each element

$$n = 5$$

$$\text{arr} = [4, -1, 0, -5, 6]$$

(16) (1) (0) (25) (36)

$$\text{ans} = \begin{array}{|c|c|c|c|c|} \hline 0 & -1 & 4 & -5 & 6 \\ \hline \end{array}$$



code

```
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();
    Integer[] arr = new Integer[n];
    for (int i = 0; i < n; i++) {
        arr[i] = scn.nextInt();
    }
    //logic
    Arrays.sort(arr, new myComparator());

    // print
    for (int i = 0; i < n; i++) {
        System.out.print(arr[i] + " ");
    }
}

public static class myComparator implements Comparator<Integer> {
    @Override
    public int compare(Integer a, Integer b) {
        return a * a - b * b;
    }
}
```

# $\Rightarrow$ Lambda function (Imp)

(alters the properties of  
inbuilt function)

---

Arrays.sort(arr, (a, b)  $\rightarrow$  {  
    return a - b;  
});

code

```
public static void main(String[] args) {  
    Scanner scn = new Scanner(System.in);  
    int n = scn.nextInt();  
    Integer[] arr = new Integer[n];  
    for (int i = 0; i < n; i++) {  
        arr[i] = scn.nextInt();  
    }  
    //logic  
    Arrays.sort(arr, (a, b) -> {  
        return a * a - b * b;  
    });  
  
    // print  
    for (int i = 0; i < n; i++) {  
        System.out.print(arr[i] + " ");  
    }  
}
```

Arrays.sort(arr, (a, b) → {  
    return logic  
});

Ques    ↑ing    :-     $a - b$   
             ↓ing    :-     $b - a$

↑ing based on    :-     $(a * a * a) - (b * b * b)$   
    cube values

↓ing based on    :-     $b * b - a * a$   
    square values

Imp

↳ gf we return  $a-b$  :- ascending order  
based on values

↳ gf we return  $b-a$  :- descending order  
based on values


↳ gf we return  $+1$  :- a value will be  
place later

↳ gf we return  $-1$  :- a value will be  
place first

Ex:- Imp

5	2	1	-2	5	-7
---	---	---	----	---	----

$(a, b)$



$$\Rightarrow \underset{-7}{b} - \underset{5}{a} \quad [5, -7]$$

$a = \text{myself}$

$$\Rightarrow \underset{5}{a} - \underset{-7}{b} \quad [-7, 5]$$

$b = \text{other}$

$$\Rightarrow -1 \quad [5, -7]$$

$$\Rightarrow +1 \quad [-7, 5]$$