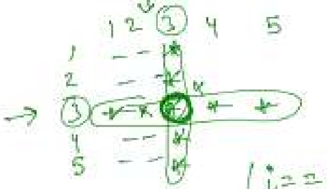


n = 5

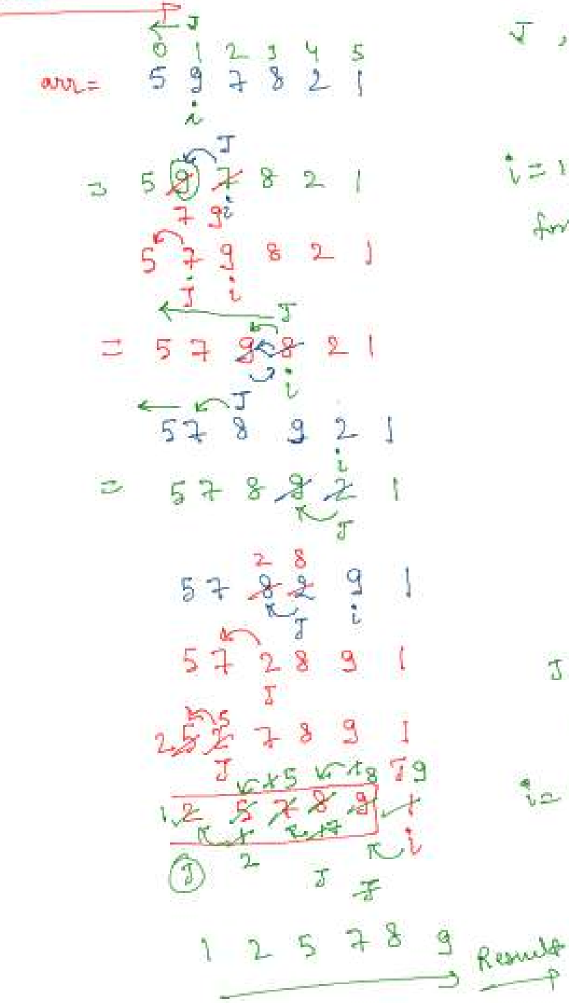
```
(i==n/2+1){

||(j==n/2+1){

{ if(i==j && i==n/2+1 && j==n/2+1){
        print(*);
    }
}
```

Insertion sort

1.



J , J-1

i=1 to arr length

for(j=i ; j≥0 ; j--){

}

J < J-1

swap

i=1

#

steps

start i = 1 go till end of array

put J = i-1 and compare J with J+1

if J+1 < J then swap

0 1 2 3 4 5
5 9 7 8 2 1
J i

1. 5 9 7 8 2 1
0 1 2 3 4 5

2. 5 ~~9~~ 7 ~~7~~ 9 8 2 1
0 1 2 3 4 5
i

0 1 2 3 4 5
J
2.1 5 7 9 8 2 1
J i

3.1 5 7 9 8 2 1
0 1 2 J
i

3.2 5 7 8 9 2 1
J i

4.1 5 7 8 ~~9~~ 2 ~~2~~ 9 1
i

4.2 5 7 ~~8~~ 2 ~~2~~ 8 9 1
J i

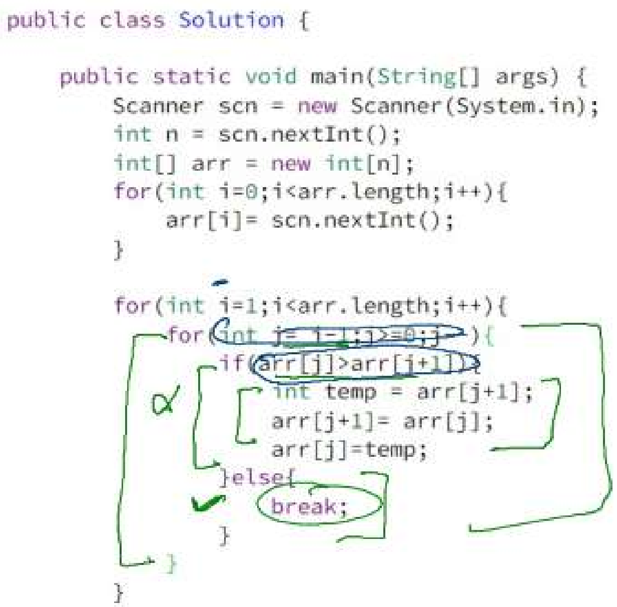
4.3 5 ~~7~~ 2 ~~2~~ 7 8 9 1
J i

4.4 ~~5~~ 2 ~~2~~ 5 7 8 9 1
i
J

4.5 2 5 7 8 9 1
i

5.1 2 5 7 8 9 1
J i

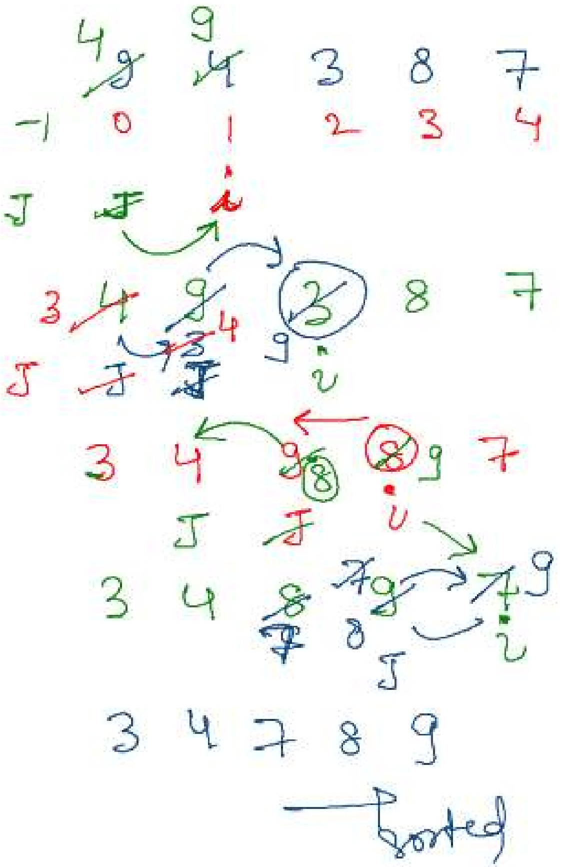
$\boxed{O(n)}$



```
public class Solution {

    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int[] arr = new int[n];
        for(int i=0;i<arr.length;i++){
            arr[i]= scn.nextInt();
        }

        for(int i=1;i<arr.length;i++){
            for(int j= i-1;j>=0;j--){
                if(arr[j]>arr[j+1]){
                    int temp = arr[j+1];
                    arr[j+1]= arr[j];
                    arr[j]=temp;
                }else{
                    break;
                }
            }
        }
```



a = ~~10~~ 20, b = ~~20~~ 10

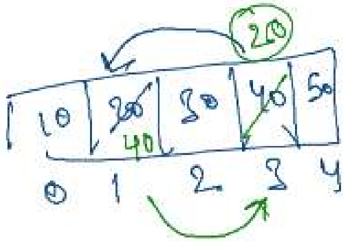
(10) temp = a;

a = b;

b = temp

O(1)

TC = O(n^2)



int temp = arr[1] // 20

arr[1] = arr[3]

arr[3] = temp

1, 3

return arr[i-1]

2nd → 1

4th ⇒

1st small	2nd small	3rd small	4th sm	5th small
↓	↓	↓	↓	↓
10	20	30	40	50
0	1	2	3	4

1. Bubble sort

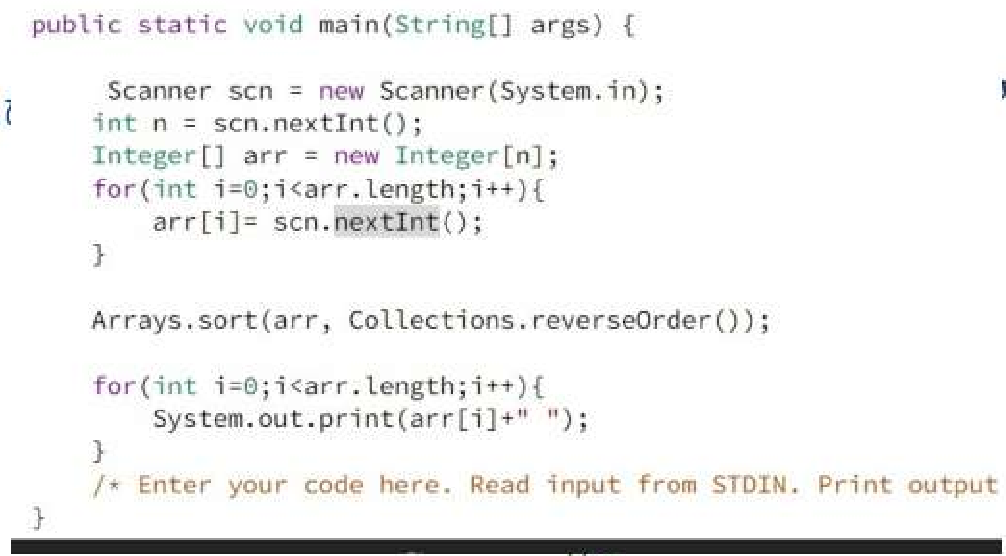
↳ take largest element till end

2. Selection sort →

↳ put smaller element in beginning

3 Insertion s

n



```
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<arr.length;i++){
        arr[i]= scn.nextInt();
    }

    Arrays.sort(arr, Collections.reverseOrder());

    for(int i=0;i<arr.length;i++){
        System.out.print(arr[i]+" ");
    }
    /* Enter your code here. Read input from STDIN. Print output
}
```

50

10 20 40 50 60 70

Ques

Java →
↳ Arrays
⇓

[String str = new String();]

[Scanner scn = new Scanner();]

inbuild class name

Inbuild class name,

```
class String {
   p.s.v. charAt() {

   }
   p.s.v. abcd() {
   }

}
```

str.charAt();
str.length();

str.abcd();

```
str.charAt() {

}
```

```
Class Arrays{     int[] arr
   p.s.v. sort() {

   }

}
```

⇒ Arrays.sort() arr

```
Class Bird {
   string color;
   int weight;

   fly() {
      Syso("flying")
   }
   eat() {
      S{
   }
}
```

physical entity

```
Bird eagle = new Bird();
Bird sparrow = new Bird();
Bird peacock = new Bird()

eagle.color = "Blue";
eagle.weight = 20;
eagle.fly();
```

Arrays.sort (arr); T.C = O(n log n);

SP = O(1);

val val val val val

arr = | 10 | 20 | 30 | 40 | 50 |

0 1 2 3 4

for each loop

```
for ( int val : arr ){
    Syso (val) → 10
                 20
                 30
                 40
                 50
}
```

Increasing

↓

Arrays.sort(arr);

↓

Coll

Arrays.sort (arr, Collections.reverseOrder( ));

boolean

↳ Boolean

int[] a

↳ Integer[ ] arr = new Integer[n];

decreasing

Integer val = 9 → "9"

↓

val.toString( );

32

```
String str = "9";
int ~~val~~ val = Integer.parseInt(str);
val = 9;
```

wrapper class

val

| 10 | 20 | 30 | 40 | 50 |

```
for( int val : arr){
    Syso ( val) 10
                20
    }           30
```

val = ~~10~~ ~~20~~ 30

```
for(int val = 0 ; val <= arr.length; val++){
        Syso ( arr[val]);   if(val == 2) {
                                 S
                                }
    }
```