

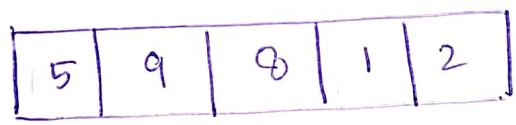
SELECTION SORT

The Algorithm maintains two subarrays in a given array

- ① Subarray which is already sorted
- ② Subarray which is unsorted.

Algorithm sorts an array by repeatedly finding the minimum element (Ascending order) from the unsorted part and putting it at beginning.

③ In iteration of SELECTION SORT, the minimum element (Ascending order) from the unsorted array is picked and moved to the sorted subarray.

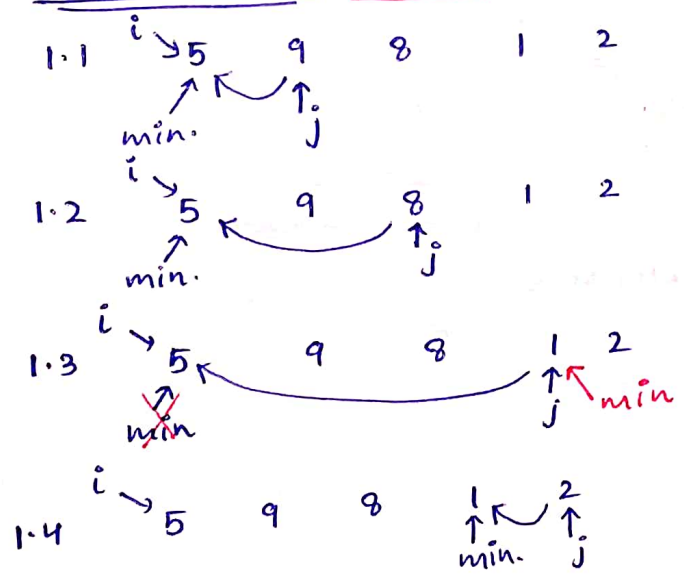


⑤ element hai
④ iterations chalegi!

④ pheli iteration me sabse chota element dundty hai aur usko first element ke sath swap krty hai! (j) min ke sath compare hoga)

ITERATION 1

i = 0

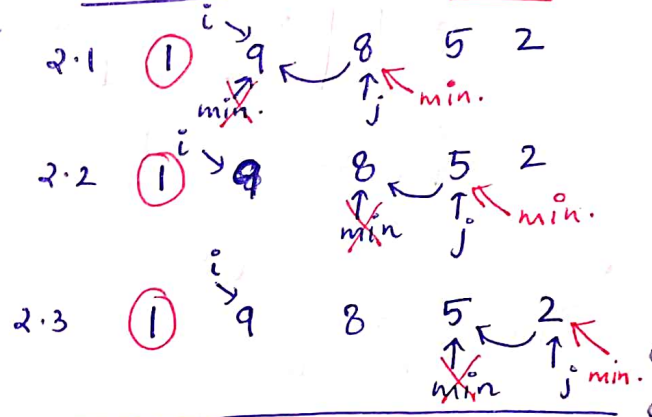


Array: 1 9 8 5 2

★ End me min. will be swapped with i

ITERATION 2

i = 1

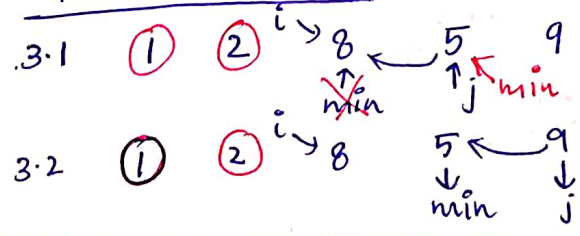


Array: 1 2 8 5 9

★ End me min. will be swapped with i

ITERATION 3

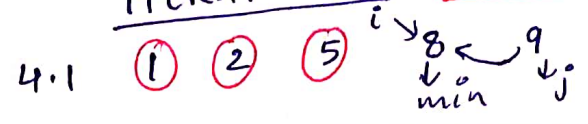
i = 2



Array: 1 2 5 8 9

ITERATION 4

i = 3



Array: 1 2 5 8 9

$i \rightarrow 0 - n-1$

$min \rightarrow i$ se start hoga hamesha!

$j \rightarrow i+1$ se start hoga aur end tak jayega!

```
public static void selectionSort (int[] arr) {  
    int n = arr.length;  
    for (int i = 0; i < n-1; i++) {  
        int minidx = i;  
        for (int j = i+1; j < n; j++) {  
            if (isSmaller (arr, j, minidx)) {  
                minidx = j;  
            }  
        }  
        swap (arr, i, minidx);  
    }  
}
```

→ loop for Journey / iterations
→ loop for comparison

// used for swapping i^{th} and j^{th} elements of array.

```
public static void swap (int[] arr, int i, int j) {  
    System.out.println ("swapping" + arr[i] + "and" + arr[j]);  
    int temp = arr[i];  
    arr[i] = arr[j];  
    arr[j] = temp;  
}
```

// returning true if i^{th} element is smaller than j^{th} element.

```
public static boolean isSmaller (int[] arr, int i, int j) {  
    System.out.println ("Comparing" + arr[i] + "and" + arr[j]);  
    if (arr[i] < arr[j]) {  
        return true;  
    } else {  
        return false;  
    }  
}
```

```
public static void print (int[] arr) {  
    for (int i = 0; i < arr.length; i++) {  
        syso (arr[i]);  
    }  
}
```

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