③ SELECTION SORT

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

The Algorithm maintains two subarrays in a given array

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

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

5	9	8	1	2

(5) element hai
(4) iterations chalegi!

⊛ 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]

1.1 — i → 5 (min), 9 (j), 8, 1, 2

1.2 — i → 5 (min), 9, 8 (j), 1, 2

1.3 — i → 5 (~~min~~), 9, 8, 1 (j, min), 2

1.4 — i → 5, 9, 8, 1 (min), 2 (j)

Array : (1) 9 8 5 2

✩ End me (min.) will be swaped with (i)

ITERATION 2 [i = 1]

2.1 — (1), i → 9 (~~min~~), 8 (j, min), 5, 2

2.2 — (1), i → 9, 8 (~~min~~), 5 (j, min), 2

2.3 — (1), i → 9, 8, 5 (~~min~~), 2 (j, min)

Array : (1) (2) 8 5 9

✩ End me (min) will be swaped with (i)

ITERATION 3 [i = 2]

3.1 — (1) (2) i → 8 (~~min~~), 5 (j, min), 9

3.2 — (1) (2) i → 8, 5 (min), 9 (j)

Array : (1) (2) (5) 8 9

ITERATION 4 [i = 3]

4.1 — (1) (2) (5) i → 8 (min), 9 (j)

Array : (1) (2) (5) (8) (9)

(i) → (0) — (n-1)

(min) → (i) se start hoga hamesha!

(j) → (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++) {          → loop for Journey/iternations
    int minidx = i;
    for(int j = i+1; j < n ; j++) {     → loop for comparsion
        if (isSmaller (arr, j, minidx){
            minidx =j;
        }
    }
    swap (arr, i, minidx);
  }
}
// used for swapping (ith) and (jth) 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 (ith) element is smaller than (jth) 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);
}}
```