

SORTING

Sorting is the process of arranging elements either in ascending or in descending order.

Some of the sorting Methods are,

- Selection Sort
- Bubble Sort
- Merge sort
- Quick sort

Selection Sort

It finds the smallest element in the list & swaps it with the element present at the head of the list. It is a very simple and natural way of sorting a list.

Steps:

- In selection sort the first element is compared with the remaining elements.
- If the first element is larger than the other elements, it should be interchanged.
- In the second iteration, the second element is compared with the following elements and interchange if not in order.
- This step is continued for various iterations, until the elements are sorted in an order.

Example : (44, 33, 55, 22, 11)

Iteration 1: First compare first element with all other element.

44, 33, 55, 22, 11 Compare 44 & 33. Not in order. So swap.

33, 44, 55, 22, 11 Compare 33 & 55. It is in order. So don't swap.

33, 44, 55, 22, 11 Compare 33 & 22. Not in order. So swap.

22, 44, 55, 33, 11 Compare 22 & 11. Not in order. So swap.

11, 44, 55, 33, 22 Now first element is in correct order.

Iteration 2: Now compare second element with all other element.

11, 44, 55, 33, 22 Compare 44 & 55. It is in order . So don't swap.

11, 44, 55, 33, 22 Compare 44 & 33. Not in order . So swap.

11, 33, 55, 44, 22 Compare 33 & 22. Not in order . So swap.

11, 22, 55, 44, 33 Now first two elements are in correct order.

Iteration 3: Now compare third element with all other element.

11, 22, 55, 44, 33 Compare 55 & 44. Not in order . So swap.

11, 22, 44, 55, 33 Compare 44 & 33. Not in order . So swap.

11, 22, 33, 55, 44 Now first three elements are in correct order.

Iteration 4: Now compare fourth element with all other element.

11, 22, 33, 55, 44 Compare 55 & 44. Not in order . So swap.

11, 22, 33, 44, 55 Now first 4 elements are in correct order.

Balance only one element is there. So sorting is over.

Program:

```
#include <stdio.h>
#include <conio.h>
void main()
{
    int i, j, temp, n, a[10];
    printf("Enter the value of N \n");
    scanf("%d", &n);
    printf("Enter the numbers \n");
    for (i = 0; i < n; i++)
        scanf("%d", &a[i]);
    for (i = 0; i < n; i++)
    {
        for (j = i + 1; j < n; j++)
        {
            if (a[i] > a[j])
            {
                temp = a[i];
                a[i] = a[j];
                a[j] = temp;
            }
        }
    }
    printf("The numbers arranged in ascending order are given below \n");
    for (i = 0; i < n; i++)
        printf("%d\n", a[i]);
}
```

```
printf("The numbers arranged in descending order are given below \n");
for(i=n-1;i>=0;i--)
    printf("%d\n",a[i]);
getch();
}
```

Output:

Enter the value of N

4

Enter the numbers

10 2 5 3

The numbers arranged in ascending order are given below

2

3

5

10

The numbers arranged in descending order are given below

10

5

3

2

