

Institute of Computer Technology  
B. Tech Computer Science and Engineering  
Subject: DS (2CSE302)

**PRACTICAL-20**

**AIM: - Implement bubble sort and insertion sort.**

**1. Swati is working on different sorting methods to sort the data. She wants to prepare sorting calculator which provides the facilities to sort all kind of sorting methods for same data. Kindly refer given scenario for calculator and implement it in C:**

**How many number you want to sort:**

**8**

**Enter the Elements for Sorting:**

**34**

**22**

**56**

**13**

**89**

**5**

**67**

**45**

**List of sorting methods:**

**1. Bubble Sort**

**2. Insertion Sort**

**3. Exit**

**Which choice do you want apply?**

**1**

**Pass-1: 22 34 13 56 5 67 45 89**

**Pass-2: 22 13 34 5 56 45 67 89**

**Pass-3: 13 22 5 34 45 56 67 89**

**Pass-4: 13 5 22 34 45 56 67 89**

**Pass-5: 5 13 22 34 45 56 67 89**

**Pass-6: 5 13 22 34 45 56 67 89**

**Pass-7: 5 13 22 34 45 56 67 89**

**SOLUTION**

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
void PrintArr(int arr[], int n)
```

```
{
```

```
    for (int i = 0; i < n; i++)
    {
        printf("%d ", arr[i]);
    }
}
void BubbleSort(int arr[], int n)
{
    int yash;
    for (int i = 0; i < n-1; i++)
    {
        for (int j = 0; j < n - i - 1; j++)
        {
            if (arr[j] > arr[j + 1])
            {
                yash = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = yash;
            }
        }
        printf("\nPass %d : ", i+1);
        PrintArr(arr, n);
    }
}
void InsertionSort(int arr[], int n)
{
    int i, yash, j;
    for (i = 1; i < n; i++)
    {
        yash = arr[i];
        j = i - 1;

        while (j >= 0 && arr[j] > yash)
        {
            arr[j + 1] = arr[j];
            j = j - 1;
        }
        arr[j + 1] = yash;
        printf("\nPass %d : ", i);
    }
}
```

```
        PrintArr(arr, n);
    }
}

int main()
{
    int arr[20];
    int num, ch;

    printf("\nHow many number you want to sort: ");
    scanf("%d", &num);
    printf("\nEnter the Elements for Sorting: ");
    for (int i = 0; i < num; i++)
    {
        scanf("%d", &arr[i]);
    }
    printf("\n\nList of Sorting methods:\n1. Bubble Sort\n2. Insertion
Sort\n3. Exit\n\nWhich choice do you want to apply? ");
    scanf("%d", &ch);
    switch (ch)
    {
    case 1:
        printf("\nBefore Bubble Sort : ");
        PrintArr(arr, num);
        printf("\n");
        BubbleSort(arr, num);
        printf("\n\nAfter Bubble Sort : ");
        PrintArr(arr, num);
        printf("\n");
        break;
    case 2:
        printf("\nBefore Insertion Sort : ");
        PrintArr(arr, num);
        printf("\n");
        InsertionSort(arr, num);
        printf("\n\nAfter Insertion Sort : ");
        PrintArr(arr, num);
        printf("\n");
    }
```

```

        break;
    case 3:
        exit(0);
        break;

    default:
        break;
}
printf("\n");
return 0;
}

```

## OUTPUT

### Bubble Sort: -

```

[yash@localhost Prac20]$ gcc p20.c
[yash@localhost Prac20]$ ./a.out

How many number you want to sort: 8

Enter the Elements for Sorting: 34 22 56 13 89 5 67 45

List of Sorting methods:
1. Bubble Sort
2. Insertion Sort
3. Exit

Which choice do you want to apply? 1

Before Bubble Sort : 34 22 56 13 89 5 67 45

Pass 1 : 22 34 13 56 5 67 45 89
Pass 2 : 22 13 34 5 56 45 67 89
Pass 3 : 13 22 5 34 45 56 67 89
Pass 4 : 13 5 22 34 45 56 67 89
Pass 5 : 5 13 22 34 45 56 67 89
Pass 6 : 5 13 22 34 45 56 67 89
Pass 7 : 5 13 22 34 45 56 67 89

After Bubble Sort : 5 13 22 34 45 56 67 89

[yash@localhost Prac20]$

```

Insertion Sort: -

```
CentOS 8 64-bit - VMware Workstation
File Edit View VM Tabs Help
Library
My Computer
CentOS 8 64-bit
Shared VMs (Deprecated)
Activities Applications Terminal
Nov 17 21:34
yash@localhost:~/Desktop/DS/practicals/Prac20
File Edit View Search Terminal Help
Pass 4 : 13 5 22 34 56 67 89 45
Pass 5 : 5 13 22 34 56 67 89 45
Pass 6 : 5 13 22 34 56 67 89 45
Pass 7 : 5 13 22 34 56 67 89 45
After Bubble Sort : 5 13 22 34 56 67 89 45
[yash@localhost Prac20]$ ./a.out
How many number you want to sort: 8
Enter the Elements for Sorting: 34 22 56 13 89 5 67 45
List of Sorting methods:
1. Bubble Sort
2. Insertion Sort
3. Exit
Which choice do you want to apply? 2
Before Insertion Sort : 34 22 56 13 89 5 67 45
Pass 1 : 22 34 56 13 89 5 67 45
Pass 2 : 22 34 56 13 89 5 67 45
Pass 3 : 13 22 34 56 89 5 67 45
Pass 4 : 13 22 34 56 89 5 67 45
Pass 5 : 5 13 22 34 56 89 67 45
Pass 6 : 5 13 22 34 56 67 89 45
Pass 7 : 5 13 22 34 45 56 67 89
After Insertion Sort : 5 13 22 34 45 56 67 89
[yash@localhost Prac20]$
```