

EXPERIENT 1.4

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SECTION: 13_A

SUBJECT: DATA STRUCTURE LAB

Question 1

Write a program to implement bubble sort. Given the numbers 7, 1, 4, 12, 67, 33, and 45. How many swaps will be performed to sort these numbers using the bubble sort?

SOLUTION

ALGORITHM

1. Declare an array arr[]={ 7, 1, 4, 12, 67, 33,45}.
2. Run the inner loop and outer loop.
3. for i <- 0 to list:Count - 1
4. for j <- 0 to list:Count – 1
5. Arrange the element of the array in the ascending order.
6. if list[i] < list[j]
7. Swap(list[i]; list[j])
8. Print the output with number of swaps performed.

PROGRAM CODE

```
#include <bits/stdc++.h>
using namespace std;
int bubbleSort(int arr[], int n)
{
    int swapCount = 1, temp, count = 0;
    for (int pass = n - 1; pass >= 0 && swapCount; pass--)
    {
        swapCount = 0;
        for (int i = 0; i <= (pass - 1); i++)
        {
            if (arr[i] > arr[i + 1])
            {
```

```

        temp = arr[i];
        arr[i] = arr[i + 1];
        arr[i + 1] = temp;
        swapCount = 1;
        count++;
    }
}
return count;
}
int main()
{
    int swaps;
    int arr[] = {7, 1, 4, 12, 67, 33, 45};
    int n = sizeof(arr) / sizeof(arr[0]);
    swaps = bubbleSort(arr, n);
    cout << "The sorted array is: ";
    for (int i = 0; i < n; i++)
    {
        cout << arr[i] << " ";
    }
    cout << endl;
    cout << "The number of swaps is: " << swaps << endl;
    return 0;
}

```

OUTPUT

```

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS E:\CHANDIGARH UNIVERSITY\COLLEGE SEMESTERS\THIRD SEMESTER\DATA STRUCTURES LAB> cd "e:\CHANDIGARH UNIVERSITY\COLLEGE SEMESTERS
ASSINGMENT_1_4_Q1.cpp -o ASSINGMENT_1_4_Q1 } ; if ($?) { .\ASSINGMENT_1_4_Q1 }
The sorted array is: 1 4 7 12 33 45 67
The number of swaps is: 4
PS E:\CHANDIGARH UNIVERSITY\COLLEGE SEMESTERS\THIRD SEMESTER\DATA STRUCTURES LAB>

```