Assignment No.: 10

Course Name	Programming in C Lab
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Branch	CSE
Class	C-1
Academic Year & Semester	2023-2024 & Semester 2
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Assignment Title (Full):	Write a C program using functions to accept a one-dimensional array of integers and sort them in ascending order.

Theory: (Note: According to the assignment title, please write the background information as an introduction, then write the steps/logic/process/algorithm of the C program in the Journal Notebook, and add its screenshot in the below theory response.)

Theory Response:

- Define a swap function that exchanges the values of two integers using pointers.
- Implement bubbleSort function that iterates through the array multiple times, comparing adjacent elements and swapping them if they are in the wrong order.
  - Outer loop controls the number of passes through the array.
  - Inner loop compares adjacent elements and swaps them if necessary.
- In main, initialize an integer array.
- Determine the number of elements in the array.
- Call bubbleSort passing the array and its size.
- Output the sorted array using printf.

Output: (Note: Execute the C program as per the assignment title, take an input code and output result screenshot with the date and time from your computer, and add its screenshot in the below output response.)

Output Response:

```c
1    #include <stdio.h>
2
3    void swap(int *a, int *b) {
4        int temp = *a;
5        *a = *b;
6        *b = temp;
7    }
8
9    void bubbleSort(int arr[], int n) {
10       for (int i = 0; i < n-1; i++) {
11           for (int j = 0; j < n-i-1; j++) {
12               if (arr[j] > arr[j+1]) {
13                   swap(&arr[j], &arr[j+1]);
14               }
15           }
16       }
17   }
18
19   int main() {
20       int arr[] = {64, 34, 25, 12, 22, 11, 90};
21       int n = sizeof(arr)/sizeof(arr[0]);
22       bubbleSort(arr, n);
23       printf("\nSorted array: \n");
24       for (int i = 0; i < n; i++) {
25           printf("%d ", arr[i]);
26       }
27       printf("\n");
28       return 0;
29   }
```

```
Sorted array:
11 12 22 25 34 64 90
> (base) fahee@Faheems-MacBook-Pro Programming_in_C %
```

Conclusion: (Note: Write the key findings or outcome from this assignment, enlist their potential real-world applications in Journal Notebook, and add its screenshot in the below conclusion response.)

Conclusion Response:

The code sorts an integer array in ascending order using the bubble sort algorithm and demonstrates the use of function calls and array manipulation in C. Bubble sort is a simple sorting algorithm that repeatedly steps through the list, compares adjacent elements, and swaps them if they are in the wrong order. This process is repeated until the array is fully sorted.

Please note that assignment content can be readable.

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