Software Engineer – Evaluation question

AdminDroid Array:

An AdminDroid array is a special type of array. In the AdminDroid array, the **first element** of the array always **has the length** of the array.

To create an AdminDroid array, you must create a regular array with the first element always indicating the array length. When adding or removing elements from the array, you must change the length in the first element.

A representation of the AdminDroid array (In memory):

9	1	2	3	4	5	6	7	8	9

Length of the Array   Array Elements

A representation of the AdminDroid array (In code):

```
1    #include<stdio.h>
2    int main()
3    {
4
5        int adminDroidArray[100] = {5, 1, 2 ,3 ,4, 5};//Declaring AdminDroid Array of Size 5
6        int i;
7
8        //Adding an element in AdminDroid Array
9        int currentSize = adminDroidArray[0];
10       adminDroidArray[++currentSize] = 6;
11       adminDroidArray[0] = currentSize;
12
13       for(i=1;i<=adminDroidArray[0];i++)
14       {
15         printf("%d ",adminDroidArray[i]);
16       }
17   }
```

We expect your interview programs to be aligned properly and compiled in Dev C++ before uploading.

A sample – for your understanding.

Below is a demonstration of how we expect your code to look when submitting. This screenshot is taken from Dev C++ editor to show syntax highlighting. *You must also follow the formatting below in your programs.*

TAMIL1001-SAMPLE.C

```c
1    //Name:
2    //College:
3    //Dept:
4    //Email:
5    //Phone:
6
7    #include<stdio.h>
8
9    void printArray(int arr[]) {
10       int i = 1, arrLength = arr[0]+1;
11       //Admindroid Array will has the length as its first element always.
12
13       for(;i< arrLength;i++) {
14          printf("%d ", arr[i]);
15       }
16       printf("\n");
17    }
18
19    void reverseArray(int arr[]) {
20       int j = arr[0], i = 1, temp;
21
22       while (i < j)
23       {
24          temp = arr[i];
25          arr[i] = arr[j];
26          arr[j] = temp;
27          i++;
28          j--;
29       }
30       printArray(arr);
31    }
32
33    void runTestCase(int tcNo, int arr[]) {
34       printf("Test Case %d:\n", tcNo);
35       printf("Input: ");
36       printArray(arr);
37       printf("Output: ");
38       reverseArray(arr);
39       printf("\n");
40    }
41
42    int main() {
43       int adminDroidArray1[] = {4, 2, 4, 3, 1};
44       int adminDroidArray2[] = {6, 1, 3, 8, 0, 5, 2};
45       int adminDroidArray3[] = {3, 4, 2, 0};
46       int adminDroidArray4[] = {10, 1, 3, 2, 9, 10, 7, 5, 8, 6, 4};
47       runTestCase(1, adminDroidArray1);
48       runTestCase(2, adminDroidArray2);
49       runTestCase(3, adminDroidArray3);
50       runTestCase(4, adminDroidArray4);
51       return 0;
52    }
```

Download this file here: TAMIL1001-SAMPLE.C

Output of the sample provided:

```
Test Case 1:
Input: 2 4 3 1
Output: 1 3 4 2

Test Case 2:
Input: 1 3 8 0 5 2
Output: 2 5 0 8 3 1

Test Case 3:
Input: 4 2 0
Output: 0 2 4

Test Case 4:
Input: 1 3 2 9 10 7 5 8 6 4
Output: 4 6 8 5 7 10 9 2 3 1


--------------------------------
Process exited after 0.03636 seconds with return value 0
Press any key to continue . . .
```

Evaluation Question – To be answered & submitted.

Sort the given AdminDroid array such that, after sorting, the first half of the array should have sorted odd numbers; similarly, second half of the array should have sorted even numbers from the AdminDroid array.

In this program, **the input will have an equal number of odd and even numbers**. Hence the AdminDroid array size will be an even number.

Note:

- The AdminDroid array length only includes the number of actual values and not the value stored in 0th index.
- The same input array should be sorted. You must not print results without storing in the AdminDroid array.
- You must print the results with AdminDroid array only.

Sample Test Case:

int sampleAdminDroidArr[] = {10, 1, 3, 2, 9, 10, 7, 5, 8, 6, 4}; //Assume this was the input in code.
Output: 1 3 5 7 9 2 4 6 8 10

Explanation:

- Here, the input contains 10 elements. Where five are odd numbers and five are even numbers.
- Odd numbers found**: 1 3 9 7 5**, and when sorted, it becomes: **1 3 5 7 9**
- Even numbers found**: 2 10 8 6 4**, and when sorted, it becomes: **2 4 6 8 10**
- Together when the array is sorted as per the question, the AdminDroid array becomes
  1 3 5 7 9 2 4 6 8 10

Evaluation submission link: https://link.admindroid.com/23-SE-SUB-GF-463

* Select **Evaluation Question** as question number when submitting the program for this question.

More Test cases for the Evaluation program:

(When printing an AdminDroid Array, only the values will be printed, not the size.)

```
Test Case 1:
        Input: 1 7 3 2 8 4
        Output: 1 3 7 2 4 8

Test Case 2:
        Input: 7 2 9 3 4 8
        Output: 3 7 9 2 4 8

Test Case 3:
        Input: 1 3 2 9 10 7 5 8 6 4
        Output: 1 3 5 7 9 2 4 6 8 10

Test Case 4:
        Input: 13 30 10 3 9 4 16 15 1 6 12 7 14 20 17 15
        Output: 1 3 7 9 13 15 15 17 4 6 10 12 14 16 20 30
```