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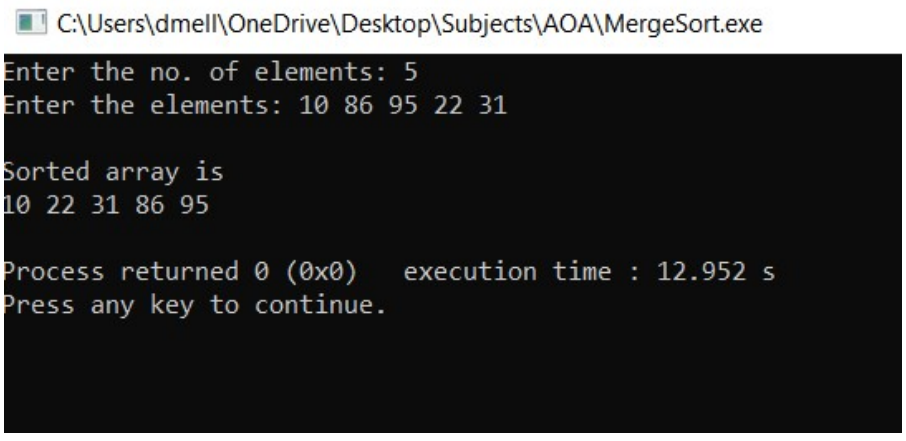
**Experiment 3: Quick Sort**

```
#include <stdio.h>
#include <stdlib.h>
void merge(int arr[], int l, int m, int r)
{
	int i, j, k;
	int n1 = m - l + 1;
	int n2 = r - m;
	int L[n1], R[n2];
	for (i = 0; i < n1; i++)
	L[i] = arr[l + i];
	for (j = 0; j < n2; j++)
		R[j] = arr[m + 1 + j];
	i = 0;
	j = 0;
	k = l;
	while (i < n1 && j < n2)
	{
		if (L[i] <= R[j])
		{
			arr[k] = L[i];
			i++;
		}
		else
		{
			arr[k] = R[j];
			j++;
		}
		k++;
	}
	while (i < n1)
	{
		arr[k] = L[i];
		i++;
		k++;
	}
	while (j < n2)
	{
		arr[k] = R[j];
		j++;
		k++;
	}
}
void mergeSort(int arr[], int l, int r)
{
	if (l < r)
	{
```

```
        int m = l + (r - l) / 2;
        mergeSort(arr, l, m);
        mergeSort(arr, m + 1, r);
        merge(arr, l, m, r);
        }
}
void printArray(int A[], int size)
{
        int i;
        for (i = 0; i < size; i++)
        printf("%d ", A[i]);
        printf("\n");
}
int main()
{
        int i,arr_size;
        printf("Enter the no. of elements: ");
        scanf("%d",&arr_size);
        int arr[arr_size];
        printf("Enter the elements: ");
        for(i=0;i<arr_size;i++)
                scanf("%d",&arr[i]);
        mergeSort(arr, 0, arr_size - 1);
        printf("\nSorted array is \n");
        printArray(arr, arr_size);
        return 0;
}
```

**Output**




**Postlab**

Space Complexity is O(n). Since same array is used and no space is wasted