

Merge Sort By Divide and Conquer

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

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

```
void merge(int arr[],int left,int mid,int right);
```

```
void merge_sort (int arr[], int left, int right)
```

```
{  
    if(left >=right)  
    {return;}  
    int mid = left+(right-left)/2;  
    merge_sort(arr,left,mid);  
    merge_sort(arr,mid+1,right);  
    merge(arr,left,mid,right);  
}
```

```
void merge(int arr[],int left,int mid,int right)
```

```
{  
  
    int index_a, index_l=0, index_r=0;  
  
    int size_left = mid - left + 1;  
  
    int size_right = right - mid;  
  
    int L[size_left], R[size_right];  
  
    for(int i=0;i<size_left;i++)  
    {  
        L[i]=arr[left+i];  
    }  
  
    for(int i=0;i<size_right;i++)  
    {  
        R[i]=arr[mid+1+i];  
    }  
  
    for(index_a = left; index_l < size_left && index_r < size_right; index_a++)  
    {  
        if( L[index_l]< R[index_r] )  
        {  
            arr[index_a] = L[index_l];  
            index_l += 1;  
        }  
  
        else  
        {  
            arr[index_a] = R[index_r];  
            index_r += 1;  
        }  
    }  
  
    while (index_l < size_left)  
    {  
        arr[index_a] = L[index_l];  
        index_l += 1;  
        index_a += 1;  
    }
```

```

    }

    while (index_r < size_right)
    {
        arr[index_a] = R [index_r];
        index_r += 1;
        index_a += 1;
    }
}

int main()
{
    int i, n, *arr;

    printf("Enter the number of elements you want to enter: \t");

    scanf("%d",&n);
    arr=(int*) malloc(n*sizeof(int));

    for(int i=0;i<n;i++){scanf("%d",&arr[i]);}

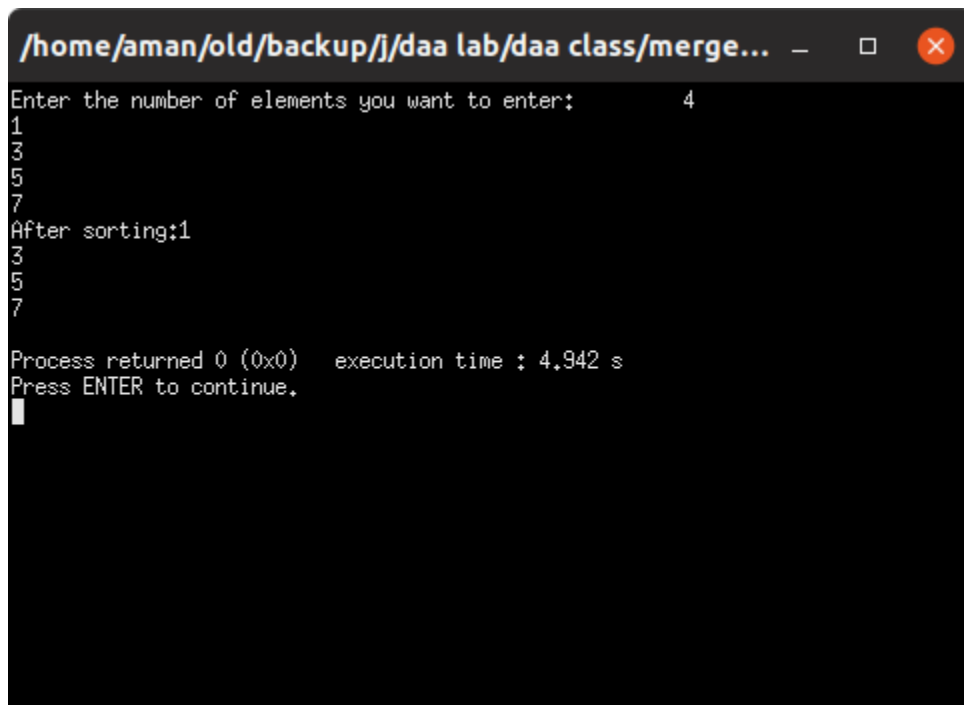
    printf("After sorting:");
    merge_sort(arr,0,n);

    for(i=1; i<n+1; i++)
    {

        printf("%d\n",arr[i]);

    }
    return 0;
}

```



```

/home/aman/old/backup/j/daa lab/daa class/merge...
Enter the number of elements you want to enter:      4
1
3
5
7
After sorting:1
3
5
7
Process returned 0 (0x0)   execution time : 4.942 s
Press ENTER to continue.

```