S.No: 4	Exp. Name: ***Merge Sort***	Date:2025-07-10

Aim:

Write a C program to perform Merge sort. Display the partial pass-wise sorting done.

Source Code:

mergeSortAlgo.c

```
// Type Content here...
# include<stdio.h>
int pass = 1;

void display( int a[], int start, int end){
   for(int i = start; i<= end; i++){
      printf("%d ",a[i]);
   }
   printf("\n");
}
void merge( int a[], int l, int m, int r){
   int n1= m-l+1;
   int n2 = r-m;

   int L[100], R[100];

   for( int i = 0; i < n1; i++)
      L[i] = a[l+i];
   for( int j = 0; j<n2; j++)
      R[j] = a[m+1+j];

   int i = 0, j = 0, k = l;

   while(i<n1 && j< n2){
      if(L[i] <= R[j]){
         a[k++] = L[i++];
      } else{
         a[k++] = R[j++];
      }
   }
   while(i < n1)
      a[k++] = L[i++];

   while(j < n2)
      a[k++] = R[j++];


   if(r - l >= 1){
      printf("Pass: ");
      display(a,l,r);
   }
}

void mergeSort(int a[], int l, int r){
   if(l < r){
      int m = (l + r)/2;
```


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```
      mergeSort(a,l,m);
      mergeSort(a,m+1,r);
      merge(a,l,m,r);
   }
}

int main(){
   int a[100], n;
   printf("no of elements: ");
   scanf("%d", &n);

   printf("elements: ");
   for(int i = 0; i<n; i++){
      scanf("%d",&a[i]);
   }
   printf("Given array:\n");
   display(a, 0, n-1);

   mergeSort(a, 0 , n-1);

   printf("Sorted array:\n");
   display(a,0,n-1);

   return 0;
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
no of elements: 5
elements: 5 3 7 1 9
Given array:
5 3 7 1 9
Pass: 3 5
Pass: 3 5 7
Pass: 1 9
Pass: 1 3 5 7 9
Sorted array:
1 3 5 7 9

Test Case - 2
User Output
no of elements: 8
elements: 8 4 2 7 1 5 3 6
Given array:
8 4 2 7 1 5 3 6
Pass: 4 8
Pass: 2 7
Pass: 2 4 7 8
Pass: 1 5

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```
Pass: 3 6
Pass: 1 3 5 6
Pass: 1 2 3 4 5 6 7 8
Sorted array:
1 2 3 4 5 6 7 8
```