LAB PROGRAM 4

AIM: Sort a given set of N integer elements using Merge Sort technique and compute its time taken. Run the program for different values of N and record the time taken to sort.

SOURCE CODE

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

void mergesort(int arr[],int lb, int ub)
{
   if(lb<ub)
   {
      int mid=(lb+ub)/2;
      mergesort(arr,lb,mid);
      mergesort(arr,mid+1,ub);
      merge(arr,lb,mid,ub);
   }
}

void merge(int arr[],int lb,int mid,int ub)
{
   int i=lb;
   int b[20];
   int j=mid+1;
   int k=lb;

   while(i<=mid && j<=ub)
   {
      if(arr[i]<arr[j])
```

```
    {
        b[k]=arr[i];
        i++;
        k++;
    }
    else
    {
        b[k]=arr[j];
        j++;
        k++;
    }
}

if(i>mid)
{
    while(j<=ub)
    {
        b[k]=arr[j];
        j++;
        k++;
    }
}
else
{
    while(i<=mid)
    {
        b[k]=arr[i];
        i++;
        k++;
```

```
        }
    }
    for(k=0;k<ub;k++)
    {
        arr[k]=b[k];
    }
}



int main()
{
    int arr[20],i,j,n;
    printf("ENTER THE SIZE OF ARRAY: ");
    scanf("%d",&n);
    printf("ENTER THE ARRAY:\n");
    for(i=0;i<n;i++)
    {
        scanf("%d",&arr[i]);
    }
    mergesort(arr,0,n-1);
    for(i=0;i<n;i++)
    {
        printf("%d\t",arr[i]);
    }
}
```

OUTPUT SCREENSHOT