ADA-LAB-4

Q) 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.

CODE-

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


void merge(int low,int mid,int high,int array[20],int mer[20])
{
   int i = low;
   int j = mid+1;
   int k = 0;

   while(i<=mid && j<=high)
   {
      if(array[i]<array[j])
      {
         mer[k] = array[i];
         i++;
         k++;
      }
      else
      {
         mer[k] = array[j];
         j++;
         k++;
      }
   }

   while (i <= mid)
   {
      mer[k] = array[i];
      i++;
      k++;
   }

   while (j <= high)
   {
      mer[k] = array[j];
      j++;
      k++;
   }

   for(int i=0;i<k;i++)
   {
      array[low+i] = mer[i];
   }
}

void merge_sort(int low,int high,int array[20],int merged[20])
{
   if(low<high)
```

```
    {
        int mid = (low+high)/2;
        merge_sort(low,mid,array,merged);
        merge_sort(mid+1,high,array,merged);
        merge(low,mid,high,array,merged);
    }
}


int main()
{
    int n,array[30];
    printf("Enter no of elements:");
    scanf("%d",&n);
printf("Enter elements:");

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

    int merged[30];

merge_sort(0,n-1,array,merged);
printf("Sorted array:");

    for(int i=0;i<n;i++)
    {
        printf("%d ",array[i]);
    }
}
```

OUTPUT-