WEEK 5 ADA

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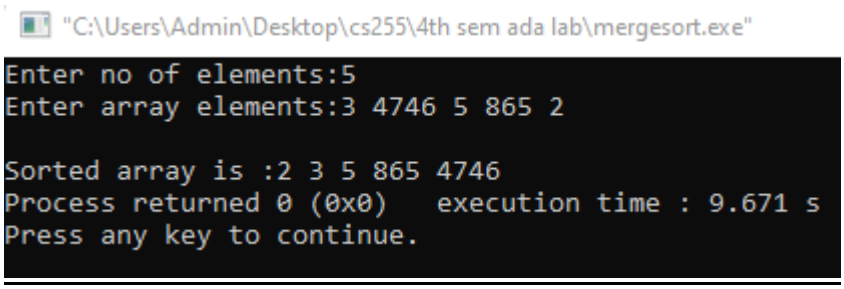
MERGE SORT CODE

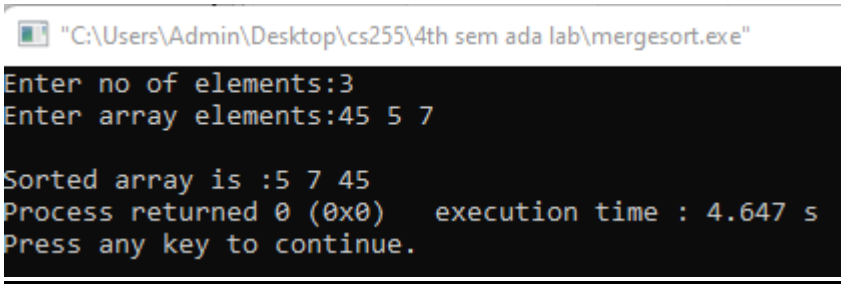
```
#include<stdio.h>

void mergesort(int a[],int i,int j);
void merge(int a[],int i1,int j1,int i2,int j2);

int main()
{
int a[30],n,i;
printf("Enter no of elements:");
scanf("%d",&n);
printf("Enter array elements:");
for(i=0;i<n;i++)
scanf("%d",&a[i]);
mergesort(a,0,n-1);
printf("\nSorted array is :");
for(i=0;i<n;i++)
printf("%d ",a[i]);
return 0;
}

void mergesort(int a[],int i,int j)
{
int mid;
```

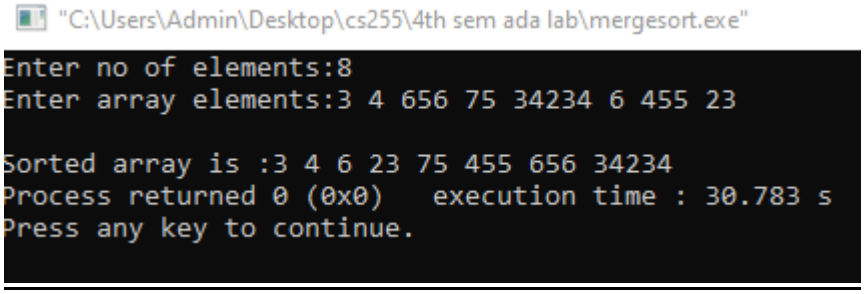
```
if(i<j)
{
mid=(i+j)/2;
mergesort(a,i,mid); //left recursion
mergesort(a,mid+1,j); //right recursion
merge(a,i,mid,mid+1,j); //merging of two sorted sub-arrays
}
}

void merge(int a[],int i1,int j1,int i2,int j2)
{
int temp[50]; //array used for merging
int i,j,k;
i=i1; //beginning of the first list
j=i2; //beginning of the second list
k=0;
while(i<=j1 && j<=j2) //while elements in both lists
{
if(a[i]<a[j])
temp[k++]=a[i++];
else
temp[k++]=a[j++];
}
while(i<=j1) //copy remaining elements of the first list
temp[k++]=a[i++];
while(j<=j2) //copy remaining elements of the second list
temp[k++]=a[j++];
//Transfer elements from temp[] back to a[]
for(i=i1,j=0;i<=j2;i++,j++)
```

```
a[i]=temp[j];

}
```

MERGE-SORT OUTPUT







QUICKSORT CODE

```
#include<stdio.h>

void qsort(int a[], int low, int high)
{
   int mid;
   if(low<high)
   {
      mid=partition(a,low,high);
      qsort(a,low,mid-1);
      qsort(a,mid+1, high);
   }
}

int partition(int a[],int low, int high)
{
   int i,j,temp, pivot;
   pivot=a[low];
   i=low+1;
   j=high;

   while(i<=j)
   {
      while(a[i]<=pivot)
         i++;
      while(a[j]>pivot)
         j--;

      if(i<j)
```

```
        {
            temp=a[i];
            a[i]=a[j];
            a[j]=temp;
        }
    }

    temp=a[low];
    a[low]=a[j];
    a[j]=temp;
    return j;
}

int main()
{
    int a[30],n,i;
    printf("Enter no of elements:");
    scanf("%d",&n);
    printf("Enter array elements:");
    for(i=0;i<n;i++)
    scanf("%d",&a[i]);

    qsort(a,0,n-1);
    printf("\nSorted array is :");
    for(i=0;i<n;i++)
    printf("%d ",a[i]);

    return 0;
}
```

QUICK-SORT OUTPUT