WEEK 5

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MERGE SORT

INPUT:

```c
#include<stdio.h>

void merge(int a[],int low, int mid,int high)
{
    int i,j,k,c[20];
    i=low;
    j=mid+1;
    k=low;
    while(i<=mid && j<=high)
    {
        if(a[i]<a[j])
            c[k++]=a[i++];
        else
            c[k++]=a[j++];
    }
    while(i<=mid)
        c[k++]=a[i++];
    while(j<=high)
        c[k++]=a[j++];
    for(i=low;i<=high;i++)
        a[i]=c[i];
}

void mergesort(int a[],int low, int high)
{
    int mid;
    if(low<high)
    {
        mid=(low+high)/2;
        mergesort(a,low,mid);
        mergesort(a,mid+1,high);
        merge(a,low,mid,high);
    }
}

int main()
{
    int i,n,a[20];
    printf("enter the number of elements:\n");
```

```
    scanf("%d",&n);
    printf("enter the elements into the array:\n");
    for(i=0;i<n;i++)
        scanf("%d",&a[i]);
    printf("before merge sort:\n");
    for(i=0;i<n;i++)
        printf("%d ",a[i]);
    printf("\n");
    mergesort(a,0,n-1);
    printf("after merge sort:\n");
    for(i=0;i<n;i++)
        printf("%d ",a[i]);
}
```

OUTPUT:

```
enter the number of elements:
5
enter the elements into the array:
20 15 -3 50 18
before merge sort:
20 15 -3 50 18
after merge sort:
-3 15 18 20 50
PS C:\Users\Admin\Downloads>
```

Quick Sort
INPUT:

```c
#include <stdio.h>
#include <stdlib.h>
int partition(int A[], int low, int high)
{
    int i, j, pivot, temp;
    i = low + 1;
    pivot = A[low];
    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;
}
void quickSort(int A[], int low, int high)
{
    int mid;
    if (low < high)
    {
        mid = partition(A, low, high);
        quickSort(A, low, mid - 1);
        quickSort(A, mid + 1, high);
    }
}
int main()
{
    int n;
    int i;
    int A[10];
    printf("\nEnter the number of elements: ");
    scanf("%d", &n);
    printf("\nEnter array elements\n");
    for (i = 0; i < n; i++)
```

```
        scanf("%d", &A[i]);
    printf("Before Quick sort:\n");
    for (i = 0; i < n; i++)
        printf("%d ", A[i]);
    printf("\n");
    quickSort(A, 0, n - 1);
    printf("After Quick sort:\n");
    for (i = 0; i < n; i++)
        printf("%d ", A[i]);
}
```

OUTPUT:

```
Enter the number of elements: 5

Enter array elements
20 50 10 -3 12
Before Quick sort:
20 50 10 -3 12
After Quick sort:
-3 10 12 20 50
PS C:\Users\Admin\Downloads>
```