Assignment-9

Implement the Merge Sort algorithm in Java to efficiently sort an array of integers.

```
package datastructures.sort;


public class MergeSortDemo {


	static void merge(int arr[],int l,int m,int r) {
		int n1=m-1+1;
		int n2=r-m;
		int L[]=new int[n1];
		int R[]=new int [n2];
		for(int i=0;i<n1;i++)
			L[i]=arr[l+i];
		for(int j=0;j<n2;j++)
			R[j]=arr[m+1+j];
		int i=0,j=0;
		int k=1;
		while(i<n1 && j<n2) {
			if(L[i]<=R[j]) {
				arr[k]=L[i];
```

```
                i++;
            }else {
                arr[k]=R[j];
                j++;
            }
            k++;
        }
        while(i<n1) {
            arr[k]=L[i];
            i++;
            k++;
        }
        while(j<n2) {
            arr[k]=R[j];
            j++;
            k++;
        }
    }

    static void sort(int arr[],int l,int r) {
        if(l<r) {
            int m=1+(r-1)/2;
            sort(arr,l,m);
            sort(arr,m+1,r);
```

```
                merge(arr,1,m,r);
            }
        }

        public static void printArr(int[] arr){
            for(int i=0;i<arr.length;i++) {
                System.out.println(arr[i]+" ");
            }
            System.out.println();

    }

    public static void main(String[] args) {
        int arr[]= {12,11,13,5,6,7};
        System.out.println("Array is : ");
        printArr(arr);
        sort(arr,0,arr.length-1);
        System.out.println("Sorted Array : ");
        printArr(arr);

    }

}
```