

7. Writing a program in Java implementing the merge sort algorithm

```
package OnlinePractice4;

import java.util.Arrays;

class MergeSort {

    void merge(int array[], int p, int q, int r) {

        int n1 = q - p + 1;

        int n2 = r - q;

        int L[] = new int[n1];

        int M[] = new int[n2];

        for (int i = 0; i < n1; i++)

            L[i] = array[p + i];

        for (int j = 0; j < n2; j++)

            M[j] = array[q + 1 + j];

        int i, j, k;

        i = 0;

        j = 0;

        k = p;

        while (i < n1 && j < n2) {

            if (L[i] <= M[j]) {

                array[k] = L[i];

                i++;

            } else {

                array[k] = M[j];

                j++;

            }

            k++;

        }

    }

}
```

```

while (i < n1) {
    array[k] = L[i];
    i++;
    k++;
}

while (j < n2) {
    array[k] = M[j];
    j++;
    k++;
}
}

void mergeSort(int array[], int left, int right) {
    if (left < right) {
        int mid = (left + right) / 2;
        mergeSort(array, left, mid);
        mergeSort(array, mid + 1, right);
        merge(array, left, mid, right);
    }
}

public static void main(String args[]) {
    int[] array = { 6, 5, 12, 10, 9, 1 };
    System.out.println("Before Selection Sort");

    for(int i =0 ; i<array.length ;++i) {
        System.out.print(array[i]+" ");
    }

    System.out.println();

    MergeSort ob = new MergeSort();
    ob.mergeSort(array, 0, array.length - 1);
}

```

```
System.out.println("After Sorted Array:");  
System.out.println(Arrays.toString(array));  
}  
}
```

output-

Before Selection Sort

6 5 12 10 9 1

After Sorted Array:

[1, 5, 6, 9, 10, 12]