

```
public class MergeSort {
    public static void main(String[] args) {
        int[] a = new int[15];
        for (int i = 0; i < a.length; i++) {
            a[i] = (int) (Math.random() * a.length);
        }
        mergeSort(a);
        for (int i = 0; i < a.length; i++) {
            System.out.print(a[i] + " ");
        }
        System.out.println();
    }

    public static void mergeSort(int[] a) {
        mergeSortHelper(a, 0, a.length-1);
    }

    public static void mergeSortHelper(int[] a, int lo, int hi) {
        if (lo >= hi) return;

        // Sort the first half of the array
        mergeSortHelper(a, lo, (lo + hi) / 2);

        // Sort the second half of the array
        mergeSortHelper(a, (lo + hi) / 2 + 1, hi);

        // "Merge" the two sorted halves
        merge(a, lo, (lo+hi) / 2, hi);
    }

    public static void merge(int[] a, int lo, int mid, int hi) {
        int[] temp = new int[a.length];
        int i = lo;
        int j = mid + 1;
        int temp_ctr = lo;
        while (temp_ctr <= hi) {
            if (i > mid || (j <= hi && a[j] < a[i])) {
                temp[temp_ctr] = a[j];
                j++;
                temp_ctr++;
            } else {
                temp[temp_ctr] = a[i];
                i++;
                temp_ctr++;
            }
        }

        // Copy temp back into the original array.
        for (temp_ctr = lo; temp_ctr <= hi; temp_ctr++) {
            a[temp_ctr] = temp[temp_ctr];
        }
    }
}
```