1. Please use the merge sort algorithm to sort the following sequence and check if this algorithm is stable. Please show the running processes.   
   Sequence: {26 17 93 31 55 20 44 77 1 63}.
2. Please complete the following table. You should give the time complexity in Big O notation and explain the result.

|  |  |  |
| --- | --- | --- |
|  | Best case | Worst case |
| Insertion Sort |  |  |
| Quick Sort |  |  |
| Merge Sort |  |  |

1. Heap sort is unstable. Please give an example to demonstrate that the order of records with equal key is not preserved
2. Write the status of the list (12, 2, 16, 30, 8, 28, 4, 10, 20, 6, 18) at the end of each phase of *MergeSort* (Program 7.9).
3. Suppose that we use Program 7.12 to obtain a Merge Sort function. Is the resulting function a stable sort?
4. Write the status of the list (12, 2, 16, 30, 8, 28, 4, 10, 20, 6, 18) at the end of the first **for** loop as well as at the end of each iteration of the second **for** loop of *HeapSort* (Program 7.14).