

## Renjun Zheng's Programming Assignment 2 Report

Time Complexity:  $O(n(\log n)^2)$  because the sequence of k, have  $(\log n)^2$ , and with n node to go through so the time complexity is  $n(\log n)^2$ .

Space Complexity:  $O(n)$  because I create a linked list of size of n, and no more space are needed.

The time complexity is the same as the first programming assignment. But because coefficient are much bigger than first one because the exists of the linked list and linked node.

The space complexity is smaller because all the memory need is just the size of the node. Even though the linked list need memory, but comparing with the memory required for the list is small.

Numbers	I/O Time	Sorting Time
10	0.000000e+00	0.000000e+00
1000	0.000000e+00	0.000000e+00
10000	0.000000e+00	1.320000e+00
100000	3.000000e--02	4.550000e+01
1000000	3.800000e--01	2.310000e+02