SOFT153 Coursework

1. Doubly linked list:
2. Please find attached a Visual Studio solution with the linked list functionality.
3. Please find attached a Visual Studio solution with the linked list sorting functionality.
4. Run-time complexity

Quicksort

|  |  |
| --- | --- |
| Nodes | Time (ms) |
| 2000 | 34.9992 |
| 4000 | 148.9959 |
| 8000 | 653.9827 |
| 16000 | 3708.9952 |
| 32000 | 21066.443 |
| 64000 | 93996.6672 |
| 128000 | 465144.8786 |

Insertion Sort

|  |  |
| --- | --- |
| Nodes | Time (ms) |
| 2000 | 13.9997 |
| 4000 | 23.999 |
| 8000 | 99.9974 |
| 16000 | 441.9883 |
| 32000 | 2229.9427 |
| 64000 | 9776.741 |
| 128000 | 43889.2841 |

Comparison

As you can see when both insertion sort and quicksort are plotted on the same graph, insertion follows the O(n) time complexity pattern and quicksort clearly shows it more closely represents O(n log n).