The following materials have been collected from the numerous sources including my own and my students over the years of teaching and experiences of programming. Please help me to keep this tutorial up-to-date by reporting any issues or questions. Please send any comments or criticisms to [idebtor@gmail.com](mailto:idebtor@gmail.com). Your assistances and comments will be appreciated.

A doubly linked list with sentinel nodes(ver 2.)

# Step 8. Test scores

If it takes less than a second, you may just write **"instant".**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| N | | 10,000 | 100,000 | 1,000,000 |  |
| Pop\_all  O(n) | my code | Instant | Instant | Instant | Insert N/2 nodes with random numbers, then N/2 nodes with a fixed number. |
| listdsx | Instant | Instant | Instant |
| unique  O(n) | my code | Instant | Instant | Instant |
| listdsx | Instant | Instant | Instant |
| selection sort  O(n^2) | my code | Instant | 16.7749 sec | xxxx | takes too long unless use quicksort |
| listdsx | Instant | 21.002 sec | xxxx |
| reverse  O(n) | my code | Instant | Instant | Instant | Insert N nodes with random numbers. |
| listdsx | Instant | Instant | Instant |
| Shuffle/half  O(n) | my code | Instant | Instant | Instant |
| listdsx | Instant | Instant | Instant |
| push sorted  O(n) | my code | Instant | Instant | Instant |
| listdsx | Instant | Instant | Instant |
| push sortedN  O(n^2) | my code | Instant | 13.7743 sec | Xxxx | Insert N/2 nodes with random numbers and  then just N/2 random numbers. |
| listdsx | Instant | 11.6878 sec | Xxxx |
| push sortedN  O(n log n) | my code | Instant | Instant | Instant |
| listdsx | Instant | Instant | Instant |