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 | 22.426 s | xxxx | takes too long unless use quicksort |
| listdsx | Instant | 24.427 s | 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 | 15.831 s | xxxx | Insert N/2 nodes with random numbers and  then just N/2 random numbers. |
| listdsx | Instant | 10.766 s | xxxx |
| push sortedN  O(n log n) | my code | Instant | Instant | Instant |
| listdsx | Instant | Instant | Instant |