

## Programming Assignment 4: Queues Using Double-Linked Linear Lists

Define and implement a C++ project of an integer queue using double-linked linear list. In the application program, use the random generator to get a trial count between 1 and 10. In each trial, randomly generate a number of enqueue operations and a number of dequeue operations, and perform enqueue and dequeue operations. Assume in each trial the number of dequeue operations is less than the current queue size.

Use file name **Report\_4\_DXXXXXXX.pdf** for the assignment report and file name **IQueue.dev**, **Node.h**, **Node.cpp**, **IQueue.h**, **IQueue.cpp**, **IQueueMain.cpp** for the corresponding program files. Compress the **.dev**, **.h**, and **.cpp** program files in a file named **Assignment\_4\_DXXXXXXX.yyy**, where **yyy** is **zip**, **rar**, or **7z**. In the assignment report, you must explain the process and experience of programming and development of this assignment. Submit **Report\_4\_DXXXXXXX.pdf** and **Assignment\_4\_DXXXXXXX.yyy** to iLearn. Programming assignment 4 is due by **23:59 pm, Wednesday, May 1**.

Example of program execution:

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Trial count: 4

>>>> Trial 1: enqueue and dequeue operations
Enqueue 19 elements to the queue.
Current queue size: 19. Content of queue from head to tail:
 35 87 62 8 96 96 56 68 39 54 68 94 9 86 56 93 85 86 51

Dequeue 7 elements to the queue.
Current queue size: 12. Content of queue from head to tail:
 68 39 54 68 94 9 86 56 93 85 86 51
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>>>> Trial 2: enqueue and dequeue operations
Enqueue 81 elements to the queue.
Current queue size: 93. Content of queue from head to tail:
 68 39 54 68 94 9 86 56 93 85 86 51 20 1 10 60 25 22 8 67
 52 50 83 26 91 9 9 15 36 90 18 68 56 1 87 17 53 82 30 85
 24 44 9 31 73 93 33 63 89 66 16 76 33 43 66 52 93 73 89 30
 60 87 7 70 58 66 49 58 41 84 61 72 40 54 51 4 69 81 23 3
 30 2 13 4 75 36 66 37 18 3 99 73 94

Dequeue 37 elements to the queue.
Current queue size: 56. Content of queue from head to tail:
 82 30 85 24 44 9 31 73 93 33 63 89 66 16 76 33 43 66 52 93
 73 89 30 60 87 7 70 58 66 49 58 41 84 61 72 40 54 51 4 69
 81 23 3 30 2 13 4 75 36 66 37 18 3 99 73 94
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>>>> Trial 3: enqueue and dequeue operations
Enqueue 65 elements to the queue.
Current queue size: 121. Content of queue from head to tail:
 82 30 85 24 44 9 31 73 93 33 63 89 66 16 76 33 43 66 52 93
 73 89 30 60 87 7 70 58 66 49 58 41 84 61 72 40 54 51 4 69
 81 23 3 30 2 13 4 75 36 66 37 18 3 99 73 94 22 28 19 3
 14 62 10 65 62 70 38 55 16 68 43 37 68 35 10 79 37 73 63 76
 98 76 31 68 25 99 74 41 90 82 36 18 44 65 14 78 71 63 7 91
 37 29 60 54 42 16 93 97 42 93 26 44 78 56 9 64 37 67 95 45
 9

Dequeue 44 elements to the queue.
Current queue size: 77. Content of queue from head to tail:
 2 13 4 75 36 66 37 18 3 99 73 94 22 28 19 3 14 62 10 65
 62 70 38 55 16 68 43 37 68 35 10 79 37 73 63 76 98 76 31 68
 25 99 74 41 90 82 36 18 44 65 14 78 71 63 7 91 37 29 60 54
 42 16 93 97 42 93 26 44 78 56 9 64 37 67 95 45 9
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>>>> Trial 4: enqueue and dequeue operations
Enqueue 77 elements to the queue.
Current queue size: 154. Content of queue from head to tail:
  2 13  4 75 36 66 37 18  3 99 73 94 22 28 19  3 14 62 10 65
62 70 38 55 16 68 43 37 68 35 10 79 37 73 63 76 98 76 31 68
25 99 74 41 90 82 36 18 44 65 14 78 71 63  7 91 37 29 60 54
42 16 93 97 42 93 26 44 78 56  9 64 37 67 95 45  9 65 52 28
82 62 76 85 55 92 10 78 84 15 38 93 73 64 60 30 97 77 17 66
 8 26 46 55 72 45 68 90 56 61 55 96 72  3 12 49 64  5 92 38
 3 11 27  6 88 79 81 76 22  4 84 95 21 38 94 85 91 96 89 88
76 94 12 46 46 41 43 20 72 15 50 97 40 31

Dequeue 60 elements to the queue.
Current queue size: 94. Content of queue from head to tail:
42 16 93 97 42 93 26 44 78 56  9 64 37 67 95 45  9 65 52 28
82 62 76 85 55 92 10 78 84 15 38 93 73 64 60 30 97 77 17 66
 8 26 46 55 72 45 68 90 56 61 55 96 72  3 12 49 64  5 92 38
 3 11 27  6 88 79 81 76 22  4 84 95 21 38 94 85 91 96 89 88
76 94 12 46 46 41 43 20 72 15 50 97 40 31
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