GeeksQuiz

Computer science mock tests for geeks

- [Home](#)
- [Latest Questions](#)
- [Articles](#)
- [C/C++ Programs](#)
- [Contribute](#)
- [Books](#)

[Subscribe](#)

Deque | Set 1 (Introduction and Applications)

September 25, 2014

[Deque or Double Ended Queue](#) is a generalized version of [Queue data structure](#) that allows insert and delete at both ends.

Operations on Deque:
Mainly the following four basic operations are performed on queue:

insetFront(): Adds an item at the front of Deque.
insertLast(): Adds an item at the rear of Deque.
deleteFront(): Deletes an item from front of Deque.
deleteLast(): Deletes an item from rear of Deque.

In addition to above operations, following operations are also supported
getFront(): Gets the front item from queue.
getRear(): Gets the last item from queue.
isEmpty(): Checks whether Deque is empty or not.
isFull(): Checks whether Deque is full or not.

Applications of Deque:
Since Deque supports both stack and queue operations, it can be used as both. The Deque data structure supports clockwise and anticlockwise rotations in O(1) time which can be useful in certain applications. Also, the problems where elements need to be removed and or added both ends can be efficiently solved using Deque. For example see [Maximum of all subarrays of size k problem.](#).
See [wiki page](#) for another example of A-Steal job scheduling algorithm where Deque is used as deletions operation is required at both ends.

Language Support:
C++ STL provides implementation of Deque as [std::deque](#) and Java provides [Deque interface](#). See [this](#)

for more details.

Implementation:

A Deque can be implemented either using a [doubly linked list](#) or circular array. In both implementation, we can implement all operations in O(1) time. We will soon be discussing C/C++ implementation of Deque Data structure.

Please write comments if you find the above codes/algorithms incorrect, or find other ways to solve the same problem.

Related Questions:

- [Binary Heap](#)
- [Delete all occurrences of a given key in a linked list](#)
- [How to create mergable stack?](#)
- [A data structure for n elements and O(1) operations](#)
- [Convert left-right representation of a bianry tree to down-right](#)
- [Print level order traversal line by line](#)
- [C Program for Red Black Tree Insertion](#)
- [Can we reverse a linked list in less than O(n)?](#)

Like ⟨ 3   **Tweet** ⟨ 0   8+1 ⟨ 1

5 Comments   **GeeksQuiz**   ● **Login** ⌄

♥ **Recommend**   ⤴ **Share**   Sort by Best ⌄

Join the discussion…

Ashish Jaiswal · 2 months ago

using DLL

full working code: handling all edge cases:

#include<stdio.h>

#include<stdlib.h>

typedef struct dll

{

int data;

struct dll*prev;

struct dll*next;

}Dll;

Dll*createnode(int d)

<div style="text-align: center;">**see more**</div>

⌃ | ⌄ • Reply • Share ›

Unique • 3 months ago

How will the implementation of deque using circular array take O(1) time for the deleteLast() operation?

⌃ | ⌄ • Reply • Share ›

Chakra Agarwal → Unique • 8 days ago

It is not possible until unless you use doubly linked list in circular linked list... For array you know the index of previous element, you can jump to index and next of this element will be front of the queue now.

⌃ | ⌄ • Reply • Share ›
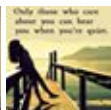
Ashish Jaiswal → Unique • 2 months ago

I am also stuck at this point please help **@GOPI GOPINATH @Kim Jong-il @neelabhsingh**

⌃ | ⌄ • Reply • Share ›

Krishna Mohan → Unique • 2 months ago

That's a good question...:)

⌃ | ⌄ • Reply • Share ›

✉ Subscribe   Ⓓ Add Disqus to your site   ▷ Privacy

GeeksQuiz

Like

13,852 people like GeeksQuiz.

Facebook social plugin

-

- # Categories

  - [Articles](#) (126)
    - [Algorithms](#) (24)
    - [C](#) (17)
    - [C++](#) (17)
    - [Data Structures](#) (29)
    - [DBMS](#) (1)
    - [Interview Experiences](#) (6)
    - [Java](#) (2)
    - [Operating Systems](#) (1)
    - [Puzzle](#) (13)
    - [Searching and Sorting](#) (10)
  - [Programs](#) (35)
  - [Quizzes](#) (2,106)
    - [Aptitude](#) (2)
    - [Computer Science Quizzes](#) (2,103)
      - [Algorithms](#) (147)
      - [C](#) (207)
      - [C++](#) (129)
      - [Computer Organization and Architecture](#) (1)
      - [Data Structures](#) (132)
      - [DBMS](#) (2)
      - [GATE](#) (1,406)
      - [Java](#) (51)
      - [Operating Systems](#) (28)
    - [Web technologies](#) (1)

-

- # Recent Discussions

  - [rajeshsethi](#)

    Can we use the concept of "Union of two arrays"...

    [Print All Distinct Elements of a given integer array](#) · [6 hours ago](#)

  - [Siva Krishna](#)

    "The 98'th prisoner decides his answer on the...

    [Puzzle 13 | (100 Prisoners with Red/Black Hats)](#) · [11 hours ago](#)

  - [Thippesh Ks](#)

    Its clearly mentioned that " A set of...

    [Check if characters of a given string can be rearranged to form a palindrome](#) · [21 hours ago](#)

- MingWei Jie

  I doubt the iterative version has a bug....

  Binary Search · 1 day ago

- pavithra

  can anyone help me by answering this question...

  Bubble Sort · 1 day ago

- Nitin Maurya

  how 8 is inserted after node 7 ?

  Linked List | Set 2 (Inserting a node) · 1 day ago

-

Valid XHTML Strict 1.0
Powered by WordPress & MooTools | MiniMoo 1.3.4