

Linked Lists with Tail Pointers

Lecture 19

Section 17.1 - 17.3

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Fri, Mar 3, 2017

1 Variations of Singly Linked Lists

2 Linked Lists with Tail Pointers

3 Assignment

Outline

1 Variations of Singly Linked Lists

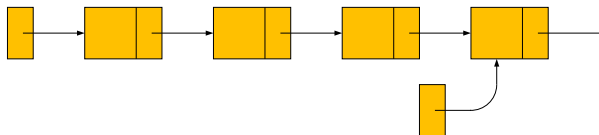
2 Linked Lists with Tail Pointers

3 Assignment

Variations of Singly Linked Lists

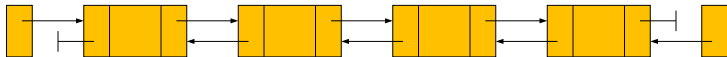
- There are many variations of the basic concept of a linked list.
 - Linked list with a tail pointer.
 - Doubly linked list.
 - Circularly linked list.

Linked List with Tail Pointer



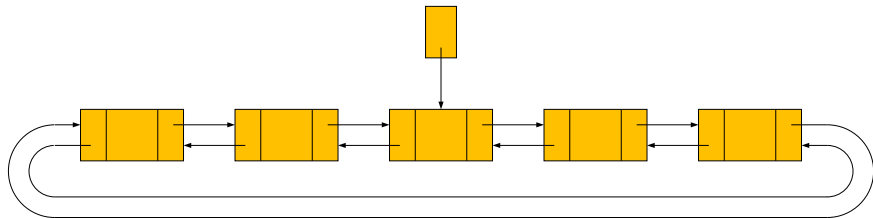
Linked list with a tail pointer

Linked List with Tail Pointer



Doubly linked list

Linked List with Tail Pointer



Circularly linked list

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Linked Lists with Tail Pointers

Definition (Linked List with Tail Pointer)

A **linked list with tail pointer** is a linked list with one additional pointer that points to the last node in the list.

One Additional Data Member

`LinkedListNode* m_tail` - A pointer to the last node in the list.

- The name of the class is `LinkedListwTail`.

Implementing the Member Functions

- The `LinkedListwTail` class is very similar to the `LinkedList` class.
- We need to rewrite only those functions that involve the tail pointer.
- `pushBack()` becomes much more efficient.
- Use a linked list with tail pointer in applications that make extensive use of `pushBack()`.

Validity Requirements

- All the requirements of a `LinkedList`, plus
 - If `m_size == 0`, then `m_tail == NULL`.
 - If `m_size > 0`, then `m_tail` points to the last node.

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- Read Sections 17.1 - 17.3.
- Also, you can google “linked list with tail pointer” and find a number web sites that discuss this.