

CS367 Lecture 10

Tuesday 1 July 2014

Announcements/Reminders:

- P2 and HW3 assigned
- P1 late days

Last class:

- ListADT with linked lists (cont'd)
 - `tail` reference and dummy header
- Linked List variations

Today:

- Comparing Complexities
- Shadow array improvement
- Adding iterators to Linked Lists

Linked List Variations

- Singly-linked
 - with tail
 - with (dummy) header node
- Doubly-linked
- Circular
 - Singly-linked
 - Doubly-linked

- **Comparing Complexities of Array-Based and Chain-Based List ADT Implementations**

Space requirements: (what is problem size?)

Array:

Singly-linked chain:

Circular singly-linked chain:

Doubly-linked chain:

Circular doubly-linked chain:

Comparing Complexities of Array-Based and Chain-Based List ADT Implementations (cont'd)

Time requirements:

	Constructor	add(E)	add(int,E)	contains(E)	size	isEmpty	get(int)	remove(int)
Array	O(1)				O(1)	O(1)		
Singly-LL	O(1)				O(1)	O(1)		
Circular SLL	O(1)				O(1)	O(1)		
Doubly-LL	O(1)				O(1)	O(1)		
Circular DLL	O(1)				O(1)	O(1)		

Comparing Complexities of Array-Based and Chain-Based List ADT Implementations (cont'd)

Ease of implementation:

Array:

Singly-linked chain:

Circular singly-linked chain:

Doubly-linked chain:

Circular doubly-linked chain:

add(E) when array is full

Naive approach:

Shadow array approach:

Amortized analysis

