CS 180 - Basic Linked Lists

Note Title 9/19/2011

Announcements

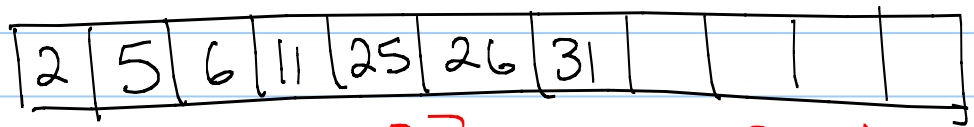
- HW due tonight
  (written part - hand in now)
- Next HW & lab are posted

Recap of arrays

Limits

- not very flexible
  - size is fixed at creation
  - 1 kind of data
  - inserting + moving can be difficult

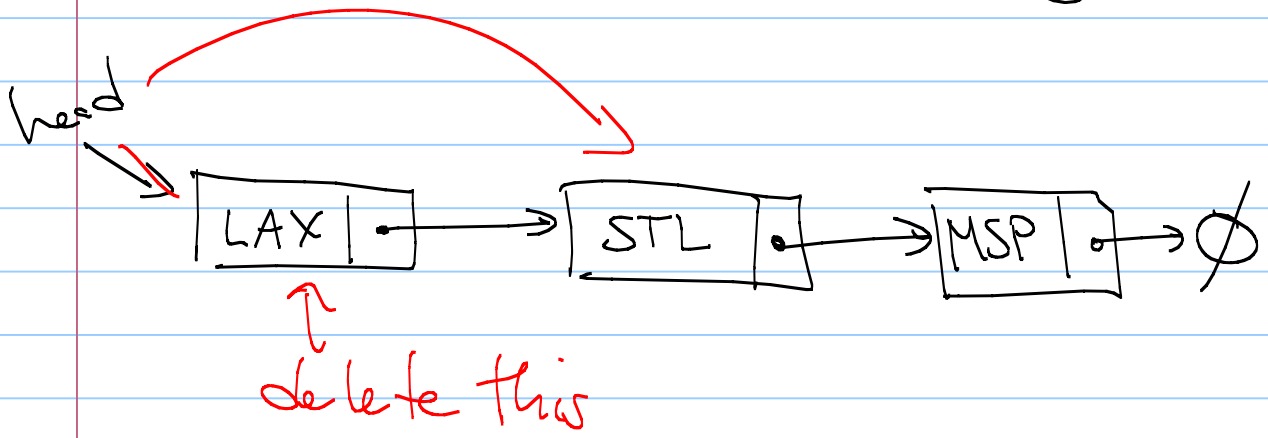
Q: How would we insert an element in the middle of an array?
ex: insert(20) in sorted order

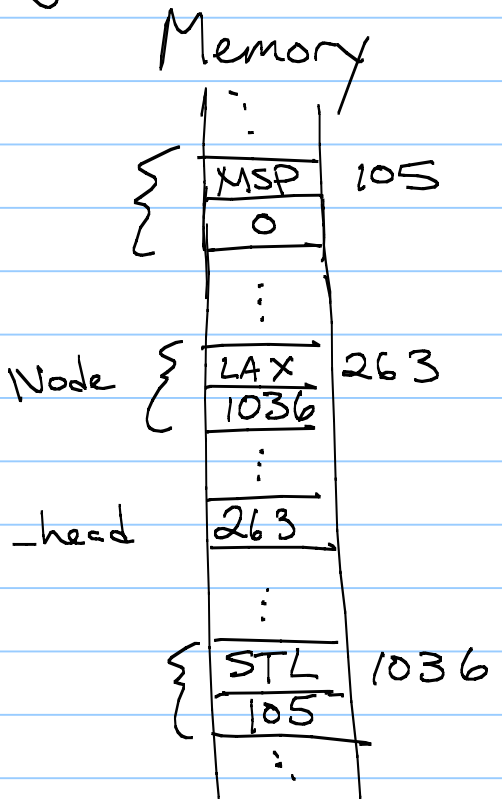


pro: A[2653] ← fast

Singly Linked Lists

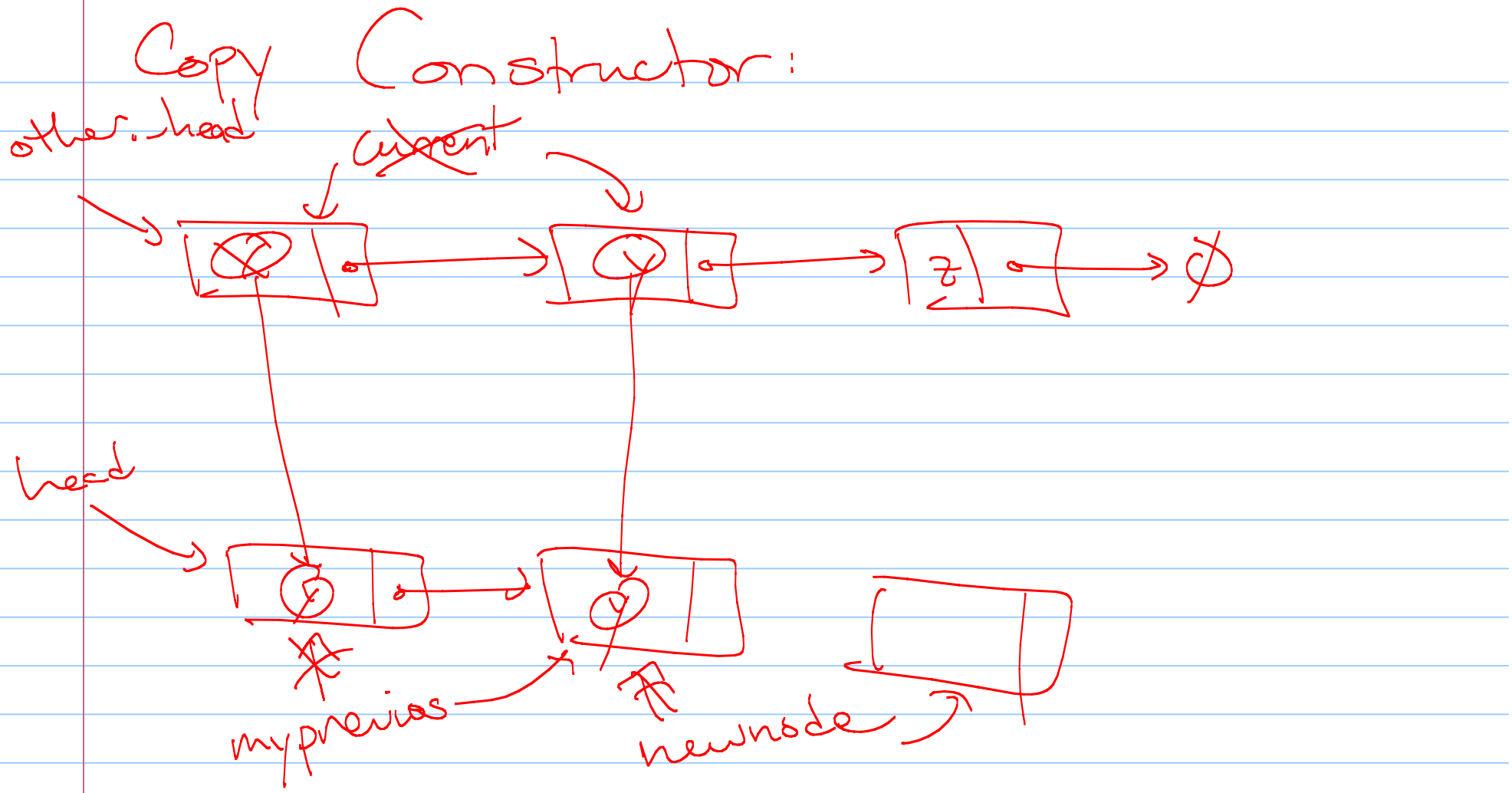
A collection of nodes that together form a linear ordering.





Con: get element 2653
↳ slow

Copy Constructor:



Code

See SLinkedList.h & SLinkedList.tcc

Algorithm Analysis

How do we compare two programs?

SPEED

→ time to run

Speed

How fast an algorithm runs can be very dependent on variables in the system.

Examples:

- architecture
- language
- low level (assembly)
- inputs vary

Primitive Operations

As a way to compare algorithms in a generic way, we instead count primitive operations.

In addition, we (generally) only analyze the worst possible running time.

Why?

Comparing

OK, so we have the worst case # of operations - usually a function of n.

How to compare?