

CS367 Lecture 8

Thursday 26 June 2014

Announcements/Reminders:

- Class on July 3
- Readings

Last class:

- ADTs vs. Data Structures
- Java Visibility Modifiers
- Chain of nodes a.k.a Linked Lists
- Practice with chains

Today:

- Java Visibility Modifiers
 - `protected`: visible in subclasses AND package.
 - Example
- Practice with chains
- ListADT with linked lists
 - `tail` reference and dummy header
- Linked List variations
- Comparing Complexities
- Shadow array improvement
- Week in Review

Java Visibility: protected

```
package p1;

public class A {
    protected int count;
}
```

In the same package:

```
package p1;

public class B {
    public void foo() {
        A a = new A();
        a.count = 5; // works!
    }
}
```

Meanwhile, in another package:

```
package p2;
import p1.*;

public class C extends A {
    public void bar() {
        A a = new A();
        C c = new C();

        a.count = 5; // won't work!
        c.count = 5;
    }
}
```

You can access the protected members declared in A from within C, but only for instances of C or subclasses of C.

Recall Chain of Linked Nodes

Conceptual Picture:

Implementation:

```
class ListNode<E> {
    private E data;
    private ListNode<E> next;

    public ListNode(E d) { this(d, null); }

    public ListNode(E d, ListNode<E> n) {
        data = d;
        next = n;
    }

    public E getData() { return data; }

    public ListNode<E> getNext() { return next; }

    public void setData(E ob) { data = ob; }

    public void setNext(ListNode<E> n) { next = n; }
}
```

Working with Linked Lists: Reversing

Write a code fragment that reverses the order of the nodes in a chain. Assume head points to the first node in the chain .

Implementing ListADT with Linked Lists under the hood

Recall our List ADT

```
public class LinkedList<E> implements ListADT<E> {
    private ListNode<E> head;

    public LinkedList() {

    }

    public void add(int pos, E item) {

    }

    public void add(E item) {

    }

    public E get(int pos) { ... }
```

Week in Review

- Complexity:
 - Concepts, Definitions, Assumptions, Examples
 - Growth of functions and notation
 - Application to computer programs and analysis
- Java Visibility Modifiers
- Chains of nodes:
 - Concept, Definition, Practice
 - Implementing List ADT with linked lists