CMSC 132: Object-Oriented Programming II

A Trick to Simplify List Implementation

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Typical List Implementation

Class List {
    Node head;
}

Class Node {
    Object value;
    Node next;
}
void insertInFrontOf(int pos, Object value) {
    if (pos == 0) {
        Node newNode = new Node(value, head);
        head = newNode;
    } else {
        Node after = head;
        for(int i = 1; i < pos; i++) after = after.next;
        Node newNode = new Node(value, after.next);
        after.next = newNode;
    }
}
Cool List Implementation Trick

- You must practice this technique if you expect to use it
- head is never null, even for an empty list
- head is set to first node when list is created
  - head is never changed
  - the value of the first node isn’t ever looked at
- Class List {
  // value of first Node isn’t part of list
  final Node head = new Node(null);
}
**Insert in Front of i’th Element**

```java
void insertInFrontOf(int pos, Object value) {
    Node after = head;
    for(int i = 0; i < pos; i++)
        after = after.next;
    Node newNode = new Node(value, after.next);
    after.next = newNode;
}
```