Programming Languages and Techniques (CIS120e)

Lecture 3
Sep 13, 2010

Recursion over Lists
A Design Problem / Situation

Suppose we have a friend who is opening a toy-store, and she wants some help computerizing her inventory. She wants to be able to do things like check how much total inventory she has, remove items from the inventory or replace one item with another, make lists of different kinds of items (dolls, games, etc.), etc.

To keep things simple, let’s start by working with just the names of the toys...
Demo I
1. Understand the problem
   What are the relevant concepts and how do they relate?
2. Formalize the interface
   How should the program interact with its environment?
3. Write test cases
   • If the main input to the program is an immutable list, make sure the tests cover both empty and non-empty cases
4. Implement the required behavior
   • If the main input to the program is an immutable list, look for a recursive solution...
     • Suppose someone has given us a partial solution that works for lists up to a certain size. Can we use it to build a better solution that works for lists that are one element larger?
     • Is there a direct solution for the empty list?
Demo II