CS 42 Fall 2012, Mid-Term Study Guide
(Midterm date: Tuesday 10/30 in class)
The mid-term can include anything we have discussed up to the break, including the items listed below. The focus is on concepts, rather than fine-grain details and syntax. Coding and short essay questions can be included.
You may use a single physical reference sheet 8.5 x 11” of your own construction. The sheet is to be submitted with your exam. It will be returned to you when the exams are graded. No other materials can be used, including computers.

States and Transitions

Functional programming
S expressions
Higher-order functions (map, foldl, foldr, filter, mappend, ...)
Common list functions (cons, list, first, rest, null?, assoc, append, reverse)
Function composition and decomposition
Symbols vs. strings
Anonymous functions (lambda expressions)
Recursion
Mutual recursion
Tail recursion
McCarthy's transformation (imperative programs to tail-recursive functions)
Accumulators

Grammars
Terminal vs. non-terminal symbols
Rules (productions)
Parsing based on grammar

Open List structures
Box-pointer diagrams
Sharing
Cost of operations (in time): O(1), O(n) notation

Language interpretation
Eval function
Environments and bindings
Constructing and evaluating expressions containing let's and lambda expressions

Objects and classes
References
Closed lists, such as stacks and queues
Using stacks and queues in graph search
Depth-first vs. Breadth-first search