**CS 315: Example Questions for Midterm Exam**

**Big O:**

* If f(x) = 3 x2 + 4 x + 7, what is its Big O?
* What is an optimal Big O for sorting?
* Which is better, O(n2) or O(n \* log(n)) ?
* What is the Big O of the following code?
* for ( int i = 0; i < n; i++ )
* for ( int j = 0; j < n; j++ )
* x[i][j] = 0;

**Linked Lists:**

* What is the result of (rest '(a b c))
* What is the Big O of reverse of a list of length n?
* What is the result of (mapcar 'twice '(3 4 5)) given (defun twice (x) (\* 2 x))

**Stack, Queue:**

* If the following operations are done on a Stack, what comes out? Push a, Push b, Pop, Push c, Pop, Pop.
* If the following are operations done on a Queue, what comes out? Insert a, Insert b, Remove, Insert c, Remove, Remove.

**Java Collections:**

* If coll is a LinkedList of Integer, write a function to add up all the elements.

**Trees:**

* Write the following expression as a tree: x = (a + b) \* c
* Give an advantage of the first-child / next-sibling form of tree.
* What is Big O of search for a specified String in a binary search tree containing n Strings, if the tree is balanced?
* In a depth-first search of a tree with branching factor b and depth d, what is Big O of time required? How much stack depth is required?

**Vocabulary:**

Briefly and clearly define the following terms: ... terms chosen from the vocabulary list on the study guide.