**CS311 : Substitution for a Midterm – Read PART 3 SUMMARY first.**

**Fill out this table first by re-reading the notes:**

B(N) W(N) in terms of comparisons

Sequential Search

Binary Search

Selection Sort

Bubble/Insertion Sort

Quick Sort

Merge Sort

F(N) in terms of comparisons

Search unordered list

Search ordered list

Sort by fix one pair per comparison

Sort

**You should try these questions to be ready for the final exam. No need to submit this but I would be happy to check your answers if you email it to me.**

**But be able to answer pretending that these are job interview questions!**

**You must have collected all ҉҉ boxes and re-read them!!!**

**1) Can someone do faster than O(logN) for ordered list search? Why or why not?**No, because O(log N) is the best complexity achievable for searching in a sorted list using binary search.

**2) Can someone do faster than O(N) for unordered list search? Why or why not?**No, because searching in an unordered list requires checking each element at least once to ensure that the element being searched for is not present in the list.

**3) Can someone do faster than O(N^2) for comparison based sorting that fixed one bad pair at a time?**

**Why or why not?**

**4) Can someone do faster than O(NlogN) for comparison based soring? Why or why not?**

**5) Discuss Space vs. Time issue related to arrays vs. vectors.**

**6) Discuss Space vs Time issue related to Quick Sort vs. Merge Sort.**

**7) Can you do stack1 == stack2 in HW1P1 client? Why or why not?**

**8) Can you do stack1 = stack2 in HW1P1 client? Why or why not?**

**9) Can you correctly pass a linked list by value to a function or return a linked list by value from a function without writing a copy constructor? Why or why not?**

**10) B is the bottom level of a binary tree that is perfectly triangular. N is the number of nodes.**

**B+1 = the number of levels = log \_\_\_\_\_\_\_ ? Try drawing a tree with 7 nodes to verify your answer.**

**11) Write C++ code to produce a dangling pointer.**

**12) Write C++ code to produce a garbage cell.**