

## CSC 502 WEEK 8 TEST STUDY GUIDE

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### 1. STUDY GUIDE

The test will follow the same format as the week 5 test, with an open-book and closed-book portion.

In addition to what is on the Week 5 Test Study Guide:

Recursion.

Quicksort and Mergesort, binary search, Java Collection hierarchy: the difference between lists and sets.

The two different ways of implementing lists: linked allocation and contiguous allocation, and their relative advantages and disadvantages.

The two different ways of implementing sets: balanced binary search trees, and hashing.

The definition of iterators, and how to use iterators.

Linked list operations: how to work with linked lists that are implemented using a `Node` class with value and successor fields. Adding an element to a linked list at the end; or at a certain index (position).

Maps and how to use them.

Binary trees: preorder, postorder, and inorder traversal.

Files and how to read them.

### 2. SOME SAMPLE PROBLEMS

1. Write the `partition` function for `Quicksort` as studied in class:

```
int partition(int [] arr, int lower, int upper)
```

2. Write the recursive method for `Quicksort` assuming that you have a `partition` method as above.

3. Assume that two arrays

```
int []arr1;  
int []arr2;
```

are sorted in ascending order. Write code to create a third array whose length is the sum of the lengths of the two arrays, and copy the elements of the two arrays into the third array so that they are in sorted order.

Do not sort: just perform a merging algorithm.

4. Assume that two arrays

```
int []arr1;  
int []arr2;
```

are sorted in ascending order. Write code to create a `LinkedList` object, and add the elements of the two arrays to the list so that the elements are added to the list in sorted order.

Do not sort: just perform a merging algorithm.

5. Suppose that you have a text file, and you are asked to group all the words in the file by their length. When you are done, you must have a list of all words from the file that have length 1, another list of all words that have length 2, and so on. Write code that will accomplish this.