

Exam 2

Review



Computer Science Department
University of Central Florida

COP 3502 – Computer Science I



Exam 2 Review

■ Outline of Material Covered:

I. Recurrence Relations

■ You will have at LEAST one full recurrence relation to work out

- This will be a 20 point question
- We have done SEVERAL of these in class
 - No excuse at all to miss this question

■ You may have other smaller questions on this topic:

- Given several equations representing several steps of the recursion, give the correct recurrence relation for the k^{th} step
- Given code, develop the recurrence relation
 - But don't actually solve it
- And other similar questions on the topic



Exam 2 Review

■ Outline of Material Covered:

II. Stacks

- What they are and how they work
- The idea of Abstract Data Types
- Stack operations
- Converting Infix to Postfix
- Evaluating Postfix expressions
 - **You are GUARANTEED to have BOTH of these on the test**
 - Probably about 20 points worth
 - So review the slides and do the problems on the lab sheets
- Implementation of stacks using arrays and linked lists
 - Understand how the code works!



Exam 2 Review

■ Outline of Material Covered:

III. Queues

- What they are and how they work
- Basic operations of a queue
- Different implementations of a queue
 - Both regular array implementations
 - Be able to explain the problems with these two methods
 - Circular array implementation
 - Be able to explain why this one is better
 - Linked list implementation
- Be able to answer short questions on coding queues
- Know when to use a queue versus a stack



Exam 2 Review

■ Outline of Material Covered:

IV. Binary Trees

- Basic info on trees
 - root, leaves, height, # of nodes, complete tree, full tree, etc
- What is a BST (ordering property)
- Implementation of a BST
- Tree traversals
 - Depth first (preorder, inorder, postorder) and breadth first
 - **You are GUARANTEED to see tree traversals**
 - Probably another 20 points worth (or more)



Exam 2 Review

■ Outline of Material Covered:

IV. Binary Trees

- Insertion into a BST
 - Given a list of values, know how to make a tree inserting those values into the tree
 - Know the code for insertion
- Deletion from a BST
 - Know the three cases and understand how to delete
- Various functions
 - You WILL have a coding question on the test
 - Most likely to code some type of function on binary trees
 - Between the slides and lab sheets, you have more than a DOZEN examples. Make sure you are okay with them.



Exam 2 Review

■ Outline of Material Covered:

II. Sorting

- Know running times of all sorts!
- Know the N-squared sorts
 - Be able to show the step-by-step sorting of a list of values using any of these sorting methods
 - Just like what was shown in lab
 - Understand the limitation of these sorting algorithms
- Merge Sort
 - Know how it works and be okay with the analysis of it
 - Understand the merge function
- Quick Sort
 - Partition, best type of pivot, and analysis of quick sort



Exam 2 Review

- How to study:
 - KNOW and UNDERSTAND the notes
 - Make sure you are 100% on the notes
 - Make sure you are 100% on all the lab questions and their respective solutions
 - Don't waste time memorizing algorithms
 - Understand how they work and WHY they work
 - And be prepared to come up with your own
 - Look at previous Foundation Exam tests
 - Practice some of the problems (ones that are applicable)
 - <http://www.cs.ucf.edu/registration/exm/index.html>



Exam 2 Review

- Types of Questions:
 - Some short answer questions:
 - Tracing through code
 - Questions on an algorithm discussed in class
 - Small questions on code
 - etc.
 - Writing Functions:
 - You will have to write functions
 - Almost guaranteed to be on binary trees
 - And usually will be recursive



Exam 2 Review

- Questions that WILL be asked (for sure):
 - 1) Recurrence Relations
 - 2) Infix/Postfix (Just like in the lab)
 - ❖ BOTH convert to postfix AND evaluate postfix
 - 3) BST traversals...all methods (just like lab)
 - 4) Code a BST function to do something
 - 5) Sorting question (Just like those in this week's lab)
- Those are definates:
 - And 1, 2, 3, and 5 should be AUTOMATIC, as they are mere regurgitation. #4 (coding some BST function) will be the sole challenging question, as it will require thought.



Exam 2 Review

- How to do well?
 - Practice the LAB questions for the aforementioned GUARANTEED problems.
 - Numbers 1, 2, 3 and 5 (previous page) should be practiced so extensively that you FLY through those problems. There is NO REASON to get stuck on the infix/postfix, sorting, traversal, or rec. rel. questions.
 - Practice those labs OVER AND OVER AND OVER
 - Practice similar questions from Foundation Exams
 - OVER AND OVER AND OVER
 - This will allow you to spend extra time where it is needed
 - On the coding question for BST



Exam 2 Review

■ Exam Aids:

- You may use one 8-1/2"x11" sheet of paper
 - FRONT AND BACK
 - Typed or written doesn't matter
 - I don't care what you put on it

■ What you CANNOT use:

- Any electronic device:
 - Calculator, phone, ipad, you get the idea
- If you are seen holding ANY electronic device, you will get 10 points off immediately! If you were cheating with that device, then the consequences are, of course, far worse.



Exam 2 Review

- So what is covered?
 - EVERYTHING until now
 - Even if I didn't "cover" it during this review
 - Anything and everything that was taught or shown in class or in the labs is fair game.
 - Including material from the first exam

■ Questions:

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