# 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 equals representing several steps of the recursion, give the correct recurrence relation for the kth 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)

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- **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.

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■ 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 Arup's Archive of tests
    - Practice some of the problems (ones that are applicable)
    - http://www.cs.ucf.edu/~dmarino/ucf/transparency/cop3502/exam/

# 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

- 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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