Exam 2 Study Guide (100 points total)

# Node Based Lists

* Basic Lists
  + Forward Lists
  + Double Linked Lists
  + API: Insert / Deletes / Iterators
* Sorted List
  + Array vs Node based lists
  + Speeds (log(n) vs n) of each public function
    - Insert / delete / search
    - Binary Search
* Specialized Lists
  + Queues
  + Stacks – both node based and array based
  + API: Push / Pop
    - Enqueue = Push
    - Dequeue = Pop
  + Speed of the operations (Push / Pop)

# C++ Topics

* Templates
* Operator Overloads
  + Be able to implement our basic COMPARISON operators
  + Be able to implement our basic MATH operators (+ - \* /).
  + Potential example: Complex + Complex -> Complex

# Recursion

* Be able to use Recursion in both a Tree and a **Node Based Linked List**.
* Understand the Base Case, General Case
* 3 rules of Recursion.
* Be ready to write some recursion code, pseudo code or full c++.

# Trees

* Navigate a Binary Search Tree
* In Order / Pre Order / Post Order Traversal
  + You will be given code, you must write / identify the correct output.
* BST Insert / Deletes (Note: This is NOT AVL / RB tree). Identify the correct tree

# Take Home Coding Section (40 points)

Open Notes Open Book Open Google

**DO NOT USE YOUR FRIENDS**

YOU WILL HAVE 48 HOURS TOTAL.

Be intimately familiar with Node Based Lists.

* Forward Lists
* Double Linked Lists
* Sorted Lists
* Queues
* Stacks.

You need to be able to understand the code and replicate it. Review Project 04 and 03. Understand how to insert and delete into these items, how the iterator works, etc.

**Also**: Understand how to implement the functions of a class from scratch. **You will be given a completely blank “.cpp” file.**

After This is closed, 2 assignments will open up: Coding Section Questions and a Multiple Choice Test

# Coding Section Questions (10 points)

There will be a series of questions on the code you did. These are expected to be short answer, 3-N sentences. I am looking for answers like “How would you change function X() and explain how this change would improve the code”. Do not just write fluff, I will mark off for things that are irrelevant (think back to your documentation). Don’t just say “Destructor deletes used memory” explain to me HOW it does this.

# Multiple Choice Test (50 points)

**THIS TEST WILL HAVE A 2 HOUR TIME LIMIT WHEN YOU START. YOU WILL HAVE 24 HOURS TO COMPLETE IT.**

This test will be open book open notes.

**DO NOT USE YOUR FRIENDS**

This will take a wide breadth of topics on Page 1. Since this test is also open book open note, there will be no definition type questions. Instead it will be things like, you’re given a line of code, what type of list is being shown, or which tree is correct after the insert. You will not be able to pass this exam if you’re teaching yourself a topic during the exam. Questions may not be limited to just multiple choice!!!