Final Exam Review

- In general know all bold terms in each section.
- Know information in slides used in class.
- Understand all Participation Activities and Challenge Activities.
- Understand any programming you did in Homework, Lab Work, and Challenge Activities. Be able to replicate it.
- The exam is made up of: short answer, hand execution and analysis of code, writing code and design.
- 204 points – Will be graded on a scale of 200 as maximum. Additional is extra credit.
- For any topic ask yourself
  - How is it done?
  - What does it do?
  - Why is it that way?

Graphical User Interfaces – 27 points

- Graphics Coordinate System (FLTK)
- Event-driven Programming
  - Event types
  - Event loop
  - Event Handling
    - Handle in Object
    - Registration (i.e. callback)
  - Relationship between draw() and redraw()

Linked List – 12 points

- Singly and Doubly linked lists
- Structure
  - Head
  - Tail
  - Node Structure
- Know how to do basic operations for both types
  - Traversal
  - Insert / Remove
    - Front
    - Back
    - Middle

Dynamic Memory – 68 points

- Operations
  - Allocation
  - Deallocation
  - Access
- Where allocated
- Call Stack with Heap
- Memory Leaks
  - Definition
  - Prevention strategies
    - Especially RAIL
- Shallow vs. Deep Copy
- Class Design
  - Rule of Three
    - Destructor
    - Copy Constructor
    - Copy Assignment
    - Why needed
  - Rule of Five
    - Move Constructor
    - Move Assignment
    - Why needed
  - Move Semantics
    - Rationale
    - RValue & LValue
Generic Programming – 32 points

- Templates
  - Function
  - Class
- ADTs
- What can be generic?
- Standard Template Library (STL)
  - Basic Model
  - Iterators
    - One-past-the-last
  - Containers
  - Algorithms
- Predicates
  - Predicate Function
  - Predicate Function Object
    - How to make
  - Lambda function
    - Definition only
  - Guidelines
- Impact of modifying container data on other iterators
  (e.g. vector vs. list)

Cumulative Part – 65 points

- Modified questions from Exams 1 and 2 (~25%)
  - (30 points)
- Things I think you should be able to do at this point (~25%)
  - Looking over review sheets for Exams 1 and 2 should remind you of concepts that may not have been covered explicitly on prior exams.
  - These questions will be more problem solving and writing code for a specific situation.
  - (35 points)