

Final Exam Review

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- IX. Computer System Performance and Simulation
 - A. Performance Metrics
 - 1. Utilization, throughput, response time and delay
 - B. System queue model versus queue data structure
 - C. Event lists and script driven simulations
- X. Data Structures
 - B. Queues
 - 1. enqueue operation
 - 2. dequeue operation
 - C. Trees
 - 1. Terminology (root, leaf, child node)
 - 2. Binary Trees
 - 3. Inorder, preorder and postorder traversals
 - D. Stacks
 - 1. Push
 - 2. Pop
 - E. Hashing
 - 1. Two examples of using hashing
 - 2. Hash functions
 - 3. Linear probing
 - 4. Chaining
- XI. Introduction to C++
 - A. Syntax difference with C
 - 1. Classes
 - 2. Stream insertion and extraction operators
 - 3. Header files
 - 4. Inline functions
 - 5. bool type
 - 6. references (aliases)
 - a. returning from function (static only)
 - 7. default arguments
 - 8. unary scope resolution operator
 - B. Overloaded Functions
 - C. Function Templates
- XII. Classes and Objects
 - A. Class Definitions and Objects
 - 1. access-specifiers: public, private, protected
 - B. Member functions
 - 1. Gradebook Example
 - a. string type, getline function
 - C. Data members
 - 1. Get and Set functions
 - a. accessing private data members

- 2. Constructors
 - a. default constructors
 - b. Constructor Example
 - c. overloading constructor functions
- D. Placing Classes in Separate Files
- E. Separating interface from implementation
 - 1. .h and .cpp files
 - a. Member function prototypes
 - 2. Binary scope resolution
 - 3. Using “driver” .cpp files for modular testing
- F. Data validation with set functions
 - 1. Ensure that data in an object is in a particular format or range.
- XIII. More C++ Classes
 - A. Preprocessor Wrapper
 - 1. #ifndef
 - B. Time Class Case Study
 - 1. setfill, setw
 - C. Class Scope and Assessing Class Members
 - 1. accessing class members externally with handles
 - D. Access and Utility Functions
 - 1. Scope issues (file versus class scope)
 - 2. Dot member selection operator
 - 3. Arrow member selection operator
 - 4. private utility functions
 - E. Destructors
 - 1. exit and abort
 - F. Calling Constructors and Destructors
 - 1. Implicit calls by compiler
 - 2. call order
 - 3. Destructor Example
- XIV. Deeper into Classes
 - A. const objects and const member functions
 - 1. const Example
 - 2. member initializer
 - B. Composition
 - 1. Composition Example
 - C. friend functions and friend classes
 - 1. friend function Example
 - D. this pointer
 - 1. implicitly and explicitly
 - 2. this Example
 - 3. cascaded member-function calls
 - E. Dynamic memory management
 - 1. new operator
 - a. dynamic allocation

- 2. delete operator
 - F. Static class members and static member functions
 - XV. Operator Overloading
 - A. Fundamentals of Operator Overloading
 - 1. keyword operator
 - 2. three operator exceptions (= & ,)
 - B. Restrictions on Operator Overloading
 - 1. precedence
 - 2. associativity
 - 3. number of operand
 - C. Operator Functions as Class Members vs. Global Functions
 - D. Overloading Stream Insertion and Stream Extraction Operators
 - E. Overloading Unary Operators
 - F. Overloading Binary Operators
 - G. Array Overloading Example
 - XVI. Inheritance
 - A. Introduction – definitions
 - 1. public, private and protected
 - B. Base Classes and Derived Classes
 - C. Five Examples of Base Class and Derived Class Relationships
 - 3. inheritance hierarchy with private members
 - 4. inheritance hierarchy with public members
 - 5. inheritance hierarchy with private members accessed through public member functions
 - D. Constructors and Destructors in Derived Classes
 - 1. components not inherited
 - 2. chain of constructor calls
 - 3. constructor/destructor in derived classes Example
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