

Final Exam Review

CS 1428
Spring 2020

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Final Exam

- Tues, May 12, 2:00pm to 4:30pm
- Online: Canvas Quiz (I plan to be on zoom)
- Open book/notes
- Comprehensive (covers entire course)
- 15% of your final grade
- Replaces your lowest test grade, if it is higher
- No collaboration of any kind
- No using other apps or browsing the internet

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Exam Format

- 100 Points total
 - ▶ 50 points: multiple choice and T/F
 - ▶ 50 points: writing code
 - ➔ code segments, functions
- Tasks:
 - ▶ Tracing code (what is the output, etc.)
 - ▶ Evaluating C++ expressions
 - ▶ Demonstrate general knowledge about C++ and programming
 - ▶ Programming (writing code)

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Content from Textbook/Revel

- 1.1-4
- 2.1-17 (except 2.11)
- 3.1-10
- 4.1-15 (except 4.7,4.13)
- 5.1-12
- 6.1-5, 7-10, and 13
- 7.1-4, 6, and 8
- 11.2-8

See Revel for specific subsections

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Ch 1: Intro to Computer and Programming

- Definitions: Computer, Program, Programmer
- Hardware vs Software
- Hardware components: (cpu, main memory, secondary storage, input and output devices)
- Program vs. Algorithm
- Programming languages: machine lang vs low level lang vs high level lang
- Compilation: source code file -> executable
- Execution (of a program)

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Ch 2: Introduction to C++

- cout and << (output)
- Literals: numbers, characters, strings
- Identifiers, rules for valid names
- Variable Definitions and Initialization
- Assignment Statements
- Data Types
 - int, short, long, float, double, bool, char, string
- Scope rules, comments, named constants

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Ch 3: Expressions and I/O

- cin and >> (input)
- Numerical Expressions: precedence rules
 - Operators: +, -, *, /, % (modulus)
- Type Conversions: implicit and explicit
- Integer division vs float division
- Pow(a,b) and other Math library functions

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Ch 4: Making Decisions

- Relational and Logical Expressions
 - Rel. Operators: < <= > >= == !=
 - Logical Operators: ! && ||
- Decision statements:
 - if and if-else
 - nested if statements and if-else if
 - block or compound statement
 - switch
- Scope of variables in blocks

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Ch 5: Loops and file i/o

- increment/decrement operators (`x++`, `x--`)
- while loop (general purpose)
- do-while (body done at least once)
- for loop (init; test; update)
- Which loops are good for which situations
- Count controlled, sentinel controlled loops
- Keeping a running total, input validation
- Sentinel controlled loops
- Nested loops, infinite loops

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Ch 6: Functions

- Function definition (implementation in code)
- Function call (void vs one that returns a value)
- Function prototype, when it is required
- Function parameters and arguments
- Passing arguments by value and by reference
- Return statement
- Returning values from functions
- Scope: variables, local vs global, lifetime

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Ch 7: Arrays

- Array declaration/definition, size
- Array elements, syntax, range of subscripts
- Array initialization: `int list[] = {6,7,8};`
- Processing arrays
 - input, output, sum, average, finding max, min
 - counting values that pass a test, array assignment (copy)
- Lack of bounds checking
- Functions and arrays

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Ch 11: Structures

- Structure Definition (with members)
- Declaring structure variables (of struct type)
- Struct var initialization: `Student s1={"Bob",3.2};`
- Accessing members (dot operator)
- Operations over structures
 - assignment, function call
 - input/output, comparison (define yourself)
- Arrays of structure, processing them
- Functions over arrays of structure

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Software Development Process

- Top Down Design
 - Break tasks into subtasks
 - Make a hierarchy of tasks
- Incremental Development
 - Implement one piece at a time
- Testing
 - Test cases: input values and expected output
- Debugging
 - Strategy: output values of variables
 - Strategy: output literals to trace execution path

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Sample problems

See the lecture entitled:
Final Exam Exercises
available soon on the class website

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How to study

- Review the Unit slides
 - Units 1-7, Software Dev, TDD, Programming
 - understand all the concepts, **quiz yourself**
- Use Revel to help understand the slides
- Review programming assignments (fix yours!)
- Review the previous tests
- Review and redo the Squarecap and Revel questions
- Do the Final Exam Review Exercises (slides)
- Practice, practice, practice! Write code! Sleep!

Office Hours during finals

Day	Date	Time
T	5/5	1:30-3:00pm
W	5/6	1:30-3:00pm
Th	5/7	1:30-3:00pm
M	5/11	1:30-3:00pm
F	5/15	1:30-3:00pm

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