Test 1 Review

CS 1428
Spring 2020

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Test 1

- Thursday February 13
- In class, closed book, closed notes, clean desk
- 15% of your final grade
- 60 minutes to complete it
- Bring your ID card!!!!
- Bring a pencil! (and eraser)
- NO: calculators or cell phones.
- NO: headphones/earbuds.

Test Format

- 100 Points total
  - ‣ 50 points: 20 multiple choice (on a provided scantron form)
  - ‣ 50 points: writing code on the test paper
    - ➡ program and/or individual statements
- Tasks:
  - ‣ Tracing code (what is the output)
  - ‣ Evaluating C++ expressions
  - ‣ Demonstrate general knowledge about C++ and programming
  - ‣ Programming (NOT graded for style!)

Content from Textbook/REVEL

Units 1 and 2:

- Chapter 1: 1.1-4
- Chapter 2: 2.1-17 (except 2.11)
- Chapter 3: 3.1-10

Content from Slides

Units 1 and 2:

- Unit 1: Intro to Programming & C++
- Unit 2: Expressions & Input/Output
- Software Development Process

These are on the class website in PDF form

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Intro to Computers 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

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Introduction to C++

- Literals: numbers, characters, strings
  ‣ Special characters ('/n', etc)
- Identifiers, rules for valid names
- Variable Declarations and Initialization
- Assignment Statements
- Data Types
  ‣ int, short, long, float, double, bool, char, string
  ‣ their values/ranges (rough idea)
  ‣ suitability of each for various types of data
- Scope rules, comments, named constants

Expressions and Types

- Numerical Expressions
  ‣ Operators: +, -, *, /, % (modulus)
  ‣ Precedence rules, parens ( )
- Type Conversions:
  ‣ binary operations
  ‣ assignment
  ‣ explicit type casting
- Integer division vs float division
- Pow(a,b) and other Math library functions

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Assignment operators

- Multiple assignment
  - ‣ `a = b = c = 4;`
- Combined Assignment operators
  - ‣ `+=   -=   *=   /=`
- Increment and Decrement
  - ‣ `x++   y--`

Input and output

- cout, stream insertion operator (<<), endl
- cin, stream extraction operator (>>)
- formatting: setw, setprecision+fixed, left/right
- inputting characters and strings
  - ‣ cin >> var versus getline(cin,var)
- using file stream objects for file I/O:
  - ‣ using ifstream, ofstream variables
  - ‣ open and close, << and >>

Software Development

Know what happens during each of these phases:

- Analysis and specification
- Design
- Implementation
- Testing and debugging
- Maintenance

Sample problem: what is output?

- What is the output of the following statements, if the user types 24 13 34?

```
int a, b;
cin >> a;
cin >> a >> b;
cout << a << " " << b << endl;
```

A) `24 13 34`   B) `24 13`   C) `24 34`   D) `13 34`

Sample problem: Programming

- Write a C++ program that computes the tax and tip on a restaurant bill. The program should input the cost of the meal from the user. The tax should be 6.75 percent of the meal cost. The tip should be 20 percent of the total after adding the tax. Display the tax and tip amount to the screen, formatted to two decimal places.

- Sample run:

```
Enter the cost: 100
tax = 6.75
tip = 21.35
```

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How to study

- Review the slides (Units 1 - 2, Software Dev)
  ‣ understand all the concepts, **quiz yourself**

- Use Revel to help understand the slides

- Review programming assignments
  ‣ assignment 2 solution up front

- Review/redo the Squarecap and Revel questions

- Do some of the programming challenges.

- Practice, practice, practice! Write code! Sleep!

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