

Exam 1 Review

CS 1428
Fall 2015

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Exam 1

- Wed, September 30
- In class, closed book, closed notes, clean desk
- 15% of your final grade
- 80 minutes to complete it
- Bring your ID card!!!!
- Bring a number 2 pencil! (and eraser)
- NO: calculators or cell phones.
- NO: headphones/earbuds.

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Exam Format

- 100 Points total
 - ▶ 56 points: multiple choice and T/F (scantron form)
 - ▶ 44 points: writing code on the test paper
 - ➔ programs and individual statements
- Tasks:
 - ▶ Tracing code (what is the output)
 - ▶ Finding errors in code
 - ▶ Evaluating C++ expressions
 - ▶ Demonstrate general knowledge about C++ and programming
 - ▶ Programming (writing code)

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Content from Textbook

Week 0 through Week 4:

- Chapter 1: 1.1-3
- Chapter 2: 2.1-17 (except 2.11)
- Chapter 3: 3.1-10
- Chapter 4: 4.1-9
- Chapter 5: 5.1 and 5.11 (first half)

See reading list online for specific topics of each section

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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
- Identifiers, rules for valid names
- Variable Definitions and Initialization
- Assignment Statements
- Data Types
 - int, short, long, float, double, bool, char, string
 - 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--`
- Hand Tracing a program

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Input and output

- cout, stream insertion operator (<<), endl
- cin, stream extraction operator (>>)
- formatting: setw, setprecision, fixed, left/right
- inputting characters and strings
 - ▶ >> vs getline(cin,var)
 - ▶ using cin.ignore() to solve problem of >> followed by getline
- using file stream objects for file I/O:
 - ▶ using ifstream, ofstream variables
 - ▶ open and close, << and >>

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Ifs and boolean expressions

- Relational and Logical Expressions
 - ▶ Rel. Operators: < <= > >= == !=
 - ▶ Logical Operators: ! && ||
 - ▶ Precedence rules, parens
- if statements:
 - ▶ if
 - ▶ if-else
 - ▶ nested if statements
 - ▶ if-else if (reformatting of nested if statements)
 - ▶ block or compound statement

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Sample problem: what is output?

- What is the output of the following statements?

```
int fox = 6;
float dog = 5.7;
dog = fox + dog;
if (fox > dog)
    cout << "Hello!";
else if (fox < dog)
    cout << dog;
else
    cout << fox;
cout << endl;
cout << fixed << setprecision(1);
cout << "dog is: " << dog << endl;
```

- A)

Hello!
dog is: 5.7

 B)

Hello!
dog is: 11.7

 C)

11.7
dog is: 11.7

 D)

6
dog is: 5.7

11

Sample problem: Programming

- Write a C++ program that reads a floating point number representing the side of a square from a file named "test.txt" and outputs the area of the square formatted to five decimal places. If the area is greater than 1,000, it should also output the following statement:

That's really big!

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How to study

- Review the slides
 - understand all the concepts, **quiz yourself**
- Use the book to help understand the slides
 - there will be no questions over material that is in the book but not on the slides
- Review programming assignments (fix yours!)
 - get printouts of solutions 2 and 3 up front or in my office
- Try some exercises from the book
- Practice, practice, practice! Write code!
- Get some sleep