

Exam 2 Review

CS 1428
Fall 2011

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Exam 2

- Friday, November 3
- In class, closed book, closed notes, clean desk
- 15% of your final grade
- 55 minutes to complete it
- I recommend using a pencil (and eraser)
- All writing will be done on the test paper I will hand out.

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Exam Format

- 100 points total
 - 40+ points: writing programs/code
 - Some multiple choice/fill-in-the-blank/short answer
 - Some tracing code/finding errors in code
 - Some binary to/from hexadecimal conversion
 - Some bits/bytes/KB/MB/GB/TB questions

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Content

- Lectures 9 - 21
 - Light on the ends, heavy on the middle
- Chapters:
 - 4: Decisions (review)
 - 5: Loops
 - 7: Arrays
 - 6: Functions (introductory)
 - Bytes and Hex

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Example Programming Problem

Write a C++ program that reads the final score (out of 100) for each of 30 students in a class. The values will be in a file named "students.dat". The program should calculate and output the average score for the class and the number of scores that were over 75.

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Example Tracing Problem

What will the EXACT output of the following code segment be?

```
int list[] = {8,10,3,55,1,2,3,7};
int x=10;
int i = 3;

while (i < 8) {
    x++;
    int t = list[i];
    if (t < 10) {
        x = list[i+1];
    } else if (t < 20) {
        x++;
    } else {
        x--;
    }
    i = i+3;
    cout << "x = " << x << endl;
}
```

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Ch 4. Making Decisions

- Relational and Logical Expressions
 - * Will not ask you to evaluate these by themselves.
 - * Need to know how to use with ifs + loops
- Decision statements:
 - * if
 - * if-else
 - * if-else if
 - * block
 - * switch

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Ch 4. Making Decisions cont.

- Other topics
 - * break statement
 - * switch case fall-through
 - * nested ifs
 - * dangling else problem
 - * checking numeric ranges

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Ch 5. Loops

- while loop
 - general purpose
- for loop
 - init; test; update
 - all are optional
- do-while
 - body always done once
 - good for menus, repeating a process
- Which ones are good for which situations

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Ch 5. Loops cont.

- Using a while loop for input validation
- Counters/count controlled loop
- increment decrement operators (as statements)
 - `x++`, `++x`, `x--`, `--x`
- Keeping a running total
- Sentinel controlled loop
- Reading data from a file of unknown length:
 - `while (infile >> number)`
- Nested loops
- Infinite loops

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Ch 7: Arrays

- Array declaration/definition: `int list[10];`
 - * size declarator limitation
- Array elements: `list[i];`
 - * syntax
 - * range of subscripts
 - * types
- Array initialization: `int list[] = {6,7,8};`
- Arrays of char
 - * leave room for null char (`'\0'`) at end

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Ch 7: Arrays cont.

- Operations over arrays
 - * input and output
 - * sum, average
 - * finding max, min (and index of which one)
 - * counting values that pass a test
 - * array assignment (copy)
 - * array compare (for equality)
- Partially filled arrays
- Lack of bounds checking
- Parallel arrays

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Bytes and Hex

- 1 byte = 8 bits
- KB, MB, GB, TB, conversion between
 - How many songs fit on my ipod?
- Hexadecimal number system:
 - * convert between hexadecimal and binary
 - * know binary value of each of the hex digits:

0	0000	4	0100	8	1000	C	1100
1	0001	5	0101	9	1001	D	1101
2	0010	6	0110	A	1010	E	1110
3	0011	7	0111	B	1011	F	1111

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Ch 6: Functions

- Function definition
 - * name, return type, parameter list, body
- Function call
- Function prototype
- Function parameters vs arguments
- Passing arguments by value
- Return statement
- Returning expressions

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How to Study

- Review the slides
 - * read book corresponding to content on slides
- Look at questions at the back of the chapters
 - * not programming challenges
- Understand the homework assignment solutions
 - * rewrite yours so it works
- Practice
- Get some sleep