

CSCI 294, C++, Spring 2020

Final Exam Topics

1. The basics
 - a. Compiled vs. interpreted languages, C++ is compiled
 - b. Comments
 - c. Escape sequences
 - d. Variables
 - i. Declaring and initializing variables
 - ii. Static variables
 - iii. Global variables
 - iv. Scope of variables
 - e. Prompting and reading from the keyboard
 - i. cin details
 - ii. Formatting output with cout
 - f. Rules and best practices for identifier naming
 - g. Mathematical operators
 - h. Pre/Post Increment/Decrement
 - i. Relational operators
 - j. Logical Operators
2. Selection statements
 - a. If
 - b. If-else
 - c. Switch
 - d. Conditional expressions
3. Repetition statements
 - a. For loops
 - b. While loops
 - c. Do-While loops
4. Built-in data types (see external link on class website)
5. cmath library (see external link on class website)
6. Functions
 - a. Function prototypes
 - b. Function overloading
 - c. Static arguments
 - d. Default arguments
 - e. Function templates
7. Recursion
8. Random number generation
9. Enumerations
10. Text File I/O
 - a. Opening and closing a text file
 - b. Reading to the end of the file

11. Arrays

- a. Creating and initializing an array
- b. Passing an array to a function
- c. Common array operations
 - i. Printing an array
 - ii. Copying an array
 - iii. Swapping array elements
 - iv. Shuffling an array
 - v. Linear and binary search
 - vi. Sorting an array (insertion sort)
 - vii. Summing array elements
 - viii. Find minimum element
 - ix. Find index of minimum element
- d. Creating and initializing 2D arrays
- e. Passing 2D arrays to a function
- f. C-Style strings

12. Vectors

13. Structures

14. Classes and Object-Oriented Programming

- a. Classes vs. objects
- b. Information hiding and encapsulation
- c. The “Public Interface”
- d. Accessors (getters)
- e. Mutators (setters)
- f. Helper methods
- g. Constructors
- h. Destructors
- i. How header files are related to implementation files
- j. Returning a reference to private data
- k. Copying objects
- l. Operator overloading

15. References

- a. Used to create variable alias
- b. Use for pass by reference

16. Pointers

- a. Declaring and dereferencing pointers
- b. Relationship between pointers and references
- c. Pass by reference using pointers
- d. The **sizeof** operator
- e. Pointers and arrays
 - i. Pointer arithmetic
 - ii. 4 ways to access an array
- f. Casting pointers
- g. Function pointers

- h. Void pointers
 - i. NULL pointers
 - j. Dangling pointers
 - k. Pointers to objects
17. Dynamic memory allocation
- a. Allocating memory for numeric types
 - b. Creating arrays dynamically