

# Review for Final – CS 102

## Vocabulary

Know vocabulary from each chapter

Also, know this vocabulary from Chapter 8

Binary file, text file, bit, byte, file, primary storage, secondary storage, volatile storage, reading a file, writing to a file

## General Ideas

Know things to do to increase readability

Be able to use the C++ data types

Be able to use and understand the math operators, including ++, --, and the shortcut operators

Know basic string ideas (Declaring, initializing, concatenation, the length function)

Why is duplicating code with copy-and-paste bad? What are some ways to get around that?

What is a constant variable? How do you declare a constant variable?

What are the naming conventions for a constant variable?

Be able to code a switch statement

## The if statement

Know how to compare floating point numbers

The last choice in a multi-way if should almost always be an else, not an else if

Know what nested ifs are

Know what short-circuit if logic is

Know how to check if a data value is in a range

(For example, is x between 10 and 20?)

Be able to code an if using &&, ||, !

## Loops

The for loop is primarily for counting. It can count up or down, and by any number

The other loops are while loops and do...while loops

Know which loops are pre-test and which are post-test and what these words mean

Know what the word iteration means

## Typical applications of loops. Know the code for each of these.

Input validation

Calculating a sum and average, especially for the elements in an array

Finding the maximum and minimum

Counting spaces in a string

Finding the first match

## Function ideas

Know the benefits of using functions

Functions should always be short: A function should do only one task

Code after a return statement is not executed; it is ignored. It's called unreachable code.

A function of type void should not have a return

A function of any other type must have a return that matches the function type

What is the difference between pass-by-value and pass-by-reference?

The default calling scheme in C++ is call by value; the exception to this is arrays

To change this, you need to put an ampersand before a variable's name

## Arrays

An array has a definite size that cannot be changed while a program is running

Know how to declare an array given some information about it

Know what the binary search is and be able to explain it with pseudocode

How do you pass an array to a function?

When an array is passed to a function, it is passed by reference

Know how to use an array. Some things to know

- Be able to print and/or calculate with an element of an array

- Be able to initialize an array using a for loop

- Be able to calculate the sum, average of the elements in an array

- Be able to find the maximum, minimum element in an array

Be able to copy one array to another array

- You have to do this element by element

## Vectors

You can add an element to the end of a vector using `push_back`

You can delete an element from the end of a vector using `pop_back`

Know how to use the `size` member function

You can copy one vector to another like you copy two ints

## Sorting

Sorting data takes a long time.

Be able to explain the selection sort using pseudocode

Know how to swap two data items

## Pointer Ideas

Know how to declare a pointer variable

Know how to assign a pointer variable to point to a variable using `&`

Be able to use an assigned pointer value

Pointers not in use should be set to `NULL`

Know specifically what the new and delete commands do

### **Pointer Arithmetic and the Array/Pointer Duality Law**

Be able to use the array/pointer duality law to access locations in an array

### **The Operating System (OS)**

The operating system is software that controls the computer's resources

Be able to name some resources and talk about how the OS controls them

### **Linked lists**

Know what a linked list is

Know how to add and delete from the beginning of a linked list

Be able to write code that traverses a linked list

### **Text files**

Know how to declare and open a text file for input or output

Be able to read from (using >> or getline()) or write to the file

### **Random Access Files**

A random access file is one type of binary (non-text) file

Know how to declare and open a random access input stream

Know that usually, the data is read into/written from a struct

Know that you can position the file pointer using seekg(). Also, know how to do this

### **The command prompt**

To access arguments from the command prompt, main() should be

```
int main (int argc, char* argv [])
```

Know how to redirect input and output (< for input, > for output, and | to connect programs)

### **True or False?**

Clients generally care about what a function does but not how the function does it.

Overloaded functions are selected by number, types and order of types of parameters.

Variables declared const cannot be modified after they are initialized.

A whole array cannot be passed to a function—each element must be sent to the function separately.

An array is a dynamically resizable data structure.

A vector is a dynamically resizable data structure.

A sequential access file allows records to be accessed in any order.

A sequential access file allows records to have variable sizes.

A random access file allows records to be accessed in any order.

A random access file allows records to have variable sizes.

**True or False? (continued)**

Records in a sequential file are usually updated in place.

A for loop is a post-test loop.

The final exam will have some multiple choice questions, some true/false questions, and some short answer essay questions. Like the other tests, some questions will involve understanding code and some will require writing code.