**CS 121 Exam Study Notes – Exam 2**

**The exam will be 70 % written and 30% programs as with exam 1.**

**Pointers will not be part of the exam.**

* Functions – General Information
  + Three code segments for a function: Body, Prototype, Call
  + Types for function and parameters
  + Rules for passing information into a function (Parameters & Arguments)
  + Passing arrays into and out of a function
  + Returning values from a function: Void, single value, More than one value
  + Recursive definition: A function that can call itself, example NFact
* Function Scope Rules
  + Variables/Identifiers declared within a function are local to that function
  + Variables/Identifiers declared outside all functions are global.
  + IMPORTANT: When you have a local variable/identifier with the same name as a global variable/identifier the LOCAL variable takes precedence.
  + Variables declared as parameters in a function are local variables
  + When the value of a global variable is changed by any function it is changed for all functions.
  + Static variables preserve their value when a function has completed execution. static int number = 10;
* Functions – Programs to study
  + Homework Assignments 4 and 5
  + In class program Scope Rules, Validate, and Functions with Array Parameters
  + Be able to write some simple functions
  + Be able to identify and correct functions that contain **either syntax or logical errors.**
* Sorting and Searching
  + Bubble Sort: Given a series of numbers show how a bubble sort would sort them. Give intermediate results for each pass
    - Start 7 4 3 8 2
    - Pass One 4 3 7 2 8
    - Pass Two 3 4 2 7 8
    - Pass Three 3 2 4 7 8
    - Pass Four 2 3 4 7 8
  + Selection Sort
    - Start 7 4 3 8 2
    - Pass One 2 4 3 8 7 Swap 2 and 7
    - Pass Two 2 3 4 8 7 Swap 3 and 4
    - Pass Three 2 3 4 8 7 4 is in place
    - Pass Four 2 3 4 7 8 Swap 7 and 8
  + Binary Search (Search for the value 18)
    - 0 1 2 3 4 5 6 7 8 9
    - 3 5 6 8 **10** 15 18 20 21 25
    - First = 0 last = 9 Middle = 4
    - Search upper segment 15 18 **20** 21 25
    - First = 5, last = 9, middle = 7
    - Search segment 5 – 7 15 **18** 20
    - First = 5, last = 7, middle = 6 NUMBER FOUND
    - If first ever becomes greater than last number was not in list
* Switch Statements
  + Know the syntax for the switch statement
  + Know how break; works
  + Know what the **default** case does
  + Be able to construct a switch that detects certain conditions. Study days in a month problem.
  + Given an if statement convert to switch equivalent.
* Records – Struct
  + Be able to show a candidate struct for a collection of information. Study the struct problems we did in class.
* Be able to identify and correct syntax and logical errors in code segments.
* Programs – Three programs dealing with functions, structures, and enumeration types.