System-level Programming

Avery Karlin

Fall 2015

Contents

1 Learning C

1.1 C Primitive Variable Types

1. All C primitives are numeric, divided purely based on variable size, and integer or floating point
   (a) C variables have sizes based on the platform they were compiled by and for, such that sizeof(type) can be used to determine the size in bytes
   (b) On a standard computer, int = 4, short = 2, long = 8, float = 4, double = 8, and char = 1 bytes (8 bits to a byte)
   (c) Types can also be specified as unsigned, such that it is not able to be given a negative value
2. Boolean values are numbers, such that 0 is false, and all nonzero numbers are considered true
3. Character literals can be represented inside single quotes rather than use a number, and Strings, though not an object, can use a double quotes literal
   (a) Strings are created by character arrays, using a null character (value 0), to show the end of the array, allowing it to be modified easier
4. Variables are able to be initialized within a for loop, but are not able to be declared, such that it must be before the loop

1.2 C Programming

1. All C programs are made up of a series of functions, run within the main function, which returns an integer (typically 0, or other values for errors)
   (a) They are compiled through "gcc file.c -o program_name", then run through "./program_name"
   (b) All files typically start with calling the C library with #include<stdio.c>