

CS 354 Midterm Review

C Programming

1. Basics - functions
2. Data types
3. Type casting
4. Arrays
5. Pointers
6. Pointer to a pointer
7. Pointers and Arrays
8. Type casting pointers
9. Structures
10. Linked List

Data Representation

1. Bitwise Operators in C - $\&$, $|$, \sim , \wedge
2. Logical Operators in C - $\&\&$, $\|\|$, $!$
3. Little Endian vs Big Endian
4. 1's complement, **2's complement**, and signed magnitude
5. Integer Arithmetic
 - a. Addition
 - b. Subtraction
 - c. Multiplication (using left shifting)
 - d. Division (using right shifting)

Assembly

1. Registers
2. MOV instruction - - movsbw, movzbl, etc.
3. Data Formats - b, w, l
4. Operand Forms
 - a. Immediate
 - b. Register
 - c. Memory - e.g. 0x480032
 - d. Memory - Scaled Indexed

5. Arithmetic and Logical Instructions
6. Push vs Pop
7. Load Effective Address
8. Control
 - a. Condition Codes
 - b. CMP and TEST
 - c. SET instructions
 - d. Jump
 - e. Loops
9. Functions
 - a. Stack Pointer
 - b. Frame Pointer
 - c. Stack Frame
 - d. CALL
 - e. LEAVE
 - f. RETURN
 - g. Recursion
10. Arrays and Structures in Assembly
 - a. Memory padding in structures
11. Pointers in Assembly
12. Stack Smashing