**COE 0449 Midterm**

**Data Representation**

* Two’s complement number system
* Converting between unsigned and signed integers; comparisons
* IEEE Floating Point Representation; converting from binary float to decimal
* Rounding
* Sizes of data types
* Puzzles with data type conversion

**C Programming**

* malloc(), calloc(), realloc() and free(); memory leaks
* Macros and functions
* Pointers and pointer arithmetic; prefixal/postfixal in/decrement operators with pointers
* String functions: strcmp(), sizeof() vs strlen()
* C memory layout: stack, heap, static data, code

**x86 Assembly**

* General form memory addressing
* Lea for performing arithmetic calculations of A + Bx
* Condition codes – Flags for Carry, Zero, Sign, and Overflow
* Compare (b – a) and test (a & b) explicitly setting condition codes
* Stack frame structure; caller vs. callee saved values
* Tracking stack values with recursive calls
* Address alignment for data structures; internal and external fragmentation