CMSI 2210 Fall 2024 Final Exam Study Sheet

The following topics are things we have covered during the class this semester. Not all of them will be on the final exam, since there just isn't time in 2 hours to cover everything. However, the ***key concepts from the course*** that you should take with you are listed; many of them ***WILL*** be on the final exam. You should also be aware that ***there may be combinations of these concepts within a single exam question***. For example, there might be a question for which you would need to convert decimal to hex for two numbers and then add them using registers in an X86_64 architecture CPU.

Remember that the test is ***open everything***, which will make it easier for you to FIND answers but will make the test questions a bit harder. We have seen a large number of terms during the semester. As always, the first page of the exam will be a list of terms that you will match with their definitions.

TOPIX

1. Concepts
    a. System and CPU Architectures
    b. System bus
    c. Compiler operation
    d. Processor parts
    e. Information representation/encoding schemes
        i. ASCII
        ii. UTF-8
        iii. BCD and Packed BCD
        iv. Unicode
    f. Functions
    g. Positional number systems
    h. Prefix translations
    i. Signed vs. unsigned data
    j. Logic components/truth tables/schematic analysis
    k. Bit-wise masking
    l. Endian-ness
    m. CISC vs. RISC
    n. File I/O
    o. Registers, addressing modes, CPU data types
2. Conversions: Binary to decimal/hex to decimal/binary to hex
3. Stanley/Penguin code interpretation and writing
4. "C" code interpretation and writing
5. X86 assembly code interpretation only
6. GDB and LLDB debugging
7. Mixing "C" and assembly code or assembly and "C" code
8. Calling conventions
9. Command line arguments in assembly

10. Floating point in assembly
11. Recursion
12. Stack frames
13. Networking
    a. IP addresses
    b. MAC addresses
    c. Protocols
    d. Port numbers
    e. Domain Name Service
    f. Address translation
    g. Client/server architecture
    h. Sockets
    i. RPCs/RMI
    j. TCP/IP address parts
    k. ONC 7-layer model and TCP/IP model
    l. Packets
    m. Networking commands
        i. netstat
        ii. ping
        iii. telnet
        iv. ipconfig / ifconfig
        v. tracert
        vi. nslookup
        vii. route print
        viii. hostname