# Exam 1 Review

## Bits, Data Types, and Operations

1. Numerical Representations
    - Base 2 / Binary
    - Base 10
    - Octal
    - Hexadecimal
2. Conversions
3. Negative Representaiton in Base 2
    - Sign Magnitude
    - 1's Complement
    - 2's Complement
4. Operations
    - Addition
    - subtration
    - AND, OR, NOT

## Digital logic Structures

1. Transistors
    - NPN
    - PNP
2. Logic Gates
    - CMOS Circuit
    - Not gate
    - And/Nand gate
    - Or/Nor gate
3. DeMorgans Law
4. Combinational Logic Circuits
    - Decoder
    - Multiplexer/MUX
    - Full Addder
        - 4 bit adder
5. Logical Completeness
6. Sequential Logic Circuits
    - R-S Latch
        - clearing/resetting
        - setting
    - Gated D-Latch

        - Write Enable
    - Register
7. Memory
    - Address Space
    - addressability
8. State Machine
    - Elements
9. Combinational vs. Sequential
10. State
    - State Diagrams
    - Finite State Machine
11. Clock
    - Master Slave Flip Flop

## Architecture Models

1. The Stored Program Computer
    - Von Nuemann Model
        - Memory
        - Processing Unit
        - control unit
    - Harvard Model
        - Memory Differences
2. Memory (detailed)
    - Address
    - Contents
    - Operations
        - Load
        - Store
        - Interface