Test 1 Study Guide

CS 200 • Spring 2022

Study Topics

- Historical Perspective
  - Characteristics of computer generations 0..4
  - Computer Level Hierarchy 0..6
  - Moore's Law
- Computer Organization and Architecture Chapter 3
- Boolean Algebra
  - Behavior of basic identities (Identity, Null, Idempotent, Inverse, Commutative, Associative, Distributive).
  - DeMorgan's Law.
  - Boolean functions.
  - Truth tables.
  - Karnaugh Maps of 2, 3, and 4 variables.
  - Sum of Products / Minterms. .
- Circuits and Gates
  - Gate symbols and behavior.
  - AND, OR, NOT, XOR Gates.
  - Universal NAND and NOR gates.
  - Logic diagrams.
  - Block diagrams.
- Combinational Circuits
  - Multiplexers and Decoders.
  - Full adder.
  - Designing circuits with multiple output bits.
- Sequential Circuits
  - Characteristics of a sequential circuit.
  - S-R Flip Flops as the basis of other flip flops
  - S-R, J-K, and D flip flop behavior
  - Counters and RAM circuits.
- Number Base Conversion
  - Other Bases to Decimal (ex. Base 5 to Base 10)
  - Base 10 to Binary, Hexadecimal, and Octal
  - Binary to Octal and Hexadecimal
  - Octal to Hex using Binary intermediate
  - Radix point and Fractional conversion (focus on Binary)

- Data Representation
  - Integers
    - Unsigned
    - Sign-Magnitude
    - 1s Complement
    - 2s Complement