Last Time

• Memory Implementation
• Project 2
Today

• Midterm review
• Homework 3
• Project 2
Midterm Preparation

• Exam discussion on D2L
  – Post sample questions (and answers)
  – Some may appear on the exam
• Look to homework assignments and exams from last year (both the midterm and final) for the types of questions
Midterm Exam

• No books
• No electronic devices
• You may bring 1 page of your own notes
  – Double-sided
Digital Logic

• Basic gates
  – Truth table
  – Symbols used in circuit diagrams
  – NOT, AND, OR, NAND, NOR, XOR
  – Tristate buffers

• Boolean algebra
  – Notation
  – Precedence
  – Basic laws: associative, distributive, commutative
  – Demorgan’s laws
  – Basic identities
Digital Logic

• Digital circuits
  – Cascading basic gates
  – Truth table to algebraic representation to circuit design
  – Multiplexers, demultiplexers

• Circuit reduction
  – Algebraic manipulation
Number Representations

- Conversion between binary and:
  - Decimal
  - Hexidecimal
- Bit-wise operations
Sequential Logic

• Notation
  – Timing diagrams
• D flip flops
• Circuit analysis
  – How does the circuit behave?
  – A “state” describes the stored information
• Basic circuit design
Sequential Logic

• Circuits with flip flops
  – Shifters
  – Counters
  – Memory
Microprocessor Components

• Memory

• Registers:
  – General purpose
  – Special purpose
    • Program counter
    • Instruction register

• Instruction decoder

• Arithmetic logical unit

• Data bus
Microcontroller I/O

- Function of the primary components
  - DDRB
  - PORTB
  - PINB
- Relationship to C code
Memory

- Components and behavior
- Types of memory
- Memory elements
- Primary I/O lines
  - Address
  - Data
  - Chip select
  - R/W
  - Clock