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

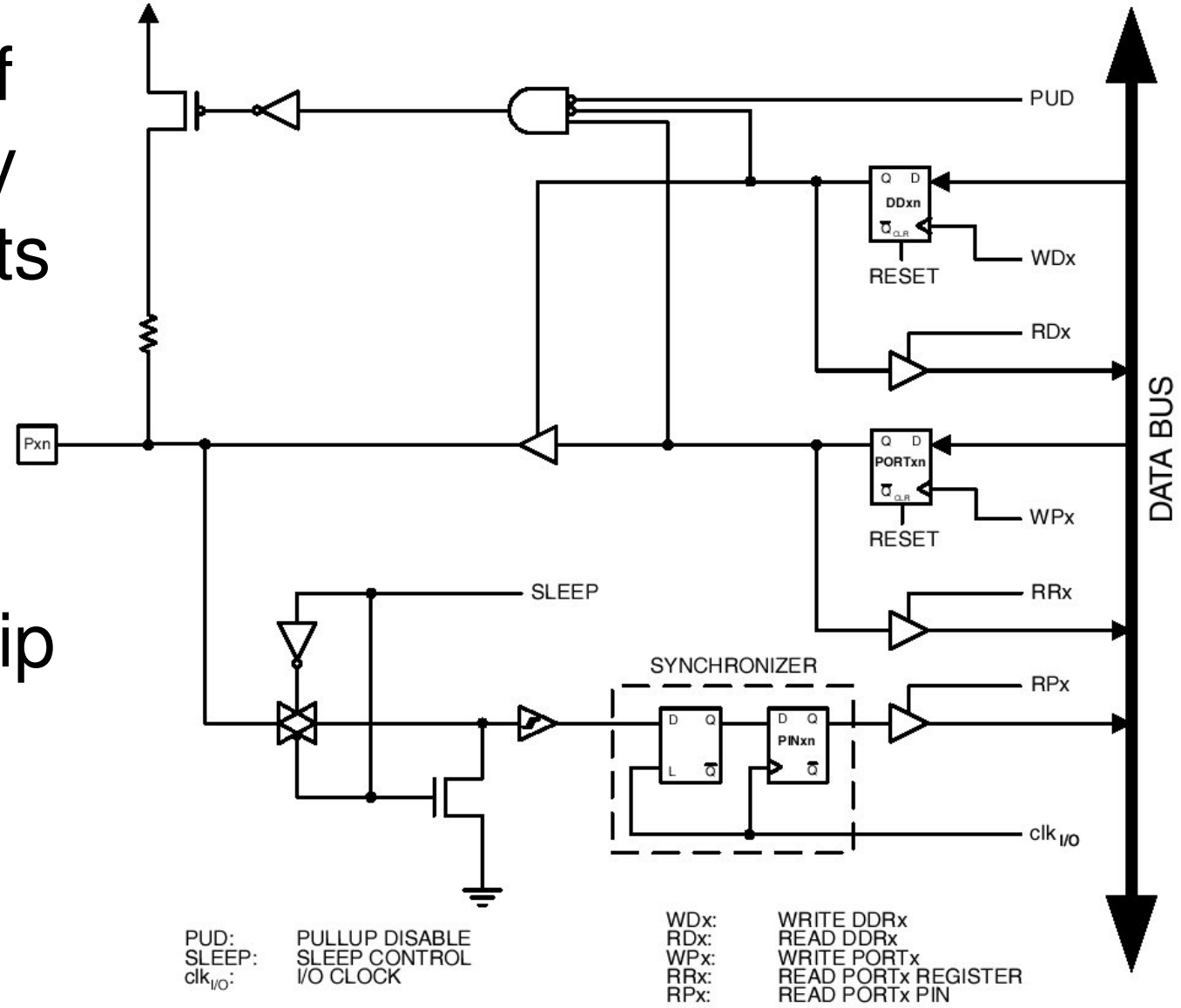
- Circuits with flip flops
  - Shifters
  - Counters
  - Memory

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