

This week:

- Project 1 (need Catme surveys to complete this grading)
- Pencasts: new d2a and a2d material

Following weeks:

- Midterm on Tuesday
- Groups send envoy by Thursday for serial port and oscilloscope training
- Project 2 due Tuesday after break

Midterm Preparation

- Exam discussion on D2L
 - Post sample questions (and answers)
- Look to in-class exercises
- Exams and homework from previous years
 - Warning: coverage can be quite different

Midterm Exam

- No books
- No electronic devices
- You may bring 1 page of **your own** notes
 - Double-sided
- Assigned seating

Number Representations

- Conversion between binary and:
 - Decimal
 - Hexadecimal
- Unsigned versus signed (2's complement) representations
- Bit-wise operations: $\&$, $|$, \sim , \wedge

Arithmetic

- Adding/subtracting binary numbers
- Taking the 2's complement of a number (taking its negative)
- Shifting left/right (multiplication/division by 2)

Microprocessor Components

- Memory
- Registers:
 - General purpose
 - Special purpose, e.g.:
 - Program counter
 - PORTx, PINx, DDRx
- Arithmetic logical unit
- Data bus

Memory

- Addresses versus values
- Reading from versus writing to
- ROM versus RAM
- ROM versus EPROM (or Flash)

Atmel Digital Input/Output

How to use:

- DDR_x
- PORT_x
- PIN_x

You may be asked (in the context of a circuit):

- What a program does
- How to fix a program with bugs

Basic Circuits

- Resistors
- Diodes
- Analog comparators

Moving Between Analog and Digital

Digital to Analog:

- Resistive network

Analog to Digital:

- Flash ADC
- Successive approximation won't be covered