Lecture 25 - Microcontrollers

Microcontroller = small computer on a chip

Typically with ADC, DAC, & various I/O formats

Program via connection to standard computer

Fairly low cost ($5-100, depending)

When you have a complicated electronics task, can often use microcontroller in place of a circuit

→ Programming is much easier than electronics

Advantages:
- Save time
- Easy to change later

Disadvantages
- More expensive
- Slower than dedicated circuits
- Analog errors due to conversions
- Learning curve to get started

Many varieties of chips:

PIC, ARM, Freestyle ...

Can also get chips set up on mini-boards, easier to use:

Arduino, PICAXE, mbed, ...

We'll use mbed boards: easiest to use

Program in C++ (similar to Java)

(Won't do anything too fancy)

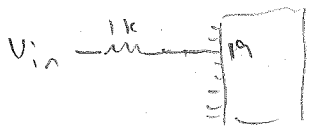
mbeds fairly high end

Cost $60

vs ~ $30 for Arduino board

Note:

In section 13.5-7, add 1k resistor in series with pin 19:



End of semester:

- Final exam Monday 12/17 2-5 pm
  Early time Saturday 12/15 2-5 pm

Last year's final posted on website (course was 50%)

Use same format this year:

- Closed book
- Two sections: Part I = short questions on content of course
  Part II = longer problems to solve

Part I covers everything

Part II: focus on important topics:

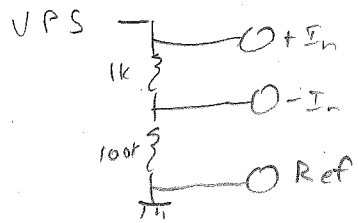
- impedance
- op amp rules
- servos & feedback
- sequential logic

- Course evals
  Count for 1% of grade
  Due Sunday Dec 9, 11:59 PM

- Project
  Work day Sunday Dec 9 2-5 pm
  Project due Thursday Dec 13, midnight [voucher included]
  Turn in on my cart
  Be sure to label with your name!

Testing: can test use same circuit from breadboard test

Check all three pins



Also power cable to test external power connection