Meggy Jr Simple and AVR

Last time
– Compiling and running MeggyJava examples as Java only

Today
– Cool MiniSVG examples
– Meggy Jr Simple library
– avr-gcc tool chain and provided Makefile
– ATmega328p chip
– avr assembly

Meggy Jr Simple Library

Key concepts
– LED screen
– Auxiliary LEDs
– Buttons
– Speaker

Example usage in exercise-MeggyJrSimple.cpp

Why multiple libraries?
– Meggy Jr Simple lies on top of Meggy Jr library
– We added some functionality to the Meggy Jr Simple library
avr-gcc tool chain

See
http://www.cs.colostate.edu/~cs453/yr2011/MeggyJavaInfo/building-for-meggy.html

ATmega328p

Terminology
- Atmel, a company
- AVR, 8-bit RISC instruction set architecture for a microcontroller
- ATmega328p, AT for Atmel, MegaAVR microcontroller, 32kb flash, 8-bit AVR, p=low power
- Arduino, programming environment for various boards with some AVR chips

Uses
- Very popular for hobbyists,
- Industry: Whirlpool appliances, electric car charger, medical products, …
**Why Assembly?**

For some embedded processors, still need to do some assembly programming.

Low-level concepts needed when implementing device drivers.

Hexdump debugging might be something you get to experience.

We want to see how the run-time stack works in gory detail!

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**AVR Instruction Set Architecture, or Assembly**

What is an ISA?

Loads, Stores, and Registers

Pushes and Pops

Learning AVR with avr-gcc

Probable AVR instructions

Calling convention

Allocating space in the heap
Next Time

Tuesday
- Lexer and Parser generation tools

Assignments
- Quiz 2 due tonight at 10pm
- PA2 due Wednesday the 16th at 11:59pm