A source of AVR Assembly information is:


The following notes are associated with the above document.

This was written for the atmega328p. We use an atmega32u4. Differences are minor: 32u4 has 2.5k internal SRAM (not 2), the interrupts supported are a bit different and the “u” signifies built-in USB.

Section 2: Technically, a byte is the smallest addressable unit of data, and is only 8 bits today by convention. Eight bits is technically an octet.

Skim section 6. The useful stuff is about the restrictions on operands for some instructions (not all registers are accessible), but how an instruction is encoded in bits is a bit too detailed. The assembler will also tell you if you try to use an instruction with an unsupported register, so learning the rules is not important.

Section 8.1 begins "In this course", obviously for a different course. It's probably a good idea to know how flags are computed.

Section 10.2 although described as possible to use "lds" instead of "in" to load a frame pointer, abandoning convention to do so will sacrifice substantial points in 216.

Section 11: As in 10.2, while memory addresses are described for I/O, we expect you to use in/out instructions for accessing I/O registers rather than use the memory map.

Section 11.3: Skip. We will not directly program the ADC. It is not fun.

Section 12: Skim. Our board uses I2C for communicating with the accelerometer and has no 7-segment display. The assembly fragment is quite good though, and worth tracing through.

Section 13: Skip. Obviously, we don't have a motor shield.

Section 14: The Interrupt Vector table for the atmega32u4 is different, described in section 9 of the full datasheet. The concept is the same. Although we have more interrupts wired up, we have just one pin change interrupt, wired to the accelerometer. We will not be using interrupts, but the idea is very important.

Section 15: Highly important to understand.

Section 16.3: It is generally important for the class that you recognize ascii and unicode.

Section 17: Skim. You may recognize this from 250.

Section 18.3: Be familiar with floating point representations. We will cover this in more detail in class.

Section 19: Very important, but incomplete.