ECE 375 Prelab 3

Lab Time: Friday 2 PM - 3:50 PM

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TA Signature

1 Questions

1. What is the stack pointer? How is the stack pointer used, and how do you initialize it? Provide pseudocode (not actual assembly code) that illustrates how to initialize the stack pointer.

   The stack pointer is used to point to the top of the stack i.e. specifies memory location. It's used to store information about the active subroutines of a program and implements a last-in, first-out (LIFO) behavior. It is decremented when something is pushed onto the stack and incremented when something is pulled from the stack.

   ```
   write high byte to SPH (stack pointer high)
   write low byte to SPL (stack pointer low)
   ```

2. What does the AVR instruction LPM do, and how do you use it? Provide pseudocode (not actual assembly code) that shows how to setup and use the LPM instruction.

   LPM is load program memory. It loads reads content from the flash program memory to a register by loading 1 byte into the register file. It can be accessed using the Z register.

   ```
   load program memory to register 0 from Z byte
   ```

3. Take a look at the definition file m32U4def.inc. What is contained within this definition file? What are some of the benefits of using a definition file like this? Please be specific, and give a couple examples if possible.

   The definition file contains variable and constant declarations using .def and .equ. Benefits of using a definition file like this makes it easy to reference what the values were set to, i.e

   ```
   .equ WskrR = 4 ; Right Whisker Input Bit
   .equ WskrL = 5 ; Left Whisker Input Bit
   ```

   As well as make programming more efficient since the registers will be initialized.