Homework 4

1. If you want to store the value 0x33A0 in register Y, what instructions will you need to do?
   * LDI R28, 0x33
   * LDI R29, 0xA0
2. Why do you need to use the push and pop instructions to save register values in data memory?
   * We use the push and pop instructions because it’s the easiest way to save register values and because as you push values to save in *stack* you need to pop them off the stack in exactly the reverse order.
3. If a C function call to an assembly function passes four-character type (char) variables with values ‘m’, ‘o’, ‘o’, ’n’, which registers you need to retrieve to correctly receive the four characters in the assembly code?
   * You will need to use registers R24, R22, R20, and R18.
4. What is the difference between CPU and microcontroller? Is AVR a CPU or a microcontroller?
   * According to the textbook, the difference between CPU and microcontroller is only that the processor, memory, and I/O are all embedded into a single chip. This being said, AVR is basically the same thing, but our book calls it a microcontroller.
5. How many bits are in the program counter register?
   * 16 bits are in the program counter register.
6. How do you read the 8 bits in the status register SREG to R18?
   * The SREG is accessed in I/O space at I/O address 0x3f, or memory address 0x5f.
7. What are the operands of the two branching instructions?
   * The operands of the branching instructions are the offset k’s, or B1 and B2.
8. What is the value of R20 at the return of this code?
   * Value of R20 at the return of this code is 16.