

EE 308 – Homework 3

For the homework problems which follow assume you have included the file derivative.h in your C program. Thus, you can refer to PORTB when you want to access a byte at address 0x0001. Where we ask for "some code" just write that part of a C program which will do the task. Where we ask for "a program" write a complete program, the declaration of variables, the main() function, etc.

- 1.** Write some C code which will clear bits 3 and 5 and set bits 4 and 2 of the eight-bit number at address 0x0050 while leaving the other bits unchanged.
- 2.** Write some C code which will set bits 15, 11, 7 and 3 of the 16-bit number at address 0x0080 while leaving the other bits unchanged
- 3.** Write some C code which will wait until Bit 7 of the eight-bit number at address 0x0040 becomes clear.
- 4.** Write a C function which does the following: the function will be called with one argument and will return one eight-bit value. Write the argument to PORTB, then generate the next pattern in the sequence for a binary counter. The procedure to do this is as follows: First set PORTB to zero (all LEDs off), then increment the number at PORTB. The function returns the eight-bit value of the next pattern.
- 5.** Write a C function which does the following: the function will be called with one argument and will return one eight-bit value. Write the argument to PORTB, then generate the next pattern in the sequence for an eight-bit Johnson counter. The procedure to do this is as follows: Shift the present pattern to the right by one bit. The most significant bit of the next pattern is the inverse of the least significant bit of the present pattern. The function returns the eight-bit value of the next pattern.