Find the contents of the port after each of the following operations:

   a) PORTB = 0x65 & 0x76;
   b) PORTD = 0x6A ^ 0x6E;
   c) PORTB = 0x70 | 0x6B;

Find the port value after each of the following instructions is executed:

   a) PORTB = 0x17>>3;   b) PORTB = 0x17<<4;

   c) PORTB = 1<<5;

Write a C program using Timer0 without interrupts to generate a 1 kHz square wave on PORT B, bit 3 (PB3) while at the same time transferring data from PORTD to PORTA. Assumer fosc = 8 MHz.

Using Timer0, write a program in C that toggles pin PORTB.2 every 100 ms for a period of 500 ms. When the timer is not being used, transfer data from PORTD to PORTC. XTAL = 8 MHz. Do not use interrupts for this problem. Create a Microchip Studio workspace for the C language (not C++) (new project => C/C++ => gcc executable project) for the ATmega32, copy your C code, compile the code, and view the disassembly window to see how your C code was translated to assembly language instructions by the compiler. Print out the disassembly window to submit with this problem. Comment on the differences between your assembly code and the version generated by the compiler.

Write an assembly program to generate a time delay of 20 us using Timer 0 with Compare Match programming (CTC mode) (see the example in the lecture notes 4/4/19). Assume fosc = 8 MHz.

In C, program Timer0 to be an event counter (endless loop). Output the current count for each loop to PORTC. Initialize the count to 10. Assume that the external count events are falling edge triggered (see the last 3 bits of TCCR0 to configure as a counter, falling edge).