ECED 3204 Microprocessor

Assignment #5

http://www.jasongu.org/3204/assignments.html

Due date: November 8, 2017. Late submission will not be accepted.

Assignment #5 contains the following problems:

E11.1 How many clock cycles are needed to create a time delay of 7 ms, assuming that the frequency of the clock input to the timer is 2 MHz?

E11.4 Write a sequence of AVR instructions and C statements to be executed by an ATMega640/1280/2560 MCU to generate a 1-kHz PWM waveform with 30% duty cycle from the OC2B pin assuming that f_{clk_IO} = 16 MHz.

E11.7 Write a C program to measure the duty cycle of a periodic square wave connected to the ICP1 pin of the ATmega640/1280/2560 device.

E11.9 Write a set of C functions that can create a time delay that is a multiple of 50 μs, 1 ms, 10 ms, 100 ms, and 1 s, respectively. The multiple is passed to these functions as a parameter with the type of **unsigned int**. These functions are to be executed by an MEGA640/1280/2560 MCU running with a 16-MHz crystal oscillator.

E11.13 Write an AVR C program to be run on an ATmega640/1280/2560 demo board to generate a periodic square wave with 2-kHz frequency and 70% duty cycle using the Timer 1 CTC mode. The MEGA640/1280/2560 is running with a 16-MHz crystal oscillator.