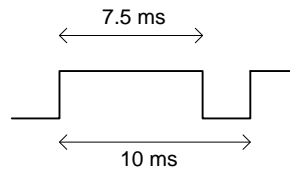


**UNC Charlotte, Department of Electrical and Computer Engineering
ECGR 4101/5101, Spring 2010, Homework #8**

You will need to refer to the M16 Software Manual, the M16 Hardware Manual and M16 C Language Programming Manual to complete this assignment. They are available online through the documentation contained in the SKP16C26 directories link on the course home page.

1. (1 point) How many timers does our Renesas microcontroller have?
2. (1 point) What is the width of a timer data register for our microcontroller?
3. (12 points) Using timers and interrupts, write a C code to toggle LED3 every 4 seconds 25 times and display the status of the LED on the LCD. Include setup details of all the control registers and header files.



4. (2 points) For an active low circuit, what is the time period, frequency and duty cycle of the waveform shown above?
5. (4 points) For an active high circuit (use the waveform shown above), what would be the value of the timer control and data registers to generate PWM pulses. No need to write the entire code, just the register names and their corresponding values.