CPE 301: Homework #5

Due on March 7, 2019 at 9:00am

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Problem 1

Description of Purpose:
Homework 5 helps us get more familiar with the arduino's language by having us do more program's. As far of the scope of what the homework wants us to do, I'm not sure until I actually do the assignments. But, from the details of what I can read, it seems that we are getting more familiar with masking, DDR, Port, and PIN operations.

Modify the Blink program you did from Chapter 3 (Arduino UNO version on page 85 of the textbook) so that the function MyDelay(mSecondsApx) uses the Arduino ATmega2560 timer1 in Normal mode to generate a delay of (mSecondsApx * one millisecond) before returning.

Solution

Problem 2

The international tuning standard for musical instruments is A above middle C at a frequency of 440Hz. Write an Arduino Mega C language program to generate this tuning frequency and sound a 440 Hz tone on a loudspeaker connected to PortB.6 using Timer 1.

Solution

Problem 3

Write an Arduino Mega C language program using the Arduino ATmega2560 timer1 in Normal mode to generate a 12 kHz square wave on PortB.6 using Timer 1.

Solution

Problem 4

Write an Arduino Mega C language program to generate a 500Hz signal on PortB.6 using Timer 1 in Normal mode. The wave should have a 30% duty cycle (duty cycle = high time / period).

Solution