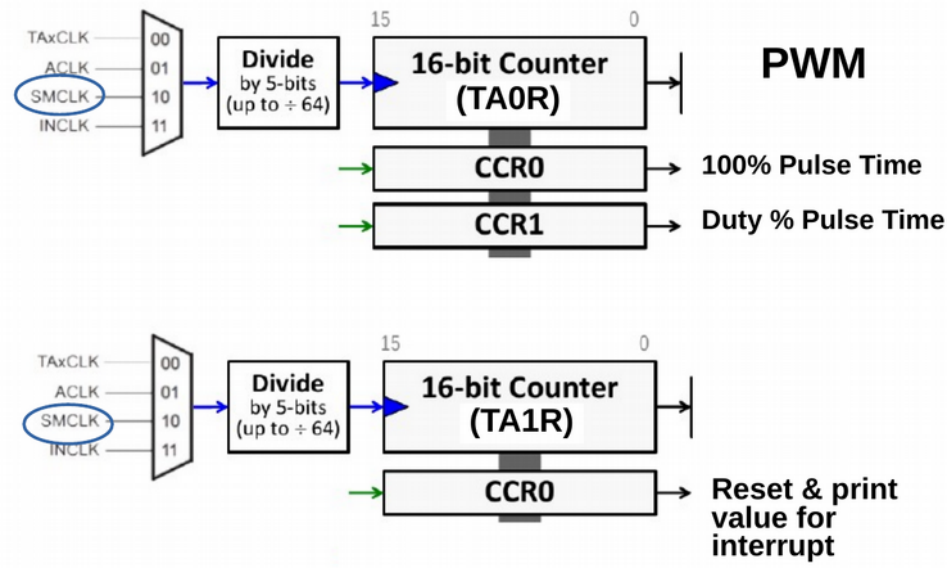
M7 Assignment Timer PWM

TA0 generates PWM, fixed duty cycle, and TA1 periodically changes the duty cycle value



Connect LaunchPad, download and run - sketch_PWMWatsonFade.ino

DOCUMENT:

Include a screen shot of the ‘Successful’ download of the code

Include a screen shot of the Serial Plotter showing the waveforms

Include a listing of the sketch code as you run it

Refer to the following initialization code from the ‘ino’ and answer the questions

Set Timer for fixed Duty Cycle PWM

```
54    /*** Timer0_A Set-Up ***/
55    TA0CCR0 |= 1000;                    // PWM period
56    TA0CCR1 |= 1;                       // TA0CCR1 PWM duty cycle
57    TA0CCTL1 |= OUTMOD_7;               // TA0CCR1 output mode = reset/set
58    TA0CTL |= TASSEL_2 + MC_1;          // SMCLK, Up Mode (Counts to TA0CCR0)
```

1. Does the Set-Up lines 54-58 require an interrupt service routine?
2. What is the duty cycle after initialization?
3. What type of waveform does OUTMOD_7 produce?

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4. Which mode is used with the counter?
5. Which clock signal is used with the counter?
6. Which Timer is used in lines 54-58 ?

```
60    /*** Timer1_A Set-Up ***/
61    TA1CCR0 |= 4000;                  // Counter value
62    TA1CCTL0 |= CCIE;                 // Enable Timer1_A interrupts
63    TA1CTL |= TASSEL_2 + MC_1;        // SMCLK, Up Mode (Counts to TA1CCR0)
```

7. Lines 60-63 use which Timer?
8. What sets the compare register to the count value?
9. What frequency is the input clock signal?
10. How often with the timer interrupt?
11. Output mode is used in this timer?

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```
68
69 #pragma vector=TIMER1_A0_VECTOR     //
70    __interrupt void Timer1_A0 (void) {
71
72     TA0CCR1 += IncDec_PWM;          //
73     if( TA0CCR1 > 998 || TA0CCR1 < 2 )
74        IncDec_PWM = -IncDec_PWM;
75
76     // print every 10th value
77     if (!DeciMate--)
78     {
79       DeciMate=10;
80       printf("%d\n", TA0CCR1);
81     }
```

12. ISR to change duty cycle
13. Which timer is the ISR for?
14. Which timer CCR value is being modified
15. Line 74 reverses the count direction when?

VIDEO:

Show ‘Successful’ of download screen from your monitor

Show the board with Green LED fading

Show screen with the Serial Plotter waveform

Be sure to say your name, date, and time