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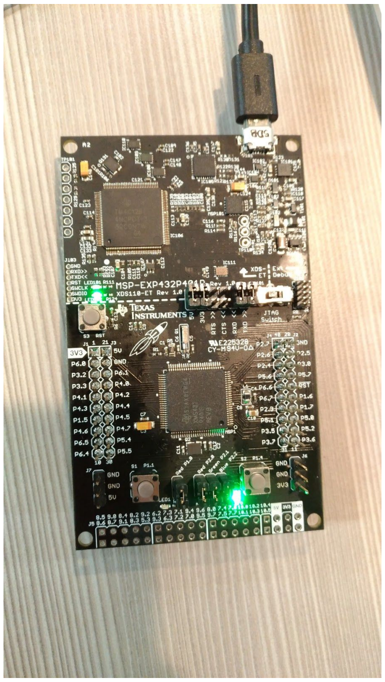
A2 Blinking LEDS



https://youtu.be/h9ZabkehBmg

Objective:
Demonstrate one pulse blinking leds at varied frequencies

```
//CPE 329 Colleen Lau, Brian Buchanan
#include "msp.h"
void delay_ms(int ms, int freq);
void delay_us(int us, int freq1);
void set_DCO(int frequency);

int main(void) {

  P2->SEL1 &= ~BIT1;      // set P2.1 as GPIO
  P2->SEL0 &= ~BIT1;      // set P2.5 as GPIO
  P2->DIR  |= BIT1;       // set P2.1 as output

  while (1) {
    P2->OUT |= BIT1;    // P2.1 on
    delay_ms(500, 1000);
    P2->OUT &= ~BIT1;   // P2.1 off
    delay_ms(500);

    P2->OUT |= BIT1;    // P2.1 on
```

```
   delay_us(500, 1000);
   P2->OUT &= ~BIT1;    // P2.1 off
   delay_us(500);
  }
}

// Delay milliseconds function
void delay_ms(int ms, int freq) {
  int i, j;
  i = freq*0.0001  ;              // convert to ms
  for (j = 0; j < ms; j++)
    for (i = 750; i > 0; i--);   // delay 1 ms (approx)
}

// Delay microseconds function
void delay_us(int us, int freq1) {
  int i, j;
  i = freq*0.0000001;             // convert to us
  for (j = 0; j < us; j++)
    for (i = 300; i > 0; i--);  // delay 1us (approx)
}

// Set  MSP432 Frequency
void set_DCO(int frequency)
{
 if (frequency == 1500000)
 {
  // Changing DCO of default 3MHz to 1.5MHz
  CS -> KEY = CS_KEY_VAL;
  CS -> CTL0 = 0;
  CS -> CTL0 = CS_CTL0_DCORSEL_0;

  // select clock sources
  CS -> CTL1 = CS_CTL1_SELA_2 | CS_CTL1_SELS_3 | CS_CTL1_SELM_3;
  CS -> KEY = 0;
 }
 else if (frequency == 6000000)
 {
  // Changing DCO of default 3MHz to 6MHz
  CS -> KEY = CS_KEY_VAL;
  CS -> CTL0 = 0;
  CS -> CTL0 = CS_CTL0_DCORSEL_2;
```

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    // select clock sources
    CS -> CTL1 = CS_CTL1_SELA_2 | CS_CTL1_SELS_3 | CS_CTL1_SELM_3;
    CS -> KEY = 0;
  }
  else if (frequency == 12000000)
  {
    // Changing DCO of default 3MHz to 12MHz
    CS -> KEY = CS_KEY_VAL;
    CS -> CTL0 = 0;
    CS -> CTL0 = CS_CTL0_DCORSEL_3;

    // select clock sources
    CS -> CTL1 = CS_CTL1_SELA_2 | CS_CTL1_SELS_3 | CS_CTL1_SELM_3;
    CS -> KEY = 0;
  }
  else if (frequency == 24000000)
  {
    // Changing DCO of default 3MHz to 1.5MHz
    CS -> KEY = CS_KEY_VAL;
    CS -> CTL0 = 0;
    CS -> CTL0 = CS_CTL0_DCORSEL_4;

    // select clock sources
    CS -> CTL1 = CS_CTL1_SELA_2 | CS_CTL1_SELS_3 | CS_CTL1_SELM_3;
    CS -> KEY = 0;
  }
  else if (frequency == 48000000)
  {
    // Transition to VCOre Level 1: AM0_LD0 --> AM1_LD0
    while ((PCM -> CTL1 & PCM_CTL1_PMR_BUSY));
    PCM -> CTL0 = PCM_CTL0_KEY_VAL | PCM_CTL0_AMR_1;
    while ((PCM -> CTL1 & PCM_CTL1_PMR_BUSY));

    // Configure Flash wait-state to 1 for banks 0 & 1
    FLCTL -> BANK0_RDCTL = (FLCTL -> BANK0_RDCTL &
                          ~(FLCTL_BANK0_RDCTL_WAIT_MASK)) |
FLCTL_BANK0_RDCTL_WAIT_1;
    FLCTL -> BANK0_RDCTL = (FLCTL -> BANK0_RDCTL &
                          ~(FLCTL_BANK1_RDCTL_WAIT_MASK)) |
FLCTL_BANK1_RDCTL_WAIT_1;

    // Configure DCO to 48MHz
    CS -> KEY = CS_KEY_VAL;
    CS -> CTL0 = 0;
    CS -> CTL0 = CS_CTL0_DCORSEL_5;

    // Select MCLK = DCO
    CS -> CTL1 = CS -> CTL1 & ~(CS_CTL1_SELM_MASK | CS_CTL1_DIVM_MASK) |
                 CS_CTL1_SELM_3;
    CS ->KEY = 0;
  }
  else
  {
    // Default Frequency
    CS -> KEY = CS_KEY_VAL;
    CS -> CTL0 = 0;
    CS -> CTL0 = CS_CTL0_DCORSEL_1;

    // select clock sources
    CS -> CTL1 = CS_CTL1_SELA_2 | CS_CTL1_SELS_3 | CS_CTL1_SELM_3;
    CS -> KEY = 0;
  }

}
```