

```
//-----  
// Blinky.c  
//-----  
// Copyright 2001 Cygnal Integrated Products, Inc.  
//  
// AUTH: BW  
// DATE: 4 SEP 01  
//  
// Target: Cygnal Educational Development Board / C8051F020  
// Tool chain: KEIL C51 6.03 / KEIL EVAL C51  
//  
// This program flashes the green LED on the C8051F020 target board about five times  
// a second using the interrupt handler for Timer3.  
// Target: C8051F02x  
//  
//-----  
// Includes  
//-----  
#include <c8051f020.h>                // SFR declarations  
  
//-----  
// 16-bit SFR Definitions for 'F02x  
//-----  
sfr16 DP          = 0x82;           // data pointer  
sfr16 TMR3RL      = 0x92;           // Timer3 reload value  
sfr16 TMR3        = 0x94;           // Timer3 counter  
sfr16 ADC0        = 0xbe;           // ADC0 data  
sfr16 ADC0GT      = 0xc4;           // ADC0 greater than window  
sfr16 ADC0LT      = 0xc6;           // ADC0 less than window  
sfr16 RCAP2       = 0xca;           // Timer2 capture/reload  
sfr16 T2          = 0xcc;           // Timer2  
sfr16 RCAP4       = 0xe4;           // Timer4 capture/reload  
sfr16 T4          = 0xf4;           // Timer4  
sfr16 DAC0        = 0xd2;           // DAC0 data  
sfr16 DAC1        = 0xd5;           // DAC1 data  
  
//-----  
// Global CONSTANTS  
//-----  
  
#define SYSCLK 1843200                // approximate SYSCLK frequency in Hz  
  
sbit  LED = P2^0;                    // green LEDs: '1' = ON; '0' = OFF  
  
//-----  
// Function PROTOTYPES  
//-----  
void PORT_Init (void);  
void Timer3_Init (int counts);  
void Timer3_ISR (void);  
  
//-----  
// MAIN Routine  
//-----  
void main (void) {  
  
    // disable watchdog timer  
    WDTCN = 0xde;  
    WDTCN = 0xad;  
  
    PORT_Init ();  
    Timer3_Init (SYSCLK / 12 / 10);    // Init Timer3 to generate interrupts  
                                        // at a 10Hz rate.  
  
    EA = 1;                            // enable global interrupts
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    while (1) {                                // spin forever
    }
}

//-----
// PORT_Init
//-----
//
// Configure the Crossbar and GPIO ports
//
void PORT_Init (void)
{
    XBR2      = 0x40;                            // Enable crossbar and weak pull-ups
    P1MDOUT |= 0x40;                            // enable P1.6 (LED) as push-pull output
}

//-----
// Timer3_Init
//-----
//
// Configure Timer3 to auto-reload and generate an interrupt at interval
// specified by <counts> using SYSCLK/12 as its time base.
//
void Timer3_Init (int counts)
{
    TMR3CN = 0x00;                               // Stop Timer3; Clear TF3;
                                                // use SYSCLK/12 as timebase
    TMR3RL = -counts;                            // Init reload values
    TMR3    = 0xffff;                            // set to reload immediately
    EIE2   |= 0x01;                              // enable Timer3 interrupts
    TMR3CN |= 0x04;                              // start Timer3
}

//-----
// Interrupt Service Routines
//-----

//-----
// Timer3_ISR
//-----
// This routine changes the state of the LED whenever Timer3 overflows.
//
void Timer3_ISR (void) interrupt 14
{
    TMR3CN &= ~(0x80);                          // clear TF3
    LED = ~LED;                                  // change state of LED
}
```