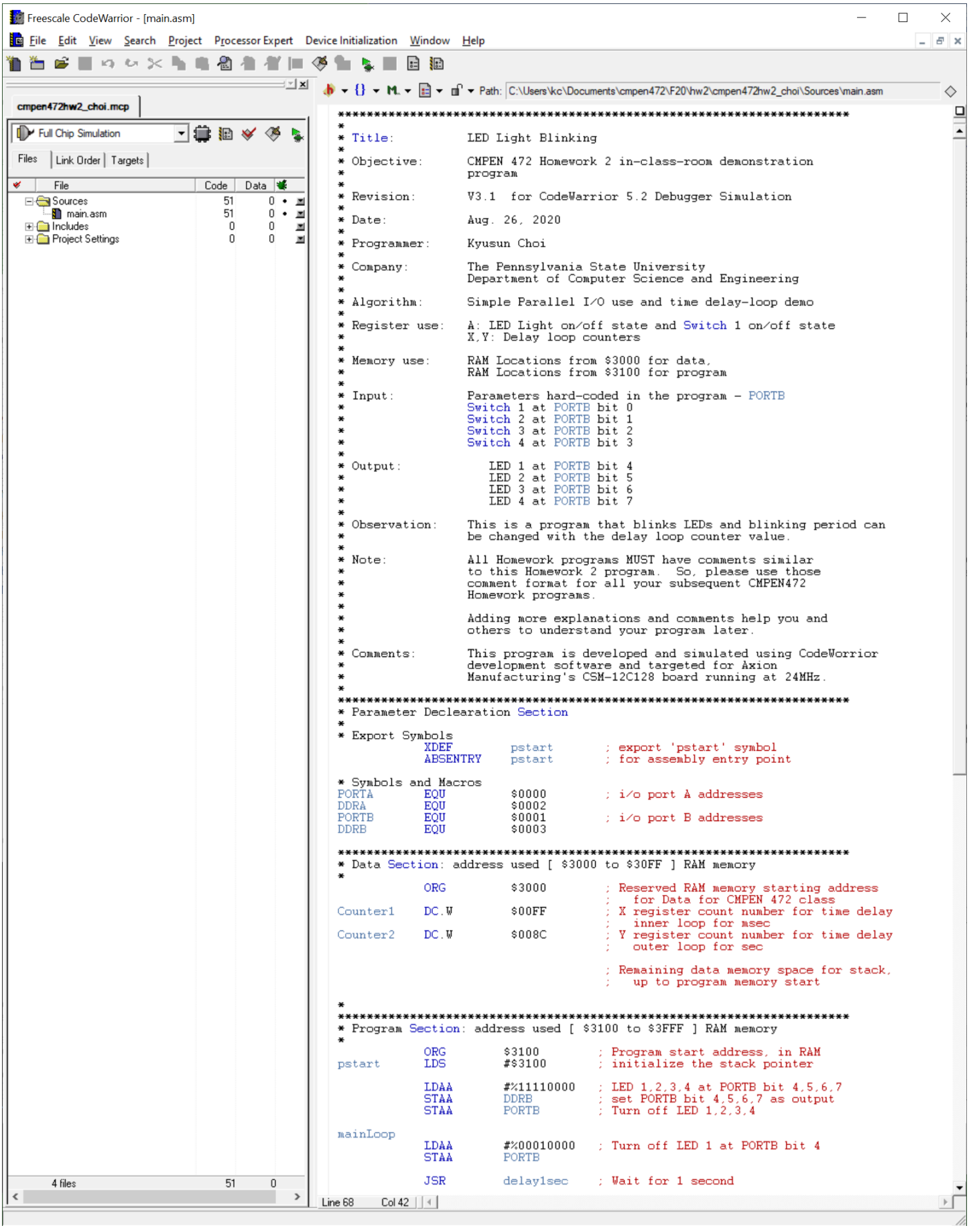
CMPEN 472 Homework 2, Blinking LED on HC12C128 Simulation




```
*****************************************************************
*
* Title:          LED Light Blinking
*
* Objective:      CMPEN 472 Homework 2 in-class-room demonstration
*                 program
*
* Revision:       V3.1  for CodeWarrior 5.2 Debugger Simulation
*
* Date:           Aug. 26, 2020
*
* Programmer:     Kyusun Choi
*
* Company:        The Pennsylvania State University
*                 Department of Computer Science and Engineering
*
* Algorithm:      Simple Parallel I/O use and time delay-loop demo
*
* Register use:   A: LED Light on/off state and Switch 1 on/off state
*                 X,Y: Delay loop counters
*
* Memory use:     RAM Locations from $3000 for data,
*                 RAM Locations from $3100 for program
*
* Input:          Parameters hard-coded in the program - PORTB
*                 Switch 1 at PORTB bit 0
*                 Switch 2 at PORTB bit 1
*                 Switch 3 at PORTB bit 2
*                 Switch 4 at PORTB bit 3
*
* Output:            LED 1 at PORTB bit 4
*                    LED 2 at PORTB bit 5
*                    LED 3 at PORTB bit 6
*                    LED 4 at PORTB bit 7
*
* Observation:    This is a program that blinks LEDs and blinking period can
*                 be changed with the delay loop counter value.
*
* Note:           All Homework programs MUST have comments similar
*                 to this Homework 2 program.  So, please use those
*                 comment format for all your subsequent CMPEN472
*                 Homework programs.
*
*                 Adding more explanations and comments help you and
*                 others to understand your program later.
*
* Comments:       This program is developed and simulated using CodeWorrior
*                 development software and targeted for Axion
*                 Manufacturing's CSM-12C128 board running at 24MHz.
*
*****************************************************************
* Parameter Declearation Section
*
* Export Symbols
            XDEF        pstart        ; export 'pstart' symbol
            ABSENTRY    pstart        ; for assembly entry point

* Symbols and Macros
PORTA       EQU         $0000         ; i/o port A addresses
DDRA        EQU         $0002
PORTB       EQU         $0001         ; i/o port B addresses
DDRB        EQU         $0003

*****************************************************************
* Data Section: address used [ $3000 to $30FF ] RAM memory
*
            ORG         $3000         ; Reserved RAM memory starting address
                                      ;   for Data for CMPEN 472 class
Counter1    DC.W        $00FF         ; X register count number for time delay
                                      ;   inner loop for msec
Counter2    DC.W        $008C         ; Y register count number for time delay
                                      ;   outer loop for sec

                                      ; Remaining data memory space for stack,
                                      ;   up to program memory start

*
*****************************************************************
* Program Section: address used [ $3100 to $3FFF ] RAM memory
*
            ORG         $3100         ; Program start address, in RAM
pstart      LDS         #$3100        ; initialize the stack pointer

            LDAA        #%11110000    ; LED 1,2,3,4 at PORTB bit 4,5,6,7
            STAA        DDRB          ; set PORTB bit 4,5,6,7 as output
            STAA        PORTB         ; Turn off LED 1,2,3,4

mainLoop
            LDAA        #%00010000    ; Turn off LED 1 at PORTB bit 4
            STAA        PORTB

            JSR         delay1sec     ; Wait for 1 second
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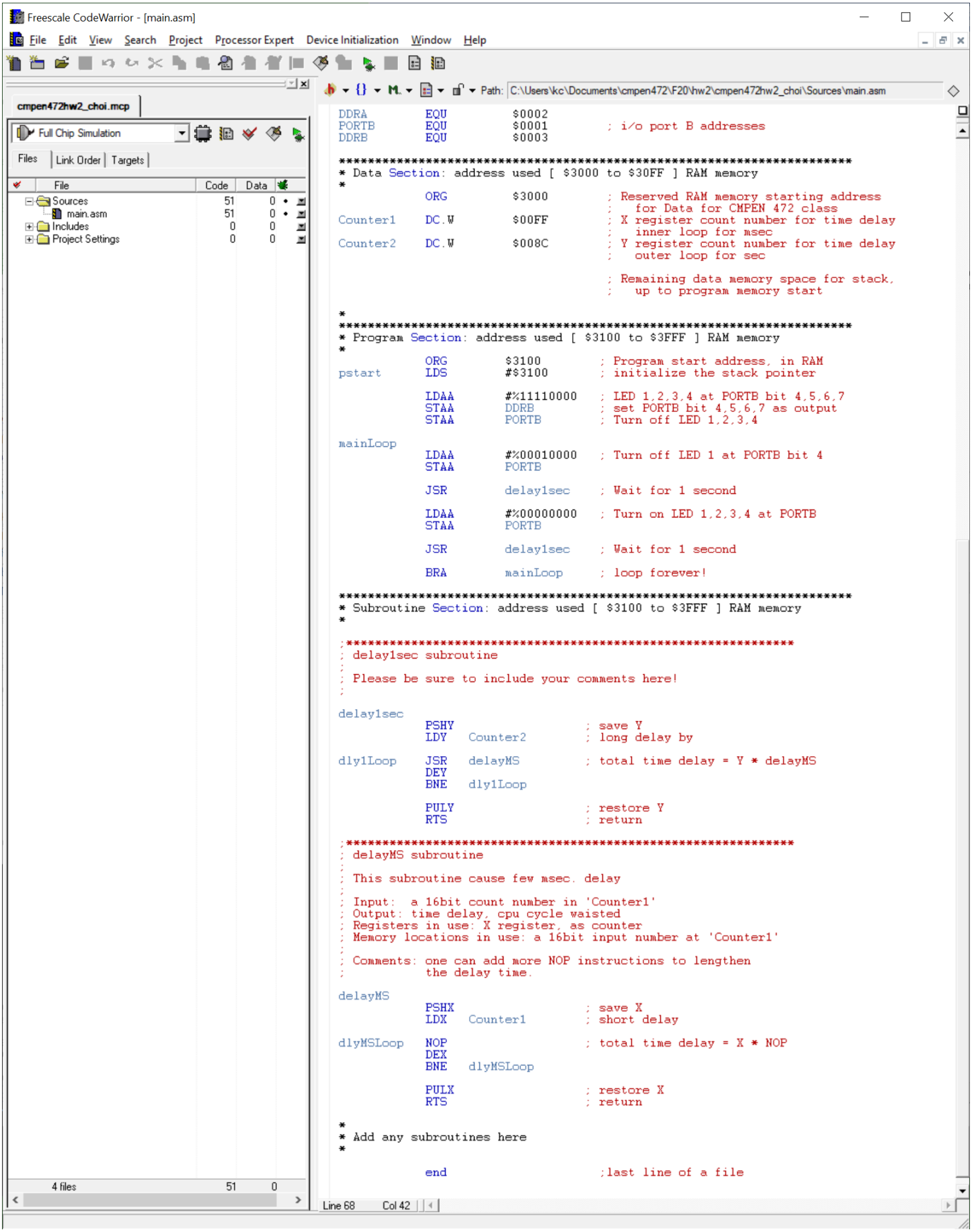
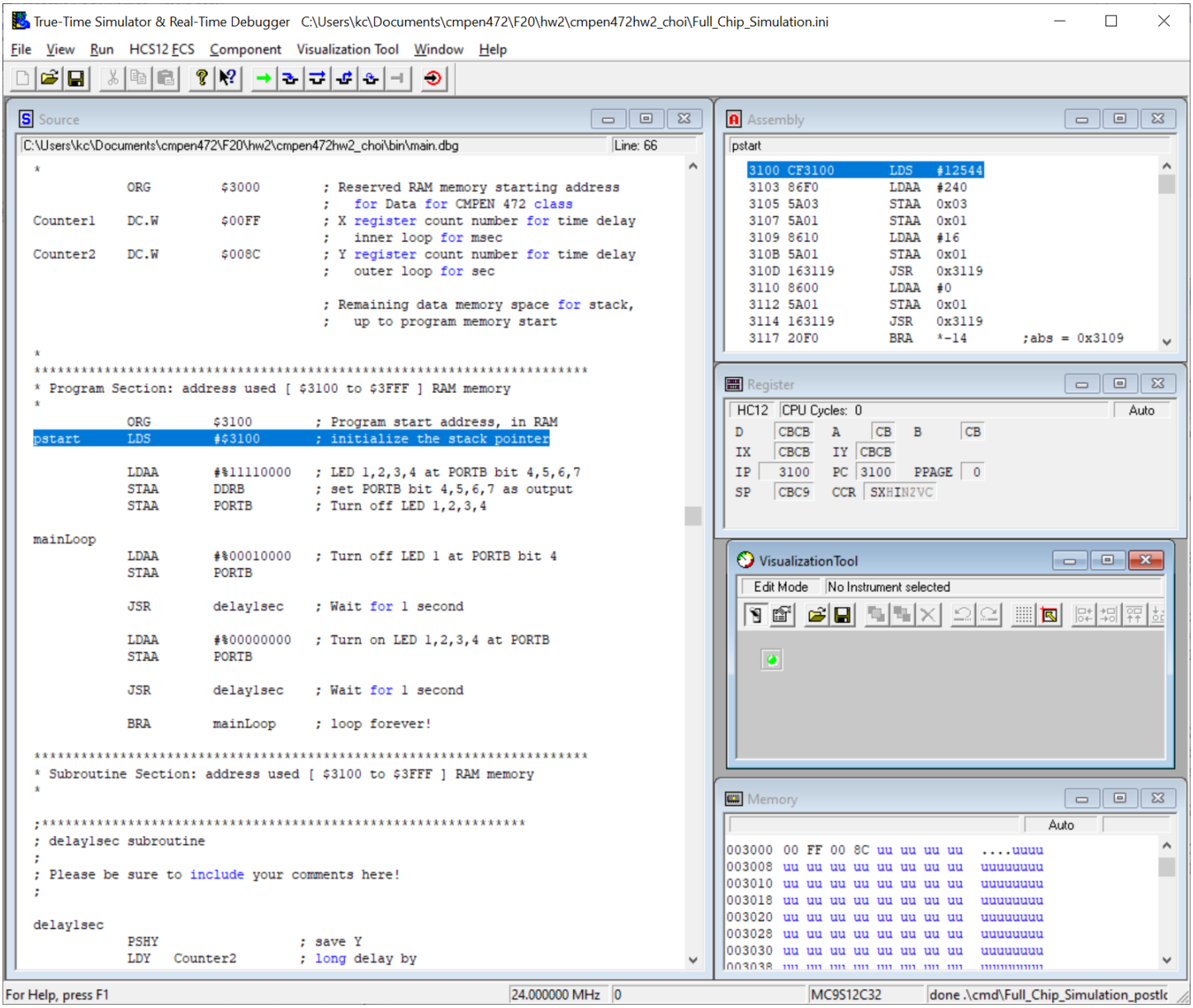


Save Make Debug



HCS12_FCS: Clock Frequency 24MHz

Component: VisualizationTool

VisualizationTool: Properties

VisualizationTool: Properties: Refresh Mode = CPU Cycles, Cycle Refresh Count = 1

VisualizationTool: Add New Instrument = LED

VisualizationTool: LED: Properties:

Set Port to Display to 0x0001	PORTB
Set Size 1 Byte	8bit port
Set Byte Order to Big Endian	
Set Bit Number to Display to 4	LED 1

VisualizationTool: Save Layout As . . . . cmpen472hw2_choi.vtl

Source
Assembly
Register
VisualizationTool
Memory

File: Save Configuration