University of British Columbia
Electrical and Computer Engineering
Digital Systems and Microcomputers
CPEN312

Lab 4 – CV-8052 Soft Processor

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Introduction

For this laboratory assignment you will setup the CV-8052 soft processor into the Altera DE0-CV, as well as write programs that can be loaded and run in the CV-8052.

Components Required for this Module

For this module you will need the Altera DE0-CV board with both Quartus Prime and CrossIDE installed in your computer. Also for this module you will need the Quartus Prime project available in the course web page: CV_8052.zip.

Laboratory Requirements

1. Follow the instructions in the 'CV-8052 Soft-Processor Getting Started Guide' available in the course web page. Make sure the program '***blinky.asm***' described in the guide works in your Altera board.

2. Write, compile, download, and test an 8051 assembly language program that displays your student number using the 7-segment displays available in the Altera DE0-CV configured as a CV-8052 soft processor (HEX0 to HEX5) using the formats listed bellow. The display format depends on the states of switches SW2 down to SW0 after they are latched by pressing pushbutton 'KEY3'. In all the examples it is assumed that the student number is "12345678". You **MUST** use your own student number!

   000: Display the six most significant digits of your student number using HEX5 down to HEX0. For example: "123456"

   001: Display the two least significant digits of your student number using HEX1 and HEX0. Keep HEX5 down to HEX2 blank. For example: " 78"

   010: Starting with the six most significant digits of your student number, scroll one digit to the left every second if SW3 is zero, or half second if SW3 is one. This should keep going forever until the selection for SW2 down to SW0 is changed. For example: "123456", "234567", "345678", "456781", "567812", "678123", etc.

   011: Starting with the six most significant digits of your student number, scroll the digits of your student number one digit to the right every second if SW3 is zero, or half second if SW3 is one. This should keep going forever until the selection for SW2 down to SW0 is changed. For example: "123456", "812345", "781234", "678123", "567812", "456781", etc.

100: Make the six least significant digits of your student number blink every second if SW3 is zero, or half second if SW3 is one. This should keep going forever until the selection for SW2 down to SW0 is changed. For example: "345678", " ", "345678", " ", etc.

101: Make the six most significant digits of your student number appear one at time every second if SW3 is zero, or half second if SW3 is one, starting with a blank display. This should keep going forever until the selection for SW2 down to SW0 is changed. For example: " ", "1 ", "12 ", "123 ", "1234 ", "12345 ", "123456", " ","1 ", etc.

110: Display "HELLO " for one second if SW3 is zero, or half second if SW3 is one, then the six most significant digits of your student number for one second if SW3 is zero, or half second if SW3 is one (for example "123456"), followed by "CPN312" for one second if SW3 is zero, or half second if SW3 is one. This should keep going forever until the selection for SW2 down to SW0 is changed.

111: Display your student number (or part of it) using a format of your own creation that is different from any of the formats required above.

Upload to canvas the assembly source code of your program as well as a video demonstration of all the patterns required above.