ECE 2504 Design Project 4 (Spring 2015)

Validation Sheet

Student: **Print your name** Student: **Last 4 digits of your ID**

Pledge: I have neither given nor received unauthorized assistance on this assignment.

Student: **Sign your name**

**Read This!**

*No GTA or student should discuss any aspect of a student’s design with another student. Among other things, this includes the manner in which a student implemented the program. All sections of this Validation Sheet must be completed in INK. Failure to use ink will result in a validation grade of 0. It is the student’s responsibility to make sure that this validation sheet is completed correctly. If there are any questions about the validation, the student should check with the instructor.*

The Validation Sheet for Project 4 is two pages long. Bring this Validation Sheet and your student ID card to the CEL when you go to have your design validated. Before you begin validation, you should have your Quartus project open on your laptop with your DE0 Nano board connected, and the programmer window open and ready to program the board. Your data.txt file should be open in the Quartus window for the GTA to see.

To the Student

Based on the instructions provided in the Project Specification, complete the table below to show the values that you placed into the Data Memory addresses 0x0-0x7 for your Project Validation.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Data Memory  Address | 0x0 | 0x1 | 0x2 | 0x3 | 0x4 | 0x5 | 0x6 | 0x7 |
| Data Value |  |  |  |  |  |  |  |  |

Identify the output that the program should supply for this data array. Remember that the values are stored in hexadecimal. (Tip: Use the Windows Calculator on the “Programmer” view to calculate the average. Set the calculator to the “Hex” setting.)

|  |  |  |
| --- | --- | --- |
| Minimum | Maximum | Average |
|  |  |  |

Your grader will check these values against the last four digits of your ID number. *If you enter incorrect values into the array table or result table, you will receive a validation grade of 0.*

To the GTA

**Do not validate this lab if the student has not**:

* Printed his or her name and last four digits of their student ID # in ink above. *Verify that the name and number printed above are the same as on the student’s ID card.*
* Completed the array table and result table on this page.

Validation Instructions

For the DIP switch settings, SW[3:1] values from 000 to 101 select registers R0-R5, with SW[0] selecting between the most significant byte (SW[0]=1) and the least significant byte (SW[0]=0) being displayed on the LEDs. The PC register is displayed for SW[3:1] = 110.

1. Program the FPGA on the DE0 Nano board using the Start button on the programmer window.
2. When the programming has successfully completed, reset the design by pressing and holding KEY0, and while keeping KEY0 pressed, pressing and releasing the KEY1 pushbutton.
3. Set the DIP switches to “1100” to show the lower 8 bits of the program counter (PC). Press and release KEY1 repeatedly *until the LEDs show the value 0x3*. Then press and release KEY1 repeatedly, noting the values shown by the LEDs, *until the LEDs show the value 0xB*. If the PC did not count consecutively from 0x3 to 0xB (i.e., 0x3, 0x4, 0x5, 0x6, 0x7, 0x8, 0x9, 0xA, 0xB) STOP the validation and do not continue.
4. Set SW[3:1] for R1, R2, and R3 (001, 010, and 011, respectively), and record the 16-bit value for each register in the table below as four digit hexadecimal numbers.

All values of the registers should be recorded as four digit hexadecimal numbers, two digits for the most significant byte of the register and two digits for the least significant byte. DIP switch settings, SW[3:1] values from 000 to 101 select registers R0-R5, with SW[0] selecting between the most significant byte (SW[0]=1) and the least significant byte (SW[0]=0) being displayed on the LEDs. The PC register is displayed for SW[3:1] = 110.

|  |  |  |  |
| --- | --- | --- | --- |
| Register | SW[3:1] | SW[0]=1 | SW[0]=0 |
| R1 | 001 | \_\_\_ \_\_\_ | \_\_\_ \_\_\_ |
| R2 | 010 | \_\_\_ \_\_\_ | \_\_\_ \_\_\_ |
| R3 | 011 | \_\_\_ \_\_\_ | \_\_\_ \_\_\_ |

|  |  |
| --- | --- |
| **Collect the DE0 Nano Board from the student. The student will need to return the BOX, the BOARD, and the ANTI-STATIC BAG. Initial the box to indicate that the student has returned the above-listed materials.** |  |

Comments (only required if something is unusual or wrong):

GTA: **Print your name** GTA: **Sign your name** GTA: **Initials**

GTA: **Date and time of Validation**