

Introduction to Xilinx Vivado and SDK platform

Signature and Grading Sheet

Group #:_____ **Name(s):**_____.

Signature

Section 4.1(b): _____.

Section 4.2(c): _____.

Section 4.3(c): _____.

Grading

- Section 4.1(b): demo (10 points):_____.
- Section 4.2(c): demo (30 points):_____.
- Section 4.3(a): C code (30 points):_____.
Attach code printout (with proper header and comment)
- Section 4.3(a): software code size (10 points):_____.
Attach screenshot (similar to Figure A.17).
- Section 4.2(c): demo (20 points):_____.

Total points: _____.

Experiment

Introduction to Xilinx Vivado and SDK platform

1 Purpose

To learn the Xilinx hardware and software platforms (Vivado/SDK) and the derivation of a basic FPro system

2 Reading

- Chapters 8 and 9 and Appendix A.1, A.2, A.4.3, and A.5 of *FPGA Prototyping b VHDL Examples 2nd edition: Xilinx MicroBlaze MCS SoC*.

3 Software

You can install the software in your own computer if you wish. Xilinx Vivado WebPACK / SDK can be download free of charge. Go to the Xilinx download link and select the “Vivado” tab. The link is

<http://www.xilinx.com/support/download.html>

4 Design Procedures

4.1 Basic Vivado hardware synthesis

- (a) Read Appendix A.1 and follow the tutorial in A.2 to get familiar with the Vivado development flow.
- (b) Demonstrate the physical circuit (2-bit comparator) to instructor and get signature.

4.2 Vanilla FPro system construction

- (a) Follow the tutorial in A.4.4.3 and A.5 to construct the vanilla FPro system and testing software.
- (b) Use a terminal emulation program, such as PuTTY, to display the UART data.
- (c) Demonstrate the physical implementation (including the PuTTY console) to instructor and get signature.

4.3 Blinking LEDs

Derive a simple software program to blink the LEDs. The specification is

- 16 LEDs blinks at the same time with two different rates.
 - The on-and off intervals of fast and slow rates are 30 ms and 200 ms, respectively.
 - The leftmost switch (sw[0]) controls the blinking rate.
 - When the switch changes state (i.e., 0 to 1 or 1 to 0), a status message, “LED currently blinks fast” or “LED currently blinks slow,” is send to UART (and displayed in PuTTY console).
- (a) Derive the software and download it to the FPGA device.
 - (b) Use a terminal emulation program, such as PuTTY, to display the UART data.
 - (c) Demonstrate the physical implementation (including the PuTTY console) to instructor and get signature.