18545 - Lab 1 Report

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0 - "Pre-Lab"

Prior to the lab we spent time to set up several channels of communication for the team and a repository to keep all our work organized. We decided to use git. So far we have only used it to collect relevant documentation. All of our reports have been shared through a designated team folder in Google Drive.

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1 - The Tools

It took some time to get the tools working and interfaced with the board before we could proceed with the lab. Once RedHat was finally installed on the lab machines we first tried to get ISE running, but the license server provided was not correct and we ran into a wall. Then we tried to get Vivado working, but obviously we ran into the same problems. We learned that Vivado could be run with a temp license so we decided to go with that. We got farther with Vivado but then ran into driver issues where the lab machine could not recognise the board through any of the interfaces. We found the Vivado installation CD in the Virtex7 box and installed a local copy of the tools because we were having trouble accessing the driver files from afs. With the tools installed locally we were able to get a simple inverter programmed on the Virtex7 board. A tip to future students doing local installs on Linux machines: make sure to source the scripts that come with the installation and that Vivado is running with root privileges or the drivers won't work.

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2 - Board Choice

The first day we went in to start the lab, we had to decide between the Virtex-5 and Virtex-7. We originally thought that the Virtex-5 would have enough to suit our needs, but there was still some worry about it running out of memory, as well as other space concerns. With the Virtex-7 we would not have any resource concerns, but it is still a fairly new board with less support. There was also the choice of HDMI vs. VGA, though we would have to find a way to interface with either one we chose. It was not until we started to attempt working with the tools that we made the final decision to go with the Virtex-7. It was simpler to get the tools up and running and would alleviate a lot of our memory concerns. We also believe that an HDMI module, or similar, will exist to aide in our graphics process. By a stroke of luck also we heard that another group had switched from Virtex-7 to Virtex-5 so that was the end of board decisions.

3 - The Lab

Our design is an adder that takes an 8-bit input from the dip switches and adds it to a running sum. This sum is displayed on the LCD and confirmed on the LEDs. On startup the sum is initialized to 0. Upon reset, by pressing the center button, the sum is set back to 0. When the south button is pressed, the value from the dip-switches is taken and added to the running sum, the value is updated to the LCD in a 5-digit decimal output. The same value is reflected on the LEDs in binary. Output to the LCD is handled by an FSM that writes each digit of the sum starting at the ten thousands place and working down to the ones digit.

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4 - Conclusion

After some work getting the tools to function and the board programmed, we were able to get our design on the board. However, we did discover that the text editor in Vivado is not very good at editing HDL code as it indents terribly and do not match begin..end segments like emacs. Thus, we will be using other text editors to write codein the future. Since this lab was fairly simple, there were not many places where we could divide and conquer. We mostly just worked together on the same machine. In the future we plan to find ways to split up the work.

XILINX Forums

USERNAMES - friedliver, unn, bakaxchan

POST - http://forums.xilinx.com/t5/Xilinx-Boards-and-Kits/Xilinx-VC707-Board-User-Clocks/m-p/355489