Notes and questions on 2020.1 Vivado HLS Tutorial – Chapter 2 Revised 9/05/2022

Completing Chapter 2, the first substantive chapter of the tutorial, should take about 2 hours once you have configured your lab environment and installed the tutorial's design files.

My hope is that by completing Ch.2 you will familiarize yourself with relevant aspects of the Vivado HLS GUI, toolset and flow. I wouldn't expect you to be expert – you will have plenty more opportunity to deepen your understanding as the labs progress – but I would hope you have an overview of the software under your belt.

Specific notes follow:

- On page 15, step 9, since you installed Vivado with limited device support, choose the **ZedBoard** "board" or the **xc7z020clg484-1** "device" as the "part" **for all** your projects. You will need to edit `[run_hls|script].tcl` scripts that use any other devices to avoid project set-up and compile time errors.
- On page 19, you should see the call to the `fir` function that is to be implemented in hardware at line 69 of the testbench.
- At step 4 on page 22, Vivado HLS has synthesized RTL from the C code, but has not yet synthesized a netlist from this RTL, or placed and routed the netlist components on the target device. The RTL will need to be imported into the main Vivado tool in order to complete these steps in the implementation of the design. The estimates are based on the HLS tool's understanding of how these physical design steps will be completed and what resources will be used.
- You will experience errors trying to Export RTL on page 24, step 5 unless you correctly patch Vivado 2020.1 for the Y2K22 bug, as outlined in part D of the Installation Guide. Implement the solution outlined in https://support.xilinx.com/s/article/76960?language=en_US
- On page 30, before step 3, edit `run_hls.tcl` and set the part being used to xc7z020clg484-1 (`set_part {xc7z020clg484-1}`)
- It is worth noting the final point on page 36
- It is not important that you understand the details of the analysis perspective discussed on page 37 at this stage. It is worth getting a flavour of what you can check in the analysis perspective and have a rough sense of the detail that is provided. Understanding the analysis perspective in full will take quite a bit of practice from many design examples.
- At the end of page 41 (and after you have observed the output that is shown in Figure 2-30), take a look at the analysis perspective for **solution 3**. Is it as you might expect, or does it not meet your expectations? Explain your conclusions about this design. How would you expect a *pipelined* design to differ from an *unrolled* design?