EEEE-521-621-Lab6

1) From mycourses download the following file: dxpRISC521pipe_v.qar or dxpRISC51pipe_vhdl.qar.
2) The goal of this lab is to design and verify all manipulation instructions of your fmlRISC521pipe or fmlRISC621pipe. This is the pipelined version of the non-pipelined processor you designed in labs 2 and 3.
3) Open the project archive provided. Analyze and synthesize, and then verify using ModelSimAltera. Except for selecting to view the internal signals, all else is setup for you in this project.
4) The memory initialization file dxpRISC521_rom1.mif contains not only a test sequence for manipulation instructions, but also for transfer and flow control instructions. The latter two categories will be designed and verified during the next lab.
5) Modify the code so that it fits your individual design specifications. You should start with your own non-pipelined code and re-arrange it as I have done in my pipelined version. Note: You are not required to implement it in exactly the same way, but you do have to show that it is pipelined, i.e. you execute machine cycles from different instructions in the same clock cycle.
6) For 621 students: you will have to augment the code with all your other manipulation instructions.
7) The Verilog code is fully functional for the instruction sequence provided in dxpRISC521_rom1.mif. The VHDL is almost there, i.e. the instructions are executed in the right sequence, but some of the automatic data forwarding still has to be debugged. This is due to the fact that some signals are visible only after the process is exited.
8) Even though the implementations work for this instruction sequence, it is still far from being 100% verified. This will happen as you continue running more benchmark programs in later labs. Furthermore, the code could be cleaned and some parts written more efficiently. You are allowed and encouraged to change it in any way you see fit.
9) Once all your manipulation instruction cycles are working, archive the project and load it on mycourses along with your report.
10) Time permitting, demo it to the TA. Note: only the TA will assign a grade.
11) This concludes this week's lab.
12) **Grading**:
    a. 521:
        i. ADD, SUB, ADDC, SUBC, NOT, AND, OR: 3 x 7 = 21 points.
        ii. SHRA and ROTRA: 2 x 4 = 8 points.
        iii. Report: 1 point.
        iv. Total = 30 points.
    b. 621:
        i. Current provided instructions: 1 x 9 = 9 points.
        ii. Additional instructions: 2 x 11 = 22 points.
        iii. Report: 1 point.
        iv. Total possible = 32 points. Total maximum awarded: 30 points. NO bonus points!