

EEEE-220-Lab9

- 1) From mycourses download on your desktop this pdf file. This lab consists of one part.
- 2) **Objective:** The objective of this lab exercise is to execute the paper and pencil design of the fmlRISC control unit, following the template and example covered in class.
- 3) **Part 1:** fmlRISC – CU – P&P – Design
- 4) Make sure you have all DP and CU related lecture handouts and notes.
- 5) It is important that your control signal table is complete at this time.
- 6) Based on the value of Bit2 of your personal design number, you'll have to implement your CU either hardwired or micro-programmed.
- 7) For the HW-CU:
 - a. As in the lecture, use one landscape oriented letter sheet to draw your CU schematic.
 - b. Next, use as many additional sheets you need to express every one of your control signals as the SOP of all input signals to the "Control Signals Combinational Logic Synthesis Block". There's no need to draw the SOP gate structures.
- 8) For the uP-CU:
 - a. As in the lecture, use the handout to draw your CU schematic.
 - b. Show in the uPM map only the values of the uPM_JMP_Addrs, uSel1, and uSel0.
 - c. The values of the DP control signals are already captured in the control signals table.
- 9) Your TA will have to check your design before you start implementing it in Lab10.
- 10) You don't have to meet and review this design with me anymore. However, if you have questions or need additional help you are more than welcome to stop by in my office hours.
- 11) If you choose to do so, you can use a drawing program for the schematic and a text editor for the SOPs. However, this may be more time consuming and it doesn't carry any points. Nonetheless, neat drawing and writing is expected and required.
- 12) **Grading:**
 - a. For the HW-CU:
 - i. 10 points for the schematic.
 - ii. 10 points for complete SOPs. TAs will check three signals at random. If these are correct, you'll get all 10 points. If any of these are wrong, one point is subtracted from the 10 for each wrong or missing product term.
 - b. For the uP-CU:
 - i. 10 points for the schematic.
 - ii. 10 points for the complete micro-program. TAs will check three micro-instructions at random. If these are correct, you'll get all 10 points. If any

of these are wrong, one point is subtracted from the 10 for each wrong or missing micro-instruction.

- 13) Show your complete design to the TA, preferably during her/his OH, i.e. before the due date and time. Within the first hour of next week's lab she/he won't have time to check all 16-22 designs.
- 14) Write your report and upload it along with scanned or photographed copies of your work in the dropbox on mycourses, as described in the lab policy.
- 15) Even if you don't complete your entire design before the due date and time, you should still upload whatever you have up to that point on mycourses!
- 16) This concludes this week's lab.