

## **CPU Design Project – Part 6 – Hardware Implementation and a Working Processor Demo**

**ELEC 6200 – Required  
ELEC 5200 – Optional/Extra Credit**

**Report Due Friday, 12/6/2013**

- 1) Follow the [Altera Quartus II and DE2 Manual](#) (posted on course website) for designing and implementing your circuit on the FPGA.
- 2) Reset can be connected to any of the 4 Keys on DE2 Board. These Keys are normally at logic '1'. And pressing them will change the logic to '0'. So make the changes in your design as needed.
- 3) Clock can be connected to any of the two free-running clock frequencies available, 27MHz and 50MHZ. To connect to any of these clock inputs, the pin numbers are mentioned in the [Pin Assignment MSEXcel](#) sheet. You can also debug your design by connecting the clock to one of the manual keys on the DE2 board, manually creating clock pulses instead of using free-running clock.
- 4) The “inr” input that selects the register number can be connected to any 4 switches on the board. And the “outvalue” that displays the contents of the register selected, can be connected to the LEDs or LCD on the board. For using 7 segment displays on the board you will require a [HEX to 7 segment](#) conversion model provided on the course website.
- 5) Run the test program and verify the results with your simulation in part 5.
- 6) You will have to show the implemented design on your DE2 Board. You will be conducting a demo as follows:
  - (a) Briefly describe what is implemented, what program you will run and what result is expected.
  - (b) Run the program pointing to the functions of the buttons you press. Let the viewer examine the result.
  - (c) Offer to make a change to some parameter to a viewer selected value and rerun the demo.
  - (d) Total duration of demo: FIVE MINUTES.
- 7) Part 5 report must be a one-page reply to three questions:
  - (a) What did you learn from this project?
  - (b) What would you do differently next time?
  - (c) What is your advice to someone who is going to work on a similar project?