ECE:3350 Spring 2019 -
Computer Architecture and Organization
Simple Instruction Set Computer (SISC) Project

Part 4: Due Monday, April 29, @ 8:30 am

This part of the project worth 66 points. You are to implement the LDP, LDR, STP, and STR instructions. Note that the new instructions effectively allow for auto-increment and decrement load and store instructions.

You are given:

- Your own solution to Part 3. **Again, you will not be able to succeed in Part 4 without first completing Part 3.**

You are required to:

- Modify any of the project .v files as needed to implement the new instructions
- Write a testbench program in imem.data that tests every SISC-supported instruction and addressing mode (I recommend modifying the one provided with part 3). **Save this instruction memory file as all_instr.data.** If there is an associated data memory file this program uses, save it as all_data.data.

- Follow these guidelines while making your changes to the datapath: You may create any new control lines or modules you deem necessary.
  - You may not remove any provided file but you may modify any file provided.
  - Your final solution must still correctly execute all of the previous instructions.
- Update the FSM state diagram and datapath diagram to reflect your modifications needed for the new instructions.
- Compress your project folder, along with the 'work' directory, the instruction memory files, the data memory files, updated state diagram, and all .v files into a .zip file named "Project_p4.zip".

Details/Notes:

Like the SWAP instruction, the new LOAD instruction addressing modes will require that two values be written to the register file during instruction execution. Be careful with the timing!

Submission Overview:

- Your .zip file should be named “Project_p4.zip” and contain the following:
  - All the .v and .data files
  - The ‘work’ directory.
  - Your updated FSM state diagram.
  - An updated datapath diagram.

Rubric:

FSM and Datapath Diagrams	10 pts
Load and Store Implementation	40 pts
Instr.data	16 pts
Total	**66 pts**