

CSCE 230 Project Part VI

Final Project, Written Report, Oral Presentation and Demonstration

Overview

By now you should have a functioning processor according to the specifications in the previous parts of the project and, perhaps, with added functionality for bonus credit. You need to convince the people who grade you that this is the case (and that you did the work yourselves, etc.). If your processor does not work (or does not work 100% up to spec) you need to explain what does work and what does not.

Now you will need to prepare the following items

1. Written Report
2. Oral team presentation (Dates given on Piazza)
3. One program that demonstrates the correctness and completeness of your processor, including any extra features for bonus credit. Only features that are demonstrated will receive credit.

Written Report

Your groups report should be at least 6 pages long (double spaced) (not including figures) and at least 8 pages if you attempted any bonus credits. While there is no page limit, be to the point and don't ramble on to give us a 20 page report. You should describe the design of all (major) components, explaining their operation in words and in figures. Also use illustrative code examples supplemented with simulation results. (a concise waveform is nice but does not speak for itself).

You should also (and separately) discuss your overall experience, achievements, pitfalls, and parts of your design that did not work. Discuss the extra features that you implemented, over and above the requirements, for bonus credit. Only components you describe in your report will receive credit This final report should contain at the minimum the following sections:

1. Overview
2. Processor Design (5-stage processor, processor size, etc)
3. Capabilities (Including each instruction, I/O devices and how to access, etc)
4. Speed
5. Testing
6. Assembler (bonus)
7. Conclusion

Bonus items should be placed in their respective sections of the report.

Address your report to someone familiar with the concepts from this class but not with your specific design choices. A technical report should not only describe these choices but also justify them appropriately.

Your grade on the report does not rely on how well your processor works, but on how well you document the current state of your processor. Your written report will be evaluated as follows:

1. (50% points) Writing quality as well as the overall quality of the report: Follow the best practices of good writing that you know from your previous coursework. In particular, the logical organization of your report should be evident from section headers and the flow of text from one paragraph to the next. Do not narrate your report.
2. (15% points) Completeness of the design of the microprocessor with all of the implemented instructions: you should briefly describe how your processor can perform all of the instructions and/or why it cannot perform some.
3. (15% points) Correctness of the microprocessor as demonstrated through simulations generated in Quartus and ModelSim: this includes integrating them into the report, not just attaching them at the end.
4. (15% points) Implementation of assembly language test programs for the processor: you must have at least one program, and it must do something interesting, give the assembly codes and brief explanation of its function, which is comprehensive enough to demonstrate all the features of your design. (wave forms should be integrated into the report)
5. (5% points) Conversion of a test program(s) to correct MIF file.

Team Presentation and Demonstration

Good oral communication skills are equally as important in the real world as good writing skills. Further, a team presentation requires more thought about how to divide the presentation between the team members and how to arrange for smooth hand over from one presenter to the next.

The presentation schedule will be posted soon. The presentations should be 8-10 minutes long, including the time to demonstrate your one program on the board. We are allowing only 2 minutes for switch over between teams, hence be ready to go as soon as your turn comes. Every student must also attend at least two other presentations. A sign-up sheet to verify this will be available during the presentations.

You must demonstrate within the presentation (or include a video of the demonstration, if you wish), and this should be well rehearsed.

While it is possible to make a good presentation using the white-board alone, this is not an efficient way to present a lot of technical information; therefore we will require that you use PowerPoint. The quality of the presentation will be judged both by how the material is orally delivered and by how well it is organized and presented. The oral team presentation will be evaluated as follows:

- Overall quality of the presentation
 - Basic presentation skills: facing the audience, speak audibly
 - Slides
 - * Organization, intro, conclusion
 - * Power point best practices
 - * Images easy to see
 - Be aware of your time limit
- Successfully downloading of the design and demonstrating the functional correctness of your microprocessor by running a test program used in the report thus showing correct results
 - This should be a complex program (i.e. computing the dot product of arrays in memory, quicksort, tic-tac-toe, games, stoplights, randomizer, etc..). **Simple programs will receive less credit as they do not demonstrate the complexity of your processor.**
 - It should demonstrate most of the instructions your processor is capable of
 - You do not have time to compile during your presentation. Compile your project ahead of time and save the .sof files separately so you can load them quickly.

Grading

- 100 points for technical report
- 50 points for oral presentation
- 50 points for processor demonstration

Submit

You must submit the report by May 3rd by 11:59pm. You must submit the powerpoint used in the presentation and the qar containing your final project by the end of the day of your presentation.

- "Project-team-number"_Part6.qar for the project archive file. The simulation file should be located inside of the archive.
- "Project-team-number"_Part6.pdf for the project report. This report should follow the best practices of writing technical reports. For tips look at the links provided on Piazza.
- "Project-team-number"_Part6.(ppt/etc)" for the powerpoint or however you presented.