EECS 314 (Computer Architecture) Class Project Specification: Spring 2015

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February 24, 2015

1 Description

It is a group project. You need to chose a group of 4-5 students (4 preferred, 5 allowable). Each group will work on one of the following projects.

Option 1: You will work on a relatively complex program written in MIPS assembly language. You will use the SPIM simulator platform to run your program. Optionally, you can use MARS simulator platform (http://courses.missouristate.edu/kenvollmar/mars/index.htm). MARS is a lightweight interactive development environment (IDE) for programming in MIPS assembly language. If you plan to use MARS, send me an email at the onset. You will be required to choose your own topic, though sample topics will be displayed on the Blackboard web site. You may consider choosing topic in the areas of simple games, multimedia processing (e.g. image conversion), simple encryption/decryption of data, scientific tasks, security attacks (e.g. buffer overflow attack) etc. Be creative about choice of topic. The deadline for the project will be the last day of class, and both TA's should receive a copy of the code (via email) as well as the hard copy of the project report by 5:00pm that date. More details about the project report will be provided later.

Option 2: Building a Mini-Super Computer using FPGA and Arduino Boards (One Group of 4) - Send an email to Prof. Bhunia if interested.

Option 3: Building a compiler for transporting Hardware Descriptions (e.g. in Verilog) into Processor ISA (One Group of 4) - Send an email to Prof. Bhunia if interested.

Option 4: Building Android Apps for Computer Architecture Exploration: A Lego Approach (One Group of 4) - Send an email to Prof. Bhunia if interested.

One-page project proposal (hard copy) is due on Thursday, March 20 in class, one per group. It should contain:

1. Group name (optional)
2. Names of the participants in a the group
3. Project title
4. One paragraph description about the project including the input/output interface
5. 2-3 sentences on how the task will be divided among the participants and timeline for completion of individual tasks

The instructor will go over each project proposal and suggest modifications if necessary. Once the proposal is approved by the instructor (via email), you need to start implementing it.

2 Judgment

Besides the project report and code, this project involves an optional presentation, whereby you will be asked to demo your application to the class as well as a panel of judges. This is typically held at the last day of the class. The top three projects will have a chance to receive some token prizes (e.g. a box of chocolates). There may be some extra credit or other kinds of incentives to actually perform the demo. Although presentation/demo is optional, all students are required to attend it.

Each project will be evaluated based on: 1) novelty/creativity; 2) completeness; 3) complexity; and 4) quality of report.

3 Contribution

This project is a significant part of your grade (25%). It is a good idea to start the project early – don't leave it until the last minute! If you're struck,

or have a question, feel free to visit the instructor or the TAs during office hours.

An useful document on MIPS file access using SPIM is posted in the "Assignments" section at the Blackboard site!

Similarly, a link to documentation on MARS simulator is also available in the Blackboard site!