SE/EE/CPR E/CYB E 492 – Spring 2024

PrairieLearn Senior Design Team

Week 20 Report

April 12 - April 19
Faculty Advisors: Phillip Jones

Team Members:

Chris Costa - Auto-Drawing
Matt Graham - Emulator
Mitch Hudson - Technical Lead, QEMU Emulator
Carter Murawski - Note Taker, Emulator
Tyler Weberski - Project Manager, Auto-Drawing
Andrew Winters - ARM Assembly Auto Grading

Summary for Progress this Week

- Attempted to change UART base addresses
- Edited the script to be silent and output to a file
- With H5_Q2A, figured how to connect c code written with c++ code for GPIO, specifically figuring out issue with libraries
- Finished H5_Q2A and most of H5_Q2B
- Started framework for the pl-rectangle element extension
- QEMU Emulator
  - Finished UART (See discussion)
  - Finished GPIO
  - Started Timers (See discussion)
- Completed official emulator writeup [PrairieLearn TM4C123GH6PM Emulator Writeup](#)

Past Week Accomplishments

- Created script for emulator configuration, setup, and run
- Updated original emulator writeup: [Emulator Writeup](#)
- Debugged C++ autograder issues
- Started additional documentation
- Continued homework development

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Chris Costa	Worked on getting more of H5 Q1 implemented and added the question format. Worked on pl-rectangle extension for pl-drawing, started on some documentation	9	114
Matt Graham	Attempted to change UART base addresses, edited the script to be silent and output to a file, completed official emulator	8	118

	writeup [PrairieLearn TM4C123GH6PM Emulator Writeup](#)		
Mitch Hudson	Finished GPIO implementation Finished UART implementation (See questions) Started Timer implementation (See questions)	28	313
Carter Murawski	created git issue board for documentation and started creating documentation for PL	3	103
Tyler Weberski	Finished up H5_Q2A, and almost done with H5_Q2B (might finish before meeting Friday), and looked into moving into documentation videos	12	117
Andrew Winters			92

Comments and Extended Discussion

- Still waiting on Dr. Jones to send the emulator UART writeup

- Clarification needed on properties of the UART:

    - RTS and CTS: How do they work? What parts of the UART do they impact?

    - Send Break: What does it do? As above, how does it influence UART functionality

    - Stick Parity and Parity: Difference between Even parity and Odd parity, how to compute them, and how Stick parity changes them

- Clarification needed on properties of the Timers:

    - Prescaler: What is the difference between "true" prescaler and linear? How do prescalers work?

    - Timer values: Need help with internal setup for timers.

- Need GitHub account for professor to add him as contributor to Mitch's GitHub repos

Plans for Coming Week

- Transition to from development to documentation

- Finish Timer implementation and write up QEMU emulator documentation

- Prepare for next year's group

Summary of Weekly Advisor Meeting

- For documentation, video AND writeup for everything, look where the last group's videos can be improved.
- Create Git issues for each documentation item. Sections for: needs to be assigned, in development, ready for review, in review, and done.
- Check if anyone else is having Tyler's error
- Get a working question for Chris's questions

- Start to test the emulator integration with P
- Emulator writing to register issues