

EE/CprE/SE 491 WEEKLY REPORT sdmay25-29

October 18, 2024 - October 24, 2024

Group number: 29

Project title: Implementation of the ABC using modern technology

Client &/Advisor: Professor Alexander Stoychev

Team Members/Role:

Connor Hand - Client Interaction and Team Organization

William Mayer - Meeting Time Tracking and Note-Taking

Peter Hurd / Noah Butler / Zachary Scurlock - Testing and Individual Component Design

Peter Hurd - Budget Handling

Weekly Summary

The overall objective of this week was assembling more adder subtractors to ensure the computation works with at least two 4-bit numbers. We are also testing and ensuring that the EEPROM works, creating a KiCad schematic for the adder-subtractor, and continuing to develop a Java implementation of the Gaussian elimination algorithm. We were able to build the adder subtractors and ensure that our EEPROM works as we intended. We are continuing to develop KiCad schematics for the adder subtractor. We did not make any significant changes to the project this week, we are still moving along with our individual module implementation.

Past week accomplishments

- Connor Hand: Drew optimized IC pinout diagram for the adder-subtractor, and began learning KiCad and using it to create schematics for the adder-subtractor.
- Zach Scurlock: Improved and built the breadboard implementation of the adder/subtractor unit.
- Peter Hurd: Finished setting up the GitHub repository for automated KiCad compilation, conducted further parts research on some new circuits we will need
- William Mayer: Progressed heavily on the Java Gaussian program.
- Noah Butler: Looked into a way to convert data in Excel to the format that our EEPROM programming software requires and continued looking into how the decimal to base-2 converter was memory mapped.

Pending issues

No issues arose during the week.

Individual contributions

<u>NAME</u>	<u>Individual Contributions</u> (Quick list of contributions. This should be short.)	<u>Hours this week</u>	<u>HOURS cumulative</u>
Connor Hand	Drew IC pinout diagram, used KiCad to develop adder-subtractor schematics	5	21
Zach Scurlock	Refactored and rebuilt adder/subtractor modules	5	20
Peter Hurd	Set up automated KiCad compilation. Component Research. Circuit Breadboarding	5	22
William Mayer	Gaussian Program. Component research.	4	18
Noah Butler	Looked into how to export a data table from Excel to xgpro. Dec2bin drum research	4	18

Comments and extended discussion (Optional)

The team is working great together but needs to focus on attending scheduled meetings.

Plans for the upcoming week

- Connor Hand: This week, I plan to continue developing the adder-subtractor schematic on KiCad and figuring out how to request a PCB of the adder-subtractor.
- Zach Scurlock: For the upcoming week I plan on comparing our digital logic circuit to the vacuum tube circuit.
- Peter Hurd: Going to work on an initial prototype circuit to represent the punch card inputs into the machine. This will provide us some guidance on how we will need to implement other components like control circuits, memory circuits, etc.
- William Mayer: Finish the Gaussian and provide further visualization on the Gaussian program. Look into developing a program or something along the lines of creating a readable punch card.
- Noah Butler: This week, I plan to make a program that takes a pivot table from a memory map in Excel and outputs it in the form the EEPROM programming software needs so we can easily make changes in the loaded memory for when we decide if we will use the 1 EEPROM or 8 EEPROM implementation.

Summary of weekly advisor meeting

As a team, we discussed updates and next steps for the project. We talked about PCB development using KiCad. We also explored using EEPROM memory chips instead of a single one, in which we would need to order more parts. For the input-output system, we noted that the punch card is divided into five vertical sections with specific rows and columns. Talked about how to manage coefficients on the drum and implement the memory table using EEPROMs to keep original design integrity. Need to work on developing a program to generate and visualize punch cards digitally and explore using clocks to manage the timing signals. Lastly, we have added an extra 30 minutes to our Thursday meetings and Stoytchev will try to join us on our group's Wednesday meetings.