Senior Design Project Intro

The senior design project we are working on is where there is a server that has modules for Dr. Abuaitah students to practice with that some of his students worked a little bit on last year. Currently the modules are all hard coded so our task is to write code that dynamically converts C to Assembly and have corresponding animations and output for it. This will bring in a lot of topics that myself and my group have had experience working with and taking classes on. This would include knowledge of Assembly and C programming, user interface design, compiler and software development, networks, and language conversion processes. Academically I have had experience with each of these categories except for very little in language process conversion but my co-op experiences have helped with that. This project will be helpful for students working with and learning C and Assembly.

College Curriculum

I have taken quite a few computer science courses so far that I believe will help contribute to the success of the project. One class would be User Interface Design (CS5167). Learning the basic concepts of a good UI design is going to be very helpful to ensure the modules are interactive and user friendly as they are geared towards teaching students. It was also helpful in learning what questions to ask and how to guide the user experience to ensure it is as smooth as possible and makes the most sense for the audience and purpose of the application. Another class that will be helpful was Software Engineering(EECE3093). This class was great because it focused a lot on proper project setup and organization for teams which we are currently implementing now with our Github practices. It was also great for full stack development because we incorporated UI design as well as backend functionality which will be used for senior design too. Computing Systems(CS2011) and Operating Systems(EECE4029) will be useful because we can apply our knowledge and practice of assembly and C which we focused on in that class to ensure we are properly calibrating our modules for student use. Throughout all of these classes the biggest non-technical takeaways were group collaboration, time management for long projects, and organization that will all be used for senior design.

Co-op Experience

For my co-ops my first two co-ops at Siemens Digital Industry I worked as first a Software Engineer and then an Engineering consultant. For both the positions I worked a lot with UI development and creating more efficient tools for developers. My team used github and Jira for project management methods so I will be able to bring both the technical UI and debugging skills as well as the project management practices into the project to ensure everything is on track and I am a useful team member. I also worked at Midmark as a software developer for my last two co-ops and I did a lot of language conversion, networks, and infrastructure development. Some of my projects throughout the co-op was updating current language versions across platforms as well as ensuring our platforms were working properly with our customized modules. This will directly translate to understanding the process of language conversion we will be doing with our

project. I worked heavily in Terraform for infrastructure and network development which will still be applicable to our project because I will at least have an understanding of that development even though we will be using different tools most likely. I also took on the role of business analyst for my team which allowed me to develop more soft skills including: cross team collaboration, identifying solutions to complex and abstract problems, flowcharts, and breaking down long term solutions into smaller more approachable steps. I expect to apply these soft skills when looking at the team management aspect and when taking this large project and breaking it down into smaller tasks. I think it will allow for smooth transitions and a clear breaking up of tasks for team members.

Motivation, preliminary approach, expected result, self evaluate contributions

My motivation for this project was that I like how many different aspects of computer science I am going to be able to work with and increase my technical skills for. I am also excited knowing that this project revolves around creating an application that will be useful for students' learning abilities and make it easier for professors to teach the code conversions and make it more interactive. The preliminary project approach is to work with my team and breakdown initially the main parts of the project so we can decide what each of our initial tasks will be. Getting a general task list that we can further break down as the semester goes on will be helpful to ensure we stay on task and we all know what each of our speciality areas are. One expected result would be that you can easily and visually see the conversion of C code to Assembly in a way that is interactive and useful for students. We will depict the stack of Assembly code output and enhance the UI to let users step through the code. If we have time we are also hoping to add a login feature to store code saved by the user.

For self evaluation and contributions one way I think I will measure it is ensuring all my tasks are completed on schedule and to the best of my ability. I know I’m doing a good job when I have everything done on time because a lot of the team’s tasks are going to be connected and depend on one another so I want to make sure I’m not holding anyone up. I will know I am done when there is nothing left for our team to accomplish and everyone is completing tasks on time and the project is running smoothly. I will also know when I’m done once we are able to test and out demo our code being converted and the animation is helpful and simple to understand. I know I have done a good job when myself and my team are able to use our conversion compiler efficiently and it is easy to use. Also when the compiler is easily explainable and intuitive for students and professors to use as a teaching and learning method.