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CS 5001

Week 3 Assignment

I am a member in a group for the senior design project which has chosen to focus on video game development. While I have not formally studied this topic, I have no doubt that many of the concepts which have been covered through UC's computer science curriculum, as well as my co-op rotations, will prove beneficial in being able to have a successful year of working on the project. This project is an opportunity to not only show the skills that I have already learned, but to practice my ability to continue to learn new skills and apply familiar concepts to new areas of application. I do not view this class as simply another set of assignments with an "exam" at the end, but rather a reward for persevering through the curriculum and now having the opportunity to demonstrate my skills in a fun way. Having the freedom to decide on what the project will cover and how it will be designed will also provide a unique experience in which I am on a team with other stakeholders but have much more input as to how things should be done and what exactly is it that will be done. Being both an overseer and developer of the project will offer a new perspective as opposed to the ones found in a course of study or co-op work environment.

The specific curriculum at UC has built a strong foundation from which to begin the senior design project. First, CS 2028 Data Structures course introduced object-oriented programming skills and taught us how to think about objects as classes which possess attributes and perform actions with methods is useful. Knowing how objects relate and are able to interact is beneficial for a game development setting as the interaction of different entities is the basis for many games. Many of the actual data structures we learned about as well will be useful to have knowledge of to think about how to store game related data in an efficient way and perform complex operations on that data. The next class from the curriculum that will be beneficial towards this project is CS 3093 Software Engineering. This class provided an overview and in-depth look at the project management process, and the practices of gathering requirements and generating user stories. Additionally, deciding on a framework for which to manage our project will be very applicable and handy. It is so easy as a young student to go into a project and just start writing code and hoping for the best, but this course presented crucial information for the project setup and planning phase. The final course I would like to touch on is CS 4071 Design and Analysis of Algorithms. Depending on what type of video game we elect to create, we will need to have thorough knowledge of how to write algorithms and assess their performance. This class provided the tools to do that, and when we consider how to optimize a game and ensure minimum performance is attainable, we will no doubt put these tools to use. Other classes that provided beneficial knowledge are CS 2071 Discrete Structures, CS 5170 Automata, CS 3003 Programming Languages, CS 2021 Python Programming, CS 4092 Database Design, CS 4065

Networking, CS 4033 AI Principles, and CS 4029 Operating Systems, to name a few. The concepts, principles, and assignments geared towards applying this knowledge in each of these classes have some application in game development and have prepared me and my group to undertake this project.

The built-in co-op program has also provided countless learning opportunities which will prove beneficial for the development of our senior project. For me specifically, I spent my early co-op rotations working in the IT department at Cincinnati Insurance Company. I gained exposure to seeing how network infrastructure and server performance was crucial to a large corporate environment. I was able to contribute by creating data visualizations and dashboards to be used by non-tech VPs and executives, which relates to game development in making an accessible UI which anyone can use and understand. I was able to work on the backend side of the company's policy rating engine and see how different UIs interact with backend code. Large, complex projects with millions of lines of code require a thorough understanding of how data is able to be transformed and transferred across project boundaries and even networks, and these concepts relate directly to game development. My later co-op rotations occurred at London Computer Systems where I worked on the backend for a web API which serves both internal and external stakeholders. I was again able to understand more about how data is communicated, changed, and saved, as well as how a complex project with millions of lines combines all of the different pieces it needs to create one working product. I think the foundations I learned in data representation, and how data is stored in a database and accessed by server-side code will prove to be beneficial in developing games. Additionally, at LCS, I worked in an agile environment where we engaged in weekly sprint planning meetings and identified crucial tickets which needed to be completed. I think this project structure will serve the senior design project well, as we will have new work to do every week and will need to touch base with standup meetings to ensure we're all working towards the same goal and are able to provide and offer help where necessary.

I am motivated to work on this project because, as I touched on in the introduction, it is an opportunity to take on the new role as more of a "project designer" and be able to showcase the many skills I have learned throughout my time at UC. I often find it hard to complete individual projects and to stay accountable for working on my own, but when I have academic or professional motivations it is certainly easier to get work done. This project will allow me to learn new skills by applying familiar concepts, and the outcome will hopefully be a functional project that I can be proud of and present on my resume. I think that video games are fun and exciting, and having the opportunity to explore this area of software is something that I look forward to. I expect that the result of this project will be a rewarding and satisfying experience where I will feel more comfortable and competent as a software developer. I hope to pick up new skills along the way too, such as familiarity with game engines, knowledge of 3D/2D graphic design for game art, a better understanding object-oriented principles and class design, and

perhaps even practical knowledge about networking and connecting two clients via a game server.

My group will first approach the project by coming up with an idea and then identifying everything that will be necessary to achieving it. We will start by planning out our game, identifying what the objective of the game, choosing an engine with which to develop it, and start making lists of requirements and constraints. We will evaluate ourselves by ensuring we are keeping pace with what the expectations are from within the class, and then addressing problems as they arise with our faculty advisor. Being able to play test our game as we develop it will help us ensure whether or not we are on the right track and having the immediate feedback of jumping into a test environment and debugging our implementations will be an often and necessary process for the development of the project. It will be evident based upon the functionality and performance of the game if we are on the right track and doing a good job. I hope personally that I will be able to contribute to the project in many ways, specifically the design and planning, writing of code, and creation of 3D models or 2D art to be used as assets in the game.