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**Individual Capstone Assessment**

For my senior capstone project, I am seeking to create an AI chess engine and associated web application whereby a user may play against said engine. I intend on implementing several “levels” for the chess engine. This may entail starting with a basic utility function which evaluates material, space, and time in a chess game. Then, I might advance the engine by using techniques of machine learning. The motivation for this project was to build some application which ties together all the knowledge I have gained from my four years of education and experience at UC. The project also leaves room for me to explore AI and machine learning to further my education.

This project will utilize my knowledge gained from every CS course I have taken thus far. This includes every class from “Python Programming” to “AI: Principles and Applications”. Indeed, I intend on creating the chess engine through Python, utilizing the knowledge I have gained from CS2021 or “Python Programming”. In “AI: Principles and Applications” or CS 4033 I was taught the basics of intelligent agents and how they could use utility functions to produce intelligent output. This will give me a good start to constructing a functional chess engine. Moreover, fundamentals learned in “Computer Science I” or CS1021C will play a major role in the success of creating such a complex coding project.

I have spent the entirety of my co-op experience working for Fox Sports Technology in Blue Ash, Ohio. Here, I have worked on the Sports Data team which is responsible for collecting and processing all the data which powers the Fox Sports App and foxsports.com. On this team, I have gained copious backend experience as well as substantial frontend experience. I have worked very closely with my team leader Joshua Montgomery who has taught me about many of the current technologies for building web applications. My co-op experience as a whole, I believe, will be the biggest contributor to successful collaboration with my team as I complete this project.

I am very excited to begin this project as I am a very big chess fan. I am an avid player with an online rating of 1800 and a total of 10,000+ games played. My preliminary approach to this project is first creating a chess engine which will output random legal moves when given a move by a player. This will allow frontend work to be completed as I advance the engine. The next step would be creating an engine which bases its move choice on certain utilities such as time, space, and material advantage. A final step would be to include some type of machine learning technique in my engine to make it a stronger chess player than me.

My expected result is to have a functioning chess engine which plays at a strength of 1600+. I also expect a very clean and responsive web application to play said engine. Although, my contribution will not be towards the front end of my application. Working mostly on the backend, I will be able to evaluate myself on the strength of my engine. Thus, the stronger I make my engine, the better I will evaluate my contribution. A lofty but exciting goal of mine is to create a chess engine which is strong enough to beat myself.