For the three major subjects we have to focus on, I would like to spread out the projects I focus on to be from throughout my career. I believe that this will allow me to work on a variety of projects from different institutions. I will also break down my plans based on the fulfillment of both required proficiency and course outcomes.

**Artifact 1:**

**This artifact will need to be revised if projects from outside SNHU are not allowed.**

The first artifact I would like to look at is from Grand Valley State University. This artifact is a Java implementation of chess. The backend is composed of a chess piece parent class that has a children's class related to each chess piece. The project currently has functionality for preventing putting yourself in check and ends on a checkmate.

The initial course encouraged us to implement a very simple chess AI to give the player something to play against. I never initially implemented this, but I believe this is a great opportunity to focus on implementing a much more complex AI than initially encouraged. This would be the core focus of the Algorithms component of the Data Structures and algorithms category. I would also take steps to reformat how data is currently stored within the program so that I can add additional information to the UI. Some of the current implementation does not support this at the moment (ex: moves using a stack that’s also used for checkmate testing – makes it difficult to implement a move history).

Proposed Changes:

Chess AI

Move History added to UI

Current Play Info Added to UI

Primary Artifact Focus: Data Structures and Algorithms – I believe this poses an interesting challenge by implementing a complex chess AI (not deep learning). It also allows me to focus on making the way data is stored much more efficient for new UI components.

Course Outcomes: 3 and 4

**Artifact 2:**

The second artifact I would like to work with is a jukebox application that was generated collaboratively. The project currently holds every playlist and artist separately in their unique class files. I believe that altering the implementation to make use of a native database would be a great chance to display competence working with databases. A large component of the project will be migrating all of the major data components to a MySQL database. This will lead the way to a more expandable application.

This more expandable application will allow me to add a massive amount of extra functionality to it. Currently, the only actual use of the application is to type in a specific playlist name and have the app print out the songs in it. Although this is not a bad implementation, it has a ton of potential. I will make it so artists, songs, and playlists can be created and viewed within the app. This way, a user can interact with the information within the database interactively. I will also take steps to turn the current student system into an account system that requires a login. This will allow me not only to give students more than one playlist, but also make it so that student playlists are private. Overall, this should massively increase the functionality of the application.

Proposed Changes:

Database Migration

In App Viewing of Artists/Songs/Playlists

In App Generation of Artists/Songs/Playlists

Login System

Private Playlists

Primary Artifact Focus: Software Engineering and Databases – I believe this migration using MySQL will show a great deal of proficiency in dealing with databases, especially considering the obvious choice for this migration would likely be a NoSQL option. The unique rigidity of MySQL will make this all the more challenging. I will also be adding a ton of extra features that were not in the initial version of this application, vastly increasing its complexity.

Course Outcomes: 1, 3, and 5

I believe the massive jump in complexity from the initial version to the proposed version creates enough extra functionality outside of just the database changes to warrant it being a viable artifact for both software engineering and databases.

**Artifact 0:**

Alongside the three primary artifacts, I would like to focus on creating a repository for each. This is not as simple as creating a repository and dumping all the code. I would like to prepare it for a more public-friendly environment. This includes creating a detailed readme for each of these documents and possibly including style guidelines to act as a template for public contributions. I think this will be great practice for practicing for collaborative projects in an individual environment.

Course Outcomes: 2