Self-Assessment

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Throughout my work in the computer science program, I have had many opportunities to learn and develop my skills in the computer science field, learn integral values, where my interests lie, as well as showcase these skills.

Collaborating in a Team Environment

One area of the computer science field I have learned and practiced throughout the computer science program is collaborating in a team environment. In my courses I have had to complete multiple assignments that were a collective team effort. These assignments were writing assignments where we would have to explain a concept in the computer science field. In these assignments I both learned and practiced working with others to accomplish a task and effectively communicating in an online environment as in person communication was not possible. Another example of my work in the program would be the GitHub repositories that almost every course included as a requirement for the end of the class. In these repositories, I practiced utilizing GitHub, a popular and effective tool used in the computer science field for group-based development. In my CS 465 course, I utilized Git to push my application directly into branches in my repository, representing stages of the project I was working on. This is an effective example and was good practice for collaborative projects where Git is often used to upload the work each member has done in a collaborative space. I also practiced and demonstrated effective explanations of the course work that was present in these repositories. Explaining what they were, what they are for, and how they can be utilized, improved, or altered. These explanations are a good example of effective communication in a collaborative environment. The last example of my work in the program is present in every single application or code project I developed in the program. This would be in code comments, for every assignment I had in the program comments were required. This gave me the opportunity to practice and develop my skill at effectively communicating through these comments, a staple in

working with others when developing in the computer science field. Throughout the program I have become more effective in my comments, bringing more understanding and clarity to my applications and I am ready to continue refining my skill as I gain experience for what is more useful to include in a real working environment.

Communicating With Stakeholders

Another area of the computer science field that I have learned and practiced throughout the program is communicating with stakeholders. In multiple different assignments throughout the program, I have been presented with mock stakeholders that would have their own ideas about a project. In these assignments, I would have to demonstrate that I can take these ideas and turn them into project requirements, creating a structured plan for the project that would meet the stakeholders' expectations. These assignments were great practice in familiarizing myself with interpreting the needs of a stakeholder and using my technical knowledge to determine what exactly they needed within the project to meet their needs. One assignment in particular that is a good representation of my abilities to perform this was completed in my CS 360 class where I did not work with mock stakeholders but with actual people. This assignment is a representation of my collective skills working with stakeholders as I had to interview real potential users, getting their actual thoughts for an app that I was developing. The app that I developed was a mobile app with the intention of providing its users with ingredients and health information about food products. The process of working with the potential users in this assignment was very similar to what would be performed in the real working world, I developed prototypes of the UI, asked identifying questions to determine what was important in the app, interpreted their needs as project requirements, and creating plans for continuing to incorporate users feedback once the app was launched. This project and others I have completed in the program have given me a

good base idea of what to expect and what is expected of me when working with stakeholders. This has helped me prepare for more learning experience in the real working world.

Data structures and Algorithms

Another area of the computer science field that I have learned and practiced throughout the program is working with data structures and algorithms. Throughout the program I have been learning and practicing how to most efficiently utilize data structures and algorithms. This is something that I have been practicing since the start of the program, with it being a consideration with almost every project that I completed throughout it. This has given me the opportunity to practice proper decision-making protocols when determining which structure or algorithm I should utilize. This gave me a good idea of what should be considered and what's important when considering a project's needs, including the required functionality and performance. Aside from learning which structures and algorithms I should utilize, I have also had the opportunity to practice implementing them into projects and finding resources detailing how they should be developed. One project in particular that demonstrates my ability to work with data structures and algorithms comes from my CS 300 class. In this project, I was tasked with reading the data from a text file, storing it, and outputting it in differently sorted manners. This project is a good example of how I have utilized data structures and algorithms to retrieve data and sort it in a practical and useful manner. This assignment and others throughout the program have given me a perspective on how important properly handling information in a project is. As well as how it can be beneficial if not detrimental in achieving a project's functionality.

Software Engineering and Database

Another area of the computer science field that I have learned and practiced throughout the program is software engineering and databases. Software engineering is something that I have

been learning throughout the program. I have been given the opportunity to practice and learn how to design and develop functional projects that meet clients' needs. This includes all of the different areas of planning and development, like the collecting requirements phase, the planning phase, development phase, testing phase, and the maintenance phase. This practice that I have completed in these projects has helped develop my skill in recognizing what goes into properly designing and engineering a project. One specific project that demonstrates my skills in this area comes from my CS 255 class. In this project, I had to develop a design document for a project that would meet each of the project requirements. This included developing aspects like use case, activity, sequence, and class diagrams as well as breaking down technical requirements. Databases have also been a large aspect of the computer science program, where I have had the opportunity to learn how and when to utilize them. I have learned about the core aspects of databases, like the difference between SQL and No-SQL databases, as well as when to utilize both and given the opportunity to actually utilize both. One particular example of a project that demonstrates my skill of working with a database comes from my CS-465 class. In this project, I had to develop a MEAN stack application that utilized a MongoDB No-SQL database. This project gave me the opportunity to practice utilizing a database from a commonly used service in a practical application. Demonstrating my ability to work with a database effectively and improve the applications functionality with it. Databases are something that I have been particularly interested in throughout the computer science program. I have always enjoyed the amount of functionality they bring to an application and find properly utilizing queries to be incredibly satisfying and powerful.

Security

The last area of the computer science field that I have learned and practiced throughout the program is security. Throughout the program, I have been tasked with implementing security

into my project's multiple times. This has helped develop my understanding of security, introducing me to the concepts of security like a multi layered defense. This has also introduced me to how Secuity is practically applied into the development of a project teaching me the approach of always having security in mind when developing and designing. I completed multiple assignments in my CS 405 course that properly demonstrate my understanding and skills when it comes to a security mindset. These assignments included preventing specific common attacks that can put an application at risk. This included vulnerabilities like SQL injections, buffer overs, underflows and more, in each of these assignments I would apply industry recommended approaches in preventing these from being a point of attack. However, one assignment in particular that really demonstrates my understanding of security as a whole would be my security policy presentation. In this assignment, I presented my security plan I created for a mock client to improve their organization's security. In this plan I not only recommended technical approaches to prevent specific attacks but explained specific tools, concepts, and training that should be implemented throughout the company to prevent vulnerabilities not only in code but the company as a whole.

Artifact Summary

This ePortfolio is a collection of three enhancements I made to already existing applications I had made previously throughout the computer science course, and all the work that went into this. The purpose of these artifacts is to demonstrate my ability to work in a collaborative environment, deliver professional communication, design computing solutions, utilize proper techniques and skills for computer practices, and develop with a security mindset. For my first enhancement I utilized a project from my CS-320 class, which was originally created as a way to practice writing Junit tests. This application contained a contact class, contact service class, and two accompanying test classes, verifying both the contact and contact service functionality. The

functionality of the application was to create a contact consisting of contact information and use the service class to make changes to existing contacts, create new contacts, or delete contacts. In my first enhancement, I converted the application from its original Java language and utilization of Junit to C++ utilizing Google Test. This enhancement is a demonstration of my knowledge and skill utilizing testing frameworks to verify functionality. As well as a demonstration of my skills in multiple programing languages and how they differ from each other. This enhancement shows my ability to utilize proper testing procedures, tools, and techniques. I demonstrated my ability to create a collaborative environment with in-code comments explaining the application to others. Lastly, I demonstrated my ability to develop with a security mindset by verifying my codes functionality and catching any errors with my tests. For my second enhancement, I utilized the result of my first enhancement, so at this point I had the same functionality as the original application but written in C++ and utilizing Google Test. In this enhancement I add more functionality to the application. I implemented a way for users to interact with the application to add contacts, update contacts, remove contacts, and display the contacts in various sorted ways. This enhancement demonstrates my ability to work with data structures and utilize algorithms to achieve functionality. This also demonstrates that I can create a collaborative work environment through the in-code comments where I explain the application. Lastly, it also demonstrates that I can develop with a security mindset as I implemented input validation to avoid common input vulnerabilities, as well as create secure error free code. For the last enhancement, I utilized an application from my CS-410 class. This application was originally created as a way to practice reverse engineering. Therefore, it is an application I built based off an existing applications functionality. This application allows users to view a list of clients and their accompanying choice, between 1 and 2. Users may also change the choice of each client in the application. In my enhancement, I converted this same functionality and changed it into a MEAN stack

application that users may access through a webpage. This demonstrates my skills in working with the MEAN stack developing processes as well as properly working with a database to make an application more efficient and provide more functionality. Which shows my skills in utilizing the proper techniques and tools that come with the MEAN stack developing process. This also demonstrates my skills in creating a collaborative environment not only with my in-code comments but because I used Git to push this application to a GitHub branch. Lastly, this demonstrates my skills in implementing security as I utilized the MongoDB security tools to restrict who would have access to the database and its functionality. All of the enhancements I made to these existing applications demonstrate the skills that I wanted to demonstrate in this ePortfolio, and most importantly demonstrate my ability to grow my skills. Comparing the enhancements to their original project files, there is significant growth that I made through the computer science program that I intend to continue when I enter the working world.