Entering Computer Science program with a concentration of software engineering at Southern New Hampshire University, I was mostly expecting to learn about syntax, methods, different languages while creating various programs. I thought that was all I needed to know about bring a programmer. As I found out through this program, there is so much more to the computer science field. I’ve learned about security, internet of things, code reviews, databases, embedded systems just to name a few. This program has opened my eyes on the whole gamut of computer science. As I’ve passed my general education courses and moved on to my major courses for computer science, I practiced all of these new theories and learned about syntax, methods and languages.

Through practice, I have showcased my strengths in the computer science field. While creating and compiling my ePortfolio, I was able to build upon an Android application that allows a user to securely login to their account using verified credentials and create/view a list of data as well as create a SQL database from scratch and implement a time saving stored procedure. Prior to the capstone course, I had a working Android mobile application that was secure due to the fact that it checked the internal database against the credentials entered by the user at the login screen. If the username and password matched the similar records in the database, a toast message would display and the screen would change to the main application function. This was done using an if statement. If the user entered string against the values in the database. An if/else statement would allow the user to move to the main application if the user entered username and password matched the database records. Else, a toast message would display and the screen would not change making this secure. The main application function displayed an empty textbox at the top of the screen with an Add button next to it. Below everything there was a Clear button, which cleared all entries in the list. When the user entered text into the text box and clicked on the Add button, the text that the user added would be displayed using a list view and every other item added thereafter would be appended to the list.

The first step that I took was to complete a code review. This gave me the opportunity to provide self-feedback now that I had a good idea on what makes communal software that can be used by anyone going forward. This also gave me practice in writing down suggestions which I will use going forward to my colleagues when completing other code reviews. Once my code review for the three artifacts was complete, I started to work on the software engineering artifact. For my software engineering artifact, I wanted to implement a way for the user to have additional functionality with their data. I was able to complete this by adding a Remove Item button which was located next to the Clear button. This button allows the user to enter an existing item in the list in the text box, click Remove, and that item would be removed from the list. If the item entered was not in the list, a toast message would be displayed and nothing would happen. I was able to accomplish this task by using an if/else statement. The if statement would check if the item exists in the list and if it does, I used “removeItem” to remove it from the list. It would also display the updated list. The else part of the if/else would simply display the toast message letting the user know the item was not found. This one button provides a simple task; however, it increases the value of the application from a view only list to an editable list.

While working on the algorithm and data structure artifact, I thought it would be beneficial for my future to keep working on the same Android application as I would like to create my own mobile application. As I near the time to start that project, I wanted to add even additional functionality. I realized although the user could scroll down on their phone screen to see all of the items on the list, it would be very difficult to keep track of all of the items and any duplicate items. To solve this problem, I created a Total button. Once a list was established and the Total button was pushed, the bottom portion of the screen displayed each different item and the total count of that item. I accomplished this by creating a hashmap and a for statement. Within the for statement was an if/else statement where the if portion determined if each item in the list was unique or a duplicate. If it was unique, the count for that item would add 1 and if it was duplicate, it would add to the existing occurrence of that item. Following that, we are printing out each unique item name and the number of occurrences of that item. I believe this was a beneficial addition that allowed the end user to easily view their data at a glance.

The third artifact I worked on featured the database. I’ve had professional experience using SQL databases where I would mostly write select statement to view the data I needed with the occasional join statement to narrow down my results. One thing that I have seen and ran in my career was stored procedures. After researching what they were, I knew I wanted to incorporate that in this program. A stored procedure allows for quick querying for specific data without the need for select statements and where clauses. Stored procedures can also be edited to look for different data each time it’s run. I was planning on working on an existing database that was created in a previous course during my program, however due to that courses expiry and access to the software that was used, I had to create my own small database using Microsoft Azure Studio. I was able to link it using the terminal and following instructions found online. Once I was setup, I created four tables which included data regarding airlines, customers and flight information. Thinking professionally, I knew airline and passenger data can be very large so I wanted a way to query certain data repeatedly. I did this by creating a stored procedure which was select \* from customers where customers.customerLastName = @lastName. The lastName variable was declared in the stored procedure as “Brown”. There were multiple records where customerlastName = “Brown” in the customers table. Once the stored procedure was run, all four occurrences of customerlastName = “Brown” was displayed out of the twenty-five records in the customers table.

While working on all three artifacts, I made sure to include secure practices, collaboration features and good software development fundamentals. An example of a secure practice that I used was the credential check in the Android application. This type of check ensured only an existing user of the system could use the features in the program. Other security checks I included were try/catch statements which allowed the system check for certain scenarios. Certain exceptions would display if those tests failed. Communication is key in computer science as anyone should be able to view and quickly comprehend the purpose of each method or other block of code. A way to practice this is done through writing short but direct comments. I included comments at each block of code with a brief description of its purpose for all of my artifacts and will continue to do this going forward. Another way to have easy communication between colleagues through code is to have indentation and even spacing in between blocks of code making it easy to read. These are simple tasks that I took the time to complete in order to prevent any potential questions for future colleagues.

As I reflect on this program, the capstone course and my future, this course has brought everything full circle. I learned about the syntax, different languages and methods as well as everything else I didn’t think I would learn. It turns out that everything else that I have learned is the bulk of computer science and has taught me how to become a beneficial contributor that is now able to review, edit, test and write programs that are secure, professional and can easily be picked up by colleagues. Working through the artifacts during the Capstone course gave me the opportunity to make significant updates to new and existing projects while following these computer science principles. Throughout this program, I have found an interest in creating mobile applications and have already created a working program. I can now take the skills learned to reach my goals.