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ELEC 3225

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Assignment #8 Report

Design System Requirements:

The Goal of this project was to create a registration system software like leopard web in which all students, instructors, and admins can do certain functions when logged in. All users share the ability to login and logout and search for all courses or search for courses based on parameters. Students need to have the ability to add or remove a course to their semester schedule which will also verify if there are any scheduling conflicts, and they must be able to print their schedule. Instructors need to have the ability to print their teaching schedule as well as search and print their course roster. Admins have the most functions with the ability to add and remove courses to the system, add instructors or students to the school database, and link or unlike a student or instructor to a specific course. Along with these required functions we needed to integrate this program into a SQL database which will have populated courses, admins, instructors, and students. A user base class will be made and then extended to derived classes of Student, Instructor, and Admin each with their respective functions. These functions need to be accessed by a UI or GUI, we chose a UI resembling a menu which can access each user depending on a correct login. This was the goal of this project.

Process and UML Models:

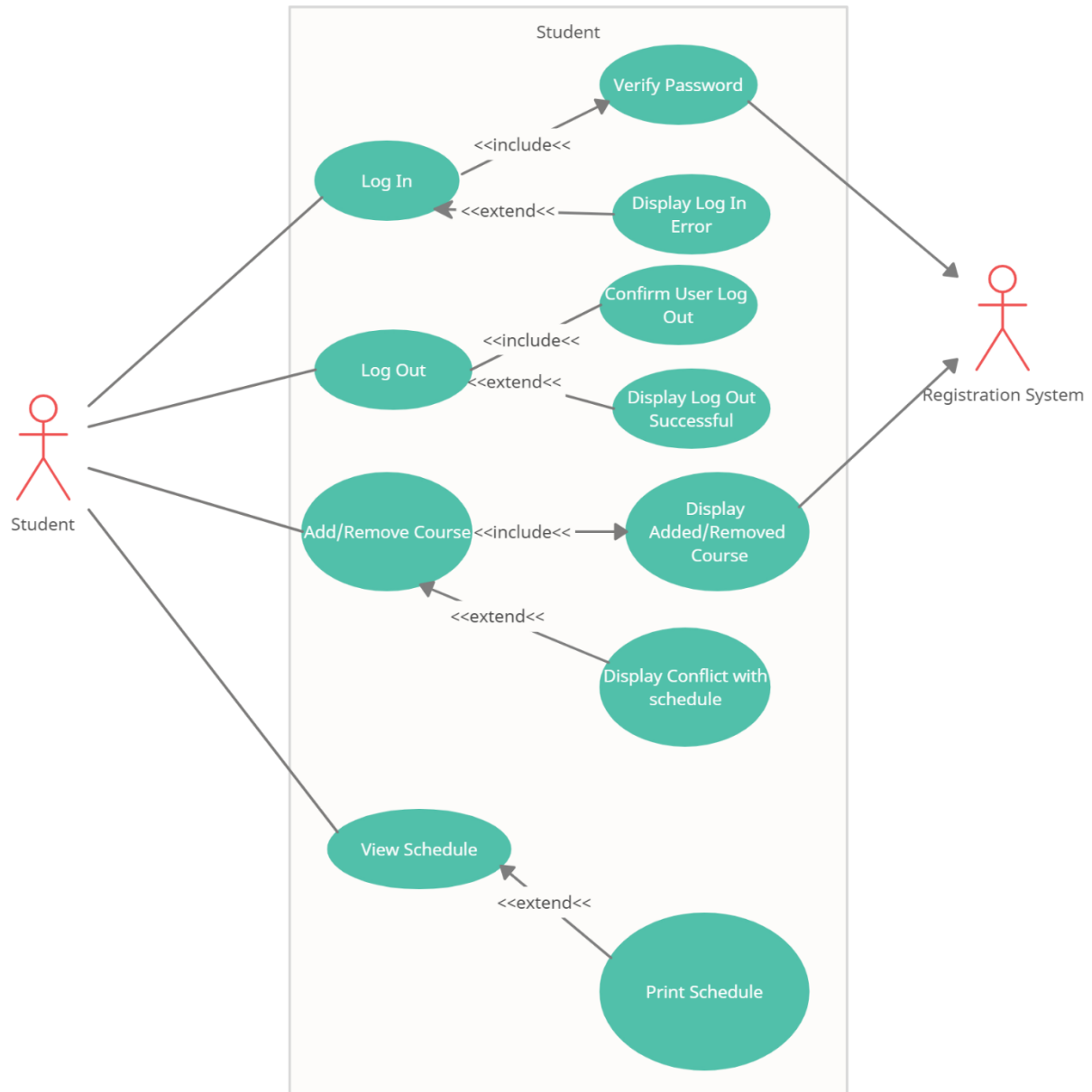


Figure 1: Student Use Case Diagram

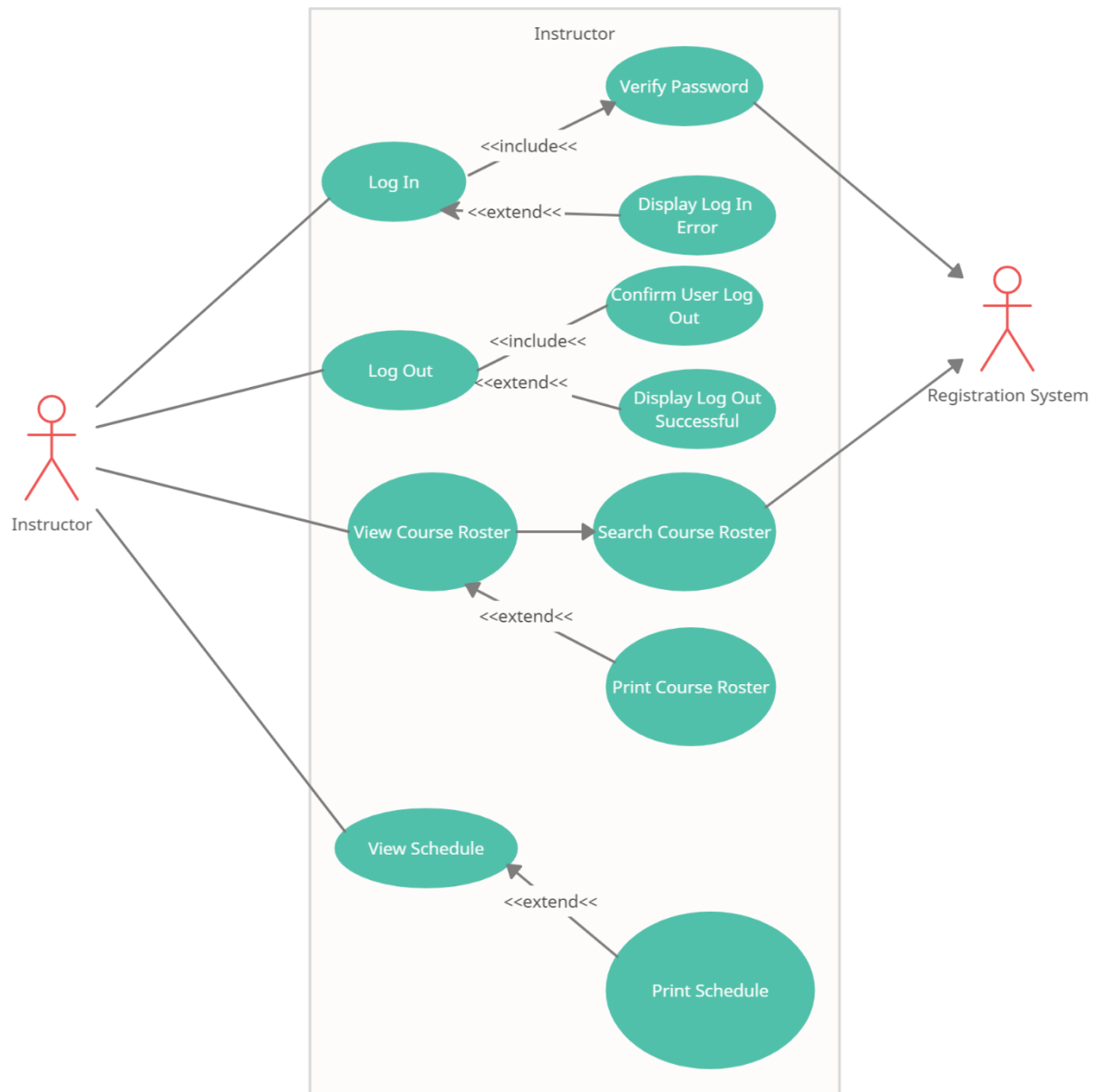


Figure 2: Instructor Use Case Diagram

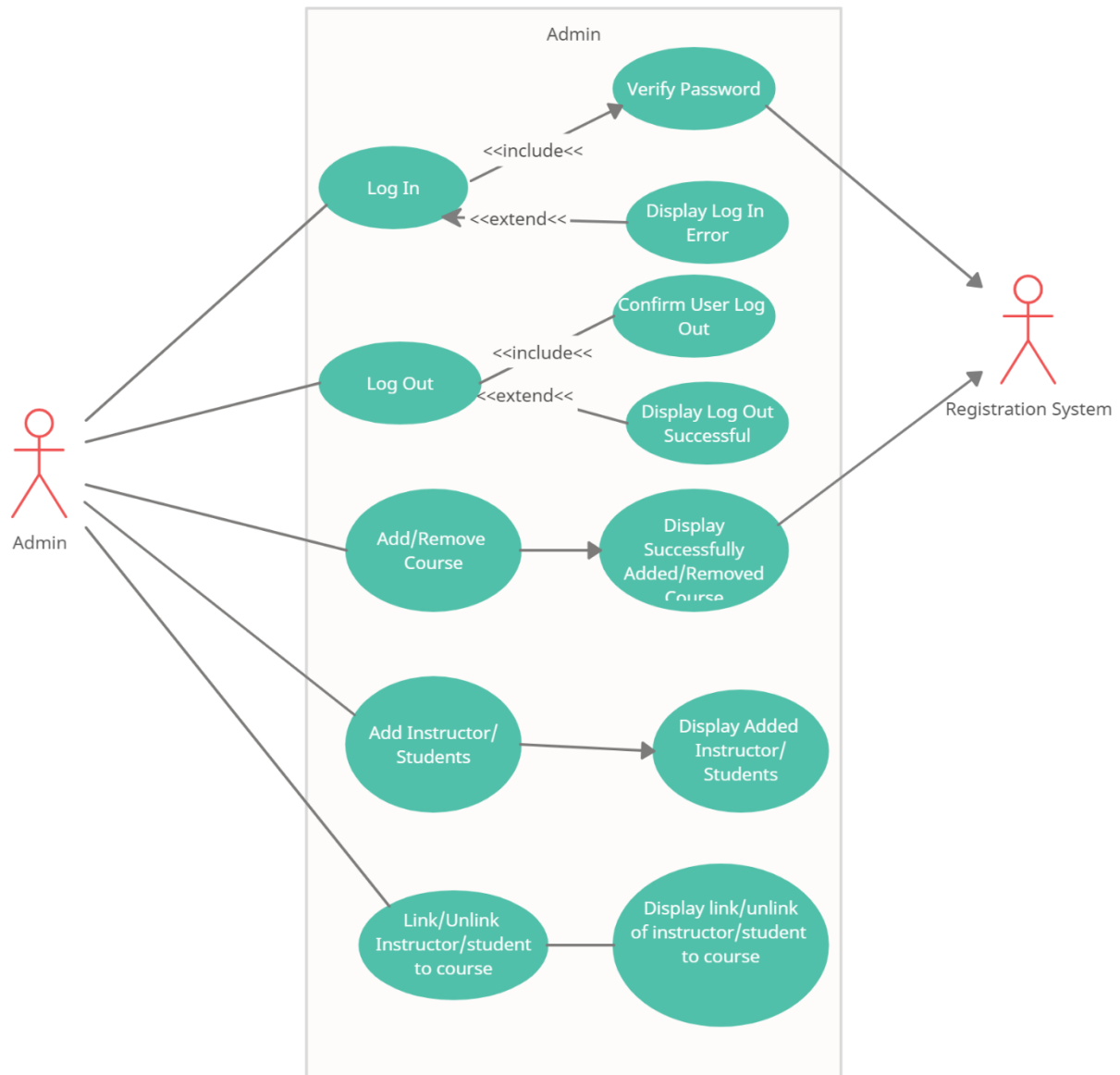


Figure 3: Admin Use Case Diagram

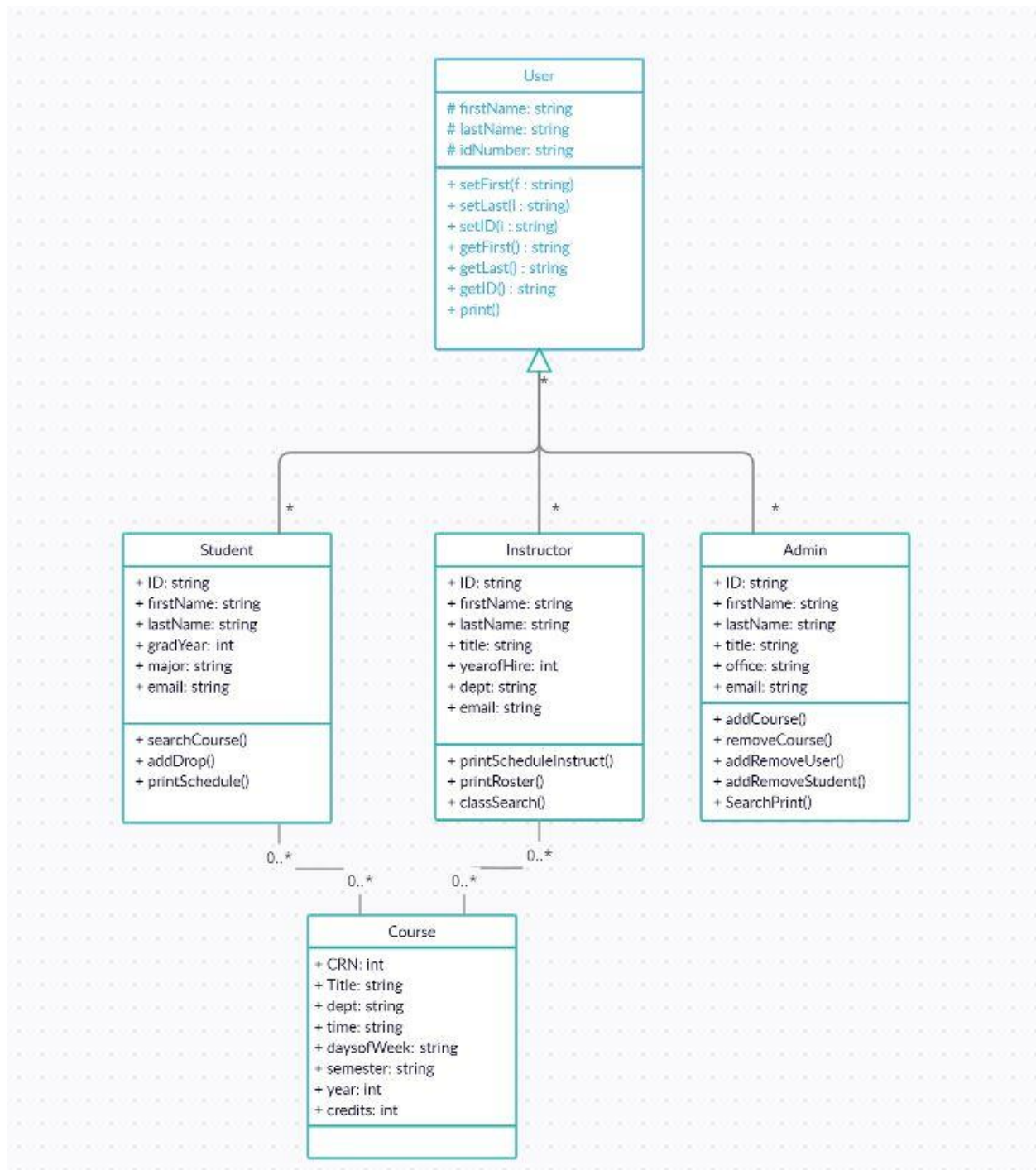


Figure 4: Class Diagram

Waterfall Process Model:

With the waterfall process model the project would be split up into phases that would be done in sequential order.

This makes for a simple model to follow and it ensures that through each phase of the project a certain point is reached and completed. For this process the first task would be to layout all the requirements and things needed to develop the project. In this case we will use the system overview and requirements that professor Rawlins has laid out for us to complete the project and add onto it clearly defining what it is we want to complete and have this program do. So this Phase is already completed. In the next phase of system design we must figure out as a group which language and which method of coding would be best to complete this project based on studying the first phase. We would need to define our functions, classes, databases, our interface we will have. This phase would hopefully be completed within the next week or two. The next phase is implementation where after the system design is figured out the system now begins development in small portions called units. In this unit testing it would be best to split the program up by each user, student, instructor, and admin. Once these users are sorted out the next part would be to start implementing databases of both users and courses. Each of these would be developed and then tested to make sure they all work individually and then in the next phase they will be integrated together. The integration phase will include joining all of these units into one system and testing the whole system to make sure there are no errors. Once the integration phase is completed the product will be ready to be demoed and released. If there are any issues in the system post release or demo the maintenance phase is the last phase that will be constant. In the maintenance phase if any errors or issues are found we would release patches to fix those errors. All of these phases will only happen once the previous phase is completed. The timeline for this model would be sequential finishing the first two phases within the first month of the course. The implementation and integration phases would take the longest as that is where the code is being done and the program is put together. Probably taking anywhere from June to the end of July. The deployment/demo phase would happen in August and Maintenance would come directly after deployment if needed.

Integration and Configuration Process Model:

This process model utilizes existing software and builds it into their system adding modifications for what they need it for. You would still need a basic outline for system requirements and specifications for the program and then you would want to find something online that resembles the idea of what you want to do. Once you find something you simply make sure you can use it and that it is open source to be used and modified. Looking quickly online using github as my main point of reference there is many similar programs that others have made that model what we are trying to achieve. I found this <https://github.com/francoisjacquet/rosariosis> online which is a project that someone made. This project has the same essential idea that we are trying to make having different classes for each member and then having many functions to do certain actions within the program/school system. This is a much more complex project but it has a nice looking UI that we could potentially use or change and model our project after leaving a large majority of their program unused.

<https://github.com/ian-mcnair/StudentDatabase/blob/master/MainApp.java>

The above github link is to a project that creates a SQL database of students and using java they import the database and create a similar program that you can display schedules, add students, teachers, etc/

This would be a really great project to model ours off of as it has features we need and it is a similar idea of using the database.

We can look at this to learn how to make the database and import it.

Once we have an idea of what we want to take from existing projects we can take that test it in our own environment after adding the necessary changes and then add on to it whatever we need to be able to meet the system requirements.

Incremental Process Model:

Incremental Process Model Assignment 2

In incremental we follow a similar model to waterfall but we develop and test after each phase until we end up with a final version.

We start out with a general outline of system requirements, listing everything we want the system to do and in which ways we plan on doing so with different functions, classes, databases and interfaces.

Once we have our outline we start with a loop of things that we will do getting different versions of the program until we reach an end version. We will analyze, design, code, and test and keep adding functionality to the program in increments.

In the first increment we will likely add the basic requirements laying out the empty functions, and classes kind of like we did with assignment 1.

With each following increment we will research and figure out the best way to implement the next incremental. Following the basic functions we would add on to those with the next incremental.

Then we would have incremental(s) for the database, same with the interface.

Each incremental adding something and testing it to make sure it works.

Whether it be searching, printing, etc. We will have the original version which will likely be the version from assignment 1 and then multiple versions for the following incrementals.

Finally ending up with a final version of the program that each incremental built up to until the full program was complete with all requirements being met.

The timeline for this all depends on how long each incremental would take to develop, code, and test, but for the simpler incrementals it would be ideal to have this done soon. Each other incremental would maybe take 2-3 weeks to code and test.

Success of Components:

The part of our program that was written is very successful. The working functions are search course and search course by CRN for all users. There is also a menu that has you select which type of user and then you can login, however this login function was Sara's responsibility so currently any username and password you enter will result in a successful login. Sara was also responsible for the remainder of the functions including adding and removing courses for both admin and students as well as adding instructors/students and linking instructors/students. She was also responsible for the print functions. Our testing worked well and helped find bugs in the code. The way I tested was by using a .txt file and inputting in that

file what my user inputs would be, doing this I set up test cases for the text file to look for and inputted those to see the result. All the code that I wrote works well and does not result in any bugs.

Code Efficiency:

50 for efficiency due to the lack of things that actually work because of Sara not doing her part. The portion of the code that is most efficient are the two functions that work which are search course and search course by CRN. The code that is least efficient is the part which simply does not exist, or in this case the part that does not function due to missing functions which is login. Login currently lets anyone login using any username and password. This is because of the lack of the login function. To improve the efficiency of this a login function where users information is stored in a database and when entered correctly prompts them with a successful login and when entered incorrectly prompts with an error.