COMP 1921 – Coursework 1 Report

Shrawan Sreekumar – EL20SS

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A brief on my experience completing the project.

As part of the COMP 1921 module I have undertaken to attain my degree, I had the opportunity to complete a C-based project. The project period spanned around three weeks, with the initial week spent designing my approach to the problem. While the overall project was successful, I could have addressed a few issues to streamline the library management system's development.

The first release of the project problem statement was quite vague. This resulted in my initial design had to consider many factors, including having to mould a system of functions around managing the .header file that the module head supplied to me. This included producing functions that had to dynamically allocate space for the different variables within the 'struct book' and write a part that handled the string input and conversion to store to these particular variables eventually. By the end of the first phase, I had created a dedicated file to implement the functions pre-declared in the book_management.h file. Considering the complexity of the book_management file, I decided to write two additional files, one to manage the library's processing and one to collect the data of the user who were to use the system. My goal was to create a compact design that could work only using pointers. However, this ended up being far too complicated for two reasons: i. A complex system of 3 primary arrays and a series of smaller ones proved difficult to link together and achieve persistence with (which was a requirement for the project), and ii. Not enough information had been provided on how to approach the problem then.

This led to, on two accounts, having to rework my code until I eventually decided to design the project as five separate files, one each to handle the books, users, loans, and interface, and one for the main function. This proved useful as I could easily debug the distinct aspects of the overall project as units and then put all the tested units together in the end. Since the three major systems of users, books and loans, shared many conceptual factors, I could test them using the same method without much effort. This resulted in an overall, cleaner, and more robust executable in the end. This uncoupled approach to testing and debugging also ensured that resourcaes weren't wasted on compiling and executing the whole application each time I needed to test something.

The hardest part of the project was: i., the initial lack of clarity on approaching the project and ii—the frequent use of pointers. Personally, the biggest struggle for me completing this project was not knowing what was and was not possible regarding the programming aspect. Had I received more clarity on this matter, I could have saved time reworking the project two times. That being said, I also think it was a good experience. It allowed me to design a solution to the same problem in multiple ways, which eventually led to a considerably more robust and secure version of the system than I initially conceived. While pointers' use complicated the design quite a bit, the most challenging part about this had to ensure all the memory allocated to the pointers had been freed properly to avoid segmentation faults. I also think this is one of the most empowering and sometimes disadvantageous parts of using the C language. The kind of versatility I had to implement the system both worked in my favour and against me.