## ***CS-242 – Fall 2020***

# Final Project – Reflective Writing

*(20 Points)*

Q1. Did Final Data Structures Programming Project advance your understanding of Data Structures? How did it further help you in polishing your logic-building skills?

* The project really helped me understand data structures in a practical sense. Choosing my own topic was a really important step for me. At first, I wanted to use queue ADT for my final project, so I decided on a code for ticket pricing in an amusement park. Upon reinspecting the directions for the project, I realized that was not as complex as the directions implied. This was the point where my logic-building skills were polished. I had to go back and choose a topic that was complex enough to satisfy the instructions provided. Once I chose my final topic (Library) I was able to go over different methods provided by different data structures and find the one (Linked List) that was most appropriate for the operations I needed my code to perform.

Q2. What were the major challenges encountered during developing the Data Structures Final Project and how did you overcome them?

* After writing and compiling the project, this is the error I was getting at run-time:

Exception in thread “main” java.lang.StackOverflowError . I instantiated a LibraryList every time I instantiated a BorrowedList because of this line :**LibraryList lib = new LibraryList();** and on the other side I instantiated a BorrowedList every time I instantiated a LibraryList because of this line :**BorrowedList bList = new BorrowedList();**

This resulted in an infinite loop of instantiation that caused the stack overflow.

* To solve this error, I gave the instance of BorrowedList as a constructor argument of LibraryList.

public BorrowedList(LibraryList lib) {  
 *borrowedList* = new LinkedList<Book>();  
 this.lib = lib;  
}

And created BorrowedList object in LibraryList constructor.

bList = new BorrowedList(this);

Q3. What further enhancements could you have made in your Project?

* I could have used List iterator in the project.
* I could have taken information on books from an external file (probably through notepad or excel) and input it in the library list.
* I could have attached student ID to borrowed books.
* I could have added RequestList class where students can request books from other libraries or get in queue for a borrowed book.

I would have used queue ADT in RequestList – first student to request the book will get notified first. If the 1st student does not need the book anymore or returns the book – 2nd student in queue gets notified.

* I could have added more information about book object such as publication house and year of publishing

Q4.) What other types of problems can be solved by a similar Data Structures Programming Project?

OR

Could your Project have been developed in some other way? Please elaborate.

* After completing Lab 8 I believe I could have developed the project using HashMap.

HashMap<Integer, Book> librayList = new HashMap<Integer, Book>();

Book b = new Book ("Business Management", "R. Mishkin");

libraryList.put(1001, b);

The start of code would look something like the lines above.

Integer would hold the ISBN numbers and I would create book object with title names and author names.

ISBN nos. would be the key and object b the value.

In add method use variable and scanner (instead of actual values like in sample code above) to keep taking input from user. Start working from there and figure out rest of the methods.