# Introduction

In this project I created an interactive GUI-based library kiosk for librarians and patrons. Patrons can checkout and return books. Librarians can create and delete librarian and patron accounts, as well as add or remove books to the library’s collection. I built these features using object-oriented design, incorporating principles such as encapsulation, abstraction, inheritance, dependency injection, and others. I will begin by introducing the patron’s point of view using the kiosk, then I will detail these processes behind the scenes by explaining my code. I will then follow this from the librarian’s point of view. Finally, I will discuss my findings, challenges, and areas of improvement I found when working on this project.

# Opening the Application

Before the application’s GUI is activated, the application will initialize the file services. The file services include User\_File, Transaction\_File, Role\_File, and Book\_File. These are all based on custom json encoding and decoding

When initially opening the application, one can see that there are multiple options. There is the option to log in so that the user can access role-based processes depending on the user’s login information. There also exists an option to view book details.

## Logging In

The login process begins with the user choosing to enter their ID information into the designated textbox, then pressing the login button. This can be viewed in the Login\_Frame under the library.py module.

### library.py & Login\_Frame

Pressing the login button will result in the user\_id being sent into the kiosk.py module, which handles the internal affairs of the library’s processes. Specifically, the user\_id is sent to the login method which lies in the Kiosk class.

### kiosk.py & login

The checkout\_item method takes two parameters as inputs, the kiosk object and the user\_id. The function will then check and see if there indeed exists

# Patron POV

## Checking Books Out

The first function I want to discuss is the way patrons can check out books. Through the GUI tool, they can enter the ISBN of the book they are interested in checking out into the designated text box, then click on the button to activate the checkout process. The GUI process can be seen in the library.py module under the Checkout\_Frame class. This frame is built from tkinter.