# CIS 22B FINAL

# Documentation File

## Group 2

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# Requirements Analysis

1. Develop a POS software package that will **(a)function as a cash register** and **(b)keep an inventory file**:

    a. **"Function as a cash register"**:
        - The program functions as a cash register by allowing the cashier to add and remove books to and from the current transaction. The program will display the subtotal, tax, and total of the transaction, and print a receipt for the transaction.

    b. **"Keep an inventory file"**:
        - The program keeps an inventory file by reading and writing to a plaintext file called "books.txt" located near the executable. The books.txt file is formatted in a way inspired by XML, using "<tag>"s to delimit information about books.

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**The program will be organized into the following three modules:**

2. Cashier Module - The **(a)user enters information for the books being purchased** and the program **(b)calculates the sales tax and total price**. In addition, the **(c)books being purchased are automatically subtracted from the Inventory Database**.

    a. **"User enters information for the books being purchased"**
        - The program will accept the ISBN of the book being purchased as input. The ISBN was chosen as the user input because 1. ISBNs are always unique and also function as the "bar code", or UPC, of a book, and 2. Since ISBNs are printed as barcodes on books, a cashier using a barcode scanner will be able to scan the book into the program without having to type the number manually.

    b. **"Calculates the sales tax and total price"**
        - The program will calculate the sales tax and total price of the current transaction, and will print out a receipt containing that information during checkout.

   c. **“Books being purchased are automatically subtracted from the Inventory Database”**
      - The program will automatically subtract books from the inventory immediately after checkout, without the user having to edit the book quantity manually.

3. Inventory Database Module - There shall be a **(a)file containing a list of all the books in Serendipity’s inventory**. The following **(b)information for each book will be stored in the file**: ISBN, Title, Author, Publisher, Date Added, Quantity-On-Hand, Wholesale Cost, Retail Price. The Inventory Database module will allow the user to **(c)look up information on any book** in the file, **(d)add new books** to the file, **(e)delete books**, and **(f)change any information** in the database.
   a. **File containing a list of all the books in Serendipity’s inventory**
      - The program keeps a .txt file containing every book in Serendipity’s inventory.

   b. **Information for each book will be stored in the file**
      - Within the text file, information for each book is delimited using XML style “<tag>”s, which are then read and parsed by the program into usable form.

   c. **Look up information on any book**
      - The program allows the user to look up information on individual and all books in the inventory using a combination of the Inventory and Report modes.

   d. **Add new books**
      - Using the Inventory mode, users can create new books from within the program by providing the required information (ISBN, title, author, etc.) which is then added to the file automatically. In addition, the program will prevent books with duplicate ISBNs from being added.

   e. **Delete books**
      - Using the Inventory mode, users can delete books from within the program by providing the books ISBN, which is then deleted from the file automatically.

   f. **Change any information**
      - Using the Inventory mode, users can change any attribute of any book in the file by first providing the books ISBN, and any change is saved to the file automatically.

4. Report Module - The Report module with analyze the information in the Inventory Database to produce any of the following reports: **(a)Inventory List, (b)Inventory Wholesale Value, (c)Inventory Retail Value, (d)List By Quantity, (e)List By Cost, (f)List By Age.**
    a. **Inventory List**
        - The program will display a list of all books in the database, including every tracked attribute, in a formatted, easy to read table.
    b. **Inventory Wholesale Value**
        - The program will display a list of all books in the database, including wholesale value, quantity, individual total wholesale value (quantity * wholesale value), and inventory total wholesale value in a formatted, easy to read table.
    c. **Inventory Retail Value**
        - The program will display a list of all books in the database, including retail value, quantity, individual total retail value (quantity * retail value), and inventory total retail value in a formatted, easy to read table.
    d. **List By Quantity**
        - The program will display a list of all books in the database, ordered by quantity-on-hand, starting with the greatest quantity first. This is accomplished internally with a selection sort.
    e. **List By Cost**
        - The program will display a list of all books in the database, ordered by wholesale cost, starting with the greatest cost first. This is accomplished internally with a selection sort.
    f. **List By Age**
        - The program will display a list of all books in the database, ordered by purchase date, starting with the oldest first. This is accomplished internally with a selection sort.
5. Coding Requirements: The demonstration of the following concepts in code: **(a)Main OOP concepts, (b)Friends, (c)Templates, (d)Operator Overloading, (e)Exception Handling**
    a. **Main OOP concepts**
        - The program uses classes to fulfill individual modules roles (Cashier, Inventory, Report), and has inheritance through the Book and InventoryBook classes.
    b. **Friends**

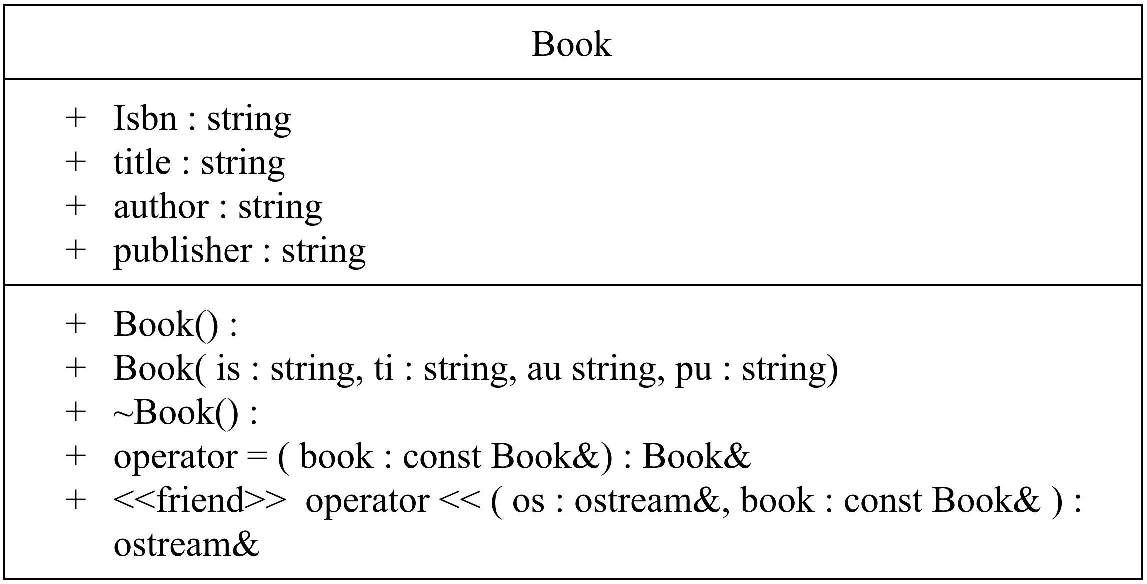
- The program uses the friend declaration in the Book and InventoryBook classes, granting ostream access to the << operator overload.

c. **Templates**
    - The program uses templates in the swap() function in the Report class.

d. **Operator Overloading**
    - The program uses operator overloads in the Book and InventoryBook classes, such as the ++ operator in InventoryBook which increases the quantity of the book by one.

e. **Exception Handling**
    - The program uses exception handling in the getUserInput() functions in main.cpp, where it will catch any exceptions thrown by std::stoi() and std::stod() and give the user an appropriate error message.

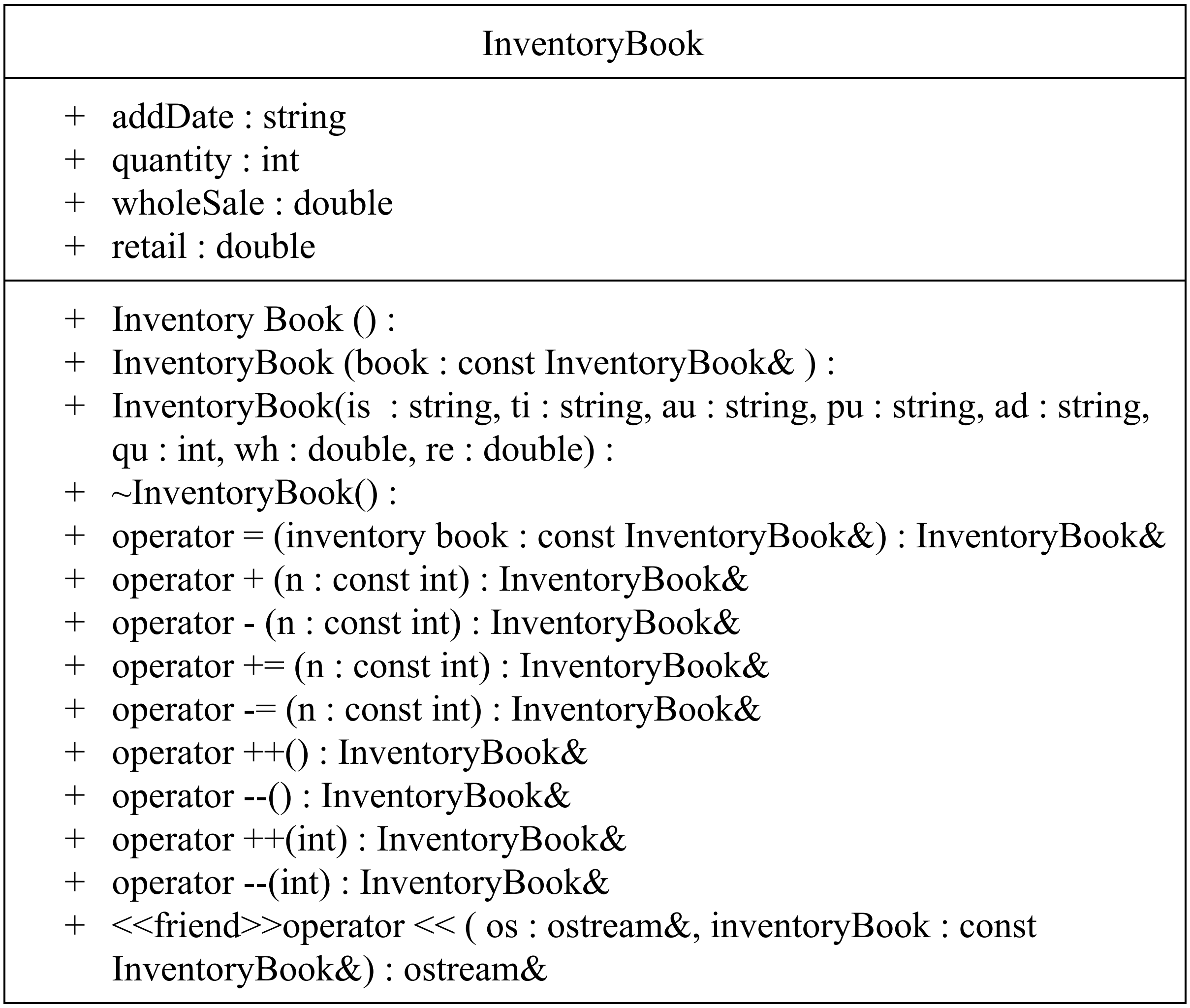
# UML
# DIAGRAMS



Book

+ Isbn : string<br>
+ title : string<br>
+ author : string<br>
+ publisher : string

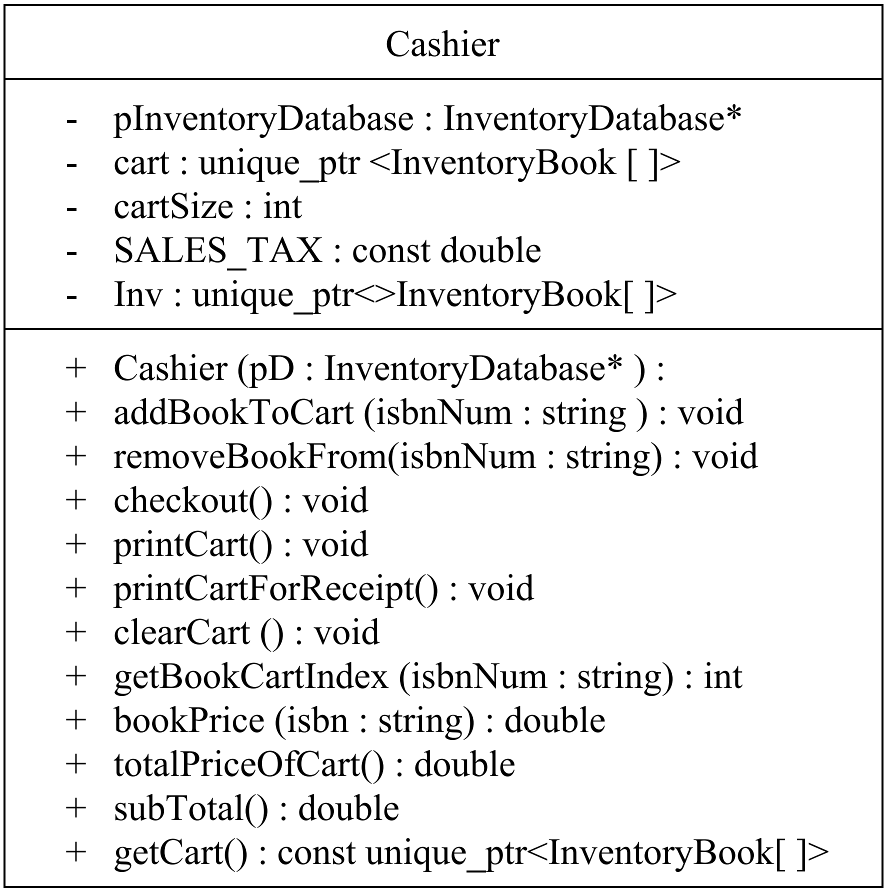
+ Book() :<br>
+ Book( is : string, ti : string, au string, pu : string)<br>
+ ~Book() :<br>
+ operator = ( book : const Book&) : Book&<br>
+ <<friend>> operator << ( os : ostream&, book : const Book& ) : ostream&



InventoryBook

+ addDate : string<br>
+ quantity : int<br>
+ wholeSale : double<br>
+ retail : double

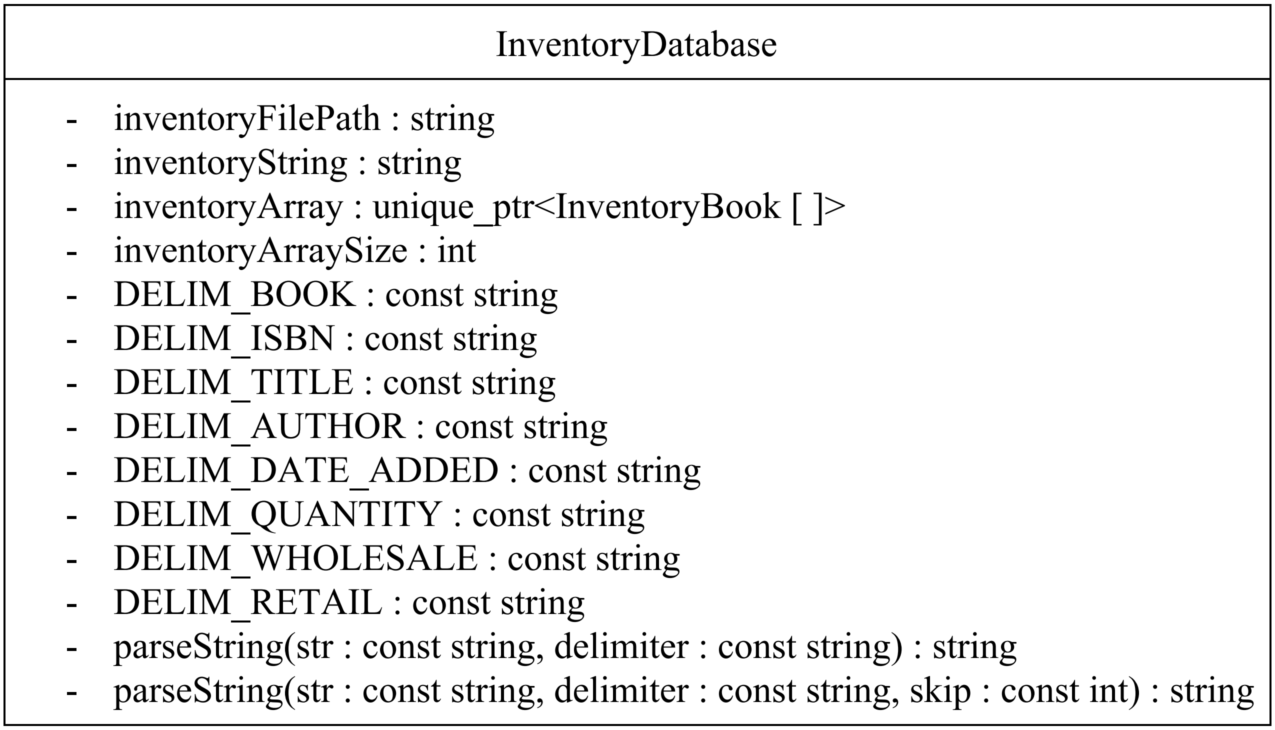
+ Inventory Book () :<br>
+ InventoryBook (book : const InventoryBook& ) :<br>
+ InventoryBook(is : string, ti : string, au : string, pu : string, ad : string, qu : int, wh : double, re : double) :<br>
+ ~InventoryBook() :<br>
+ operator = (inventory book : const InventoryBook&) : InventoryBook&<br>
+ operator + (n : const int) : InventoryBook&<br>
+ operator - (n : const int) : InventoryBook&<br>
+ operator += (n : const int) : InventoryBook&<br>
+ operator -= (n : const int) : InventoryBook&<br>
+ operator ++() : InventoryBook&<br>
+ operator --() : InventoryBook&<br>
+ operator ++(int) : InventoryBook&<br>
+ operator --(int) : InventoryBook&<br>
+ <<friend>>operator << ( os : ostream&, inventoryBook : const InventoryBook&) : ostream&



Cashier

- pInventoryDatabase : InventoryDatabase*
- cart : unique_ptr <InventoryBook [ ]>
- cartSize : int
- SALES_TAX : const double
- Inv : unique_ptr<>InventoryBook[ ]>

+ Cashier (pD : InventoryDatabase* ) :
+ addBookToCart (isbnNum : string ) : void
+ removeBookFrom(isbnNum : string) : void
+ checkout() : void
+ printCart() : void
+ printCartForReceipt() : void
+ clearCart () : void
+ getBookCartIndex (isbnNum : string) : int
+ bookPrice (isbn : string) : double
+ totalPriceOfCart() : double
+ subTotal() : double
+ getCart() : const unique_ptr<InventoryBook[ ]>



InventoryDatabase

- inventoryFilePath : string
- inventoryString : string
- inventoryArray : unique_ptr<InventoryBook [ ]>
- inventoryArraySize : int
- DELIM_BOOK : const string
- DELIM_ISBN : const string
- DELIM_TITLE : const string
- DELIM_AUTHOR : const string
- DELIM_DATE_ADDED : const string
- DELIM_QUANTITY : const string
- DELIM_WHOLESALE : const string
- DELIM_RETAIL : const string
- parseString(str : const string, delimiter : const string) : string
- parseString(str : const string, delimiter : const string, skip : const int) : string

| |
|---|
| - fileToString(path : const string) : string<br>- bookToString(book : InventoryBook) : string<br>- inventoryArrayToString () : string<br>- getNumBooksInString(str : const string) : int |
| + InventoryDatabase() :<br>+ InventoryDatabase(path : const string) :<br>+ InventoryDatabase(const InventoryDatabase&) :<br>+ ~InventoryDatabase() :<br>+ buildInventoryArray(path : const string) : bool<br>+ getInventoryArray() : const unique_ptr<InventoryBook [ ]><br>+ getInventoryArraySize() : const int<br>+ setBookIsbnByIsbn(isbn : const string, edit : const string) : void<br>+ setBookTitleByIsbn(isbn : const string, edit : const string) : void<br>+ setBookAuthorByIsbn(isbn : const string, edit : const string) : void<br>+ setBookPublisherByIsbn(isbn : const string, edit : const string) : void<br>+ setBookAddDateByIsbn(isbn : const string, edit : const string) : void<br>+ setBookQuantityByIsbn(isbn : const string, edit : const int) : void<br>+ setBookWholesaleByIsbn(isbn : const string, edit : const double) : void<br>+ setBookRetailByIsbn(isbn : const string, edit : const double) : void<br>+ addToBookQuantityByIsbn(isbn : const string, amount : const int) : void<br>+ addBookToArray(book : InventoryBook) : void<br>+ removeBookFromArray(index : int) : void<br>+ getBookByIsbn(isbn : string) : InventoryBook<br>+ getBookIndexByIsbn(isbn : string) : int<br>+ operator = (const InventoryDatabase) : InventoryDatabase& |

| Report |
|---|
| - convertDataToInt(date : string) : int<br>- <T : template> : template<br>- Swap (a : T&, b : T&) : void |
| + selectionSortQuantity(books : InventoryBook*, numBooks : int) : void<br>+ selectionSortCost(books : InventoryBook*, numBooks : int) : void<br>+ selectionSortAge(books : InventoryBook*, numBooks : int) : void<br>+ getBookTotalWolesale(book : InventoryBook) : double |

+ getInventoryTotalWolesale(book : InventoryBook*, numBooks : int ) : double
+ getBookTotalRetail(book : InventoryBook) : double
+ getInventoryTotalRetail(book : InventoryBook*, numBooks : int) : double

# PSEUDOCODE

Main Pseudo Code:

```
Do this
Display Main Menu:

Cashier Mode.
Inventory Mode.
Report Mode.
Exit.

Get user input.
If user chooses Cashier Mode

    Display Cashier Mode Menu:

    Sell books
    Back

    If user chooses Sell Book

    Display Sell Books Menu:

    Add Book To Cart
    Remove Book From Cart
    Checkout
    Back

    If user chooses Add Book To Cart (in Sell Book Menu)
        Ask the user for an isbn
        Read the isbn from the user
        While
            Isbn is a 13 integer long, proceed
            If not display error message and read it again
        For every element in the inventory array
            Check if user isbn equals one of the inventory book isbn
                If book isbn found has a quantity less than or equal to zero
                    Display error message
                If quantity is greater call addBookToCart function in Cashier class
                    Decrease quantity book in copy of inventory array.
                Display a message letting user know book is added.
        If user isbn does not equal any of the inventory book isbn
            Display an error message letting the user know there is no book
    Ask the user if they want to add another book
    while user input is valid
        Proceed.
        If not display error message and read it again
    If user answer is one
        Run the loop again
    If user answer is two
        Return to Sell Book Menu

If user Chooses Remove Book From Cart (in Sell Book Menu)
    Ask user for a book isbn
    Read the book isbn from the user
    While
        Book isbn is a 13 digit long proceed
        If not
            Display error message and read it again
    To check if book exists in cart call getBookCartIndex in cashier
        If it is equal to negative one
            Display error message: book wasn't found on cart
        Also if the cart is empty
            Display error message: cart is empty.
        If book exists
            Call remove function from cashier class.
            Display message letting user know is remove.
    Ask the user if they want to remove another book from cart
    while user input is valid
        Proceed.
        If not display error message and read it again
    If user answer is one
        Run the loop again
    If user answer is two
        Return to Sell Book Menu

If user chooses Checkout (in Sell Book Menu)
    If cart is greater than zero
        Display the user cart so far with each price and a total price.
```

```
                Asks the user if they want to checkout or cancel the transaction
                If user inputs one
                    It is going to print the receipt.
                    Call the checkout function from cashier class
                    Return to the Sell Book Menu
                If user inputs two
                    Displays a message: Transaction Cancel
            If cart is less than or equal to zero
                Displays a message: Cart is empty
        If user chooses Back option (in Sell Book Menu)
            Goes back to Cashier Mode Menu

        If user chooses Back option (in Cashier Mode Menu)
            Goes back to Main Menu

    If user chooses Inventory Mode
        Display the Inventory Mode Menu

        Find Book By Id
        Find Book By Isbn
        Add Book To Database
        Remove Book From Database
        Edit Book In Database
        Back

        If user chooses Find Book By Id (in Inventory Mode Menu)
            If copy of database array is equal to zero
                Display error message: database empty
            Else
                Proceed
            Ask the user for the ID of the book
            Reads the user input ID
                If id is less than zero or id is greater than the copy of database array
                    Display error message: ID does not exists in database.
                Else
                    Display books relevant to user's input ID
                    Press Enter to continue and return to Inventory Mode Menu

        If user chooses Find Book By Isbn (in Inventory Mode Menu)
        If copy of database array is equal to zero
            Display error message: database empty
        Else
            Proceed
        Ask the user to input the book isbn
        Reads the book isbn
        For every element in the copy of the inventory array
            If the user isbn equal a book isbn in copy of the inventory array
                Assigns the index of the book to a variable
                And sets a boolean variable to true.
        If boolean variable is false
            Display an error message: Book isbn does not exists in inventory.
        Else
            Display inventory array relevant to user book isbn.
            Press enter to continue and return to Inventory Mode Menu

    If user chooses Add Book To Database (in Inventory Mode Menu)
        While the variable isbn is an empty string
            Ask user for a book isbn
            Reads the user isbn
        If user isbn number is not 13 digits
            Display error message: isbn must be 13 digits
        Else
            Try an exception if parameter is out of rage
            If an empty string is catch
                Error message: isbn must be a number
            For every element in the inventory copy array
                If the user isbn equal to an existing isbn in the array
                    Display error message: isbn already exists
        Ask user for a book title
        Reads the book title
        Ask the reader for an author
        Reads the book author
        Asks the user for a publisher
        Reads the user publisher
        While the variable addDate is empty
            Ask the user for a date
            Read the user date
            If the user date does not equal 10 digits
            Set boolean variable error to true
        If user date does not contain the slash character
            Set boolean variable error to true
        else
            Try an exception if parameters are incorrect
            If an empty string is catch
                Set boolean variable error to true

        if month, date, and year are not in the right range
            Set boolean variable error to true
        If error equals true
            Display error message: date must be mm/dd/yyyy
    Ask user for the number of books
    Reads the number of books
    Ask user for the wholesale price
    Reads user wholesale price
    Ask user for the retail price
    Reads the retail price
    Creates a variable from the InventoryBook class
    Class the constructor of the class in order to create an InventoryBook object
    An inventory database variable calls addBookToArray function to add the book
        Displays a message: Book successfully added
    Press enter to continue and return to Inventory Mode Menu

If user chooses Remove Book From Database (in Inventory Mode Menu)
    if copy of database array is equal to zero
        Display error message: database empty
    Else
        Proceed
     Ask the user to enter the book isbn
    Read the book isbn
    For every element in the inventory copy array
        If the user isbn is equal to an existing book isbn in the array
            Call removeBookFromArray function from the inventory class
            Sets boolean variable bookExists to true
        If bookExists equals to true
            Display a message: successfully removed from inventory
        else
            Display error message: book does not exists in database
```

```
If user chooses Edit Book By Isbn (in Inventory Mode Menu)
    if copy of database array is equal to zero
        Display error message: database empty
    Else
        Proceed
     Ask the user to enter the book isbn
    Read the book isbn
    For every element in the inventory copy array
        If user isbn is equal to an existing isbn in the copy array
            Set bookExists to true
            Assign book index to foundIndex
            Assign the book to foundBook
        If bookExists is equal to false
            Display an error message: book does not exists on inventory
        else
            Display book attributes

            Isbn
            Title
            Author
            Publisher
            Date added
            On-hand
            Wholesale
            Retail

        Ask the user to choose an attribute to edit
        Read the user attribute

            If user chooses Isbn:
            While newString variable is an empty string
                Ask user to enter the new isbn
                Read the isbn from user
                Check if isbn is 13 digits if not
                    Display error message: isbn 13 digits long
                else
                    Try an exception if out of range
                    If empty string is catched
                        Display error message
        For every element in the inventory array
            If user isbn equals another isbn from array
                Display an error message
Inventory database calls setBookIsbnByIsn function sets new isbn
Display message: Isbn has been successfully added

If user chooses Title:
Ask the user for the book title
Reads the book title from the user
inventoryDatabase calls setBookTitleByIsbn and sets new title
Display message: title successfully added

If user chooses Author:
Ask the user for the book author
Reads the book author from the user
inventoryDatabase calls setBookAuthorByIsbn and sets new author
Display message: author successfully added

If user chooses Publisher:
Ask the user for the book publisher
Reads the book publisher from the user
inventoryDatabase calls setBookPublisherByIsbn sets publisher
Display message: publisher successfully added

If user chooses Added Date:
While newString is empty
    Ask user for the book date
    Reads the date from the user
If date is not have 10 characters long
    Set boolean variable error to true
else
    If date does not contain slashes /
        Set boolean variable error to true
    Try an exception if out of rage
    If empty input is catched
        Set boolean variable error to true
    If month, day and year is out of range respectively
        Set boolean variable error to true
If error is equal to true
```

```
                    Display an error message: date must be mm/dd/yyyy
                inventoryDatabase calls setAddDateByIsbn, sets new date
                Display message: Date successfully added.

                If user chooses Quantity:
                Ask the user for the book quantity
                Reads the book quantity from the user
                inventoryDatabase calls setBookQuantityrByIsbn sets quantity
                Display message: quantity successfully added

                If user chooses Wholesale:
                Ask the user for the book wholesale
                Reads the book wholesale from the user
                inventoryDatabase calls setBookWholesalerByIsbn sets wholesale
                Display message: wholesale successfully added

                If user chooses Retail:
                Ask the user for the book retail
                Reads the book retail from the user
                inventoryDatabase calls setBookRetailByIsbn sets new retail
                Display message: retail successfully added

            Press enter to continue and return to Inventory Mode Menu

    If user Chooses Back (in Inventory Mode Menu)
        Goes back to the Main menu

If user chooses Report Mode:
    Display Report Mode Menu

    Inventory List
    Inventory Wholesale value
    Inventory Retail value
    List By Quantity
    List By Cost
    List By Age
    Back

    If user chooses Inventory List (in Report Mode Menu)
```

```
        Display the whole book Inventory list

    If user chooses Inventory Wholesale Value (in Report Mode Menu)
        Display book Inventory by wholesale order value.

    If user chooses Inventory Retail Value (in Report Mode Menu)
        Display book Inventory by retail order value.

    If user chooses List By Quantity (in Report Mode Menu)
        Display book Inventory in quantity order

    If user chooses List By Cost (in Report Mode Menu)
        Display book Inventory in cost order

    If user chooses List By Age (in Report Mode Menu)
        Display book Inventory in age order

    If user chooses Back (in Report Mode Menu)
        Goes back to the Main Menu

If user chooses Exit:
    Displays goodbye function

======= Helper Functions =======

generateBars
    Gets an int as a parameter
        Depending on the number it generates the equal sign character "="
    Returns the bars generated

getUserInputInt
Gets two int const as parameters
Do this
    Try an exemption if user input is out of range
        If user input exceeds the max and min bounds
            Display error message
    If an invalid argument is catch
        Display error message
        Set boolean variable to true.
    If out of range is catch
        Display error messahe
        Set boolean variable to true
    If empty string is catch
        Display error message
        Set boolean variable to true.
While error is true
    Do the loop again
Return the user integer

getUserInputDouble
Gets two double const as parameters
Do this
    Try an exemption if user input is out of range
        If user input exceeds the max and min bounds
            Display error message
    If an invalid argument is catch
        Display error message
        Set boolean variable to true.
    If out of range is catch
        Display error messahe
        Set boolean variable to true
    If empty string is catch
        Display error message
        Set boolean variable to true.
While error is true
    Do the loop again
Return the user double

getUserInputString
    Reads the user input by line

    Returns the user string

clearScreen
Gets a boolean as a parameter
    Clears the screen
    Display header after cleaning the screen
```

Pause

Pauses the screen until the user press enter

Initialize

Resize the window terminal

Creates two variables

Uses System mode to resize the terminal window

printHeader

Displays Serendipity Bookseller header

displayGoodbye

Clears the screen

Displays the goodbye message.

## **Book.cpp**

2 constructors -

- Default constructor
    - Set isbn, title, author, and publisher equal to empty strings
- Second constructor
    - Set isbn equal to what the user passes in as parameters
    - Set title equal to what the user passes in as parameters
    - Set author equal to what the user passes in as parameters
    - Set publisher equal to what the user passes in as parameters

Include destructor

Operation overload of =

- Setting a Book object equal to another Book means that all of the attributes of the Book should be the same as the attributes of the Book it is set equal to
- The address to the book should be passed as the parameter

Operation overload of <<

- Prints out the attribute values of the book the operation is performed on

## **Cashier.cpp**

Constructor with a pointer to InventoryDatabase object as a parameter

- Should set the pInventoryDatabase pointer attribute equal to the parameter
- Should set the unique pointer cart attribute to a list of InventoryBooks of size 100
- Should set cart size to 0
- Should set the unique pointer inventory attribute by calling the getInventoryArray function in InventoryDatabase

Add Book to Cart function

- Should have a string as parameter (the isbn number of the book)
- Should go through the inventory array using a for loop
    - If the isbn of the book is equal to the string argument, should add the book to cart by increasing quantity
    - Should decrease the quantity in the copy of the inventory array in Inventory Database

Remove Book from Cart function

- Should have a string as parameter (the isbn number of the book)
- Should go through the inventory array using a for loop

    - If the isbn of the book is equal to the string argument, should remove the book from cart by decreasing quantity
    - Should increase the quantity in the copy of the inventory array in Inventory Database

Get Book Cart Index

- Go through the cart using a for loop
- If the isbn number passed as a parameter matches the isbn of the book, pass i (the counter in the for loop)

Book price

- Isbn in the string parameter
- If getBookIndexByIsbn returns -1 when isbn is passed as the argument, then -1 is returned
    - If it doesn't pass -1, the price is returned by finding the book in the inventory by isbn and multiplying its wholesale number by sales tax

Subtotal

- Function returns subtotal of books in the cart by looping through the cart and multiplying the quantity of the book times its retail price

Total Price of Cart

- Does the same thing as the above function but multiplies the subtotal by the sales tax and adds it to the subtotal

Checkout

- Reduces quantity in inventory by the amount of books that are in the cart
- Loops through the books in the cart and subtracts this value from the inventory array
- Does this in the copy of the array and the inventory array in the InventoryDatabase by calling addToBookQuantityByIsbn

getCart

- Make a copyCartArray unique pointer of cart size
- Go through the cart array and assign all the attribute values of each book to the books in the copyCartArray
- Return the copyCartArray

printCart

- Loop through the cart array
- Print out the isbn, title, quantity, and retail

printCartForReciept

- Loop through the cart using a for loop
- Print the attribute values of the book, formatting the way you desire

- Go to the next line at the end of the loop

clearCart

- Set the cart size to 0
- Reassign cart to a unique pointer cart attribute to a list of InventoryBooks of size 100 (All attribute values reset)

## **InventoryBook.cpp**

3 constructors -

- Default constructor
    - Set isbn, title, author, and publisher, and addDate equal to empty strings
    - Set quantity, wholesale, and retail to 0
- Second constructor
    - The address to an InventoryBook should be the parameter
    - Set the attributes (isbn, title, author, and publisher, addDate, quantity, wholesale, and retail) equal to the attributes of the InventoryBook in the parameter
- Third constructor
    - 5 strings and 3 ints should be in the parameter
    - Set the attributes isbn, title, author, and publisher, and addDate equal to the string values
    - Set the quantity, wholesale, and retail equal to the int values

Operation overload of =

- Setting an InventoryBook object equal to another InventoryBook means that all of the attributes of the InventoryBook should be the same as the attributes of the InventoryBook it is set equal to

Operation overload of +, -, +=, -=, ++, —

- These operations are performed on the quantity attribute of the book

Operation overload of <<

- Prints out the attribute values of the book the operation is performed on

## **InventoryDatabase.cpp**

parseString

- Use the delimiter to parse the string and then return this string

fileToString

- Create a input file object with the string path as the argument (the path string should be a parameter of the function)

- Reserve space in the string to store the entire file
- Store the entire file in the string by iterating from beginning to end

bookToString

- Turn the book into a string using the delimiter and return this string

inventoryArrayToString

- Create a string variable named bookString
- Loop through each book in the string
- Call the function bookToString and pass the current book in the inventory array
    - Append what the function returns to bookString
- After the loop is finished, return bookString

getNumBooksInString

- Using a while loop and the book delimiter,  get the number of books that are in the inventory string

saveInventoryArrayToFile

- Convert the inventory array to a string
- Save it to a file by creating an ofstream object (output file) and writing into the output file
- Close the output file at the end

buildInventoryArray

- Use a for loop to loop through each index in the inventory array
- Use the parse string function to set the title, isbn, author, publisher, addDate, quantity, wholesale, and retail of each book in the inventory array

getInventoryArray

- Make a copyInventoryArray unique pointer of cart size
- Go through the inventory array and assign all the attribute values of each book to the books in the copyInventoryArray
- Return the copyInventoryArray

getInventoryArraySize

- Returns the inventory size attribute

set Book Isbn By Isbn

- The isbn string (isbn) of the book should be the parameter as well as the isbn that the user wants to change the book’s isbn to (edit)
- Loop through the inventory array
- If the isbn passed as the argument is equal to the isbn of the book, set the isbn of the book to edit

setBookTitleByIsbn

- The isbn string (isbn) of the book should be the parameter as well as the title that the user wants to change
- Loop through the inventory array
- If the isbn passed as the argument is equal to the isbn of the book, set the title of the book to title passed in the parameter

setBookAuthorByIsbn

- The isbn string (isbn) of the book should be the parameter as well as the author that the user wants to change
- Loop through the inventory array
- If the isbn passed as the argument is equal to the isbn of the book, set the author of the book to author passed in the parameter

setBookPublisherByIsbn

- The isbn string (isbn) of the book should be the parameter as well as the publisher that the user wants to change
- Loop through the inventory array
- If the isbn passed as the argument is equal to the isbn of the book, set the publisher of the book to publisher passed in the parameter

setBookAddDateByIsbn, setBookQuantityByIsbn, setBookWholesaleByIsbn, setBookRetailByIsbn, addToBookQuantityByIsbn should have the same psuedocode as above except with alternate parameters depending on the function

getBookByIsbn

- The isbn on the book should be the parameter
- Loop through the inventory array
- If the isbn passed as the argument matches the isbn of the book, return that book

getBookIndexByIsbn

- The isbn on the book should be the parameter
- Loop through the inventory array
- If the isbn passed as the argument matches the isbn of the book, return the index of that book by returning the counter of the for loop

addBookToArray

- Create a new inventory array and make the size the old size + 1
- Copy the old books into the array
- Copy the new book into the array
- The new book should be passed as the parameter
- Swap the old array and the new array, then set the array size variable to the right value
- Save changes to file

remove Book From Array

- Make a new array to hold the old books, minus the one we are removing
- Keep track of whether we have passed the book to remove or not
- Copy the old books into the new array, except the one we are removing
- Swap the old array and the new array, then set the array size variable to the right value
- Save changes to file

2 constructors

- Default constructor
    - Should set inventoryFilePath to an empty string as well as inventoryString to an empty string
- 2nd constructor
    - Should set inventoryFilePath to the string named path (should be a parameter) and should set inventoryString to an empty string

Include the destructor, and call saveInventoryArrayToFile in the destructor

## **Report.cpp**

selectionSortQunatity

- A pointer to Inventory Book and an int named numBooks should be the parameters
- Iterate through and find the book with the largest quantity
- Swap the book with the largest quantity with the index farthest to the left that is unsorted
- Keep doing this till the entire list is sorted (this can be done using 2 for loops)

selectionSortCost

- A pointer to Inventory Book and an int named numBooks should be the parameters
- Iterate through and find the book with the largest cost
- Swap the book with the largest quantity with the index farthest to the left that is unsorted
- Keep doing this till the entire list is sorted (this can be done using 2 for loops)

selectionSortAge

- A pointer to Inventory Book and an int named numBooks should be the parameters
- Iterate through and find the book with the largest age
- Swap the book with the largest quantity with the index farthest to the left that is unsorted
- Keep doing this till the entire list is sorted (this can be done using 2 for loops)

converyDateToInt

- Use the function stoi to convert the date to an integer value and return this integer value

getBookTotalWholesale

- The parameter should be an InventoryBook object

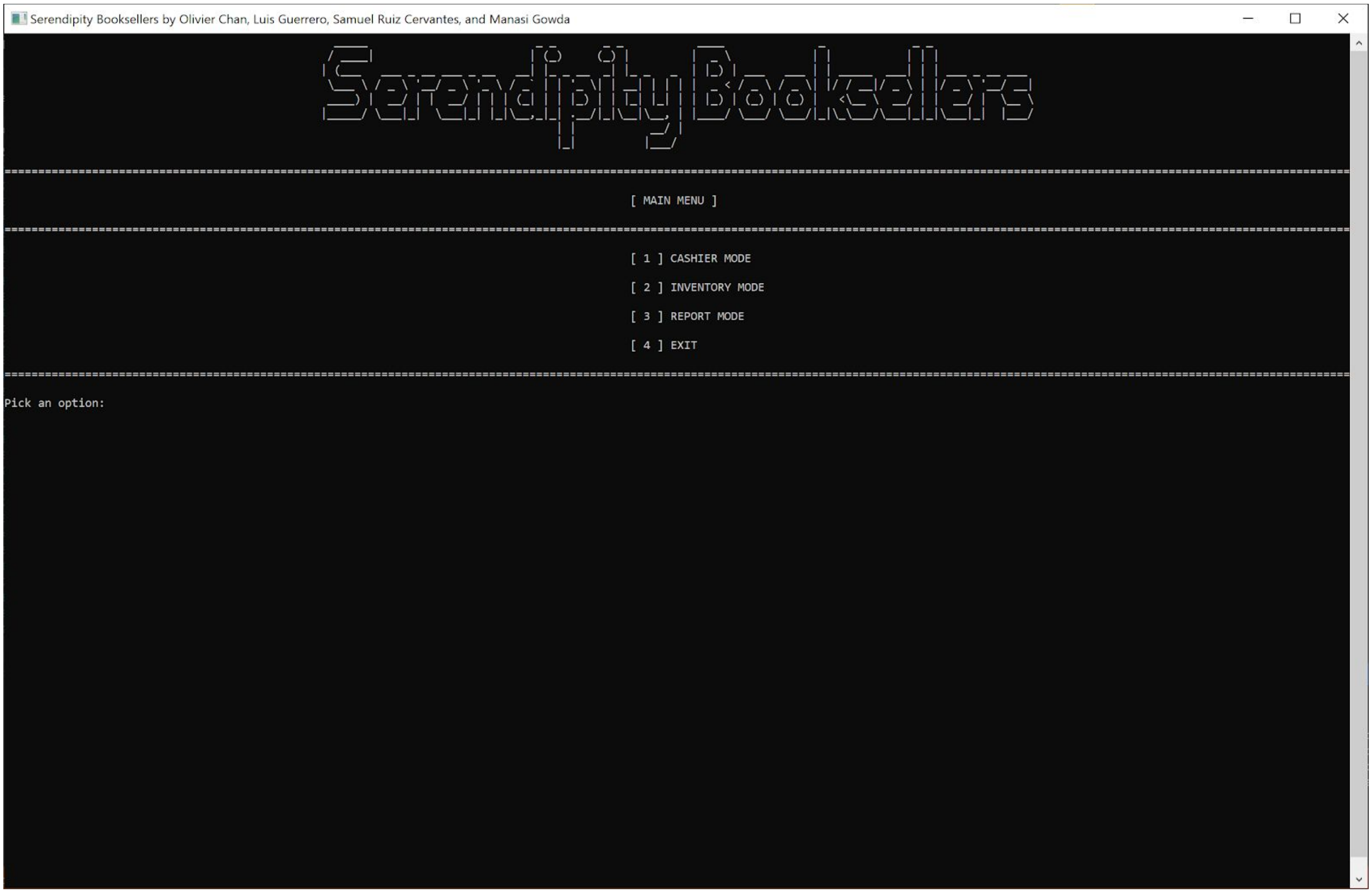
- Multiply its quantity times wholesale and return this number

getBookTotalRetail

- The parameter should be an InventoryBook object
- Multiply its quantity times retail and return this number

# Screenshots

# MAIN MENU



Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda

```
================================================================================

                                 [ MAIN MENU ]

================================================================================

                                 [ 1 ] CASHIER MODE

                                 [ 2 ] INVENTORY MODE

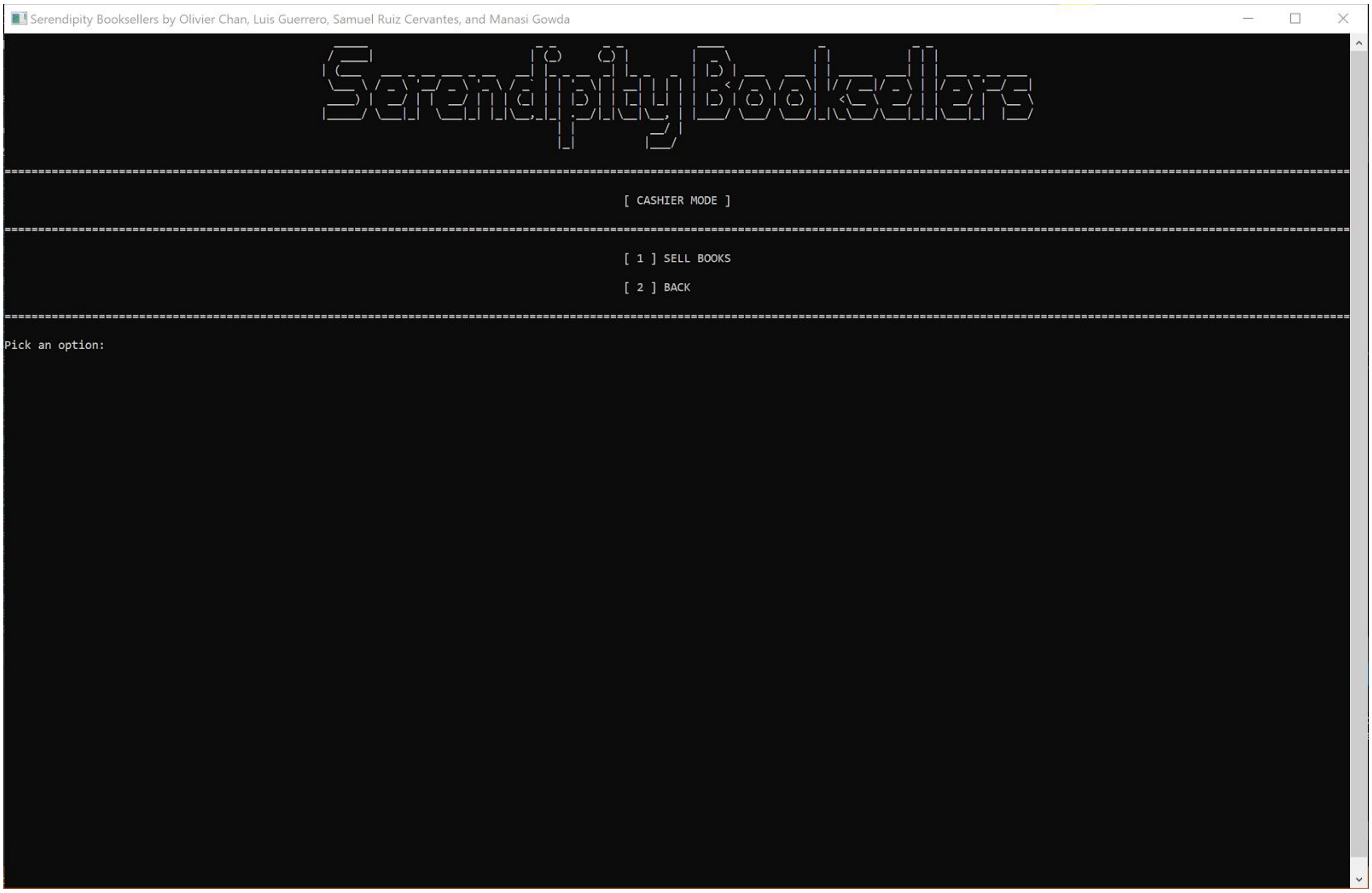
                                 [ 3 ] REPORT MODE

                                 [ 4 ] EXIT

================================================================================

Pick an option:
```

# CASHIER MODE



Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda

```
================================================================================

                                [ CASHIER MODE ]

================================================================================

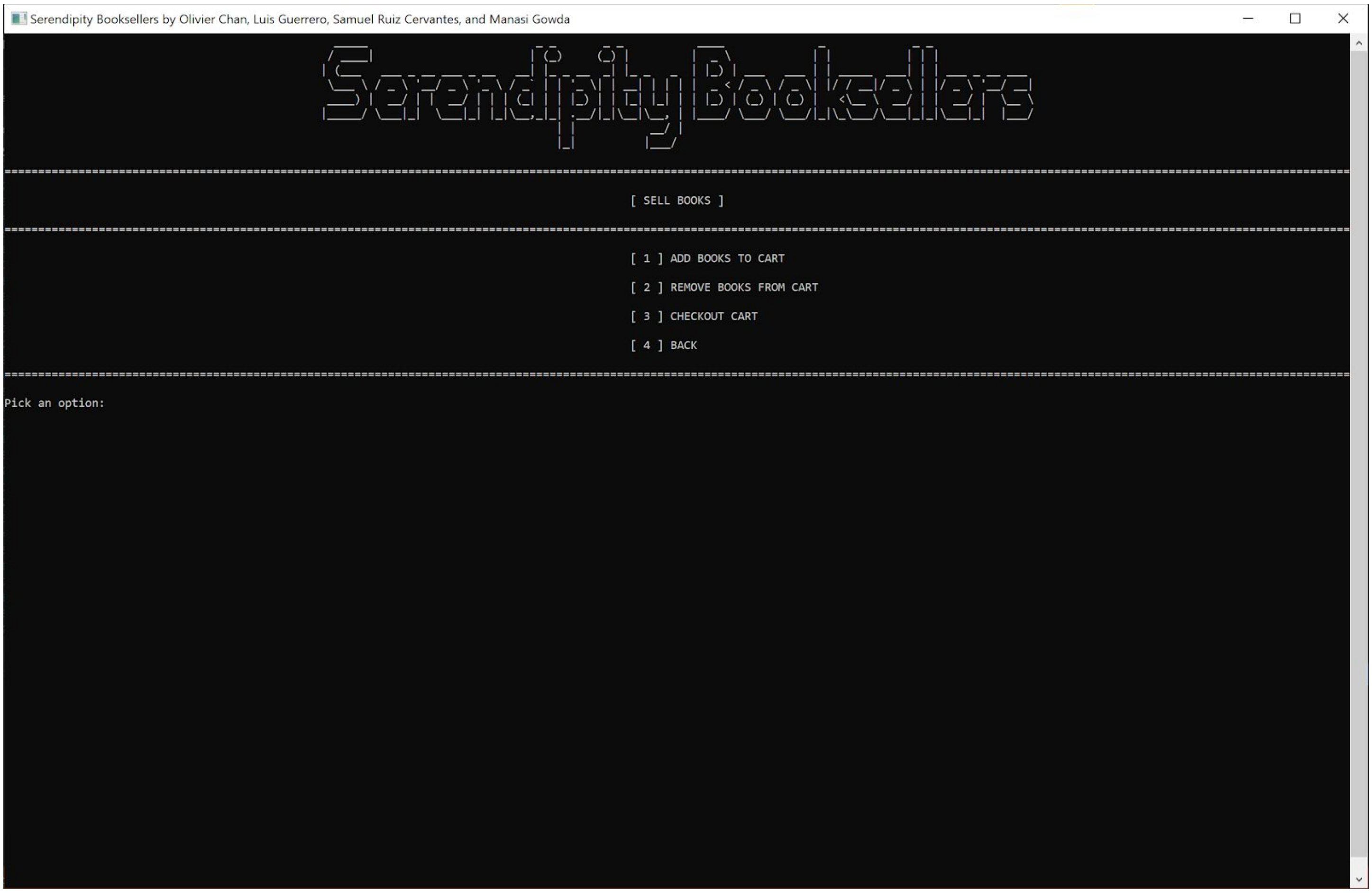
                                [ 1 ] SELL BOOKS

                                [ 2 ] BACK

================================================================================

Pick an option:
```

# SELL BOOKS


Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda
Serendipity Booksellers

```
[ SELL BOOKS ]

[ 1 ] ADD BOOKS TO CART

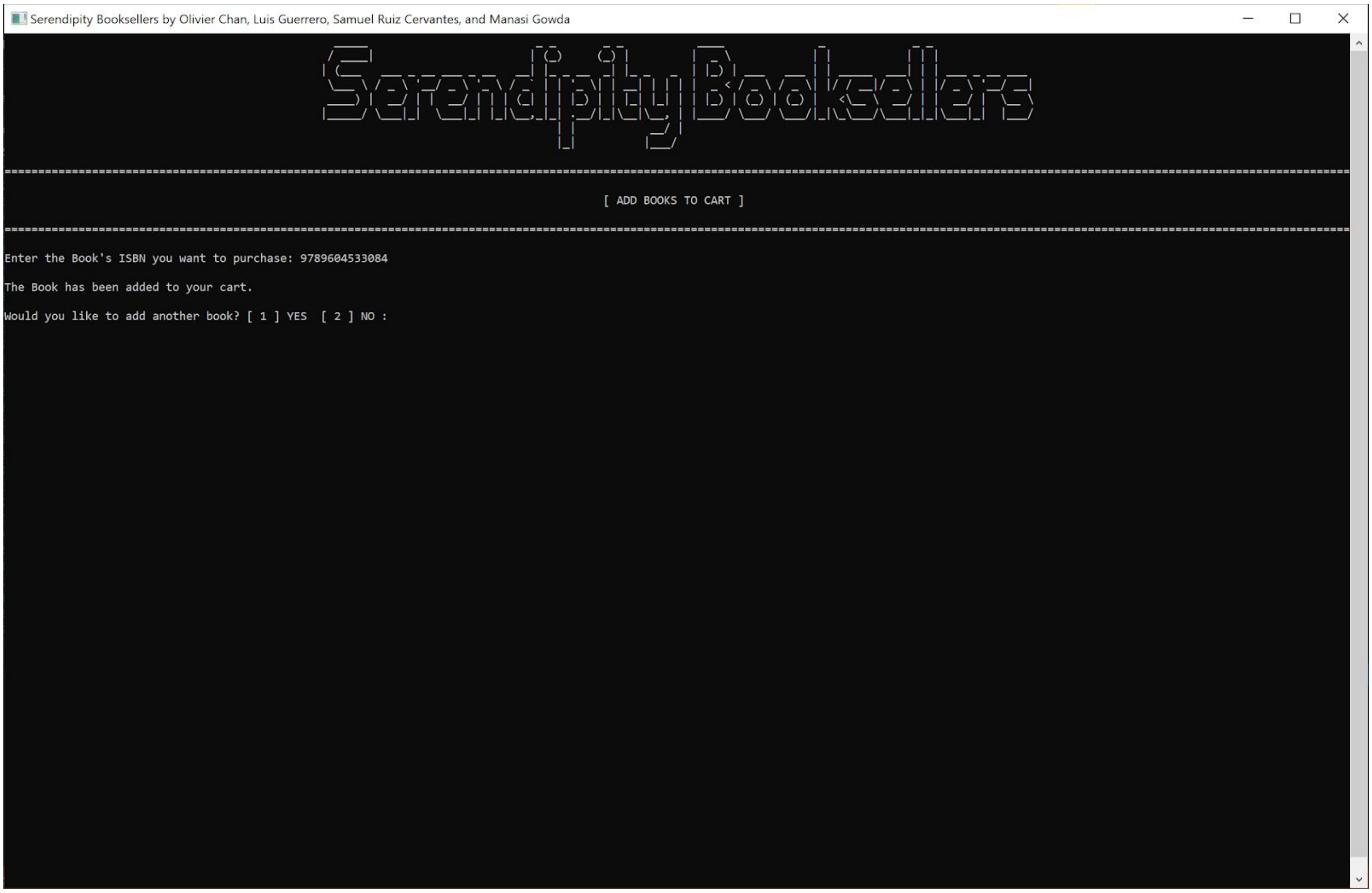
[ 2 ] REMOVE BOOKS FROM CART

[ 3 ] CHECKOUT CART

[ 4 ] BACK

Pick an option:
```

# ADD BOOKS TO CART


Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda
Serendipity Booksellers

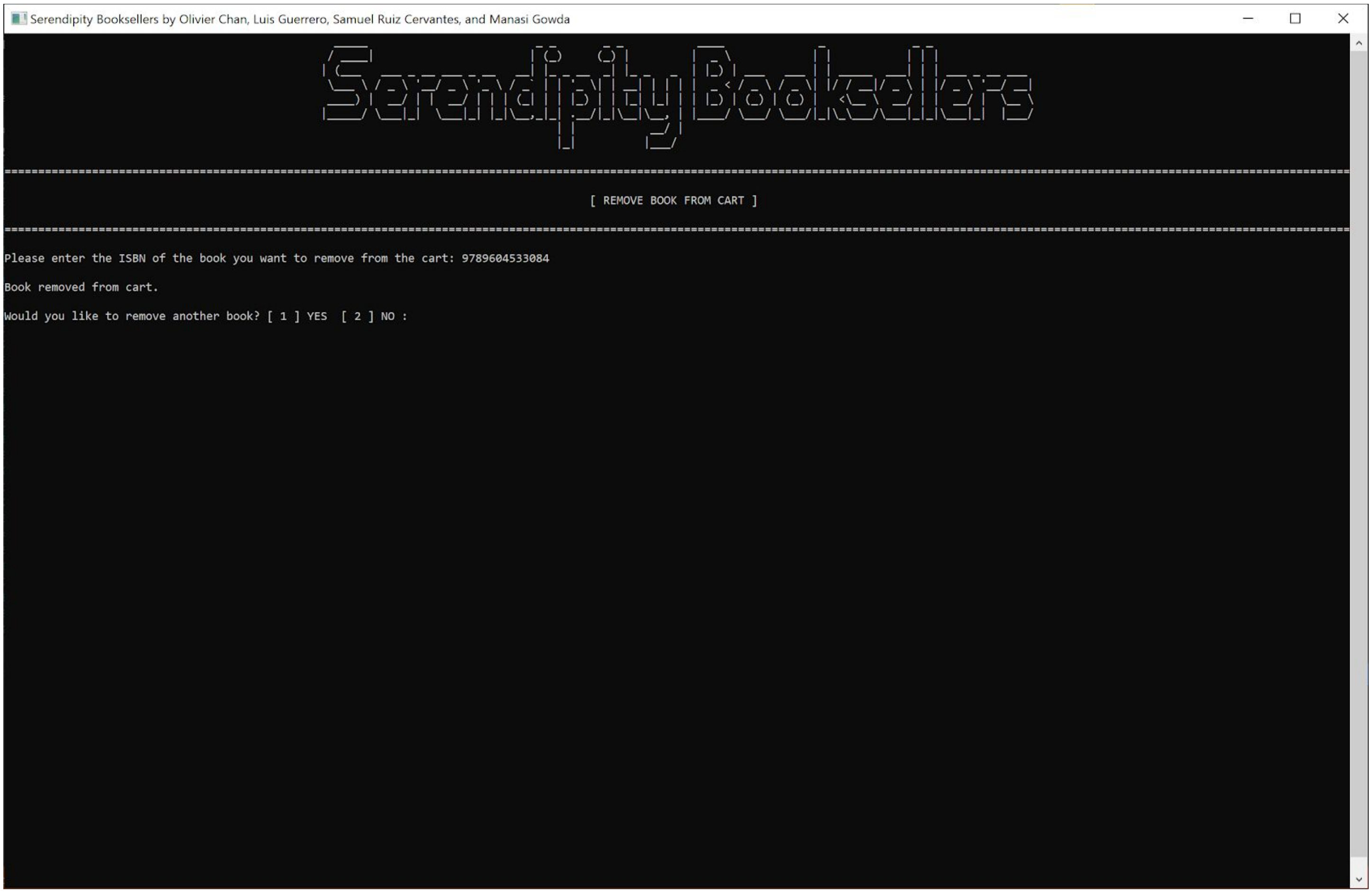
```
[ ADD BOOKS TO CART ]

Enter the Book's ISBN you want to purchase: 9789604533084

The Book has been added to your cart.

Would you like to add another book? [ 1 ] YES  [ 2 ] NO :
```

# REMOVE BOOKS FROM CART


Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda

```
==========================================================================================

                                   [ REMOVE BOOK FROM CART ]

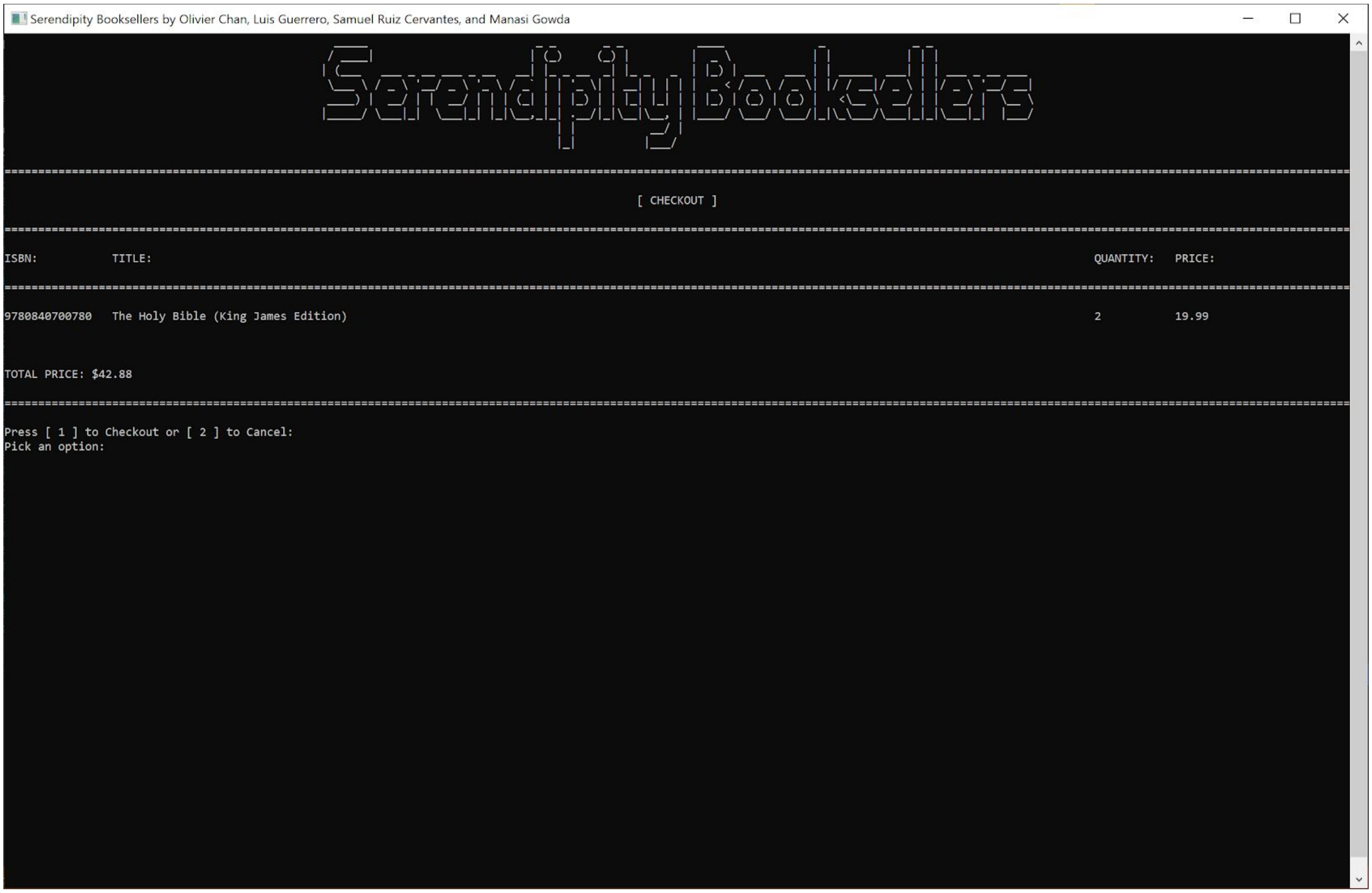
==========================================================================================

Please enter the ISBN of the book you want to remove from the cart: 9789604533084

Book removed from cart.

Would you like to remove another book? [ 1 ] YES  [ 2 ] NO :
```

# CHECKOUT


Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda

```
==========================================================================================

                                      [ CHECKOUT ]

==========================================================================================

ISBN:          TITLE:                                                        QUANTITY:   PRICE:

==========================================================================================

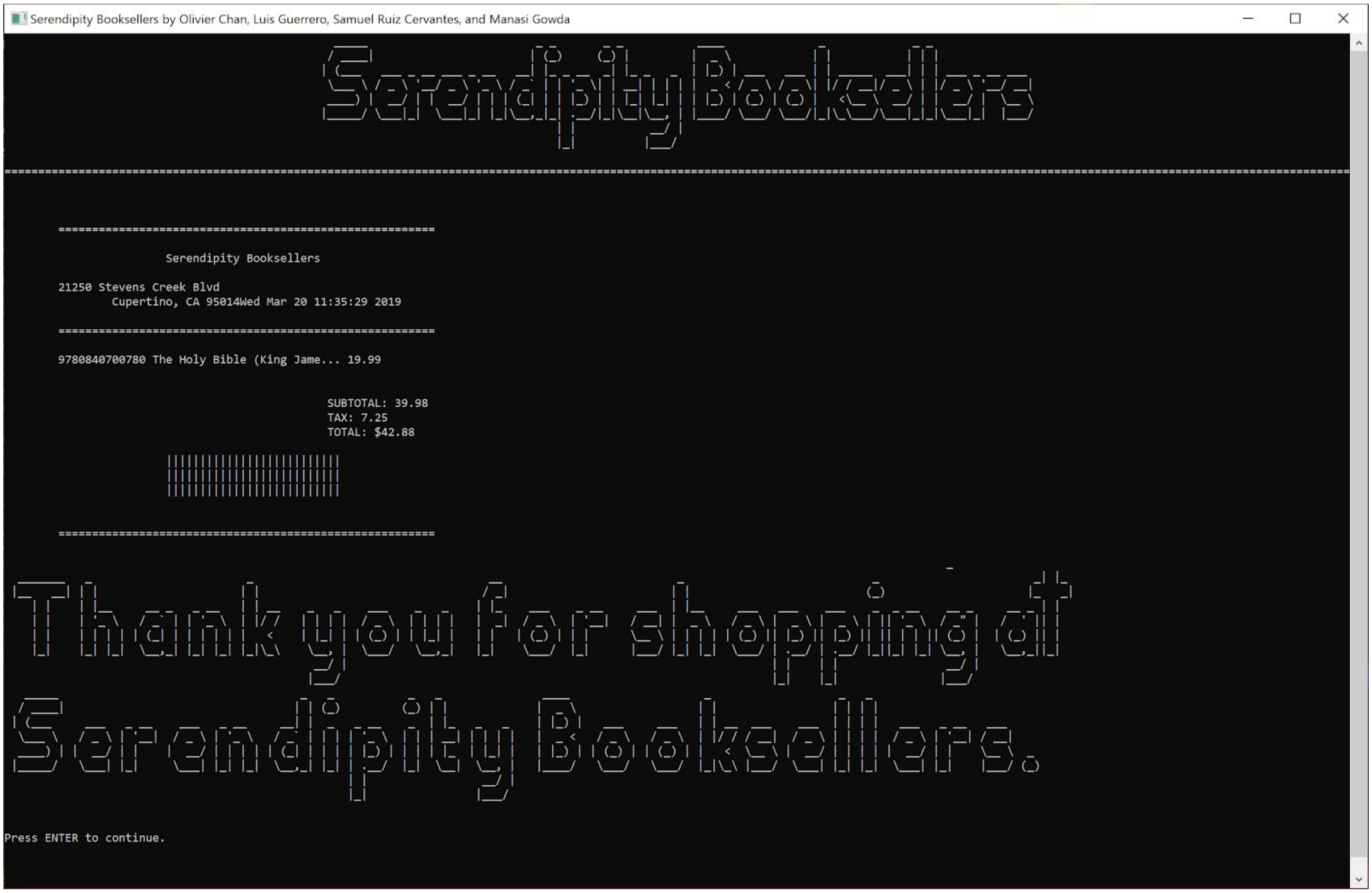
9780840700780   The Holy Bible (King James Edition)                          2           19.99


TOTAL PRICE: $42.88

==========================================================================================

Press [ 1 ] to Checkout or [ 2 ] to Cancel:
Pick an option:
```

# RECEIPT


Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda
Serendipity Booksellers
Thank you for shopping at
Serendipity Booksellers.

```
        ========================================================

                        Serendipity Booksellers

        21250 Stevens Creek Blvd
                Cupertino, CA 95014Wed Mar 20 11:35:29 2019

        ========================================================

        9780840700780 The Holy Bible (King Jame... 19.99

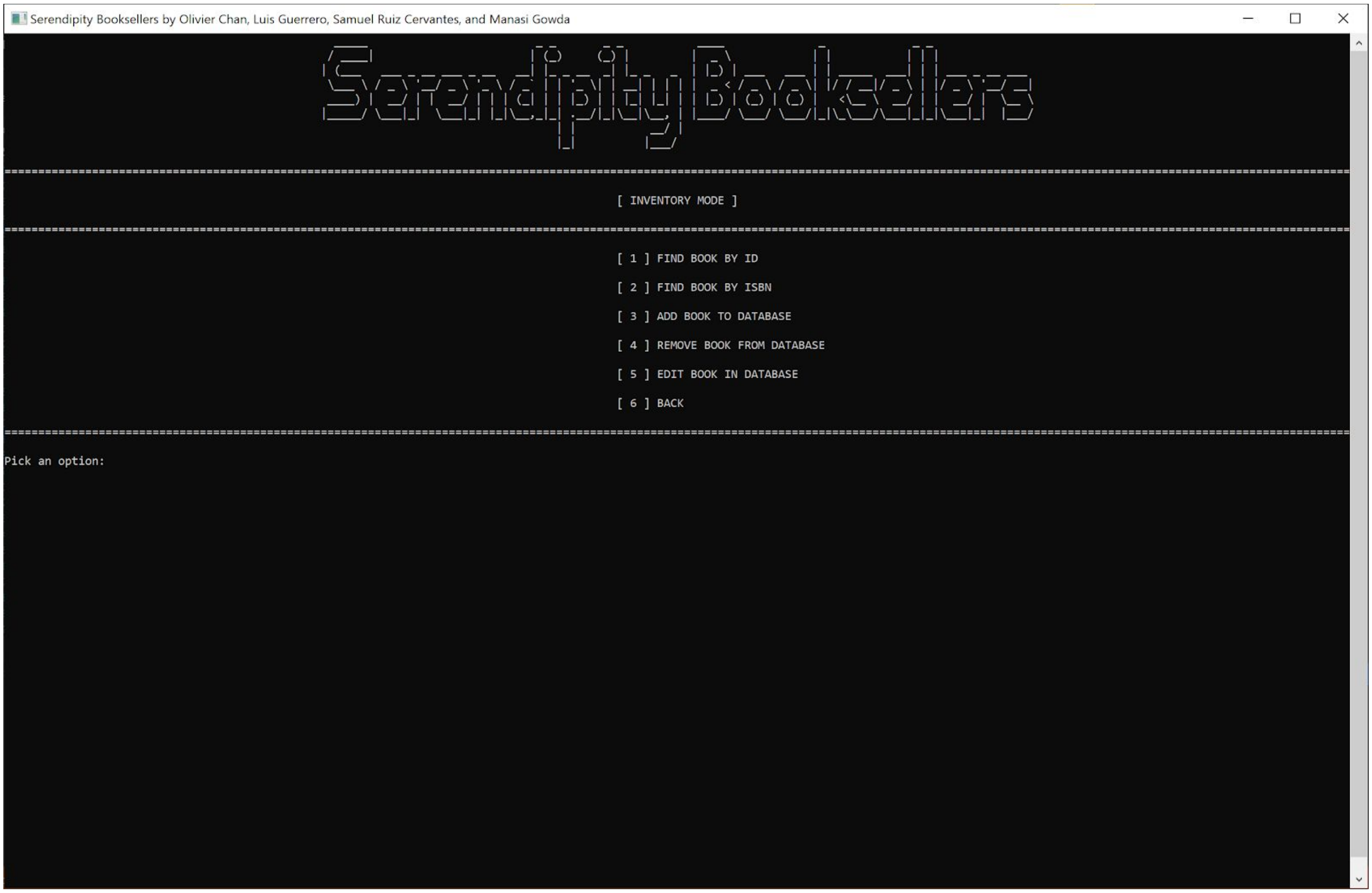

                                        SUBTOTAL: 39.98
                                        TAX: 7.25
                                        TOTAL: $42.88

                        ||||||||||||||||||||||||||
                        ||||||||||||||||||||||||||
                        ||||||||||||||||||||||||||

        ========================================================

Press ENTER to continue.
```

# INVENTORY MODE


Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda
Serendipity Booksellers

```
==========================================================================================

                                  [ INVENTORY MODE ]

==========================================================================================

                                  [ 1 ] FIND BOOK BY ID

                                  [ 2 ] FIND BOOK BY ISBN

                                  [ 3 ] ADD BOOK TO DATABASE

                                  [ 4 ] REMOVE BOOK FROM DATABASE

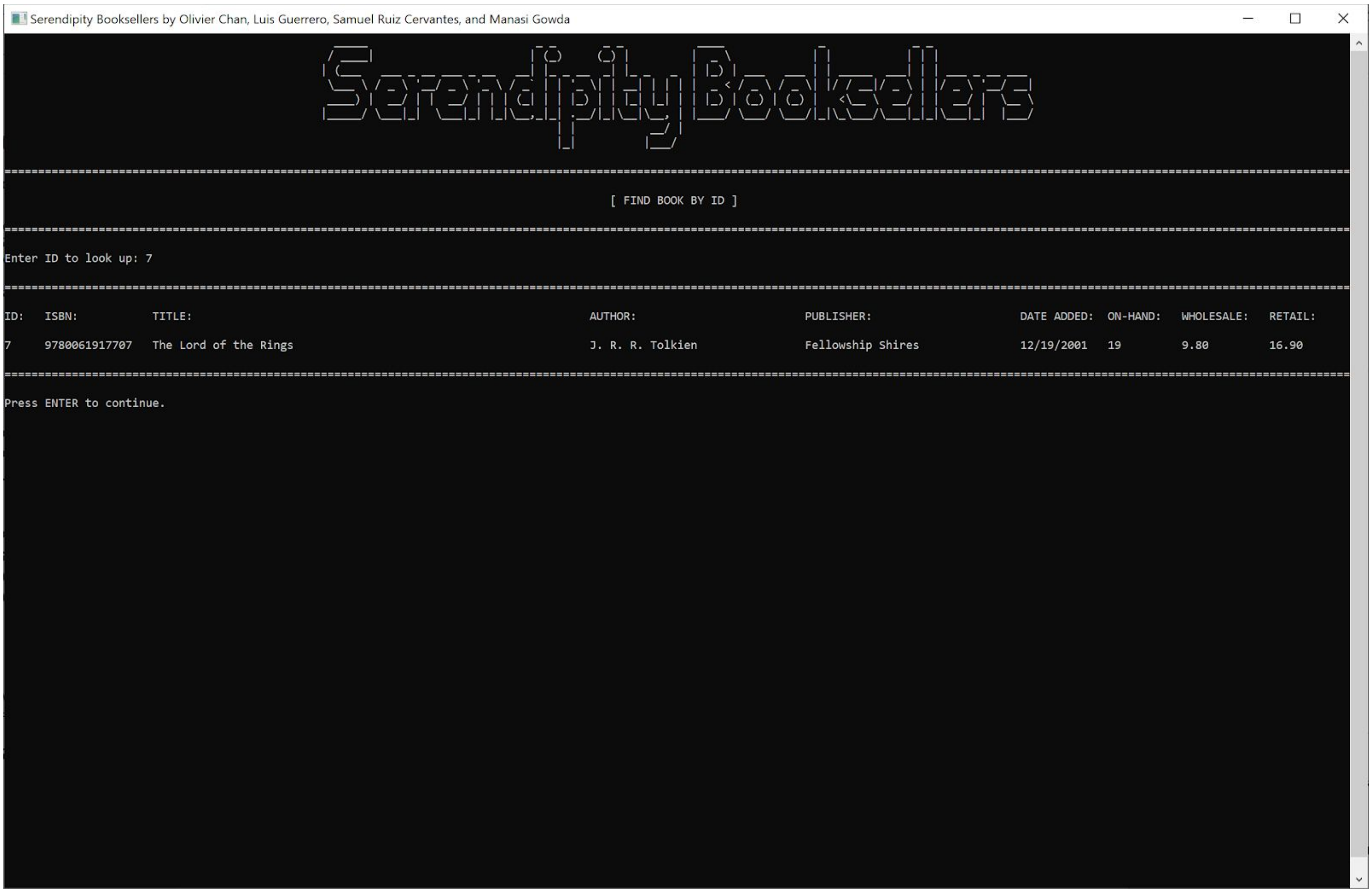
                                  [ 5 ] EDIT BOOK IN DATABASE

                                  [ 6 ] BACK

==========================================================================================

Pick an option:
```

# FIND BOOK BY ID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Serendipity Booksellers

```
========================================================================================================================================================================================================

                                                                                          [ FIND BOOK BY ID ]

========================================================================================================================================================================================================

Enter ID to look up: 7

========================================================================================================================================================================================================

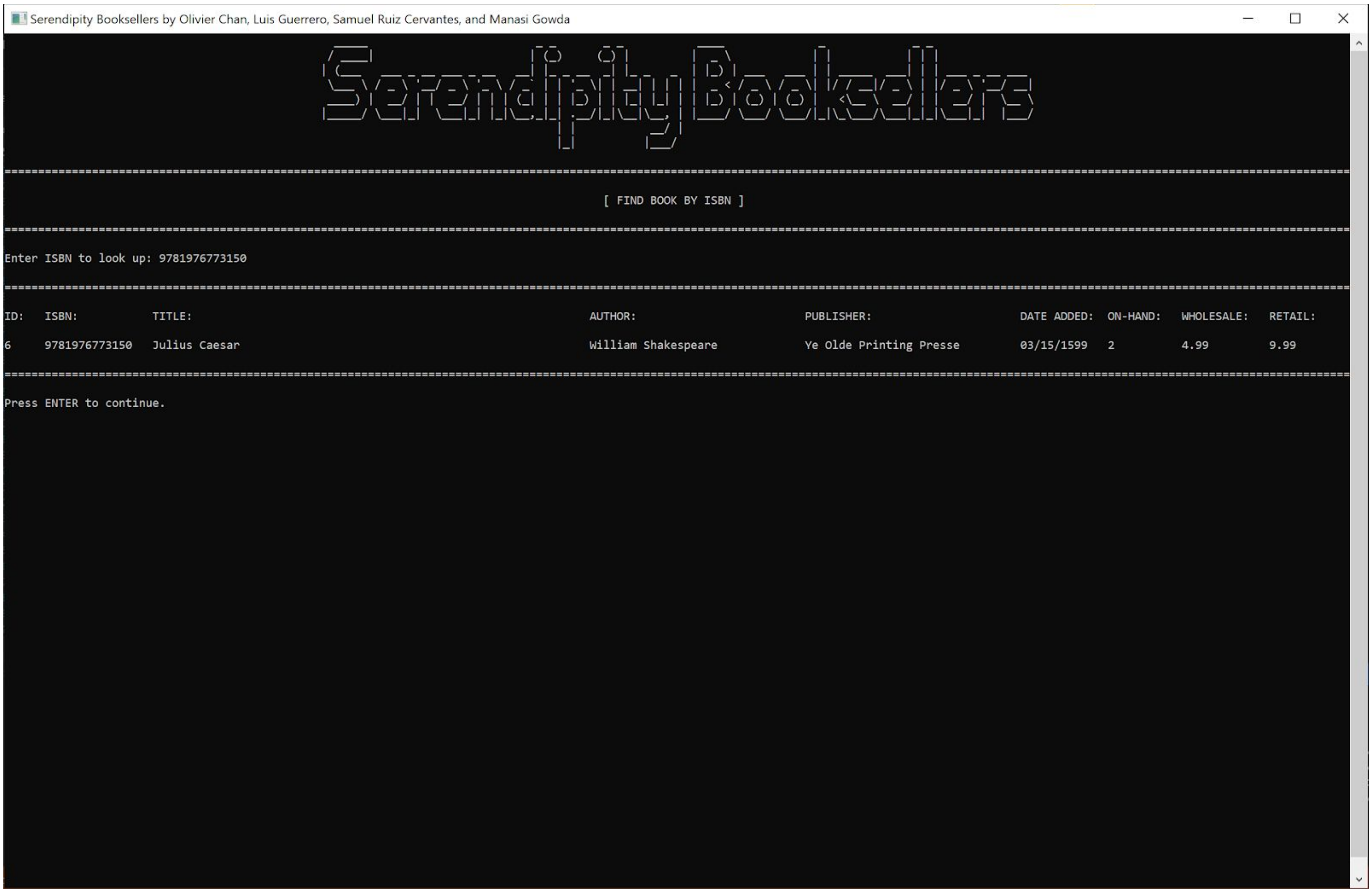
ID:   ISBN:           TITLE:                                                           AUTHOR:                         PUBLISHER:                      DATE ADDED:  ON-HAND:   WHOLESALE:   RETAIL:

7     9780061917707   The Lord of the Rings                                            J. R. R. Tolkien                Fellowship Shires               12/19/2001   19         9.80         16.90

========================================================================================================================================================================================================

Press ENTER to continue.
```

# FIND BOOK BY ISBN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Serendipity Booksellers

```
========================================================================================================================================================================================================

                                                                                         [ FIND BOOK BY ISBN ]

========================================================================================================================================================================================================

Enter ISBN to look up: 9781976773150

========================================================================================================================================================================================================

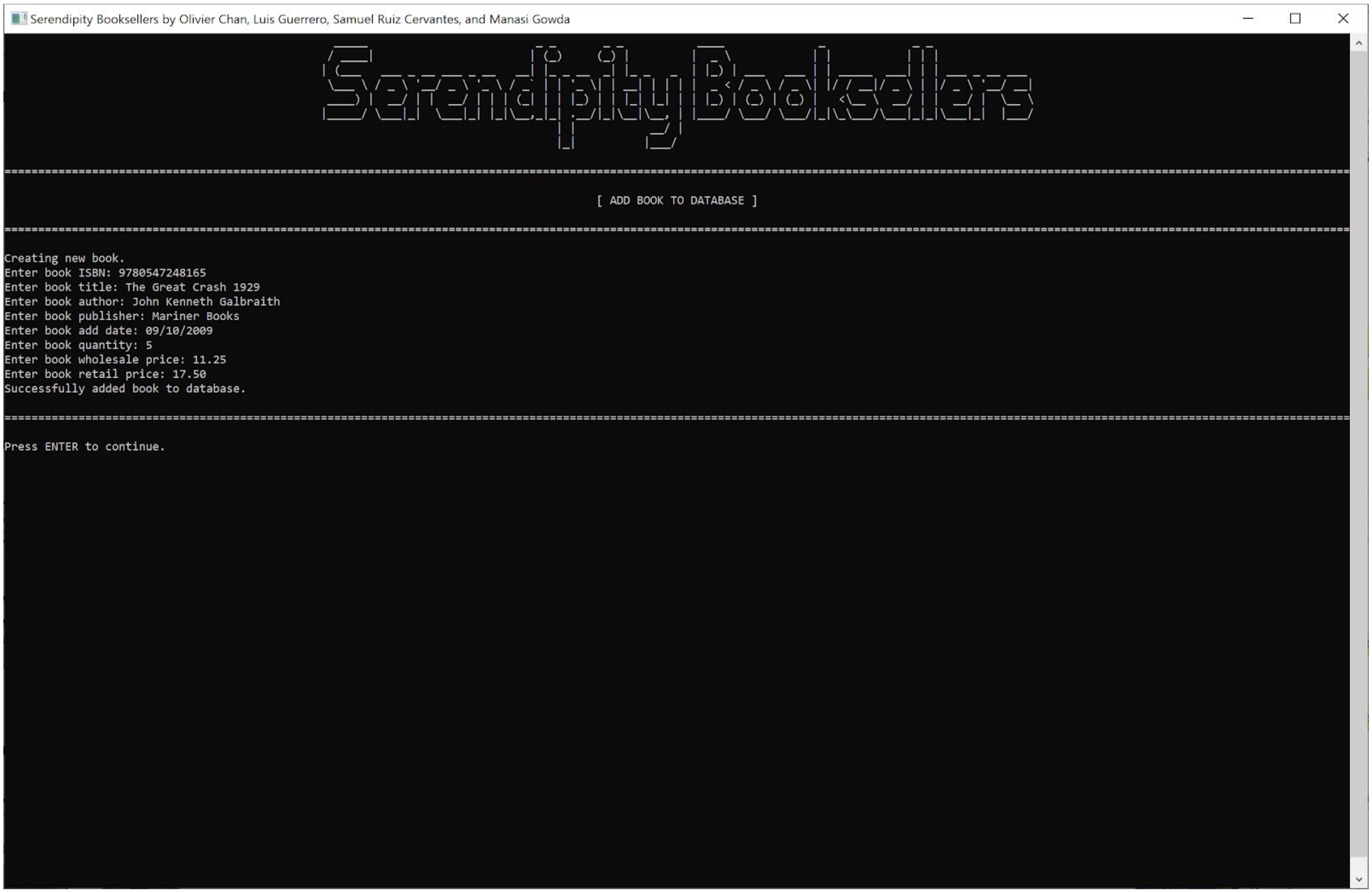
ID:   ISBN:           TITLE:                                                           AUTHOR:                         PUBLISHER:                      DATE ADDED:  ON-HAND:   WHOLESALE:   RETAIL:

6     9781976773150   Julius Caesar                                                    William Shakespeare             Ye Olde Printing Presse         03/15/1599   2          4.99         9.99

========================================================================================================================================================================================================

Press ENTER to continue.
```

# ADD BOOK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Serendipity Booksellers

```
==========================================================================================

                                [ ADD BOOK TO DATABASE ]

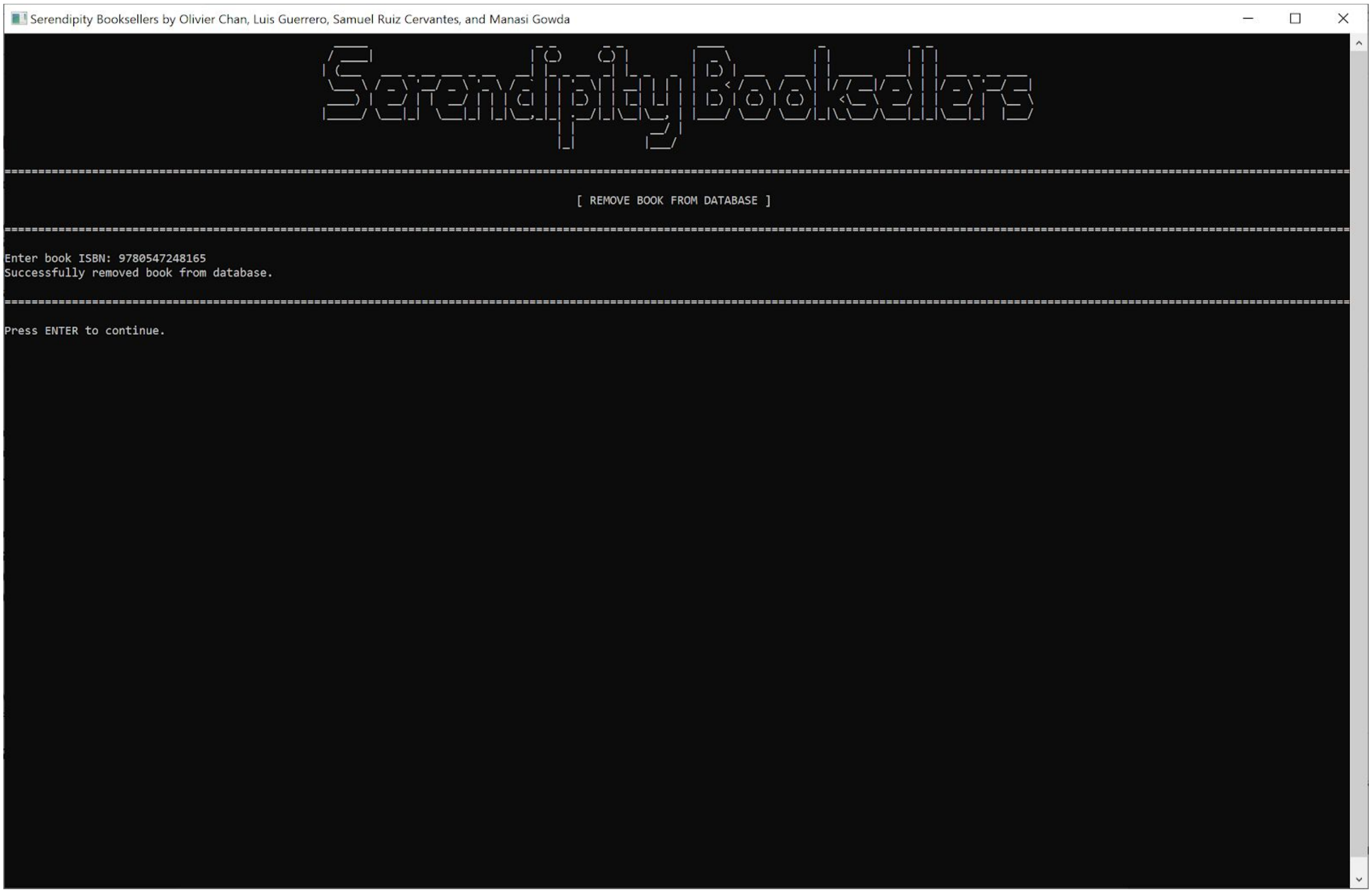
==========================================================================================

Creating new book.
Enter book ISBN: 9780547248165
Enter book title: The Great Crash 1929
Enter book author: John Kenneth Galbraith
Enter book publisher: Mariner Books
Enter book add date: 09/10/2009
Enter book quantity: 5
Enter book wholesale price: 11.25
Enter book retail price: 17.50
Successfully added book to database.

==========================================================================================

Press ENTER to continue.
```

# REMOVE BOOK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Serendipity Booksellers

```
==========================================================================================

                              [ REMOVE BOOK FROM DATABASE ]

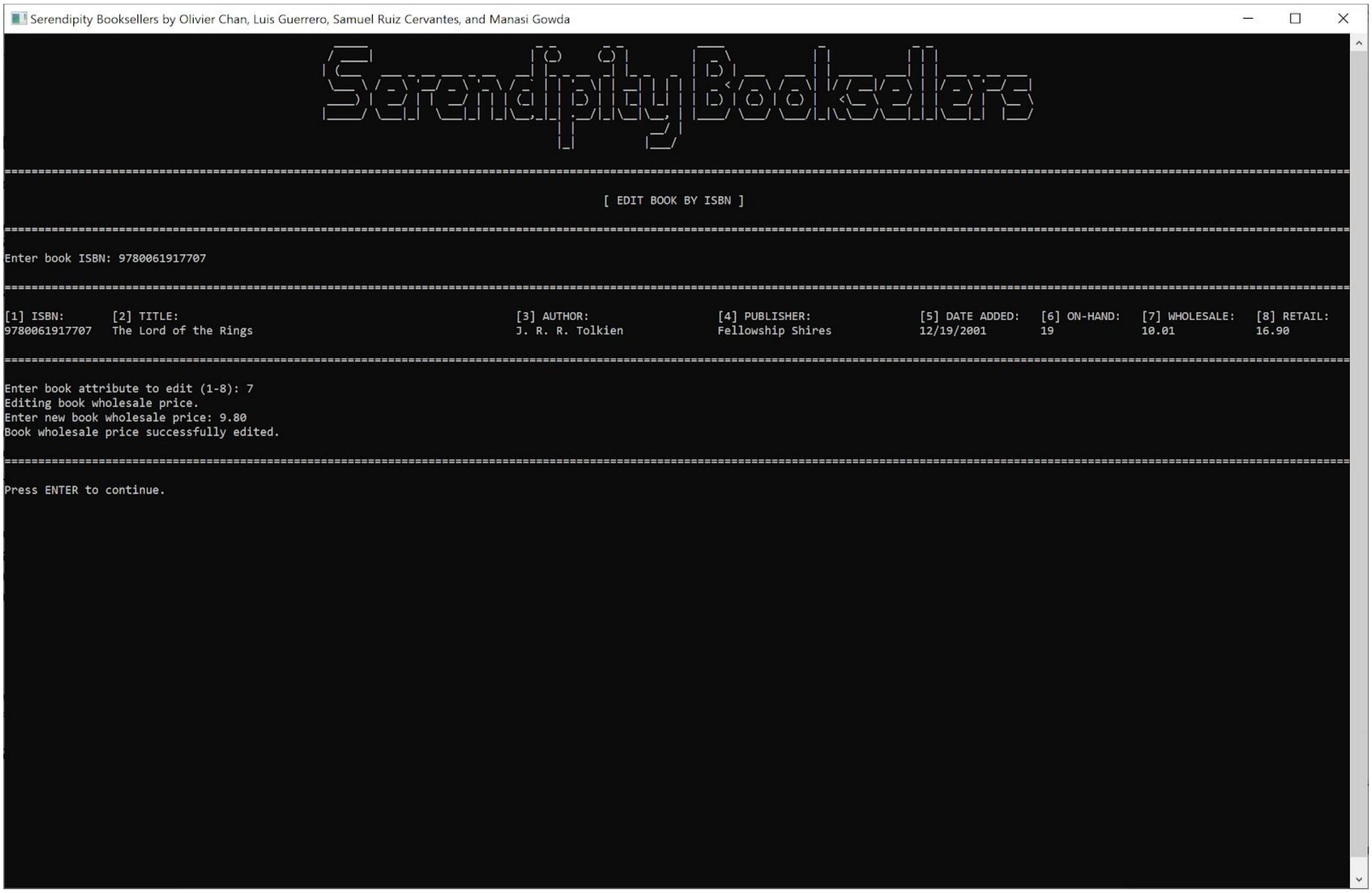
==========================================================================================

Enter book ISBN: 9780547248165
Successfully removed book from database.

==========================================================================================

Press ENTER to continue.
```

# EDIT BOOK



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```
================================================================================

                            [ EDIT BOOK BY ISBN ]

================================================================================

Enter book ISBN: 9780061917707

================================================================================

[1] ISBN:       [2] TITLE:                                                  [3] AUTHOR:                   [4] PUBLISHER:                [5] DATE ADDED:   [6] ON-HAND:   [7] WHOLESALE:   [8] RETAIL:
9780061917707   The Lord of the Rings                                       J. R. R. Tolkien              Fellowship Shires             12/19/2001        19             10.01            16.90

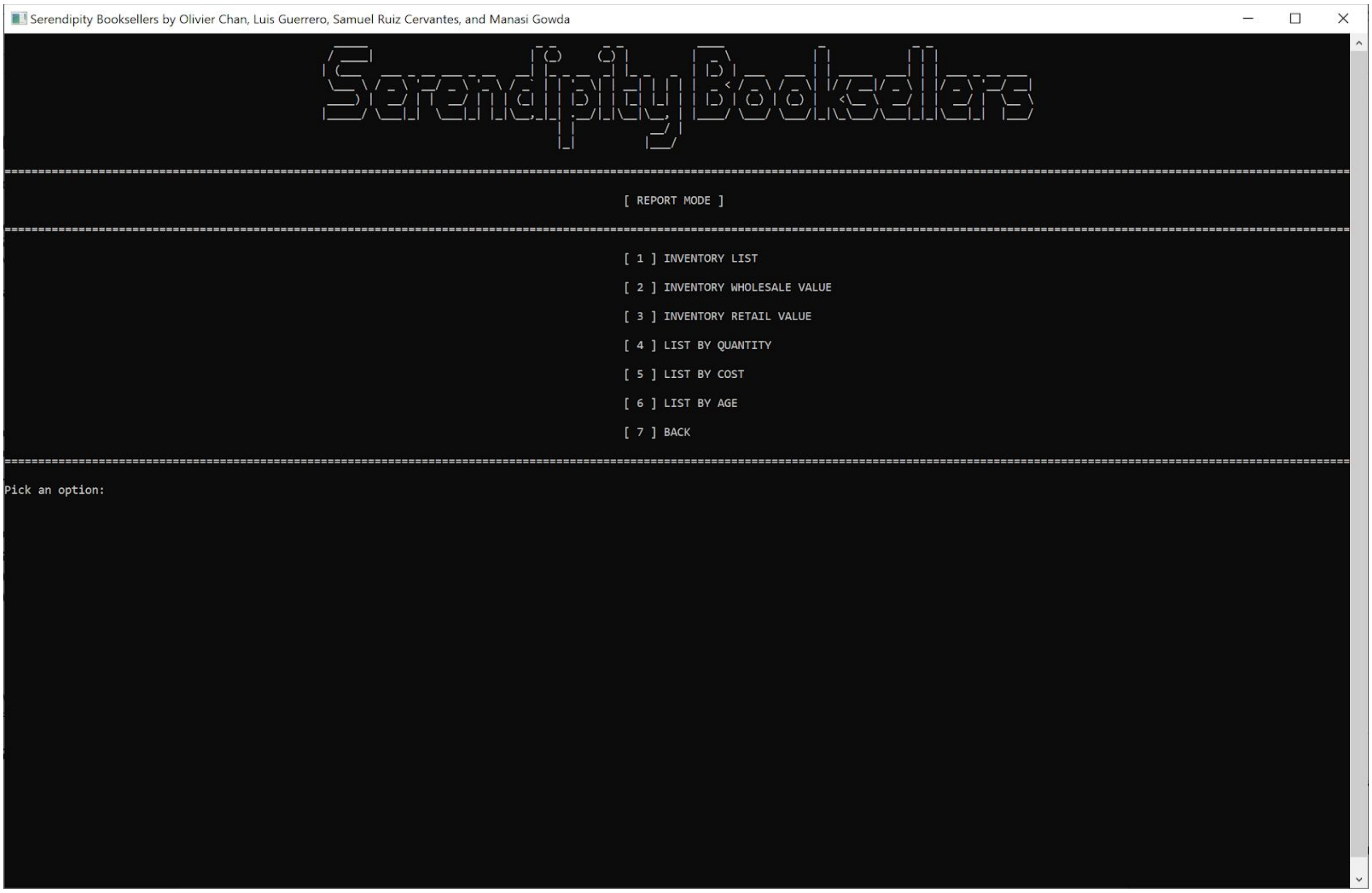
================================================================================

Enter book attribute to edit (1-8): 7
Editing book wholesale price.
Enter new book wholesale price: 9.80
Book wholesale price successfully edited.

================================================================================

Press ENTER to continue.
```

# REPORT MODE



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```
================================================================================

                            [ REPORT MODE ]

================================================================================

                            [ 1 ] INVENTORY LIST

                            [ 2 ] INVENTORY WHOLESALE VALUE

                            [ 3 ] INVENTORY RETAIL VALUE

                            [ 4 ] LIST BY QUANTITY

                            [ 5 ] LIST BY COST

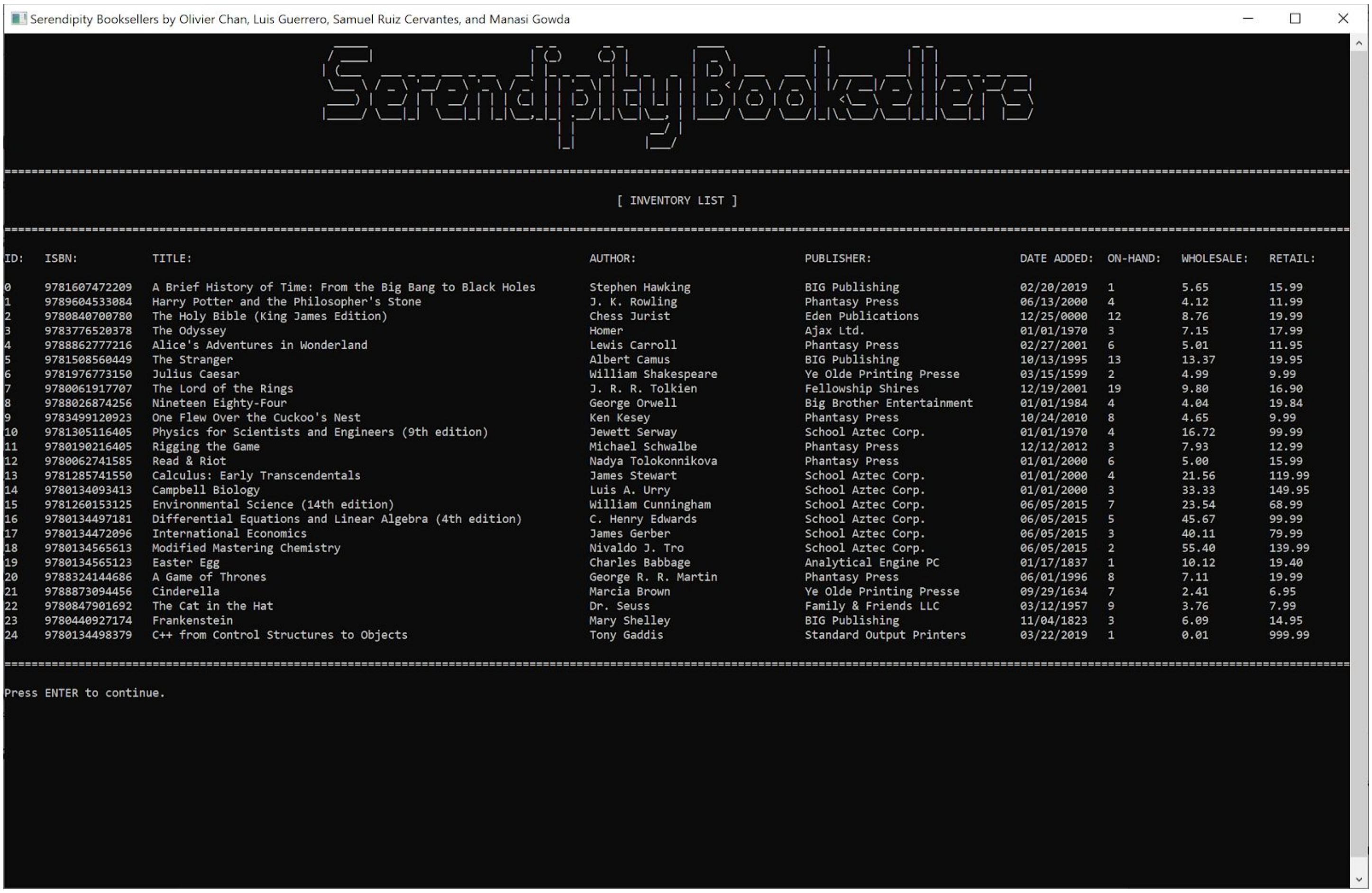
                            [ 6 ] LIST BY AGE

                            [ 7 ] BACK

================================================================================

Pick an option:
```

# INVENTORY LIST



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```
=======================================================================================================================================================================================================

                                                                                           [ INVENTORY LIST ]

=======================================================================================================================================================================================================

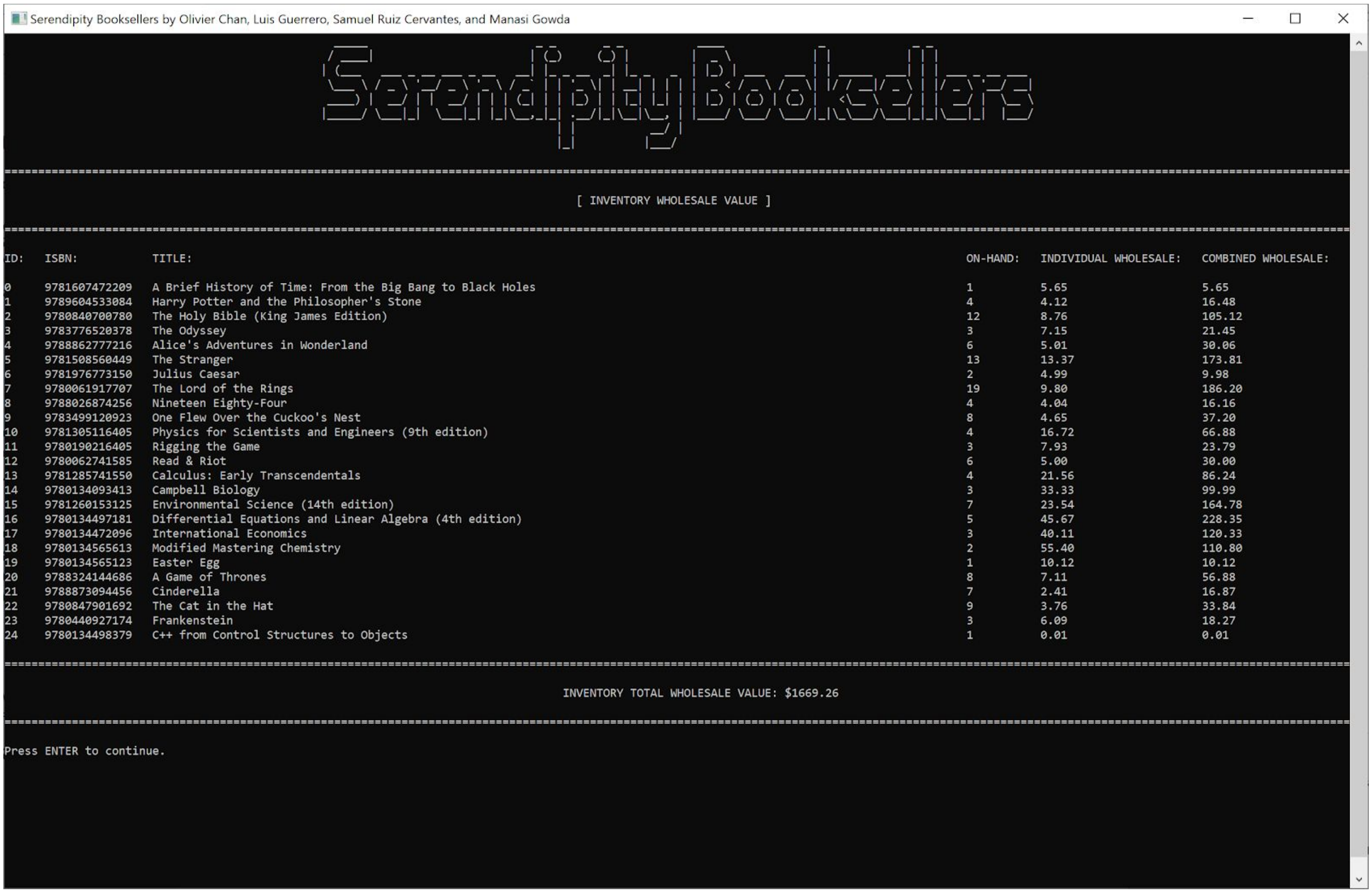
ID:   ISBN:           TITLE:                                                           AUTHOR:                         PUBLISHER:                      DATE ADDED:  ON-HAND:   WHOLESALE:   RETAIL:

0     9781607472209   A Brief History of Time: From the Big Bang to Black Holes        Stephen Hawking                 BIG Publishing                  02/20/2019   1          5.65         15.99
1     9789604533084   Harry Potter and the Philosopher's Stone                         J. K. Rowling                   Phantasy Press                  06/13/2000   4          4.12         11.99
2     9780840700780   The Holy Bible (King James Edition)                              Chess Jurist                    Eden Publications               12/25/0000   12         8.76         19.99
3     9783776520378   The Odyssey                                                      Homer                           Ajax Ltd.                       01/01/1970   3          7.15         17.99
4     9788862777216   Alice's Adventures in Wonderland                                 Lewis Carroll                   Phantasy Press                  02/27/2001   6          5.01         11.95
5     9781508560449   The Stranger                                                     Albert Camus                    BIG Publishing                  10/13/1995   13         13.37        19.95
6     9781976773150   Julius Caesar                                                    William Shakespeare             Ye Olde Printing Presse         03/15/1599   2          4.99         9.99
7     9780061917707   The Lord of the Rings                                            J. R. R. Tolkien                Fellowship Shires               12/19/2001   19         9.80         16.90
8     9788026874256   Nineteen Eighty-Four                                             George Orwell                   Big Brother Entertainment       01/01/1984   4          4.04         19.84
9     9783499120923   One Flew Over the Cuckoo's Nest                                  Ken Kesey                       Phantasy Press                  10/24/2010   8          4.65         9.99
10    9781305116405   Physics for Scientists and Engineers (9th edition)               Jewett Serway                   School Aztec Corp.              01/01/1970   4          16.72        99.99
11    9780190216405   Rigging the Game                                                 Michael Schwalbe                Phantasy Press                  12/12/2012   3          7.93         12.99
12    9780062741585   Read & Riot                                                      Nadya Tolokonnikova             Phantasy Press                  01/01/2000   6          5.00         15.99
13    9781285741550   Calculus: Early Transcendentals                                  James Stewart                   School Aztec Corp.              01/01/2000   4          21.56        119.99
14    9780134093413   Campbell Biology                                                 Luis A. Urry                    School Aztec Corp.              01/01/2000   3          33.33        149.95
15    9781260153125   Environmental Science (14th edition)                             William Cunningham              School Aztec Corp.              06/05/2015   7          23.54        68.99
16    9780134497181   Differential Equations and Linear Algebra (4th edition)          C. Henry Edwards                School Aztec Corp.              06/05/2015   5          45.67        99.99
17    9780134472096   International Economics                                          James Gerber                    School Aztec Corp.              06/05/2015   3          40.11        79.99
18    9780134565613   Modified Mastering Chemistry                                     Nivaldo J. Tro                  School Aztec Corp.              06/05/2015   2          55.40        139.99
19    9780134565123   Easter Egg                                                       Charles Babbage                 Analytical Engine PC            01/17/1837   1          10.12        19.40
20    9788324144686   A Game of Thrones                                                George R. R. Martin             Phantasy Press                  06/01/1996   8          7.11         19.99
21    9788873094456   Cinderella                                                       Marcia Brown                    Ye Olde Printing Presse         09/29/1634   7          2.41         6.95
22    9780847901692   The Cat in the Hat                                               Dr. Seuss                       Family & Friends LLC            03/12/1957   9          3.76         7.99
23    9780440927174   Frankenstein                                                     Mary Shelley                    BIG Publishing                  11/04/1823   3          6.09         14.95
24    9780134498379   C++ from Control Structures to Objects                           Tony Gaddis                     Standard Output Printers        03/22/2019   1          0.01         999.99

=======================================================================================================================================================================================================

Press ENTER to continue.
```

# INVENTORY WHOLESALE VALUE



Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda

```
=======================================================================================================================================================================================================

                                                                                     [ INVENTORY WHOLESALE VALUE ]

=======================================================================================================================================================================================================

ID:   ISBN:           TITLE:                                                                                                                   ON-HAND:   INDIVIDUAL WHOLESALE:   COMBINED WHOLESALE:

0     9781607472209   A Brief History of Time: From the Big Bang to Black Holes                                                                1          5.65                    5.65
1     9789604533084   Harry Potter and the Philosopher's Stone                                                                                 4          4.12                    16.48
2     9780840700780   The Holy Bible (King James Edition)                                                                                      12         8.76                    105.12
3     9783776520378   The Odyssey                                                                                                              3          7.15                    21.45
4     9788862777216   Alice's Adventures in Wonderland                                                                                         6          5.01                    30.06
5     9781508560449   The Stranger                                                                                                             13         13.37                   173.81
6     9781976773150   Julius Caesar                                                                                                            2          4.99                    9.98
7     9780061917707   The Lord of the Rings                                                                                                    19         9.80                    186.20
8     9788026874256   Nineteen Eighty-Four                                                                                                     4          4.04                    16.16
9     9783499120923   One Flew Over the Cuckoo's Nest                                                                                          8          4.65                    37.20
10    9781305116405   Physics for Scientists and Engineers (9th edition)                                                                       4          16.72                   66.88
11    9780190216405   Rigging the Game                                                                                                         3          7.93                    23.79
12    9780062741585   Read & Riot                                                                                                              6          5.00                    30.00
13    9781285741550   Calculus: Early Transcendentals                                                                                          4          21.56                   86.24
14    9780134093413   Campbell Biology                                                                                                         3          33.33                   99.99
15    9781260153125   Environmental Science (14th edition)                                                                                     7          23.54                   164.78
16    9780134497181   Differential Equations and Linear Algebra (4th edition)                                                                  5          45.67                   228.35
17    9780134472096   International Economics                                                                                                  3          40.11                   120.33
18    9780134565613   Modified Mastering Chemistry                                                                                             2          55.40                   110.80
19    9780134565123   Easter Egg                                                                                                               1          10.12                   10.12
20    9788324144686   A Game of Thrones                                                                                                        8          7.11                    56.88
21    9788873094456   Cinderella                                                                                                               7          2.41                    16.87
22    9780847901692   The Cat in the Hat                                                                                                       9          3.76                    33.84
23    9780440927174   Frankenstein                                                                                                             3          6.09                    18.27
24    9780134498379   C++ from Control Structures to Objects                                                                                   1          0.01                    0.01

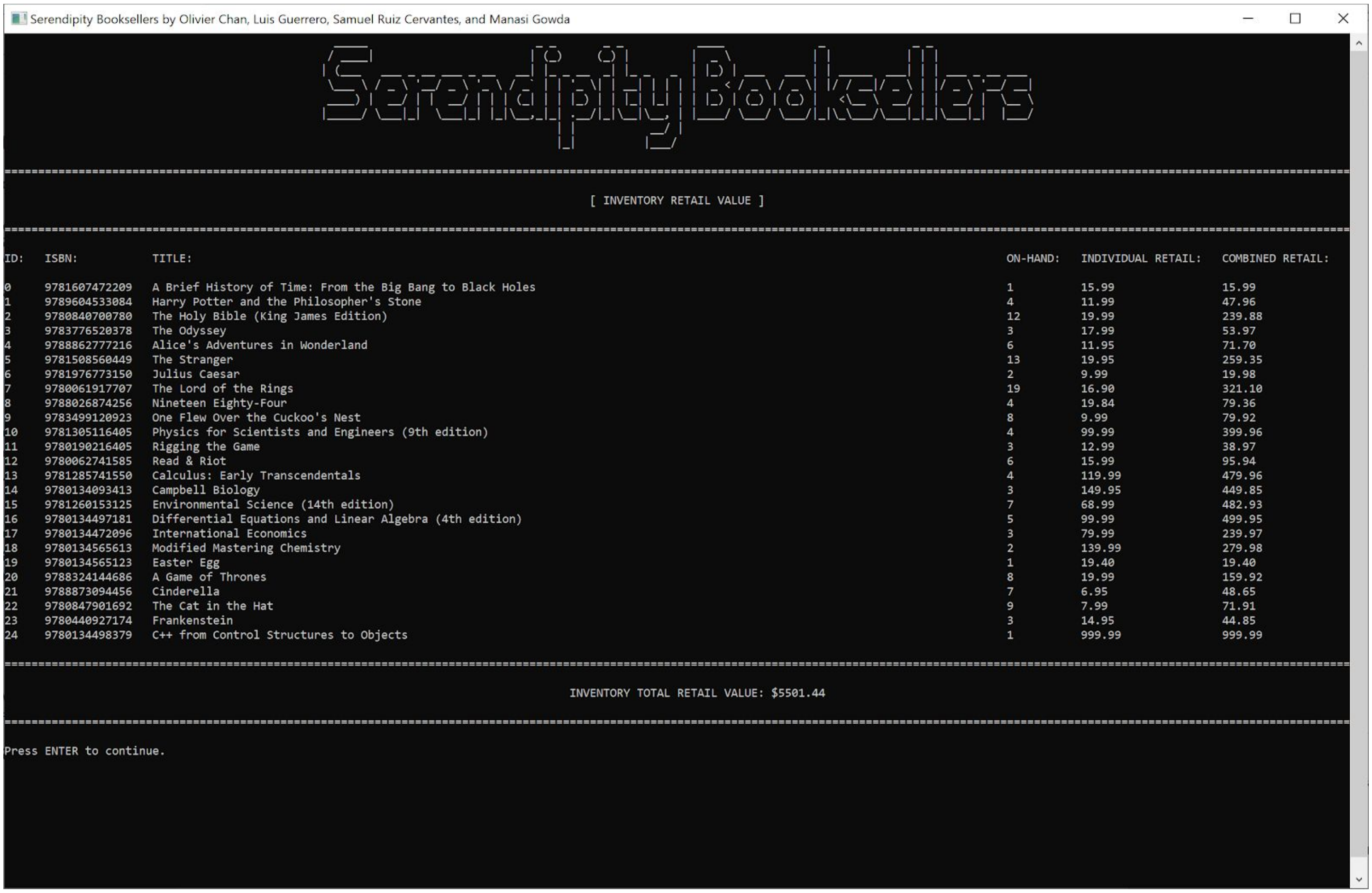
=======================================================================================================================================================================================================

                                                                                   INVENTORY TOTAL WHOLESALE VALUE: $1669.26

=======================================================================================================================================================================================================

Press ENTER to continue.
```

# INVENTORY RETAIL VALUE


Serendipity Booksellers by Olivier Chan, Luis Guerrero, Samuel Ruiz Cervantes, and Manasi Gowda
Serendipity Booksellers

```
====================================================================================================================

                                          [ INVENTORY RETAIL VALUE ]

====================================================================================================================

ID:  ISBN:          TITLE:                                                          ON-HAND:  INDIVIDUAL RETAIL:  COMBINED RETAIL:

0    9781607472209  A Brief History of Time: From the Big Bang to Black Holes       1         15.99               15.99
1    9789604533084  Harry Potter and the Philosopher's Stone                        4         11.99               47.96
2    9780840700780  The Holy Bible (King James Edition)                             12        19.99               239.88
3    9783776520378  The Odyssey                                                     3         17.99               53.97
4    9788862777216  Alice's Adventures in Wonderland                                6         11.95               71.70
5    9781508560449  The Stranger                                                    13        19.95               259.35
6    9781976773150  Julius Caesar                                                   2         9.99                19.98
7    9780061917707  The Lord of the Rings                                           19        16.90               321.10
8    9788026874256  Nineteen Eighty-Four                                            4         19.84               79.36
9    9783499120923  One Flew Over the Cuckoo's Nest                                 8         9.99                79.92
10   9781305116405  Physics for Scientists and Engineers (9th edition)              4         99.99               399.96
11   9780190216405  Rigging the Game                                                3         12.99               38.97
12   9780062741585  Read & Riot                                                     6         15.99               95.94
13   9781285741550  Calculus: Early Transcendentals                                 4         119.99              479.96
14   9780134093413  Campbell Biology                                                3         149.95              449.85
15   9781260153125  Environmental Science (14th edition)                            7         68.99               482.93
16   9780134497181  Differential Equations and Linear Algebra (4th edition)         5         99.99               499.95
17   9780134472096  International Economics                                         3         79.99               239.97
18   9780134565613  Modified Mastering Chemistry                                    2         139.99              279.98
19   9780134565123  Easter Egg                                                      1         19.40               19.40
20   9788324144686  A Game of Thrones                                               8         19.99               159.92
21   9788873094456  Cinderella                                                      7         6.95                48.65
22   9780847901692  The Cat in the Hat                                              9         7.99                71.91
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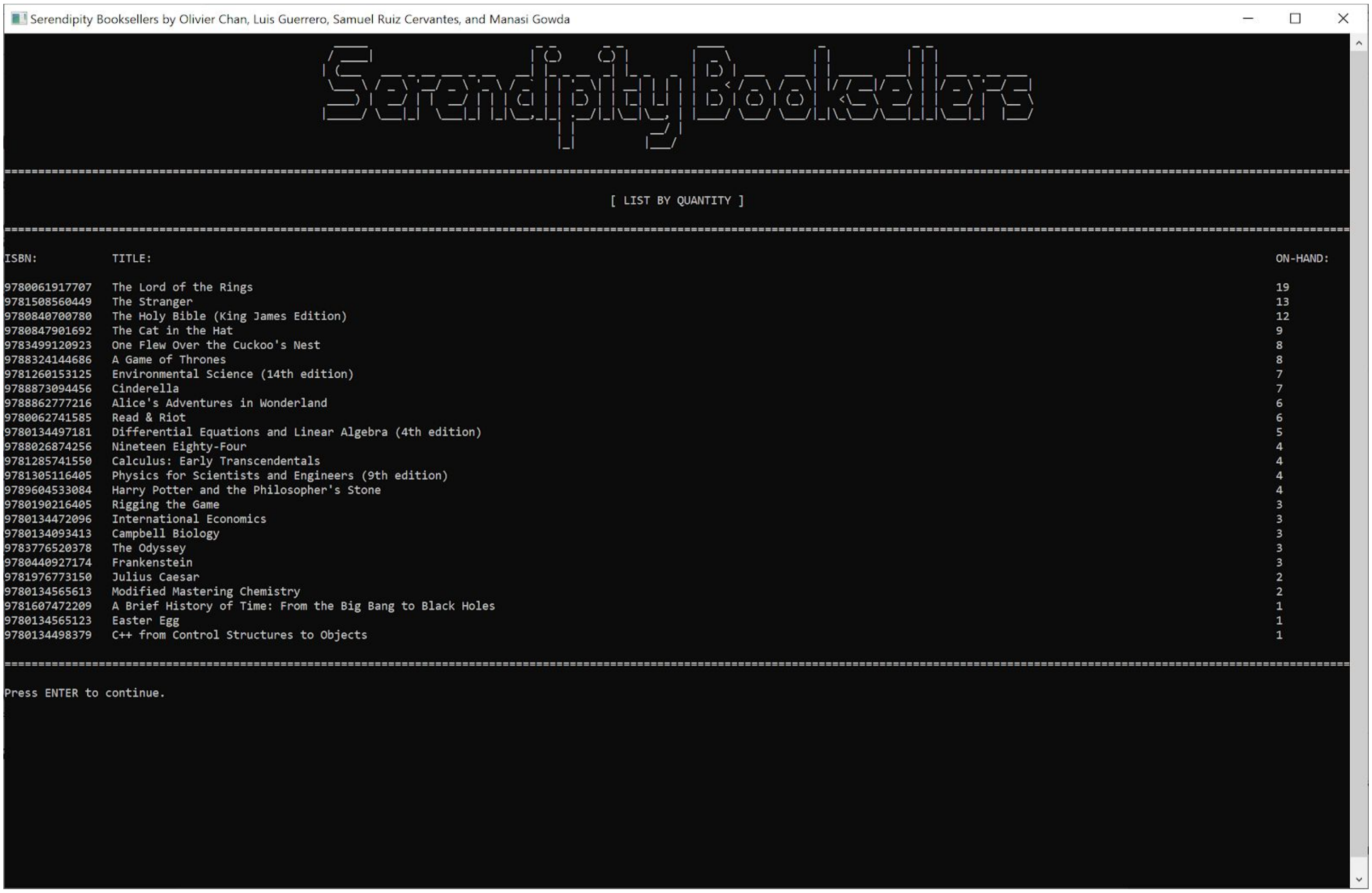
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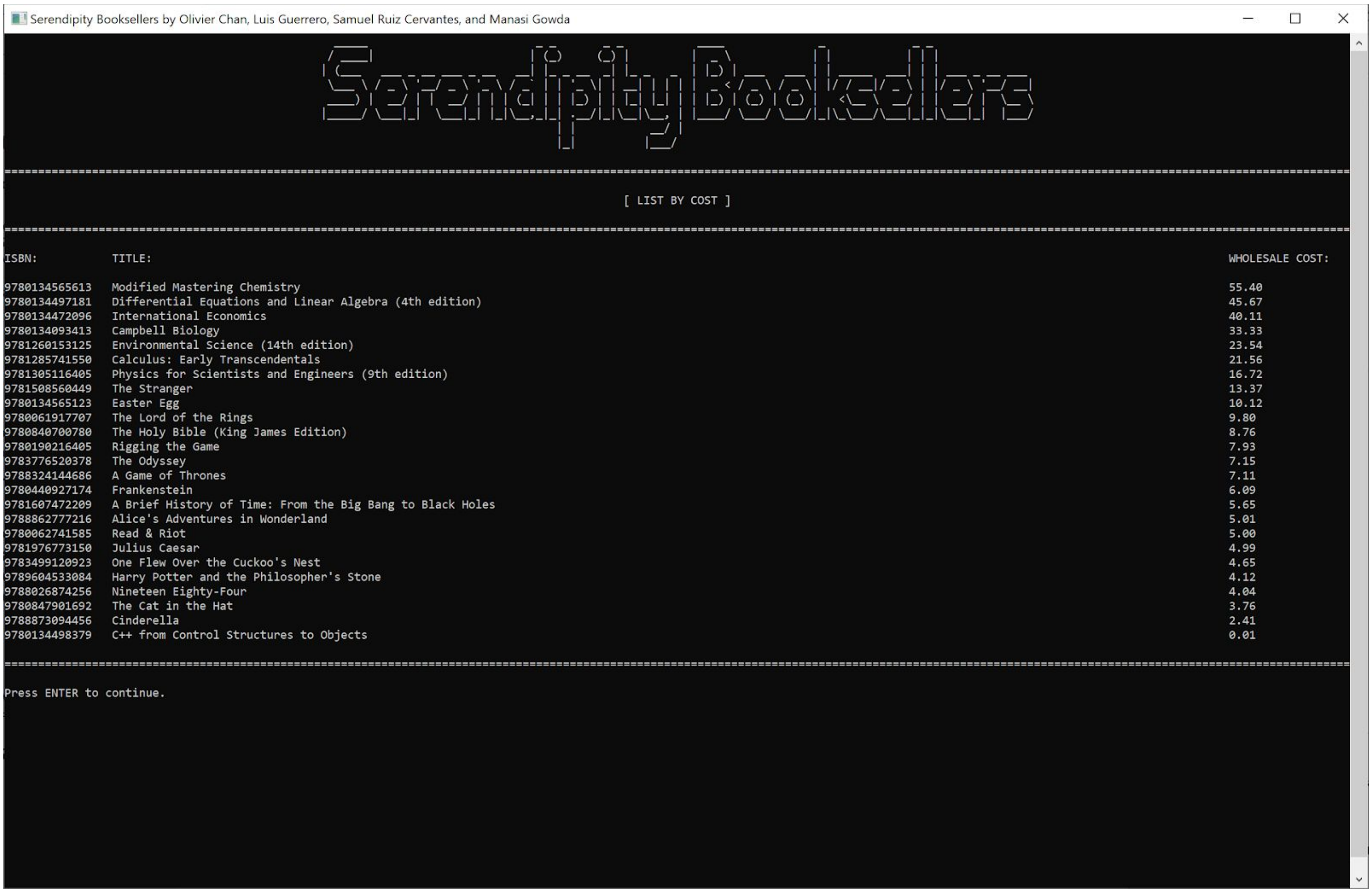
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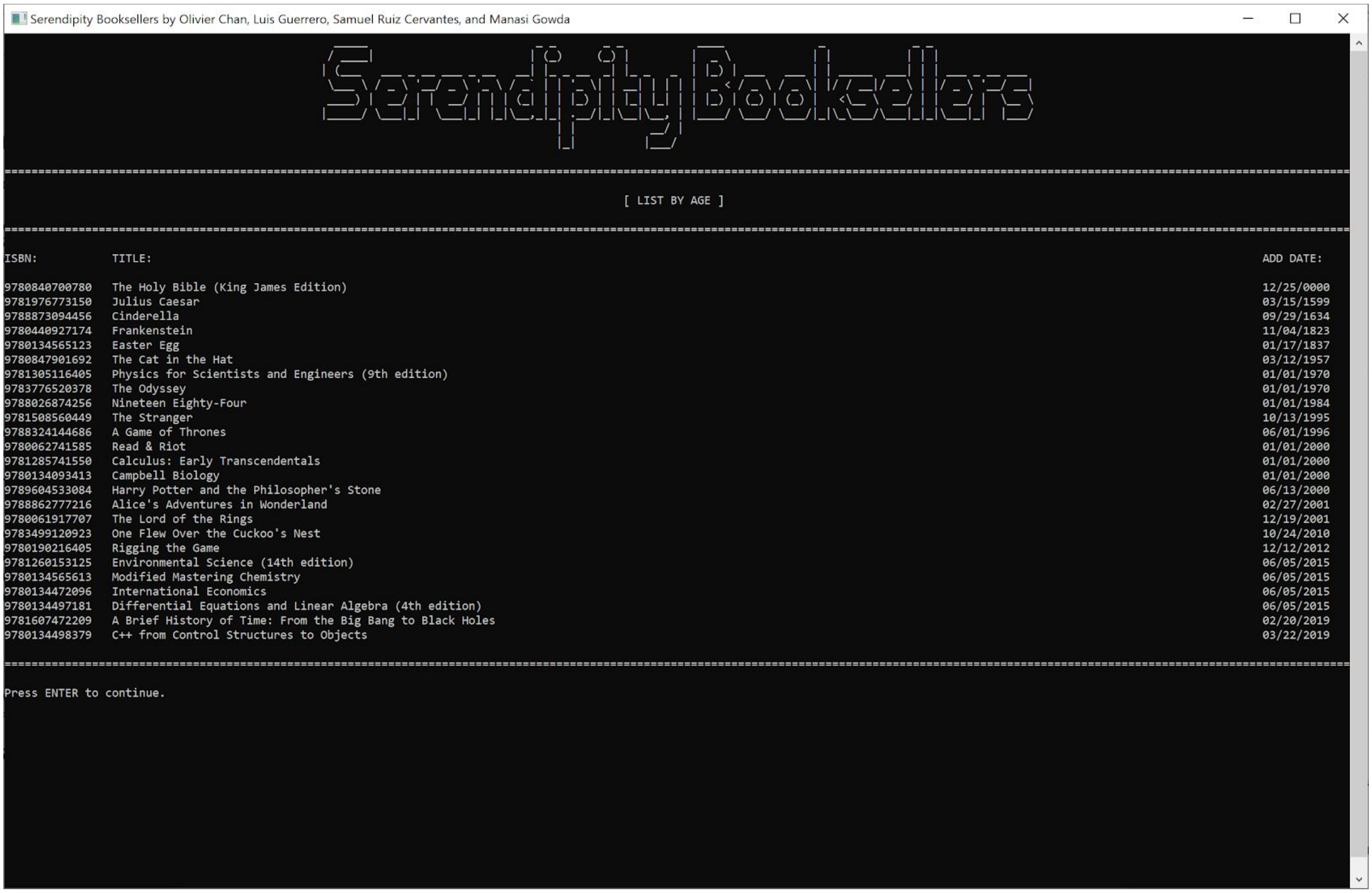
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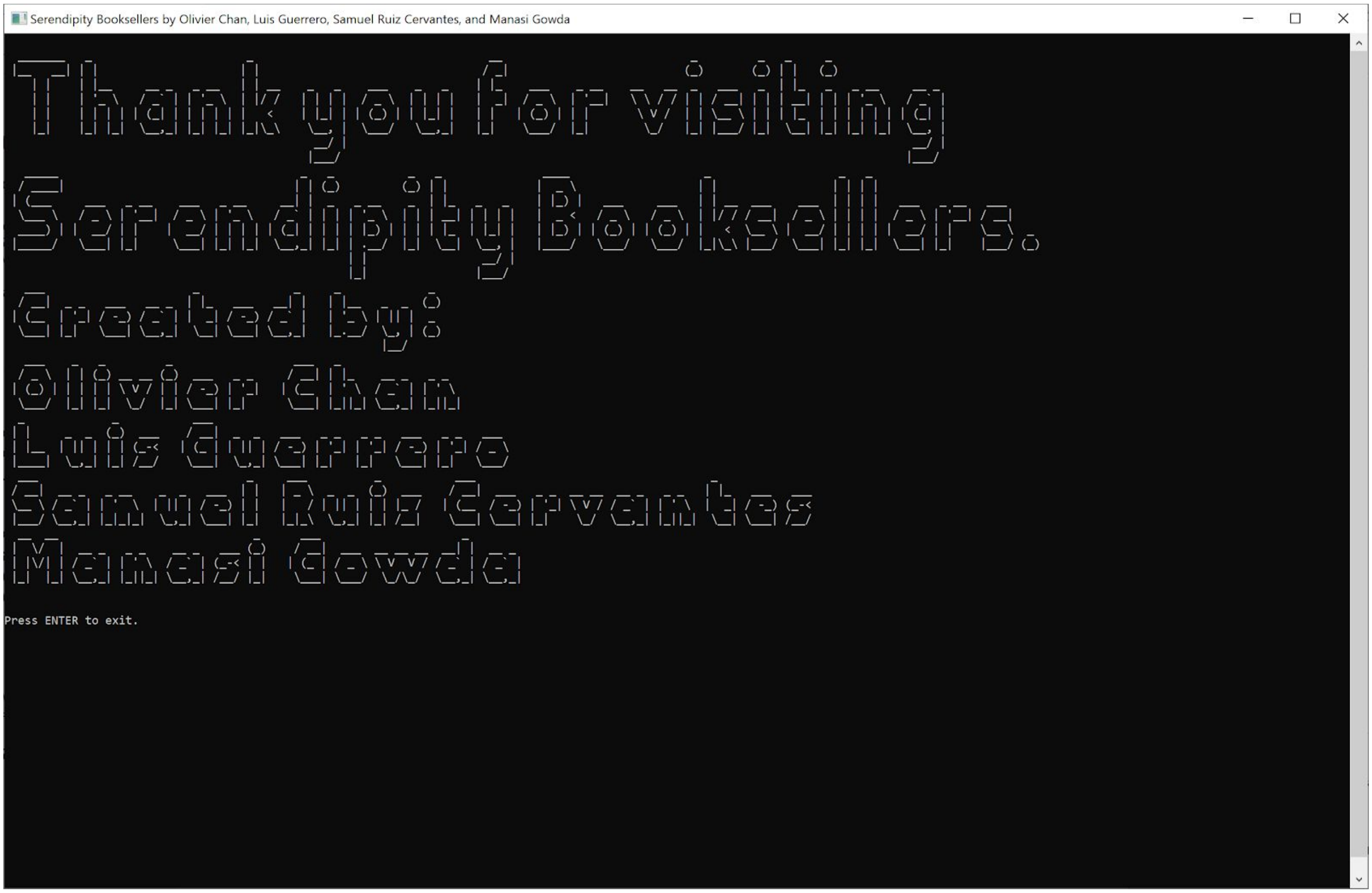

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