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I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.

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1. Introduction

This is the first coursework of fundamentals of computing module. We are required to develop a program for a library. The program is created using Python programming language and IDLE (Integrated Development and Learning Environment) of Python. All the codes were written and run in the python shell window. The program was built with the help of algorithms, flowcharts, and pseudocodes.

The program created in this coursework can also be in real life libraries. The librarian keeps records of books currently in the library in a paper or a record book. Similarly, the books borrowed and returned are also recorded in the record book. It is a lot of work to do for a librarian and takes up lot of time. Different books are used to record different transactions and when a person returns a book it is time consuming to find the exact record of when it was borrowed. Therefore, this program can help a lot in helping the librarian. People should move along with the times. Since new technologies are being introduced every day, the old method that were used are slowly being converted to the modern methods. This program will help the librarians to keep proper records of books in their stocks, books borrowed and returned by their customers. The program is user friendly and time efficient.

➢ Goals and Objective

The coursework's main goal to develop a library management system. Through the program, the user should be able to know the books that are available in the library. As in real life library, a person can borrow the book and take it home to read. The program implements a similar feature. The user can borrow books from the list of available books by inputting their name and selecting the books. The stock of the certain books borrowed will decrease. A bill will be prepared for the user with the name, author, and price of the books. Similarly, when returning the books, the user had previously borrowed. The user needs to input their name again and the program will find

the bill that was made when borrowing the books. Additional cost will be fined if the book is not returned on time. The program will automatically add up the cost and final cost is given to the user.

The program was implemented with every knowledge I had gained during my lecture, tutorial, and workshop classes. When working on the program, the concepts of the loops, conditionals, files, lists and many more became clearer. The program is intended to be user friendly and efficient for anyone to use.

2. Discussion and Analysis

2.1 Algorithms

Step 1 : Start

Step 2 : Input number from 1 to 4

Step 3 : If input is 1,

Display list of books from Books.txt

If no, then go to step 4

Step 4 : If input is 2,

Go to step 5

If no, then go to step 17

Step 5 : Input first name of borrower

Step 6 : If first name is not alphabet,

Print “Please input alphabet from A-Z” and go to step 5

If no, go to step 7

Step 7 : Input last name of borrower

Step 8 : If last name is not alphabet,

Print “Please input alphabet from A-Z” and go to step 7

If no, go to step 9

Step 9 : Create borrow.txt file and store the data of the borrower

Step 10: Input a number from the options below

Step 11: Is the book available?

If yes, append details of the books in borrow.txt file and go to step 12

If no, Print “Sorry, the Book is not available right now. Please visit us after some time.” And go to step 10

Step 12: Update the books quantity in Books.txt file

Step 13: Do you want to borrow another book?

If yes, go to step 10

If no, go to step 14

Step 14: Print “Thank you for using our service to borrow books from us."

Step 15: Append total price and print Thank you for your time in borrow.txt file

Step 16: Go to step 2

Step 17: If input is 3,

Go to step 18

If no, then go to step 28

Step 18: Input name of borrower

Step 19: Does the name match the borrower’s name

If yes, read borrow.txt file and go to step 21

If no, Print “The name is incorrect or not registered.” And go to step 19

Step 20: Create return.txt file and store the data of the returner

Step 21: Update the books quantity in Books.txt file

Step 22: Has the book return date expired?

If yes, go to step 23

If no, go to step 25

Step 23: Input how days was it returned late.

Step 24: Add fine: fine and add it to total price

Step 25: Print “Final Total : $” and the price

Step 26: Append total price and print Thank you for your time in return.txt file

Step 27: Go to step 2

Step 28: If input is 4,

Print "Thank you for using our library system"

Step 29: End

2.2 Flowchart

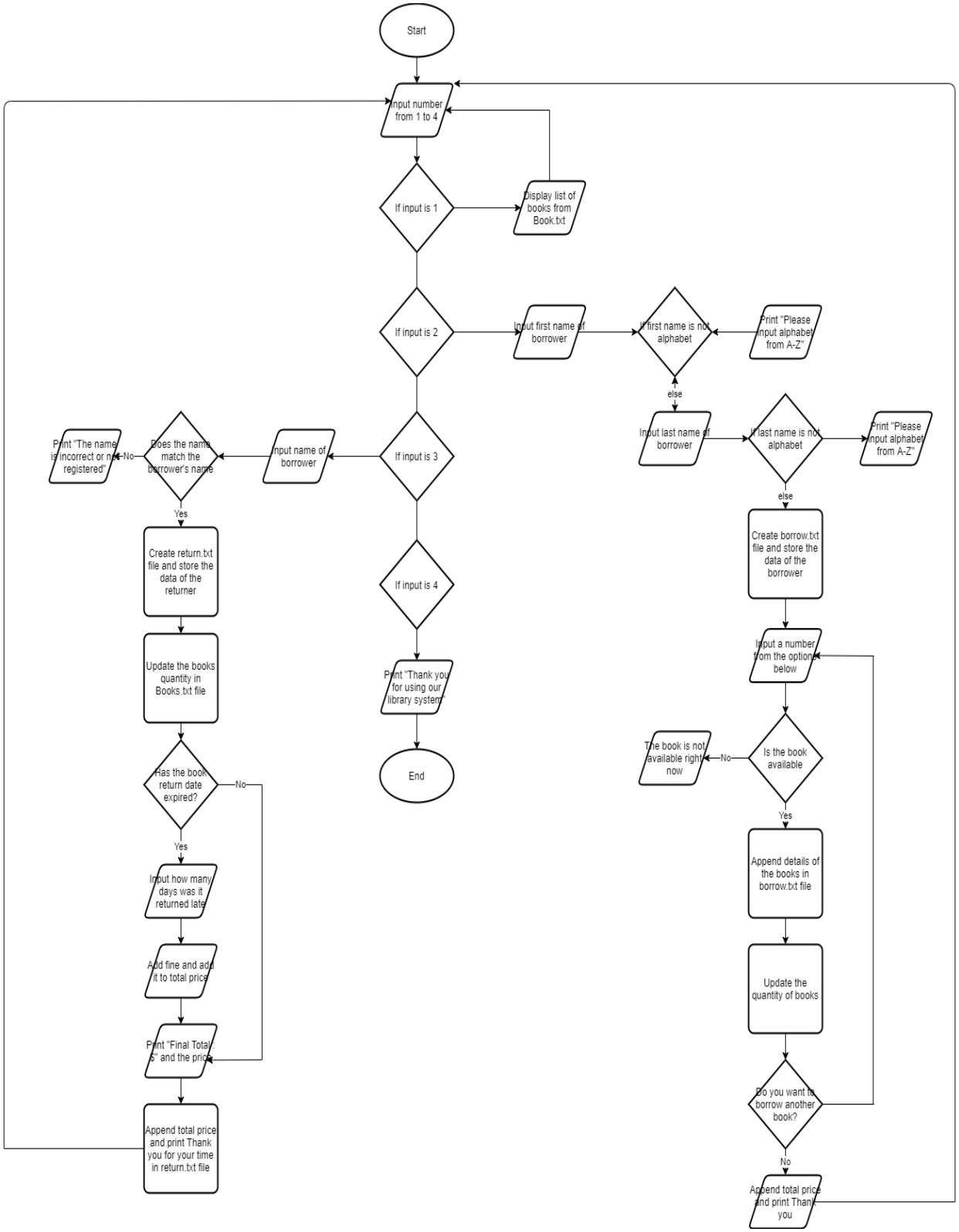

Figure 1 Flowchart of the program

2.3 Pseudocode

- **Pseudocode for Main.py**

IMPORT module Return
IMPORT module BooksList
IMPORT module Date_Time
IMPORT module Borrow

CREATE function Library
ASSIGN boolean value True to menu
WHILE menu is true
PRINT "xxxxxxxxxxxxxxxxxxxxxxxxx"
PRINT "Thali Katuwal Library"
PRINT "Thali, Kathmandu"
PRINT "xxxxxxxxxxxxxxxxxxxxxxxxx"
PRINT "Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock."
PRINT "Input 1 – To show the books available"
PRINT "Input 2 – To borrow a book from the book list"
PRINT "Input 3 – To return a book you had borrowed"
PRINT" Input 4 – To exit the program"

TRY
INPUT "Enter a number from 1 to 4 : " in int datatype and **STORE** in variable a

IF a is 1
CALL booklist function from BooksList module
PRINT "The books we have available right now are :"
PRINT "Book Name Author Name Quantity Price"
OPEN Books.txt in read mode

FOR i of length 5
PRINT CALL BookName in index 'i' from BooksList module **CALL** AuthorName in index 'i' from BooksList module **CALL** Quantity in index 'i' from BooksList module **CALL** Price in index 'i' from BooksList module
END FOR

PRINT empty string
CLOSE Books.txt file
END IF

ELIF a is 2

```
                    CALL booklist function from BooksList module
                    CALL BorrowBook function from Borrow module
                END ELIF

                ELIF a is 3
                    CALL booklist function from BooksList module
                    CALL ReturnBook function from Return module
                END ELIF

                ELIF a is 4
                    PRINT Thank you for using our library system
                    SET menu to False
                END ELIF

                ELSE
                    PRINT "Please enter a number from 1 to 4"
                END ELSE

            END TRY

            EXCEPT ValueError
                PRINT "Please input the number"
            END EXCEPT

END Function Library
```

- **Pseudocode for BooksList.py**

```
CREATE empty list BookName
CREATE empty list AuthorName
CREATE empty list Quantity
CREATE empty list Price

CREATE function booklist
    OPEN Books.txt file in read mode
    READ lines in Books.txt file
    REMOVE new line FOR a in lines of Books.txt file

    FOR i of length lines

        ASSIGN variable x to 0

        FOR j of index i SPLIT by ','
```

```
                    IF x is 0
                        APPEND j in BookName
                    END IF

                    ELIF x=1
                        APPEND j in AuthorName
                    END ELIF

                    ELIF x=2
                        APPEND j in Quantity
                    END ELIF

                    ELIF x=3
                        APPEND j in Price
                    END ELIF

                    ASSIGN x to x+1

                END FOR

            END FOR
```

- **Pseudocode for Date_Time.py**

```
CREATE function getDateTime
        IMPORT module datetime

        ASSIGN datetime to CALL function now from datetime module
        RETURN datetime as String datatype
```

- **Pseudocode for Borrow.py**

```
IMPORT module Date_Time
IMPORT module BooksList

CREATE function BorrowBook
  ASSIGN boolean value False to Borrowed
  WHILE boolean is True
    INPUT “Input first name of borrower” and STORE in variable firstname
    IF firstname is alphabet
      BREAK
    PRINT “Please input alphabet from A-Z”
  END WHILE

  WHILE boolean is True
```

INPUT “Input last name of borrower” and **STORE** in variable lastname
IF lastname is alphabet
BREAK
PRINT “Please input alphabet from A-Z”
END WHILE

CREATE variable Borrow and **ASSIGN** “Borrowed by-“ and value of firstname and “.txt”
OPEN Borrow file in read and write mode
WRITE “Thali Katuwal Library”
WRITE “Thali, Kathmandu”
WRITE "----------"
WRITE “Details of the borrower and books borrowed”
WRITE “Borrowed By: ” and value of firstname and lastname
WRITE “Date and Time: ” and value returned by function getDateTime from Date_Time Module
WRITE “S.N. Book Name Author Name Price”
CLOSE Borrow file

CREATE variable total and **ASSIGN** 0.0 as float datatype
WHILE Borrowed is False
PRINT “Please select an option below:”

FOR i of length 5
PRINT “Input” and ‘i’ and “to borrow book” and **CALL** BookName in index ‘i’ from BooksList module
END FOR

TRY

TAKE Input and **STORE** in variable a as int datatype

IF a is less than 0
PRINT “Please enter a valid number given above”
END IF

ELSE

TRY

IF index ‘a’ in Quantity from BooksList module of int datatype is more than 0

PRINT “The book you’ve selected is in stock”
OPEN Borrow file in append mode
WRITE “1.” and **CALL** BookName in index ‘i’ from BooksList module and **CALL** AuthorName in index ‘i’ from BooksList module and **CALL** Quantity in

index ‘i’ from BooksList module and “$” **CALL** Price in index ‘i’ from BooksList module
CLOSE Borrow file
DECREASE the value of index ‘a’ in Quantity from BooksList module by 1
ADD int value of index ‘a’ Price from BooksList module to total
OPEN Books.txt in append mode

FOR i of length 5
WRITE CALL BookName in index ‘i’ from BooksList module “,” **CALL** AuthorName in index ‘i’ from BooksList module “,” **CALL** Quantity in index ‘i’ from BooksList module “, $” **CALL** Price in index ‘i’ from BooksList module
END FOR

CLOSE Books.txt
ASSIGN boolean value True to variable Borrowed2
ASSIGN variable count to 1

WHILE Borrowed2 is False

INPUT "If you want to borrow another book then press Y for Yes if not then press N for No:” in uppercase and **STORE** in choice
IF choice is Y
PRINT “Please select an option below”

FOR i of length 5
PRINT “Input” and ‘i’ and “to borrow book” and **CALL** BookName in index ‘i’ from BooksList module
END FOR

TRY

TAKE Input and **STORE** in variable b as int datatype
IF b equals a
PRINT “I am sorry. You can’t borrow the same book twice”
END IF

ELSE

TRY

IF index ‘b’ in Quantity from BooksList module of int datatype is more than 0

PRINT “The book you’ve selected is in stock”
INCREASE count by 1

OPEN Borrow file in append mode
WRITE value of count in string datatype and **CALL** BookName in index 'i' from BooksList module and **CALL** AuthorName in index 'i' from BooksList module and **CALL** Quantity in index 'i' from BooksList module and "$" **CALL** Price in index 'i' from BooksList module
CLOSE Borrow file
DECREASE the value of index 'b' in Quantity from BooksList module by 1
ADD int value of index 'b' Price from BooksList module to total
OPEN Books.txt in append mode

FOR i of length 5
WRITE CALL BookName in index 'i' from BooksList module ","
CALL AuthorName in index 'i' from BooksList module ","
CALL Quantity in index 'i' from BooksList module ", $" **CALL** Price in index 'i' from BooksList module
END FOR

CLOSE Books.txt

END IF

ELSE
PRINT "Book is not available right now. Please visit us after some time."
END ELSE

END TRY

EXCEPT IndexError
PRINT "Please choose book according to number"
END EXCEPT

END ELSE

END TRY

EXCEPT ValueError
PRINT "Please input as suggested"
END EXCEPT

END IF

ELIF choice is N

```
                PRINT "Thank you for using our service to borrow books from us.
                Here's your bill"
                PRINT " "
                SET Borrowed2 to False
                SET Borrowed to True
            END ELIF

            ELSE
                PRINT "Please input as suggested"
            END ELSE

        ELSE
            PRINT "Book is not available right now. Please visit us after some time."
        END ELSE

    END TRY

    EXCEPT IndexError
        PRINT "Please choose book according to their number"
    END EXCEPT

  END ELSE

 END TRY

 EXCEPT ValueError
     PRINT "Please input as suggested."
 END EXCEPT

OPEN Borrow file in append mode
WRITE "Total: $" and value of total in string datatype
WRITE "************************************************************"
WRITE "THANK YOU FOR YOUR TIME HERE. WE HOPE TO SEE YOU AGAIN"
WRITE "************************************************************"
CLOSE Borrow file

OPEN Borrow file in read mode
READ the file and STORE in variable lines
PRINT lines
CLOSE Borrow file
```

- **Pseudocode for Return.py**

IMPORT module BooksList
IMPORT module Date_Time

CREATE function ReturnBook
  INPUT “Enter the first name of borrower: ” and **STORE** in variable name
  CREATE variable ‘a’ and ASSIGN “Borrowed by-” and name and “.txt”

  TRY
    OPEN ‘a’ file in read mode
    READ ‘a’ file and **STORE** in data
    PRINT data
  END TRY

  EXCEPT
    PRINT “The borrower’s name is incorrect or not registered.”
    CALL function ReturnBook
  END EXCEPT

  CREATE variable Return and **ASSIGN** “Returned by-” and name and “.txt”
  OPEN Return file in read and write mode
  WRITE “Thali Katuwal Library”
  WRITE “Thali, Kathmandu”
  WRITE "----------"
  WRITE “Details of the returner and books returned”
  WRITE “Borrowed By: ” and value of name
  WRITE “Date and Time: ” and value returned by function getDateTime from
   Date_Time Module
  WRITE “S.N. Book Name Author Name Price”
  CLOSE Borrow file
  ASSIGN variable count as 0 int datatype
  ASSIGN variable total as 0.0 float datatype

  FOR i of length 5

    IF index ‘i’ of BookName of BooksList is in data
      INCREASE Count by 1
      OPEN Return file in append mode
      WRITE count in string datatype **CALL** BookName in index ‘i’ from BooksList
       module “,” **CALL** AuthorName in index ‘i’ from BooksList module “,” **CALL**
       Quantity in index ‘i’ from BooksList module “, $” **CALL** Price in index ‘i’ from
       BooksList module
      CLOSE Return file

```
    INCREASE the value of index 'i' in Quantity from BooksList module by 1
    ADD int value of index 'a' Price from BooksList module to total
  END IF

END FOR

ASSIGN boolean value False to Check
ASSIGN boolean value False to Fine

WHILE Check is False
  PRINT "The book return date expires in 10 days. Has the book return date already
  expired?
  PRINT "Press Y for Yes and N for No"
  TAKE input in uppercase and STORE in choice

  WHILE Fine is False
    IF choice is Y
      PRINT "By how many days was the book returned late?"

      TRY
        TAKE input as int datatype and STORE in day variable
        ASSIGN variable fine as 3*day
        OPEN Return file
        WRITE "Fine: $" and value of fine in string datatype
        CLOSE Return file
        ADD fine in total variable
        SET Check to True
        SET Fine to True
      END TRY

      EXCEPT ValueError
        PRINT "Please input the days you were late"
      END EXCEPT

    END IF

    ELIF choice is N
      PRINT "Please wait your bill is being ready"
      SET Check to True
      SET Fine to True
    END ELIF

    ELSE
      PRINT "Please input as suggested"
      BREAK
    END ELSE
```

END WHILE

END WHILE

PRINT “Final Total: “ and “$” and value of total in string datatype
PRINT “Thank you for returning back the book. Here’s your bill.”
OPEN Return file in append mode
WRITE “Final Total: $” and value of total in string datatype
WRITE “**********”
WRITE “THANK YOU FOR YOUR TIME HERE. WE HOPE TO SEE YOU AGAIN”
WRITE “**********”
CLOSE Return file
OPEN Books.txt in read and write mode

FOR i of length 5
WRITE CALL BookName in index ‘i’ from BooksList module “,” **CALL** AuthorName in index ‘i’ from BooksList module “,” **CALL** Quantity in index ‘i’ from BooksList module “, $” **CALL** Price in index ‘i’ from BooksList module
END FOR

CLOSE Books.txt
OPEN Return file in read mode
READ the file and STORE in variable lines
PRINT lines
CLOSE Return file

3. Data Structures

Data structures in python can defined as a way of storing data and information so it can be accessed easily. A programmer utilizes various data structure according to his/her necessity. There are two types of data structures in python. They are primitive data structures and non-primitive data structures. Both of the data structures are used in this coursework.

Primitive data structures include integer, float, string and boolean. All of them are used in the process of coding. The integer datatype is mostly used to decrease and increase the quantity of books and add the prices of the books. Similarly, the float datatype is used to in the total price for the final cost of the books when borrowing or returning. String datatypes are used many parts of the code like printing the information and writing int datatype in string datatype in a text file. Finally, the Boolean is used in the code for the while loop assigning false and true.

Non-primitive data structures include array, list, tuple, set, dictionary, and files. Since tuples cannot be updated after being created, sets store data in a random order and dictionary store data in a key and value order. List is used in the coursework to store data since it is mutable. A list is an ordered sequence of data which can be accessed by using index. It is denoted by [ ]. Lists are versatile. Four lists are used to store data for the book name, author name, quantity of the book and price of the book respectively. A for loop is used to insert and append the data in the list. Since, the borrow and return process used in the library needs to change the data every time the process is executed. It is easier to use a list to modify the data. Similarly, files are also used in the coding process. Files are used for the creation of bills after the user borrows or returns the books. A text file is created and file.write function is used write data in the text file. File.read and file.readlines are also used to read the text file in the program after a user borrows or returns the books. Finally, file.close is used to close the text file.

```
BookName=[]
AuthorName=[]
Quantity=[]
Price=[]

def booklist():
    f=open("Books.txt","r")
    lines=f.readlines()
    lines=[a.strip('\n') for a in lines]
    for i in range(len(lines)):
        x=0
        for j in lines[i].split(','):
            if(x==0):
                BookName.append(j)
            elif(x==1):
                AuthorName.append(j)
            elif(x==2):
                Quantity.append(j)
            elif(x==3):
                Price.append(j.strip("$"))
            x+=1
```

Figure 2 Implementation of Data Structure

```
Borrowed=False
while(True):
    firstname=input("Input the first name of the borrower: ")
    if firstname.isalpha():
        break
    print("Please input alphabet from A-Z")
while(True):
    lastname=input("Input the last name of the borrower: ")
    if lastname.isalpha():
        break
    print("Please input alphabet from A-Z")

Borrow="Borrowed by-"+firstname+".txt"
f=open(Borrow,"w+")
f.write("\t\t\t Thali Katuwal Library \n")
f.write("\t\t\t Thali, Kathmandu")
f.write("\n-------------------------------------------------------")
f.write("\n\t\t Details of the borrower and books borrowed\n")
f.write("\t\t Borrowed By: "+ firstname+" "+lastname+"\n")
f.write("\t\t Date and Time: " + Date_Time.getDateTime()+"\n\n")
f.write("S.N. \t\t Book Name \t\t\t Author Name \t\t Price\n" )
f.close()

total=0.0
```

Figure 3 Implementation of Data Structure 2

```
f=open(Borrow,"a")
f.write("\n\t\t\t\t\t\t\t\t\t\tTotal: $"+ str(total))
f.write("\n*****************************************************************")
f.write("\nTHANK YOU FOR YOUR TIME HERE.\nWE HOPE TO SEE YOU AGAIN")
f.write("\n*****************************************************************")
f.close()

f=open(Borrow,"r")
lines=f.read()
print(lines)
```

Figure 4 Implementation of Data Structure 3

```
if(int(BooksList.Quantity[b])>0):
    print("\nThe book you've selected is in stock.\n")
    count=count+1
    f=open(Borrow,"a")
    f.write(str(count)+". \t\t"+ BooksList.BookName[b]+"\t\t\t  "+BooksList.AuthorName[b]+" \t\t  "+"$"+BooksList.Price[b]+"\n")
    f.close()
    BooksList.Quantity[b]=int(BooksList.Quantity[b])-1
    total=total+int(BooksList.Price[b])
    f=open("Books.txt","w+")
    for i in range(5):
        f.write(BooksList.BookName[i]+","+BooksList.AuthorName[i]+","+str(BooksList.Quantity[i])+","+"$"+BooksList.Price[i]+"\n")
    f.close()
```

Figure 5 Implementation of Data Structure 4

4. Program

4.1 Implementation of the program

For the program, a total of 5 python files and 1 text file are created and codes are written. The main.py file contains the main code and is used when opening the program. The bookslist.py is used to store the book's name, author name, quantity, and price of the books in a list. The date_time.py is used to implement the date and time for when the book is borrowed or returned. The book.txt file contains the book name, author name, quantity, and price of the books. Finally, the borrow.py and return.py files are used to write the codes for the borrowing process and returning process of the books respectively.

When the main.py code is run, displaying the user what to do. The program runs on an infinite loop and won't stop until the user tells to do so.

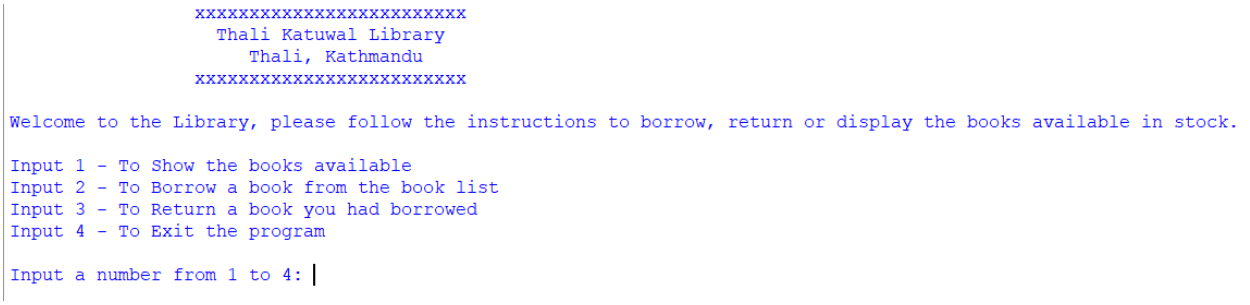

Figure 6 Main Menu of the program

The program asks the user to input a number from 1 to 4. When 1 is pressed, the bookslist function is called from bookslist module and it displays the books available in the library using for loop.

```
Input a number from 1 to 4: 1

The books we have available right now are :

Book Name                Author Name             Quantity        Price

Harry Potter             JK Rowling              8               $2
Cheque Book              Vasdev Mohi             15              $3
Das Capital              Karl Marx               28              $5
Divine Comedy            Dante                   21              $6
Faust                    Goethe                  17              $4


                xxxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4:
```

Figure 7 After 1 is inputted

The loop continues after displaying the books. If a wrong number is inputted, the program will print a specific message and the loop continues again and similarly if a string value or float value is entered it will display another specific message. The program is made to handle exceptions from the user.

```
                xxxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4: 5

Please enter a number from 1 to 4
```

Figure 8 If wrong input is given

```
                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4: asd

Please input the number.

                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4:
```

Figure 9 If wrong datatype is inputted

4.2 Borrow Process

When 2 is pressed, the borrow function is called from the borrow module along with the bookslist function from the bookslist module. After that, the user is asked to input their first name and last name. When inputting the name, if any other datatype is entered instead of alphabets, a message will be shown, and the user needs to enter the name again.

```
Input a number from 1 to 4: 2

Input the first name of the borrower: Niwahang
Input the last name of the borrower: 123
Please input alphabet from A-Z
Input the last name of the borrower:
```

Figure 10 If other than alphabet is entered

```
Input a number from 1 to 4: 2

Input the first name of the borrower: Niwahang
Input the last name of the borrower: Limbu

Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
```

Figure 11 After inputting the name

A text file is created after the user inputs their name. After the name is entered, the user can borrow a book by inputting a number respective to the book. If any other number than the number mentioned in the program is inputted, a message will be shown. The program checks if the book is available in the stock or not after the user input the book number. If the book is not available, a message will be displayed. If the book is available, it will show a message saying its available and asks the user if he/she wants to borrow another book. Y and N can be inputted in any case. If Y is inputted the program goes on a loop to borrow another book. A same book can't be borrowed twice.

If the same books are tried to borrow again a message will be shown. The loop won't stop until N is inputted or the books are out of stock.

```
Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
fad

Please input as suggested.

Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
-1
Plese enter a valid number given above.

Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
```

Figure 12 If wrong input is given

```
Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
1

The book you've selected is in stock.

If you want to borrow another book then press Y for Yes if not then press N for No:
Y

Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
1
I am sorry. You can't borrow the same book twice.
If you want to borrow another book then press Y for Yes if not then press N for No:
Y

Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
4

The book you've selected is in stock.
```

Figure 13 After inputting the book number and borrowing another book

After N is inputted, the program prints a thank you message and read the text file that was created. After the text file is shown the program goes on to continue the first loop that was the main menu.

```
If you want to borrow another book then press Y for Yes if not then press N for No:
N

Thank you for using our service to borrow books from us. Here's your bill.


                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------------
                Details of the borrower and books borrowed
                Borrowed By: Niwahang Limbu
                Date and Time: 2021-09-09 14:19:17.049106

S.N.            Book Name                       Author Name             Price
1.              Cheque Book                     Vasdev Mohi             $3
2.              Faust                            Goethe                  $4

                                                                      Total: $7.0
*******************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*******************************************************************************************************************************

                xxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4:
```

Figure 14 After No is inputted the borrow process ends

The text file is created as Borrowed By- and the first name of the borrower on the same folder the code files are located. The books that were borrowed by the user are appended in the text file that was created earlier and the total price is added in the text file as well. The quantity of books of the books borrowed is decreased by 1 in the books.txt file.

Books.txt	✓	09/09/2021 03:26 PM	Text Document	1 KB
BooksList.py	✓	07/09/2021 09:29 PM	Python File	1 KB
Borrow.py	✓	07/09/2021 11:39 PM	Python File	6 KB
Borrowed by-Niwahang.txt	✓	09/09/2021 02:50 PM	Text Document	1 KB
Date_Time.py	✓	07/09/2021 09:34 PM	Python File	1 KB
Main.py	✓	07/09/2021 09:03 PM	Python File	2 KB
Return.py	✓	09/09/2021 03:02 PM	Python File	4 KB

Figure 15 Creation of text file after borrowing

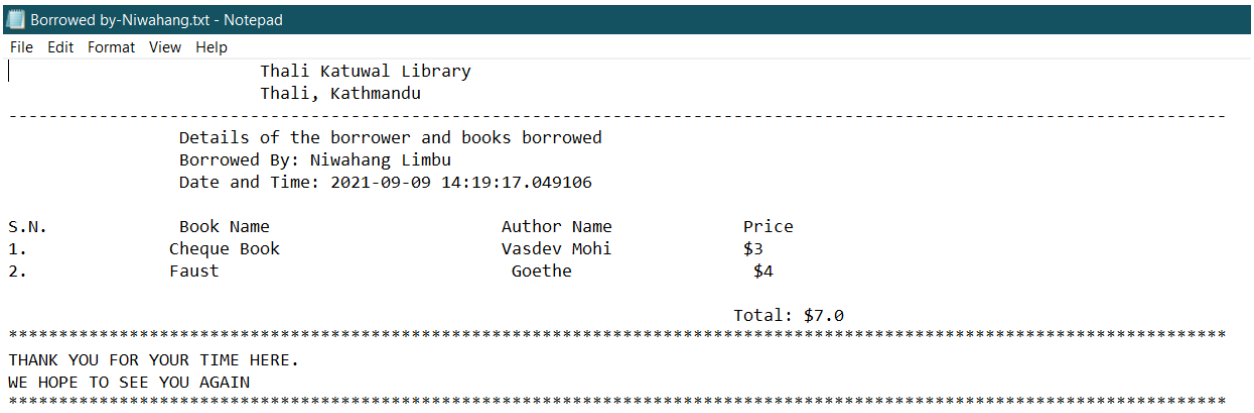

Figure 16 Opening the txt file

4.3 Return Process

When 3 is pressed, the return function is called from the return module along with the bookslist function from the bookslist module. After that, the user is required to input the name of the borrower. The name the user inputs is compared to the text file which was created during the borrow process. If the name matches the program continues if the name doesn't match, then a message will be shown, and the user need to input the name again.

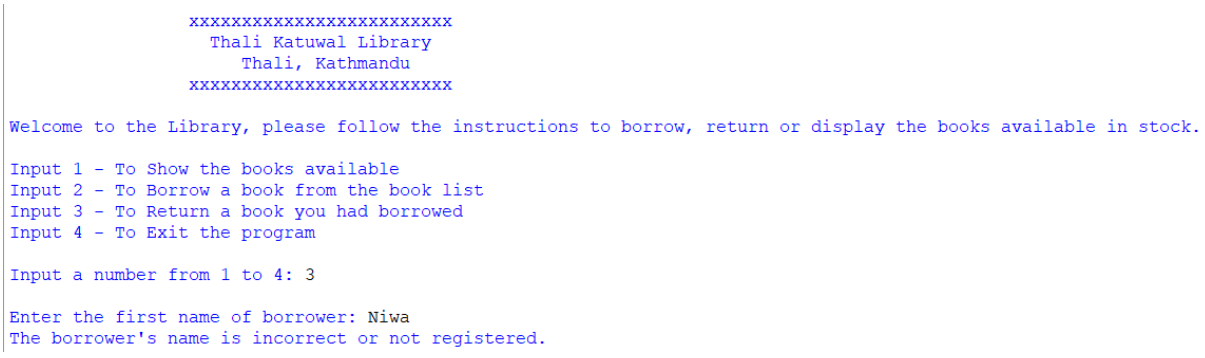

Figure 17 If the name is inputted incorrectly

When the name matches, the program reads the borrowed text file which is the bill that was created during the borrow process. Similar to the borrow process, a text file is also created after the user inputs their name.

```
Enter the first name of borrower: Niwahang
                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------------
                Details of the borrower and books borrowed
                Borrowed By: Niwahang Limbu
                Date and Time: 2021-09-09 14:50:42.366115

S.N.            Book Name                       Author Name             Price
1.              Cheque Book                     Vasdev Mohi             $3
2.              Faust                            Goethe                  $4

                                                                       Total: $7.0
*******************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*******************************************************************************************************************************
The book return date expires in 10 days. Has the book return date already expired?
Press Y for Yes and N for No
```

Figure 18 After the name is entered

After reading the file, the program asks the user if the book has been returned late. The user needs to input Y if it is being returned late or N if it is not being returned late. If any other datatype is inputted a message will be shown.

```
The book return date expires in 10 days. Has the book return date already expired?
Press Y for Yes and N for No
abc
Please input as suggested

The book return date expires in 10 days. Has the book return date already expired?
Press Y for Yes and N for No
```

Figure 19 If wrong input is given

If Y is inputted, then the program will ask the user by how many days is the book being returned. The user needs to input a number for the days late. If a string or wrong input is given similar message is shown.

```
The book return date expires in 10 days. Has the book return date already expired?
Press Y for Yes and N for No
Y
By how many days was the book returned late?
two
Please input the days you were late in integer type.

By how many days was the book returned late?
```

Figure 20 If wrong datatype or input is given

After inputting the days, the book was returned late. The program will fine you for returning the book late. The program automatically calculates the fine and add it to the total price. After that, the program prints a thank you message and read the text file that was created. After the text file is shown the program goes on to continue the first loop that was the main menu.

```
By how many days was the book returned late?
2

Final Total: $13.0

 Thank you for returning back the book. Here's your bill.

                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------
                Details of the returner and books returned
                        Returned By: Niwahang
                        Date and Time: 2021-09-09 15:07:38.320849

S.N.            Book Name               Author Name             Price
1               Cheque Book             Vasdev Mohi             $3
2               Faust                   Goethe                  $4

                                                        Fine: $6
                                                        Final Total: $13.0
*************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*************************************************************************************************************************

                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4:
```

Figure 21 After the book returned late days is inputted

If N is inputted, then the program just shows the final total and reads text file that was created.

```
The book return date expires in 10 days. Has the book return date already expired?
Press Y for Yes and N for No
N
Please wait your bill is being ready

Final Total: $7.0

 Thank you for returning back the book. Here's your bill.

                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------------
                Details of the returner and books returned
                        Returned By: Niwahang
                        Date and Time: 2021-09-09 15:15:59.285029

S.N.            Book Name               Author Name             Price
1               Cheque Book             Vasdev Mohi             $3
2               Faust                   Goethe                  $4
                                                        Final Total: $7.0
*******************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*******************************************************************************************************************************

                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4:
```

Figure 22 If the book is returned on time

The text file is created as Returned By- and the name that was inputted on the same folder the code files are located. The books that were returned by the user are appended in the text file that was created earlier and the total price is added in the text file as well. The quantity of books of the books borrowed is decreased by 1 in the books.txt file.

Books.txt	✓	09/09/2021 03:26 PM	Text Document	1 KB
BooksList.py	✓	07/09/2021 09:29 PM	Python File	1 KB
Borrow.py	✓	07/09/2021 11:39 PM	Python File	6 KB
Borrowed by-Niwahang.txt	✓	09/09/2021 02:50 PM	Text Document	1 KB
Date_Time.py	✓	07/09/2021 09:34 PM	Python File	1 KB
Main.py	✓	07/09/2021 09:03 PM	Python File	2 KB
Return.py	✓	09/09/2021 03:02 PM	Python File	4 KB
Returned by-Niwahang.txt	✓	09/09/2021 03:16 PM	Text Document	1 KB

Figure 23 Creation of txt file after returning

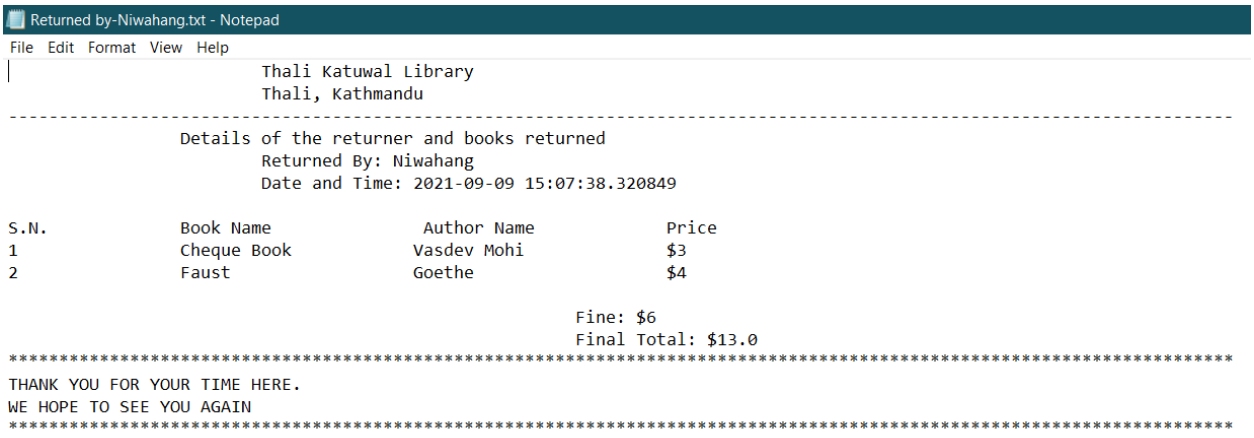

Figure 24 Opening the text file

4.4 Termination of the program

Finally, when 4 is pressed, the program ends. A message is shown before the program ends.

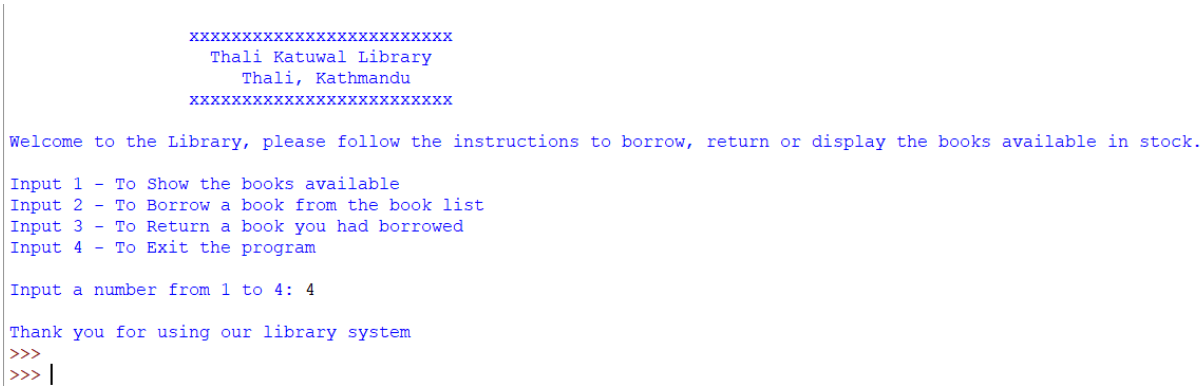

Figure 25 After 4 is inputted

5. Testing

5.1 Test 1 – Show implementation of try and except

Test Number	1
Objective:	Show implementation of try and except
Action:	→ abcd1 is inputted in the input section.
Expected Result:	The program should handle wrong output of the user and a message should be shown.
Actual Result:	The program handled wrong output of the user and a message was shown.
Conclusion:	The test is successful.

Table 1 Test Table 1

Output Result:

```
                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow,return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4: abcd1

Please input the number.

                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow,return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4:
```

Figure 26 Exception is handled

5.2 Test 2 – Selection borrow and return option

Test Number	2
Objective:	Selection borrow and return option
Action:	→ 2 is inputted in the input section to go borrow a book. → First name and last name are inputted. → Negative value is inputted. → Non-existent value is inputted.
Expected Result:	The program should handle the wrong inputs and a message should be displayed.
Actual Result:	The program handled the wrong inputs, and a message was shown.
Conclusion:	The test is successful.

Table 2 Test Table 2

Output Result:

```
                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow,return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4: 2

Input the first name of the borrower: Niwahang
Input the last name of the borrower: Angbuhang

Please select a option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
-2
Plese enter a valid number given above.
```

Figure 27 Providing negative value as input

```
Please select a option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
abcd1

Please input as suggested.

Please select a option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
```

Figure 28 Providing non-existent value

5.3 Test 3 – File generation of borrow

Test Number	**3**
Objective:	File generation of borrow
Action:	→ 2 is inputted in the input section to go to borrow a book. → First name and last name are inputted. → A number 3 is inputted to borrow a book. → Y is inputted to borrow another book. → A number 4 is inputted again to borrow a book. → N is inputted to end borrowing books. → The borrow txt file created is opened.
Expected Result:	The program should let us borrow the books available and a text file should be generated.
Actual Result:	The program let us borrow the books and the text file was generated.
Conclusion:	The test is successful.

Table 3 Test Table 3

Output Result:

```
                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow,return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4: 2

Input the first name of the borrower: Niwahang
Input the last name of the borrower: Angbuhang

Please select a option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
3

The book you've selected is in stock.

If you want to borrow another book then press Y for Yes if not then press N for No:
Y
```

Figure 29 Borrow Process

```
Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
4

The book you've selected is in stock.

If you want to borrow another book then press Y for Yes if not then press N for No:
n

Thank you for using our service to borrow books from us. Here's your bill.


                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------
                Details of the borrower and books borrowed
                Borrowed By: Niwahang Angbuhang
                Date and Time: 2021-09-07 20:50:17.400191

S.N.            Book Name                    Author Name            Price
1.             Divine Comedy                 Dante                  $6
2.             Faust                          Goethe                 $4

                                                                   Total: $10.0
*************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*************************************************************************************************************************
```

Figure 30 Borrow Process 2

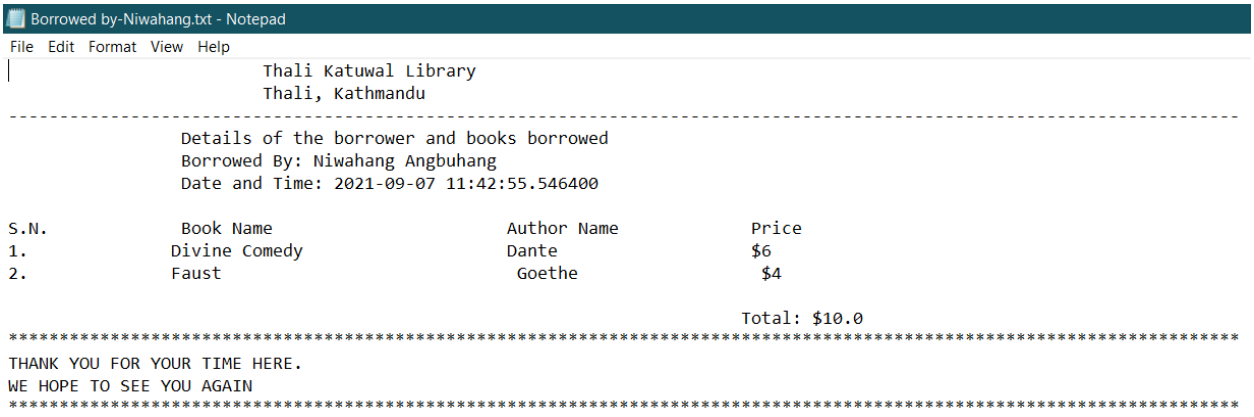

Figure 31 Text file after borrowing

5.4 Test 4 – File generation of return

Test Number	**4**
Objective:	File generation of return
Action:	→ 3 is inputted in the input section to go to return a book. → First name of the borrower is inputted. → Y is inputted since the books are returned late. → 3 is inputted since the books are returned 3 days late. → The return txt file created is opened.
Expected Result:	The program should let us return the books and a text file should be generated.
Actual Result:	The program let us return the books and the text file was generated.
Conclusion:	The test is successful.

Table 4 Test Table 4

Output Result:

```
                xxxxxxxxxxxxxxxxxxxxxxxx
                  Thali Katuwal Library
                     Thali, Kathmandu
                xxxxxxxxxxxxxxxxxxxxxxxx

Welcome to the Library, please follow the instructions to borrow, return or display the books available in stock.

Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4: 3

Enter the first name of borrower: Niwahang
                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------
                Details of the borrower and books borrowed
                Borrowed By: Niwahang Angbuhang
                Date and Time: 2021-09-08 13:02:56.993118

S.N.             Book Name                      Author Name             Price
1.              Divine Comedy                   Dante                   $6
2.              Faust                            Goethe                  $4

                                                                       Total: $10.0
*************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*************************************************************************************************************************
The book return date expires in 10 days. Has the book return date already expired?
Press Y for Yes and N for No
Y
By how many days was the book returned late?
3

Final Total: $19.0

 Thank you for returning back the book. Here's your bill.
```

Figure 32 Return Process

```
                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------
                Details of the returner and books returned
                        Returned By: Niwahang
                        Date and Time: 2021-09-08 13:03:27.470326

S.N.            Book Name               Author Name             Price
1               Divine Comedy          Dante                   $6
2               Faust                  Goethe                  $4

                                                        Fine: $9
                                                        Final Total: $19.0
*************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*************************************************************************************************************************
```

Figure 33 Return Process 2

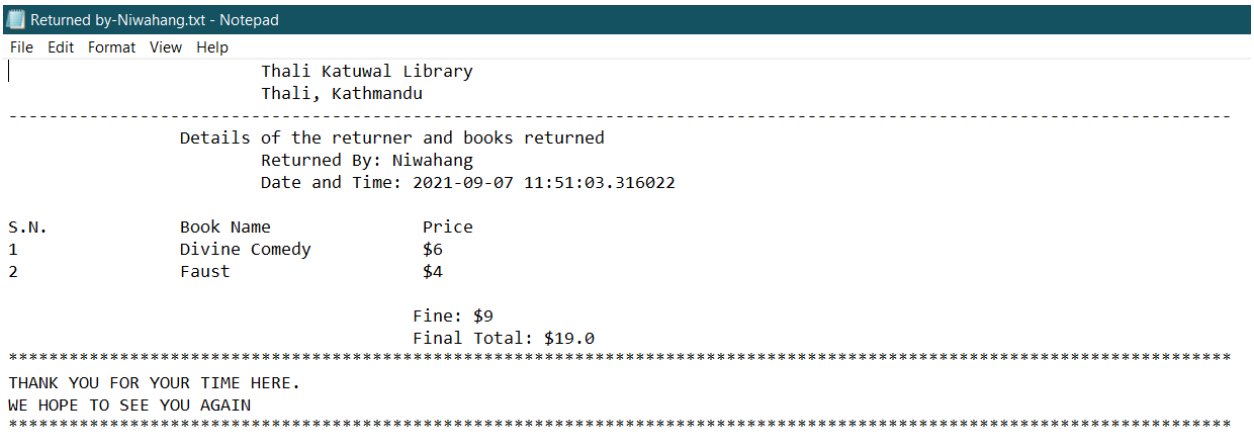

Figure 34 Text file after returning

5.5 Test 5 – Show update in stock

Test Number	**5**
Objective:	Show update in stock
Action:	→ The books.txt where books are stored is opened before borrowing the books. → Some books are borrowed using the program. → Books.txt is opened again after borrowing the books. → The books are returned using the program. → Books.txt is opened after returning the books.
Expected Result:	The quantity of the books should be updated after borrowing and returning the books.
Actual Result:	The quantity of the books was updated after borrowing and returning the books.
Conclusion:	The test is successful.

Table 5 Test Table 5

Output Result:

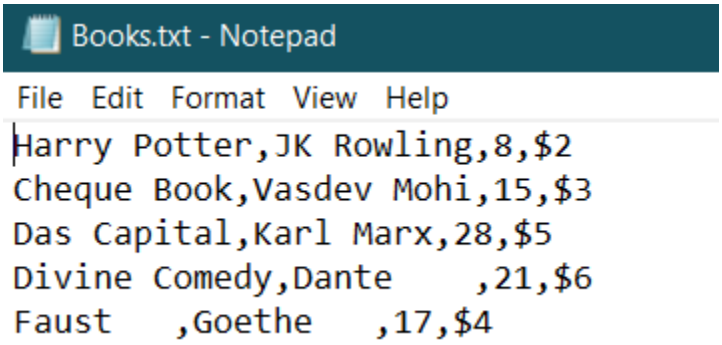

Figure 35 Books.txt before borrowing book

```
Input 1 - To Show the books available
Input 2 - To Borrow a book from the book list
Input 3 - To Return a book you had borrowed
Input 4 - To Exit the program

Input a number from 1 to 4: 2

Input the first name of the borrower: Sikumhang
Input the last name of the borrower: Angdembe

Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
2

The book you've selected is in stock.

If you want to borrow another book then press Y for Yes if not then press N for No:
Y

Please select an option below:

Input 0 to borrow book Harry Potter
Input 1 to borrow book Cheque Book
Input 2 to borrow book Das Capital
Input 3 to borrow book Divine Comedy
Input 4 to borrow book Faust
3

The book you've selected is in stock.

If you want to borrow another book then press Y for Yes if not then press N for No:
N

Thank you for using our service to borrow books from us. Here's your bill.
```

Figure 36 Borrow Process

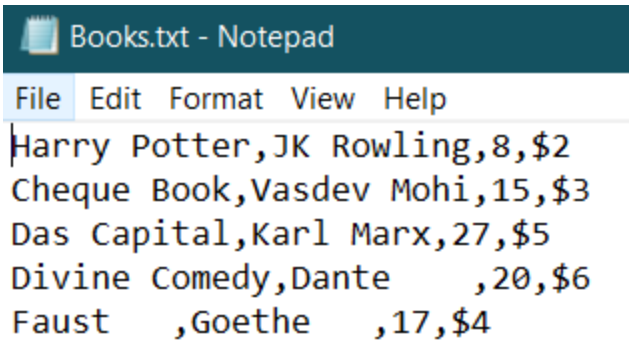

Figure 37 Books.txt after borrowing books

```
Enter the first name of borrower: Sikumhang
                        Thali Katuwal Library
                        Thali, Kathmandu
-------------------------------------------------------------------------------------------------------------------------------------
                Details of the borrower and books borrowed
                Borrowed By: Sikumhang Angdembe
                Date and Time: 2021-09-09 15:24:45.192947

S.N.            Book Name                       Author Name             Price
1.              Das Capital                     Karl Marx               $5
2.              Divine Comedy                    Dante                   $6

                                                                    Total: $11.0
*************************************************************************************************************************************
THANK YOU FOR YOUR TIME HERE.
WE HOPE TO SEE YOU AGAIN
*************************************************************************************************************************************
The book return date expires in 10 days. Has the book return date already expired?
Press Y for Yes and N for No
N
Please wait your bill is being ready

Final Total: $11.0

 Thank you for returning back the book. Here's your bill.
```

Figure 38 Return Process

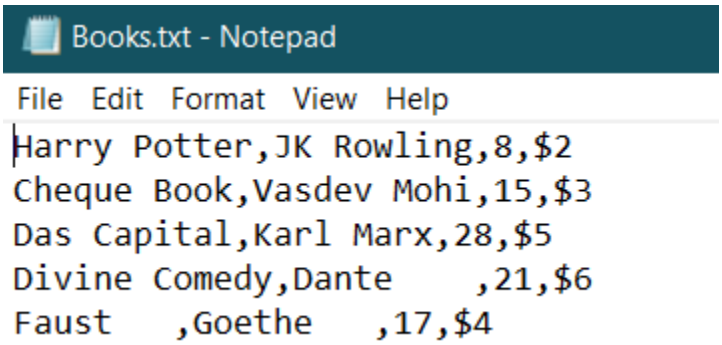

Figure 39 Books.txt after returning

6. Conclusion

Throughout the coursework, most of the things that was taught in the classes were implemented. I believe that my knowledge in Python programming has improved by a mile. After learning, practicing, and making many errors I've finally completed the coursework. Through different trials and errors, the aspects which were confusing at first are now completely understandable.

When the coursework was given out, the question was really difficult to understand. I didn't know from where to start the coursework as there were minimal details on the coursework. Then the teachers explained the coursework briefly and instructed us on how to start the project in the classes. The teachers would check our coursework weekly and instructed us on what to do and how to fix the bugs and errors in the classes.

There were tons of challenges while doing the coursework. The subject was practically new for me, however with the steady help of the teachers and going through the internet I was able to finish the coursework on schedule. It was troublesome as the entire world was battling with COVID-19. The stage was truly hard for us all. It was difficult for me to do this coursework. Online classes are not as effective as physical classes. So, I had to watch the lecture, tutorial, and workshop recordings of the class many times to understand. There were a few bugs while doing this coursework however with the assistance of the teachers and some of my friends, I was able to debug the bugs and make the code work.

After finally finishing the coursework, I gained much more knowledge on data structures, various in-built functions, loops, conditions, and many more in python. This was a valuable experience for me. I can say that I have developed my programming skills which will greatly help in the future.

Bibliography

Appendix

- **Main.py**

```
import Return
import BooksList
import Date_Time
import Borrow

def Library():
    menu=True
    while(menu==True):
        print("\n\t\t xxxxxxxxxxxxxxxxxxxxxxxxx")
        print("\t\t   Thali Katuwal Library")
        print("\t\t      Thali, Kathmandu")
        print("\t\t xxxxxxxxxxxxxxxxxxxxxxxxx\n")
        print("Welcome to the Library, please follow the instructions to borrow,
return or display the books available in stock.\n")
        print("Input 1 - To Show the books available")
        print("Input 2 - To Borrow a book from the book list")
        print("Input 3 - To Return a book you had borrowed")
        print("Input 4 - To Exit the program")
        try:
            a=int(input("\nInput a number from 1 to 4: "))
            print()
            if(a==1):
                BooksList.booklist()
                print("The books we have available right now are : \n")
                print("Book Name \t\t Author Name \t\t Quantity \t Price \n")
                f=open("Books.txt","r")
                for i in range(5):

print(BooksList.BookName[i]+"\t\t"+BooksList.AuthorName[i]+"\t\t"+BooksList.Qu
antity[i]+"\t\t"+"$"+BooksList.Price[i])
                print()
                f.close()

            elif(a==2):
                BooksList.booklist()
                Borrow.BorrowBook()

            elif(a==3):
                BooksList.booklist()
                Return.ReturnBook()
```

```
            elif(a==4):
                print("Thank you for using our library system")
                menu=False

            else:
                print("Please enter a number from 1 to 4")

        except ValueError:
            print("\nPlease input the number.")
Library()
```

- **BooksList.py**

```
BookName=[]
AuthorName=[]
Quantity=[]
Price=[]

def booklist():
    f=open("Books.txt","r")
    lines=f.readlines()
    lines=[a.strip('\n') for a in lines]
    for i in range(len(lines)):
        x=0
        for j in lines[i].split(','):
            if(x==0):
                BookName.append(j)
            elif(x==1):
                AuthorName.append(j)
            elif(x==2):
                Quantity.append(j)
            elif(x==3):
                Price.append(j.strip("$"))
            x+=1
```

- **Date_Time.py**

```
def getDateTime():
    import datetime

    datetime=datetime.datetime.now()
    return str(datetime)
```

- Borrow.py

```
import Date_Time
import BooksList

def BorrowBook():
    Borrowed=False
    while(True):
        firstname=input("Input the first name of the borrower: ")
        if firstname.isalpha():
            break
        print("Please input alphabet from A-Z")
    while(True):
        lastname=input("Input the last name of the borrower: ")
        if lastname.isalpha():
            break
        print("Please input alphabet from A-Z")

    Borrow="Borrowed by-"+firstname+".txt"
    f=open(Borrow,"w+")
    f.write("\t\t\t Thali Katuwal Library \n")
    f.write("\t\t\t Thali, Kathmandu")
    f.write("\n-----------------------------------------------------------------------------------------------
----------------------------")
    f.write("\n\t\t Details of the borrower and books borrowed\n")
    f.write("\t\t Borrowed By: "+ firstname+" "+lastname+"\n")
    f.write("\t\t Date and Time: " + Date_Time.getDateTime()+"\n\n")
    f.write("S.N. \t\t Book Name \t\t\t Author Name \t\t Price\n" )
    f.close()

    total=0.0
    while Borrowed==False:
        print("\nPlease select an option below:\n")
        for i in range(5):
            print("Input",i, "to borrow book", BooksList.BookName[i])
        try:
            a=int(input())
            if a<0:
                print("Plese enter a valid number given above.")
            else:
                try:
                    if(int(BooksList.Quantity[a])>0):
                        print("\nThe book you've selected is in stock.\n")
                        f=open(Borrow,"a")
                        f.write("1. \t\t"+ BooksList.BookName[a]+" \t\t\t
"+BooksList.AuthorName[a]+" \t\t "+"$"+BooksList.Price[a]+"\n")
                        f.close()
                        BooksList.Quantity[a]=int(BooksList.Quantity[a])-1
```

```
                    total=total+int(BooksList.Price[a])
                    f=open("Books.txt","w+")
                    for i in range(5):

f.write(BooksList.BookName[i]+","+BooksList.AuthorName[i]+","+str(BooksList.Q
uantity[i])+","+"$"+BooksList.Price[i]+"\n")
                    f.close()

                    Borrowed2=True
                    count=1
                    while Borrowed2==True:
                        choice=str(input("If you want to borrow another book then press
Y for Yes if not then press N for No: \n").upper())
                        if(choice=="Y"):
                            print("\nPlease select an option below:\n")
                            for i in range(5):
                                print("Input", i, "to borrow book", BooksList.BookName[i])
                            try:
                                b=int(input())
                                if b==a:
                                    print("I am sorry. You can't borrow the same book
twice.")
                                else:
                                    try:
                                        if(int(BooksList.Quantity[b])>0):
                                            print("\nThe book you've selected is in stock.\n")
                                            count=count+1
                                            f=open(Borrow,"a")
                                            f.write(str(count)+". \t\t"+
BooksList.BookName[b]+"\t\t\t  "+BooksList.AuthorName[b]+" \t\t
"+"$"+BooksList.Price[b]+"\n")
                                            f.close()
                                            BooksList.Quantity[b]=int(BooksList.Quantity[b])-1
                                            total=total+int(BooksList.Price[b])
                                            f=open("Books.txt","w+")
                                            for i in range(5):

f.write(BooksList.BookName[i]+","+BooksList.AuthorName[i]+","+str(BooksList.Q
uantity[i])+","+"$"+BooksList.Price[i]+"\n")
                                            f.close()
                                        else:
                                            print("Book is not available right now. Please visit
us after some time.")
                                    except IndexError:
                                        print("\nPlease choose book acording to their
number.")
```

```
                        except ValueError:
                            print("\nPlease input as suggested.")
                    elif(choice=="N"):
                        print("\nThank you for using our service to borrow books from
us. Here's your bill.\n")
                        print("")
                        Borrowed2=False
                        Borrowed=True
                    else:
                        print("Please input as suggested")
                else:
                    print("Book is not available right now. Please visit us after some
time.")
            except IndexError:
                print("\nPlease choose book acording to their number.")
        except ValueError:
            print("\nPlease input as suggested.")
    f=open(Borrow,"a")
    f.write("\n\t\t\t\t\t\t\t\t\t\tTotal: $"+ str(total))

f.write("\n**********************************************************************************
****************************************")
    f.write("\nTHANK YOU FOR YOUR TIME HERE.\nWE HOPE TO SEE YOU
AGAIN")

f.write("\n**********************************************************************************
****************************************")
    f.close()

    f=open(Borrow,"r")
    lines=f.read()
    print(lines)
    f.close()
```

- **Return.py**

```
import BooksList
import Date_Time
def ReturnBook():
    name=input("Enter the first name of borrower: ")
    a="Borrowed by-"+name+".txt"
    try:

        f=open(a,"r")
        data=f.read()
```

```
            print(data)

        except:
            print("The borrower's name is incorrect or not registered.")
            ReturnBook()

        Return="Returned by-"+name+".txt"
        f=open(Return,"w+")
        f.write("\t\t\t Thali Katuwal Library \n")
        f.write("\t\t\t Thali, Kathmandu")
        f.write("\n----------------------------------------------------------------------------------------
----------------------------")
        f.write("\n\t\t Details of the returner and books returned\n")
        f.write("\t\t\t Returned By: "+ name+"\n")
        f.write("\t\t\t Date and Time: " + Date_Time.getDateTime()+"\n\n")
        f.write("S.N. \t\t Book Name \t\t Author Name \t\t Price\n")
        f.close()
        count=0
        total=0.0
        for i in range(5):
            if BooksList.BookName[i] in data:
                count=count+1
                f=open(Return,"a")
                f.write(str(count)+" \t\t "+BooksList.BookName[i]+"
\t\t"+BooksList.AuthorName[i]+" \t\t"+" $"+BooksList.Price[i]+"\n")
                f.close()
                BooksList.Quantity[i]=int(BooksList.Quantity[i])+1
                total+=int(BooksList.Price[i])

        Check=False
        Fine=False
        while Check==False:
            print("The book return date expires in 10 days. Has the book return date
already expired?")
            print("Press Y for Yes and N for No")
            choice=input().upper

            while Fine==False:
                if(choice()=="Y"):
                    print("By how many days was the book returned late?")
                    try:
                        day=int(input())
                        fine=3*day
                        f=open(Return,"a")
                        f.write("\n\t\t\t\t\t\t\tFine: $"+ str(fine)+"\n")
                        f.close()
```

```
                    total=total+fine
                    Check=True
                    Fine=True
                except ValueError:
                    print("Please input the days you were late in integer type.\n")
            elif(choice()=="N"):
                print("Please wait your bill is being ready")
                Check=True
                Fine=True
            else:
                print("Please input as suggested\n")
                break
        print("\nFinal Total: "+ "$"+str(total))
        print("\n Thank you for returning back the book. Here's your bill.\n")
        f=open(Return,"a")
        f.write("\t\t\t\t\t\t\tFinal Total: $"+ str(total))

    f.write("\n*****************************************************************************
*****************************************")
        f.write("\nTHANK YOU FOR YOUR TIME HERE.\nWE HOPE TO SEE YOU
AGAIN")

    f.write("\n*****************************************************************************
*****************************************")
        f.close()


        f=open("Books.txt","w+")
        for i in range(5):

    f.write(BooksList.BookName[i]+","+BooksList.AuthorName[i]+","+str(BooksList.Q
uantity[i])+","+"$"+BooksList.Price[i]+"\n")
        f.close()

        f=open(Return,"r")
        lines=f.read()
        print(lines)
        f.close()
```