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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 submission will be treated as non-submission and a marks of zero will be awarded.

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Introduction

The Library management system is a project for overseeing borrowing and returning of book from a library. The broad of books in library includes keeping record of accessible books, record of client, books borrowed by the client, books returned by the user, date and time along with the appropriate message. Showing suitable messages after each borrowing and returning of book is vital as it gives feelings of standing ground to current use. Furthermore, a library maintains its book information (stock) in a text file.

This application shows books accessible to acquire by a user. Dealing with invalid source of information, hanging tight for a substantial contribution from a user is likewise to be included for this undertaking. After every transaction of book the book stock information base is needed to be refreshed. For returning the acquired book user can continue the book returning process bringing back order. Like the book borrowing process, after returning the book an update is to be made to the book data base alongside suitable message.

The price of borrowing a book should be shown to user and appropriate fine should be added if book is not returned within minimum return time. Moreover, this application displays the list of book in a text file available in the store which are to be borrow by a user. If the user selected book is accessible to borrow, book borrowing process is proceed where a message is generated displaying details. At the point when a client acquires a book a note is created which contains the name of the borrower, the name of the book acquired, the date and season of such issue and the aggregate sum to be paid for the getting. In the same way, if a user wish to borrow more than one book at that time he/she can have that too where all the borrowed books is written to the notes and the amount is also added up for all the borrowed books. Similarly, to return a borrowed book, return command is to be provided to the program which enables the book returning process. After completion of either book borrowing or book returning the main menu displays the books accessible to borrow and waits for user command. To exit the program exit command is to be entered.

Furthermore, this project was developed to complete fulfilment of coursework. The coursework was not an easy assignment. There were a great deal of difficulties and restless evenings to go through in request to finish the project on schedule. Loads of research, conversation, investigation and frequent queries with instructors were needed to be done to create library management system as needed in the project.

Discussion and Analysis

The coursework is aggregation of different assignments like performing research, preparing algorithm, flowchart, pseudocode, composing code and recording the whole procedure for arrangement of the report. With devotion and exertion these assignments were achieved.

Since the coursework was assigned under Fundamentals of Computing which managed with python programming language, the coursework was to be completed utilizing python. Python is an interpreted, object-oriented programming language like perl that has acquired popularity as a result of its unmistakable punctuation and meaningfulness. Python is supposed to be moderately simple to learn and compact, which means its statements can be interpreted in a number of operating systems, including UNIX-based system, Mac OS, MS-DOS, OS/2, and different version of Microsoft Windows. Even for extensive tasks like machine learning and artificial intelligence python is considered as the first choice of programming language to go for. Python is not simply restricted to this, different mobile applications can likewise be constructed utilizing python. This wide acknowledgement of python has developed huge networks of engineers which make sharing of thoughts and troubleshooting much more simpler and proficient task.

To develop the program lecture slides, tutorial and lab workshop were returned to. From there idea of producing work process of the coursework was created. After performing some exploration appropriate data structure was chosen and coding strategy was started. To code Python IDLE was utilized which was exceptionally useful as it created error messages which coordinated toward debugging of the program. Similarly, for developing flowchart Draw.io was utilized. Draw.io is an open source on the web drawing device that can be utilized to develop flowchart and other

diagrammatical infographics. For troubleshooting of code, many google search were directed and suitable hunt result were chosen from generated results.

Algorithm

An algorithm is a limited arrangement of instructions that, whenever followed, achieves a specific task. It is a step wise system to be followed to take care of an issue. Likewise, Developing algorithm is initial move towards programming which characterizes the steps to be taken which leads the way towards making a software. An algorithm is not restricted to one stage. Truth be told same algorithm can be utilized to develop programs in particularly all programming language accessible till date. In addition, all algorithms must satisfy following criteria:

- Input.
- Output.
- Definiteness.
- Finiteness.
- Effectiveness.

Here is the algorithm for this project:

Step 1: Start

Step 2: Set the main loop to true, with in main loop do the accompanying.

Step 3: Read the text records containing book stock and shows book accessible to acquire.

Step 4: Read user input, check for the returning of book, exit and accessibility of book in book stock.

Step 5: Display the first name of the borrower.

Step 6: Set input for the borrower first name.

Step 7: Display the last name of the borrower.

Step 8: Set input for the borrower last name.

Step 9: Display the list of book available.

Step 10: Select an option of books from 0-6 to be borrowed.

Step 11: Check if the user input is available then get a book.

Step 12: Check if the user wish to borrow multiple book.

Step 13: If the user wish to borrow multiple books, go to Step 9.

Step 14: Select an option of books available from 0-6.

Step 15: Check if the user input is available then get another book.

Step 16: Decrease amount of book acquired by user, write to the file and show message.

Step 16: Go to step 3

Step 17: Check if the borrower name is correct.

Step 18: Check if the borrower has returned the book in time or not.

Step 19: If the user has not returned the book in minimum expected time, user should pay fine

Step 18: From step 4, if the user input is return, go to step 19.

Step 19: Increase the amount of book returned, write to file and show the message.

Step 20: Display a suitable message after using library management system.

Flowchart

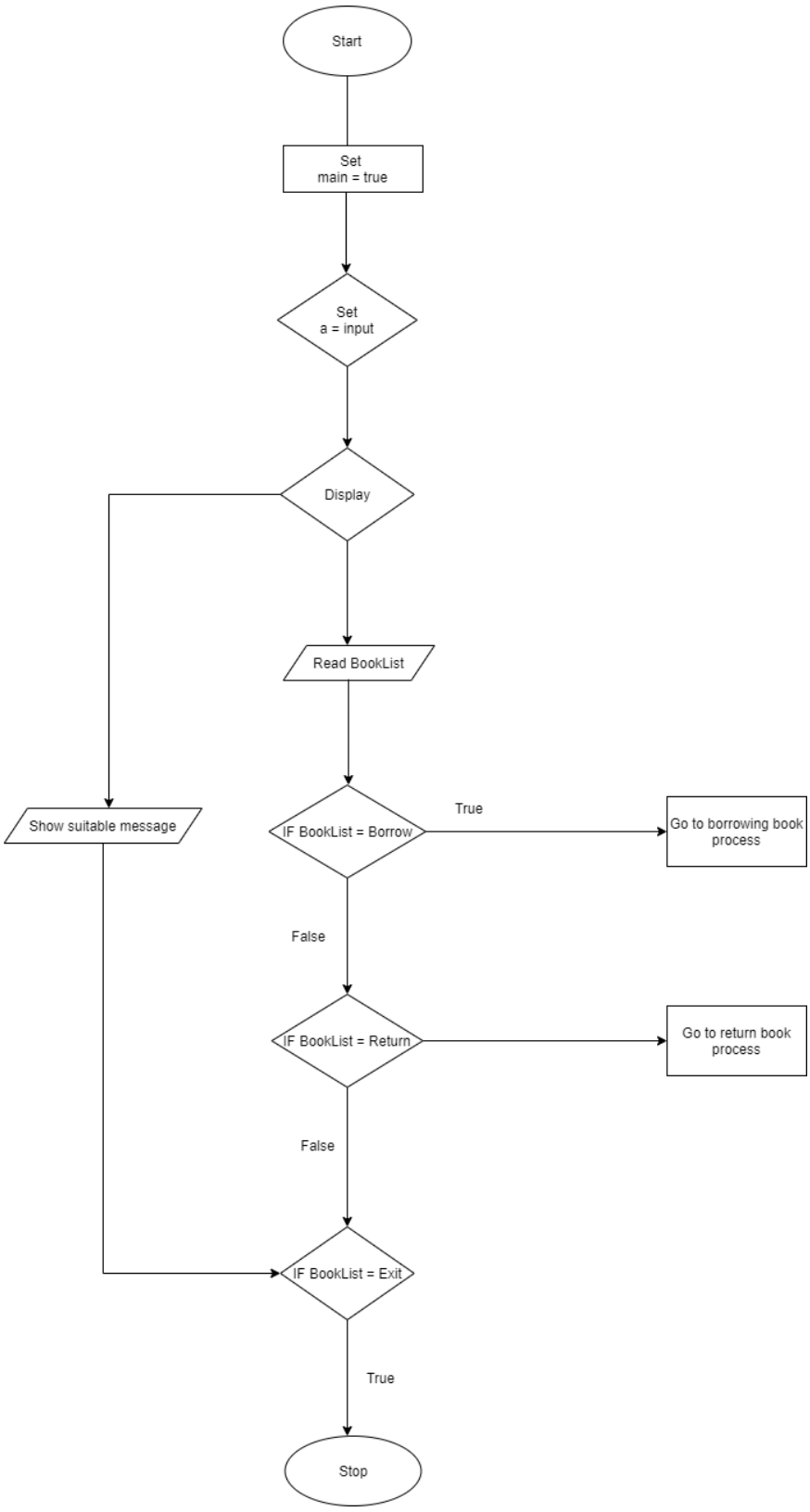

Figure 1: Flowchart

Pseudocode

Pseudocode is an informal method of programming portrayal that does not need any strict programming language syntax or fundamentals innovation contemplations. It is utilized for making a layout or an unfinished version of a program. Pseudocode sums up a program's stream, however excludes underlying details. System designers compose pseudocode to gurantee that developers understand a software task's necessities and adjust code appropriately.

Moreover, it is not an actual programming language so it cannot be compiled into an executable program. These codes are not understood by any compiler or interpreter but they are very helpful while writing actual code. It acts as a layer of false screen which is visible to developer but not to compiler. The pseudocode of the program is as follows:

ListSplit Process

Define listsplit()

Declare bookname

Declare authorname

Declare quantity

Declare price

Create empty list for bookname

Create empty list for authorname

Create empty list for quantity

Create empty list for price

Open BookList.txt in r mode as z

Test lines = z.readlines()

Test lines = [x.strip('n') for x in lines]

For i in range(len(lines)):

Initialize count = 0

For a in lens[i].split(‘, ‘)

If (count == 0)

Add bookname(a)

Elif (count == 1)

Add authorname(a)

Elif (count == 2)

Add quantity(a)

Elif (count == 3)

Add price(a.strip(“$))

Initialize count += 1

Book Borrowing Process

Define borrowbook()

While success is False

While True

Assign the First name of borrower

If Firstname.isalpha()

Break

Check the validity of client name

Print “Please enter a valid input”

Display “Please enter a valid input

While True

Assign the last name of borrower

If Lastname.isalpha()

Break

Check the validity of client name

Print “Please enter a valid input

Display “Please enter a valid input

Assign t as “Borrow-“+input from Firstname+”.txt”

Open borrow file in w mode

Open borrow file in w mode as z

Write Library Management System in borrow file as z

Write Firstname and lastname of the borrower in borrow file as z

Write Date and time in borrow file as z

Write Bookname and Authorname in borrow file as z

While success is FALSE

Print “Please select an alternatives below”

Display “Please select an alternatives below”

For i in range(len(ListSplit.bookname))

Print (“Enter”, i, “to borrow book”, ListSplit.bookname[i])

Display the bookname to be borrowed by a borrower

Try

Assign a as input variable

Try

If (int(ListSplit.quantity[a]) > 0)

Print “Book is accessible”

Display “Book is accessible in our store”

Open borrow file in a input as z

Write bookname and authorname as z

Test ListSplit.quantity[a] = int(ListSplit.quantity[a]) -1

Open BookList.txt textfile in w mode

Open BookList.txt textfile in w mode as z

For i in range(7)

Write bookname, authorname, quantity and price in borrow file as z

Assign loop is True

Initialize count = 1

While loop == True

Display “Do you wish to acquire more books? Press Y for Yes and N for No

If(choice.upper() == “Y”)

Initialize count = count +1

Print “Please select and alternatives below”.

For i in range(len(ListSplit.bookname))

Print “The bookname to be borrowed

Display "The bookname to be borrowed

Assign a as input variable

If(int(ListSplit.quantity[a] >0)

Print "Book is accessible in our store"

Open borrow file in a variable as z

Write and Count bookname and authorname in a borrow file as z

Test ListSplit.quantity[a] = int(ListSplit.quantity[a]) – 1

Open BookList.txt text file in w mode as z

For in range(7)

Write bookname, authorname, quantity and price in borrow file as z

Set success = False

Set success = False

Else

Set loop = False

Break

Elif (choice.upper() == "N")

Print "Thankyou for getting books from us."

Print(" ")

Display "Thankyou for getting books from us."

Set loop = False

Set Success = True

Else

Print “Please enter a valid input”

Display “Please enter a valid input”

Else

Print “Book is not accessible in our store”

Reset borrowbook()

Set success = False

Except IndexError

Print(“ “)

Print “Please choose book according to their number.”

Display “Please choose book according to their number.”

Except ValueError

Print(“ “)

Print “Please pick as propose.”

Display “Please pick as propose.”

Returning Book Process

Define reurnbook()

Assign The name of borrower

Assign a as “Borrow-“ “input from name+”.txt”

Try

Open a in borrow file of r mode as z

IF lines = z.readlines()

IF lines = [a.strip(“$) for a in liens]

Open a in borrow file as z

IF data = z.read()

Print (data)

Display(data)

Except

Print “The borrower name is incorrect”

Display “The borrower name is incorrect”.

Assign b as “return-“+input from name+”.txt”

Open b in return file of w mode as z

Write Library Management System as z in return file.

Write the name of client who returns the book as z in return file.

Write the date and time as z in return file.

Write S.N , bookname and price as z in return file.

Set total = 0.0

For i in range(7)

    If ListSplit.bookname[i] in data

    Open b in return file of a in borrow file as z.

    Write book name in file

    Test ListSplit.quantity[i] = int(ListSplit.quantity[i]) +1

    Set total += float(ListSplit.price[i])

Print “+$”+str(total)

Print “ Is the book return date terminated already? Press Y for Yes and N for No”.

Display “ Is the book return date terminated already? Press Y for Yes and N for No”.

Set stat = input()

If(stat.upper() == “Y”)

    Print “How long was the book returned late?”

    Display “How long was the book returned late?”

    Set day as input

    Set fine = 3 * day

    Open b in return file of a in borrow file as z

    Write Fine in return file as z

    Declare total = total + fine

Print final total price

Display final total price

Open b in return file of a in borrow file as z

Write total price in return file as z

Open BookList.txt of w mode as z

For i in range(7)

Write bookname, authorname, quantity and price in return file as z

Main Process

Define main()

While(True)

Print “Welcome to the Library management system”

Display “Welcome to the Library management system”

Print (“-----“)

Display (“---“)

Print “Enter 1. To Display”

Display “Enter 1. To Display”

Print “Enter 2. To borrow a book”

Display “Enter 2. To borrow a book”

Print “Enter 3. To return a book”

Display “Enter 3. To return a book”

Print “Enter 4. To exit”

Display “Enter 4. To exit”

Try

    Assign q variable

    Input Select a choice from 1 to 4 in q variable

    If (q == 1)

```
        Open Stock.txt of r mode as z
        If lines = z.read()
        Print lines
        Display lines
        Elif (q == 2)
                Set ListSplit.listSplit()
                Set Borrow.borrowbook()
        Elif (q == 3)
                Set ListSplit.listSplit()
                Set Return.returnbook()
        Elif (q == 4)
                Print “Much thanks for utilizing Library Management framework”)
                Break
        Else
                Print “Please enter a valid number from 1 to 4”
Except ValueError
        Print “Please input as suggested.”
        Print (“ “)
Input main()
```

Data Structure

Python has been utilized worldwide for various fields making websites, artificial intelligence and considerably more. In any case, to make the entirety of this potential, data assumes a vital part which implies that this data ought to be put away effectively and the access to it must be convenient. So to accomplish this we use something called Data Structure.

Organizing**,** managing and storing data is important as it enables easier access and efficient modifications. Data Structures allows us to organize our data in such a way that enables us to store collections of data, relate them and perform operations on them accordingly. Python has implicit support for data structure which enable us to store and access data. These structures are called List, Dictionary, Tuple and Set.

(Anon., n.d.)

List:

A list is an ordered sequence of information, accessible by index which is denoted by square brackets [ ]. Likewise, a list contains usually of the same element types and can contain another list to form a multi-dimensional list. List can be cut, concatenated indexed and update individual things in the list. List are mutable so their structure and content can be changed. Thus, list can be utilized properly while working with stacks, queues, sorting items, matrixes and working with enormous measure of data.

List can be created as follows:

```
bookname = []
authorname = []
quantity = []
price = []
```

Figure 2: Creating a list

Dictionary:

In Python, a Dictionary can be created by placing a sequence of elements within curly { } braces, separated by ‘comma’. Dictionary holds a pair of values, one being the Key and the other corresponding pair element being its key:value. Values in a dictionary can be of any data type and can be duplicated, whereas keys can’t be repeated and must be immutable. (Anon., n.d.)

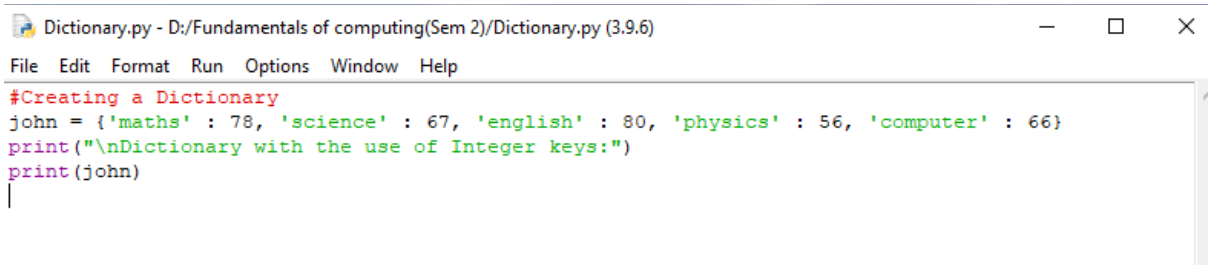

Figure 3: Creating a dictionary

Output:

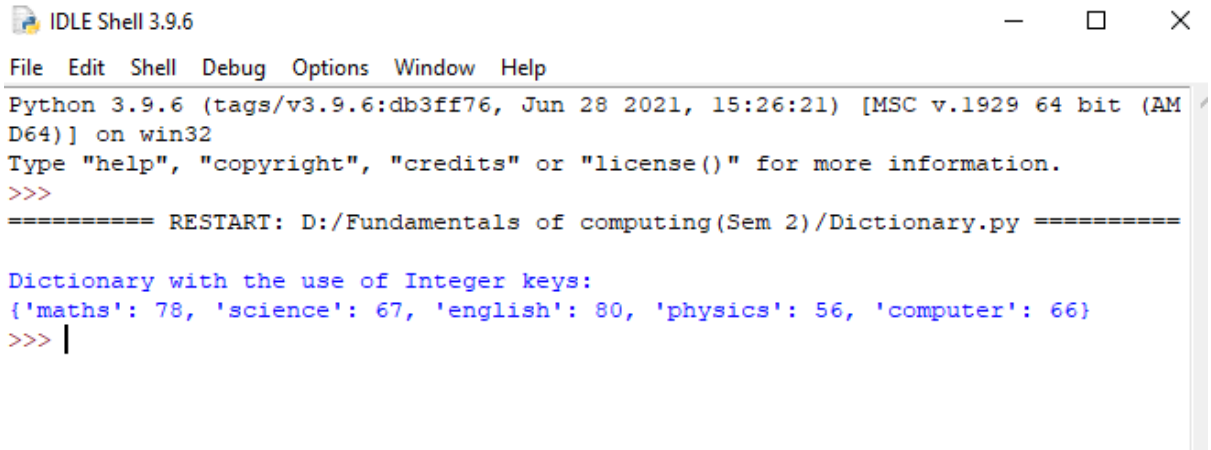

Figure 4: Output of dictionary.

Tuples:

Tuples are utilized to store various items in a solitary variable. It is one of the four inherent data types in python used to store collection of information, the other three are List, Set, and Dictionary, all with various characteristics and uses. Moreover, a tuple is an assortment which is ordered, allow duplicates values and unchangeable, which is basically composed with round brackets.

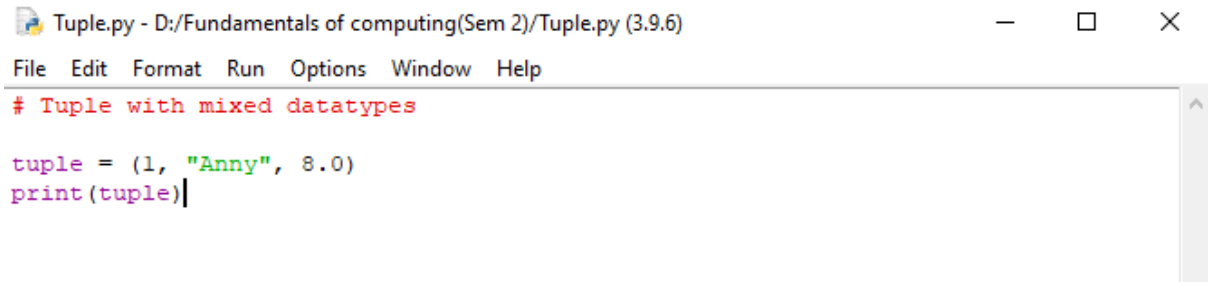

Figure 5: Creating Tuples

Output:

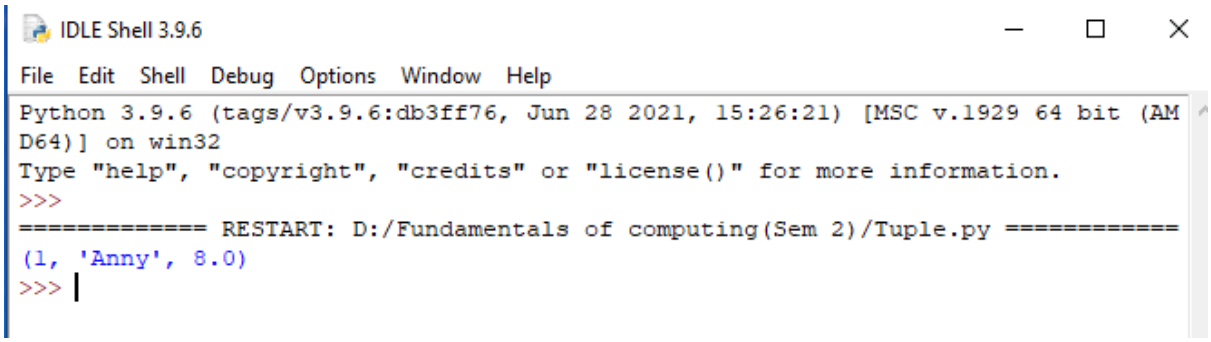

Figure 6: Output of Tuples

Set:

Mathematically a set is a collection of items not in any particular order. A python set is similar to this mathematical definition. However, the elements in the python set cannot be duplicates and are immutable but the set as a whole is mutable. Likewise, there is no index attached to any elements in a python set. So they do not support any indexing or slicing operation. A set is created by using the set ( ) function or placing all the elements with a pair of curly braces. (Anon., n.d.)

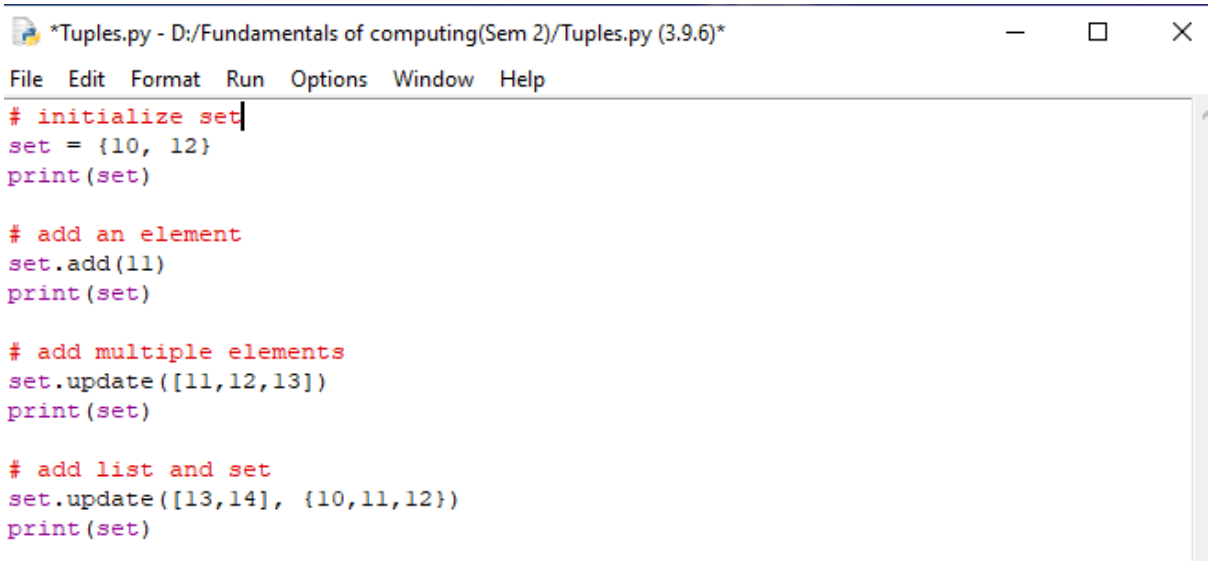

Figure 7: Creating Set Operation

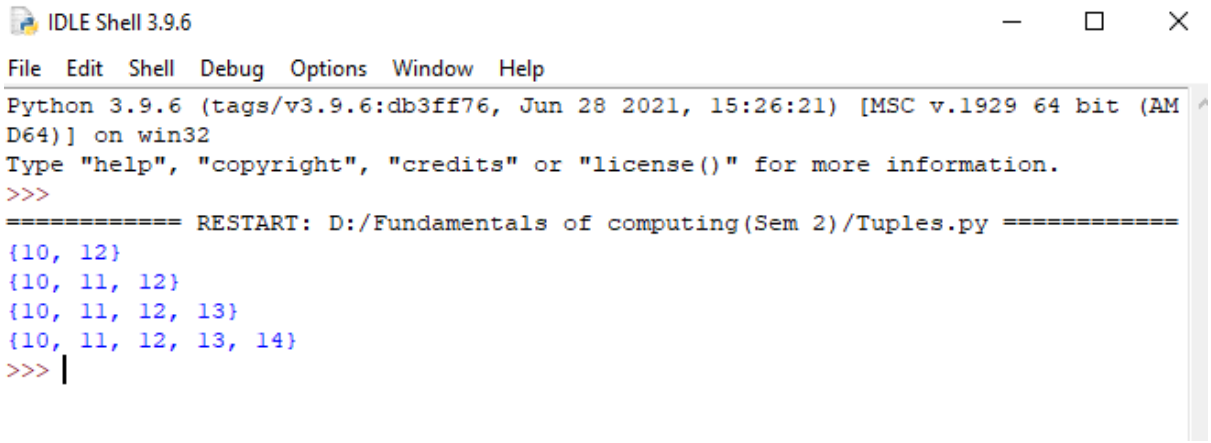

Figure 8: Output of Set Operation

Program

To construct a full working of library management system, whole code was separated into six modules for appropriate administration of code.

These modules are as listed below:

1. Main.py
2. ListSplit.py
3. DateTime.py
4. Borrow.py
5. Return.py
6. BookList.txt

These modules are describes in below below:

Main.py

The main program module carry the establishment of the library management system as the name recommends. It imports from any remaining modules, call their functions each time at whatever point essential with required parameters and get compensated details as fundamental. At first this main module sets a variable consistent with run main loop ceaselessly. Inside the main loop, it calls the display books accessible to borrow and pauses for client choice. After that, at that point it calls really look at module to actually look at client determination. In that event, that the client selected book is accessible to borrow then it keeps on booking acquire measure. Similarly, On the off chance that the client choice is to return a book it keeps on booking bring measure back or if the client select to exit, its exits the program. Likewise, on the off chance if the client selection is other than above notice, it shows a message and proceeds with the program hanging tight for valid client input. On top of that, the main program gives up the control stream execution to different other modules to persue client input, execute transactions and compose to data set record.

```
>>>
====================== RESTART: D:\New folder (3)\Main.py ======================
       Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4: 1

My life and struggle, Pashto,91,$3
The Christmas Pig, JK Rowling,38,$2
Whereabouts, Jhumpa Lahiri,62,$1.5
The Bench, Meghan Markle,79,$3
Names of the Women, Jeet Thayil,94,$5
Harry Potter,JK Rowling,30,$2
Start With Why,Simon Sinek,0,$ $1.5


       Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4:2

Please,enter the first name of the borrower: Tsunade
Please,enter the last name of the borrower: Uzumaki
Date:  2021-09-09
Time:  11:34:46.593324
Please select an alternatives below:
Enter 0 to borrow book My life and struggle
Enter 1 to borrow book The Christmas Pig
Enter 2 to borrow book Whereabouts
Enter 3 to borrow book The Bench
Enter 4 to borrow book Names of the Women
```

Figure 9: Screenshot of main program(1)

```
Enter 5 to borrow book Harry Potter
Enter 6 to borrow book Start With Why
1
Book is accessible in our store.
Do you wish to acquire more books? Anyway you cannot aquire same book twice. Ent
er Y(Yes) or N(No).Y
Please,select an option below:
Enter 0 to borrow book My life and struggle
Enter 1 to borrow book The Christmas Pig
Enter 2 to borrow book Whereabouts
Enter 3 to borrow book The Bench
Enter 4 to borrow book Names of the Women
Enter 5 to borrow book Harry Potter
Enter 6 to borrow book Start With Why
3
Book is accessible in our store.
Do you wish to acquire more books? Anyway you cannot aquire same book twice. Ent
er Y(Yes) or N(No).N
Thank you for getting books from us.

       Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4:3

Please, Enter the name of borrower: Tsunade
               Library management system
                 Borrowed By: Tsunade Uzumaki
Date: 2021-09-09    Time:11:34:46.597313

S.N.      Bookname              Authorname
1.     The Christmas Pig       JK Rowling
2.     The Bench       Meghan Markle

Date:  2021-09-09
Time:  11:35:14.570381
Rate of books borrowed:  $5.0
```

Figure 10: Screenshot of main program(2)

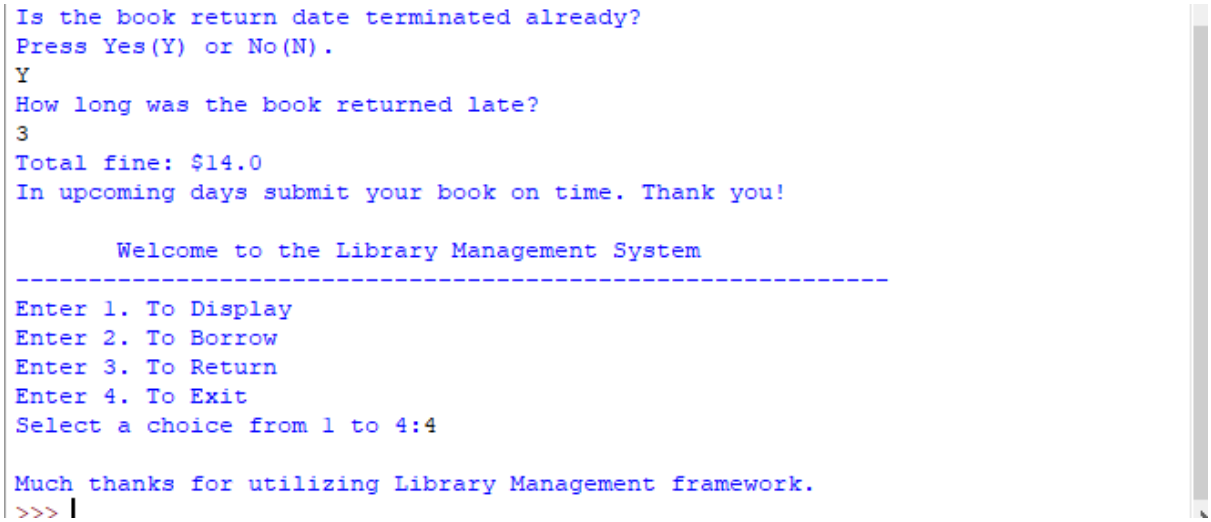

Figure 11: Screenshot of main program(3)

ListSplit.py

In the ListSplit module the listsplit work was characterized and the variable such as bookname, authorname, quantity and price were set unfilled. Besides BookList.txt is a text record so this text was open and the program to persue every one of the lines.

DateTime.py

In the DateTime module two functions were characterized that is getdate and gettime. First and foremost date time was imported to both of the functions in the program and afterward the current date was initialized. After that it was printed just as gotten back with the current date and time.

Borrow.py

In the Borrow module, firstly the listsplit and datetime module were imported and call their functions each time at whatever point essential with required parameters and get compensated details as fundamental. Inside the main loop, it calls the display books accessible to borrow and pauses for client choice. After that, at that point it calls really look at module to actually look at client determination. In that event, that the client selected book is accessible to borrow then it keeps on booking acquire. Then, at that time the amount of the book is deiminised with the number of books borrowed by the client and the after the borrowing process is completed the details will be saved in the text file along with the borrower name and date and time of borrowed. However, if there is a value error or index the message will display saying invalid input and if not borrowed process is successful.

```
      Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4:2

Please,enter the first name of the borrower: Tsunade
Please,enter the last name of the borrower: Uzumaki
Date:  2021-09-09
Time:  11:34:46.593324
Please select an alternatives below:
Enter 0 to borrow book My life and struggle
Enter 1 to borrow book The Christmas Pig
Enter 2 to borrow book Whereabouts
Enter 3 to borrow book The Bench
Enter 4 to borrow book Names of the Women
Enter 5 to borrow book Harry Potter
Enter 6 to borrow book Start With Why
1
Book is accessible in our store.
Do you wish to acquire more books? Anyway you cannot aquire same book twice. Enter Y(Yes) or N(No).Y
Please,select an option below:
Enter 0 to borrow book My life and struggle
Enter 1 to borrow book The Christmas Pig
Enter 2 to borrow book Whereabouts
Enter 3 to borrow book The Bench
Enter 4 to borrow book Names of the Women
Enter 5 to borrow book Harry Potter
Enter 6 to borrow book Start With Why
3
Book is accessible in our store.
Do you wish to acquire more books? Anyway you cannot aquire same book twice. Enter Y(Yes) or N(No).N
Thank you for getting books from us.
```

Figure 12: Screenshot of borrow program

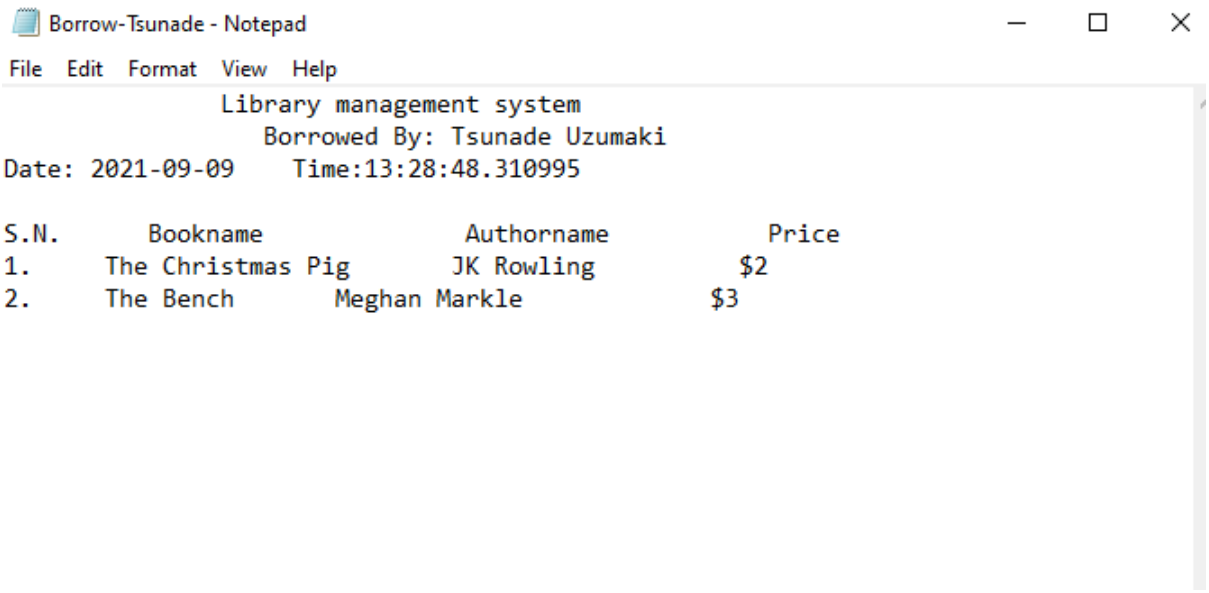

Figure 13: Screenshot of creation of txt file of borrow process

Return.py

Alike borrow module, in this return module the listsplit and datetime module were imported and call their functions each time at whatever point essential with required parameters and get compensated details as fundamental. While returning the book the client will be asked name as input after getting substantial username it bring every one of the information of acquiring books with get date and time and furthermore get the return date and time. Then, at that point the client should pay certain fine if the customer is late for returning books, if not customer will get certain message and bring book back. At last they get message and the information will again be put away in the message record with details like name, date, book name, author name, price, etc. What's more, soon after the interaction end amount of the book will be included the BookList.

```
       Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4:3

Please, Enter the name of borrower: Tsunade
               Library management system
                 Borrowed By: Tsunade Uzumaki
Date: 2021-09-09    Time:11:34:46.597313

S.N.      Bookname              Authorname
1.     The Christmas Pig       JK Rowling
2.     The Bench       Meghan Markle

Date:  2021-09-09
Time:  11:35:14.570381
Rate of books borrowed:  $5.0
Is the book return date terminated already?
Press Yes(Y) or No(N).
Y
How long was the book returned late?
3
Total fine: $14.0
In upcoming days submit your book on time. Thank you!
```

Figure 14: Screenshot of return program

*Return-Tsunade - Notepad

File Edit Format View Help

```
            Library Management System
               Returned By: Tsunade
          Date: 2021-09-09    Time:13:29:01.949002

S.N.            Bookname                        Price
2            The Christmas Pig                   $2
4            The Bench                           $3
Fine: $9
Total: $14.0
```

Figure 15: Screenshot of creation of text file of return process

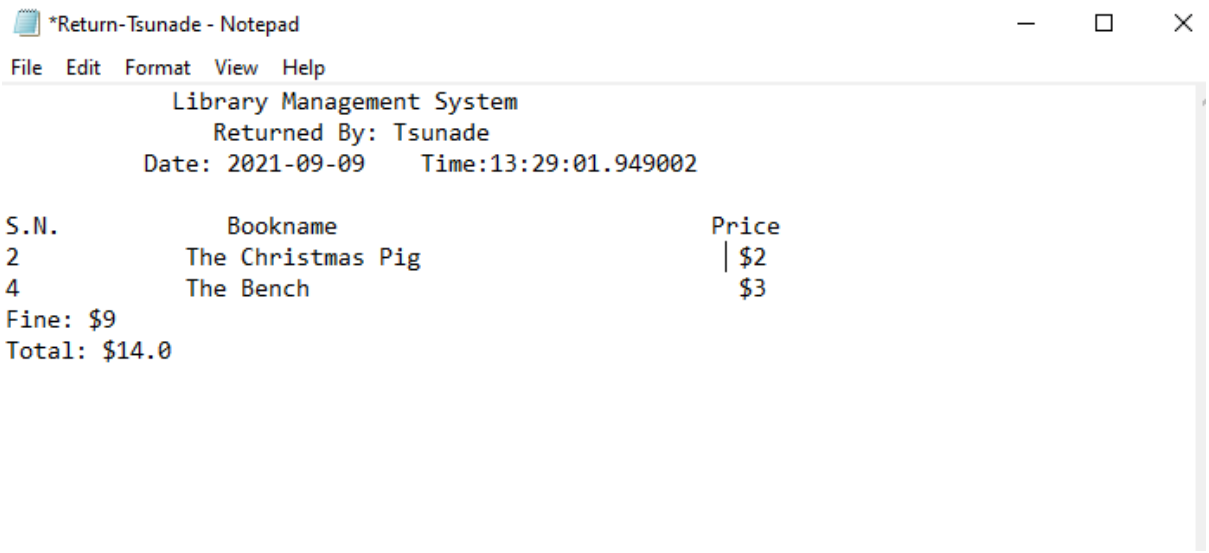

Figure 16: Screenshot of opening text and show the bill

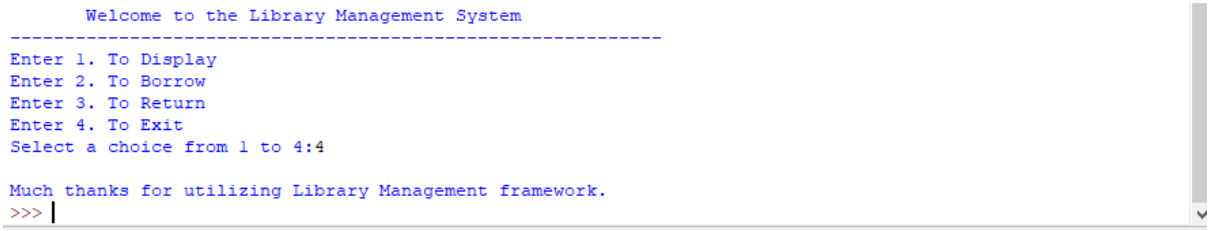

Figure 17: Screenshot of program displaying the termination

BookList.txt

Booklist is a text document. Text document stores data in a text composed structure. Additionally, rundown of books are composed and put away in the BookList.txt record. It gives data just as different codes in the python can access. So that there won't be any sort of wreck and inconveniences with our code in one hand likewise it tends to be gotten to with appropriate and complete data by the codes in the python.

Testing

Testing is the way toward executing a program or application to discover its blunder and to perform effectively so a product ought to be error-free.

In simple word, testing is a strategy for discovering how well the program functions. In different terms, testing communicates what level of information or skill has been procured. All in all, testing is utilized at significant checkpoints in the general cycle to decide if objectives are being met.

Following are the test result:

Test 1 – Show implementation of try, except which provide invalid input and show message.

Test no:	1
Objectives:	To show the implementation of try and catch method which will afterward provide invalid input and show message.
Action:	String data type was placed instead of int datatype.
Expected Result:	A message saying please input as suggested will appear.
Actual Result:	A message saying please input as suggested appears.
Conclusion:	The test is successful.

Table 1: Test 1

Output:

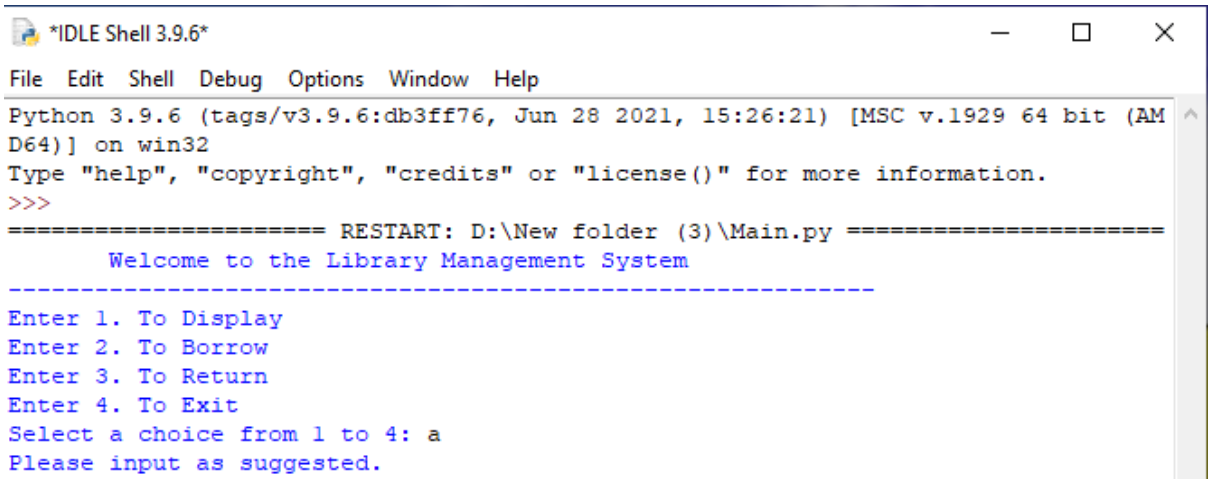

Figure 18: Screenshot of providing invalid input and show message

Test 2 – Selection borrow and return option

a. Provide negative value as input
b. Provide non existed value as input.

Test no:	2(a)
Objectives:	To provide negative value as input.
Action:	Negative value was entered while selecting a choice from 1 to 4.
Expected Result:	Please, enter a valid number from 1 to 4 will appear.
Actual Result:	Please, enter a valid number from 1 to 4 appears.
Conclusion:	The test is successful.

Table 2: Test 2(a)

Output Result:

```
       Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4: -2

Please enter a valid number from 1 to 4.
```

Figure 19: Screenshot of providing negative value as input.

Test no:	2(b)
Objectives:	To provide non existed value as input.
Action:	Non existed value was entered while choosing a book.
Expected result:	A message saying please choose book according to their number appears
Actual result:	A message saying please choose book according to their number appears.
Conclusion:	The test is successful.

Table 3: Test 2(b)

Output:

```
       Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4: 2

Please,enter the first name of the borrower: Tsunade
Please,enter the last name of the borrower: Uzumaki
Date:  2021-09-09
Time:  14:55:35.701908
Please select an alternatives below:
Enter 0 to borrow book My life and struggle
Enter 1 to borrow book The Christmas Pig
Enter 2 to borrow book Whereabouts
Enter 3 to borrow book The Bench
Enter 4 to borrow book Names of the Women
Enter 5 to borrow book Harry Potter
Enter 6 to borrow book Start With Why
8

Please choose book according to their number.
```

Figure 20: Screenshot of providing non existed value as input.

Test 3 – File generation of borrow

a. Show complete borrow process in the shell
b. Finally show the borrow note in txt file

Test no:	3(a)
Objectives:	To show the complete borrow process in the shell
Action:	The complete borrow process program was executed.
Expected result:	The program will run effectively.
Actual result:	The program runs without any kind of error messages.
Conclusion:	The test is successful.

Table 4: Test 3(a)

```
      Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4:2

Please,enter the first name of the borrower: Tsunade
Please,enter the last name of the borrower: Uzumaki
Date:  2021-09-09
Time:  15:21:00.862492
Please select an alternatives below:
Enter 0 to borrow book My life and struggle
Enter 1 to borrow book The Christmas Pig
Enter 2 to borrow book Whereabouts
Enter 3 to borrow book The Bench
Enter 4 to borrow book Names of the Women
Enter 5 to borrow book Harry Potter
Enter 6 to borrow book Start With Why
1
Book is accessible in our store.
Do you wish to acquire more books? Anyway you cannot aquire same book twice. Enter Y(Yes) or N(No).Y
Please,select an option below:
Enter 0 to borrow book My life and struggle
Enter 1 to borrow book The Christmas Pig
Enter 2 to borrow book Whereabouts
Enter 3 to borrow book The Bench
Enter 4 to borrow book Names of the Women
Enter 5 to borrow book Harry Potter
Enter 6 to borrow book Start With Why
3
Book is accessible in our store.
Do you wish to acquire more books? Anyway you cannot aquire same book twice. Enter Y(Yes) or N(No).N
Thank you for getting books from us.
```

Figure 21: Screenshot of complete borrowing process in shell

Test no:	3(b)
Objectives:	To show the borrow note in the txt file.
Action:	A txt file is created where all the data will be stored and the whole code of borrow module was run.
Expected result:	Data will be saved in the txt file after running the program.
Actual result:	Data was saved in the txt file after running the program.
Conclusion:	The test is successful.

Table 5: Test 3(b)

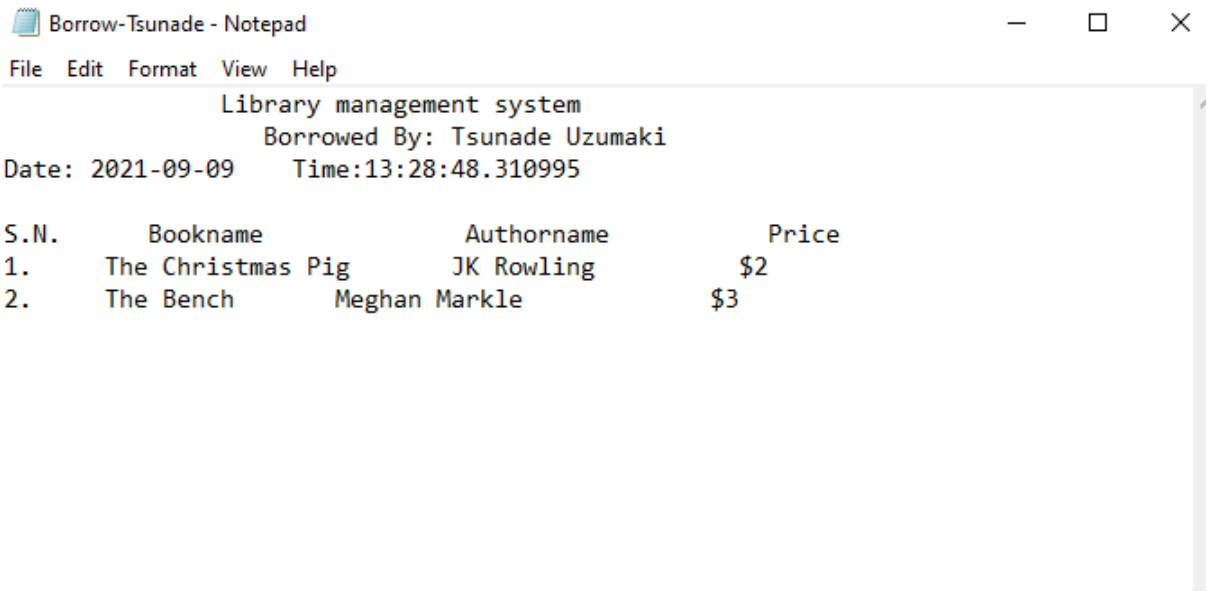

Figure 22: Screenshot of borrow note in txt file

Test 4 – File generation of return

a. Show the complete return process in the shell
b. Finally show the return note in the txt file

Test no:	4(a)
Objectives:	To show the complete return process in the shell
Action:	The complete return process program was executed.
Expected result:	The program will run effectively.
Actual result:	The program runs without any kind of error messages.
Conclusion:	The test is successful.

Table 6: Test 4(a)

```
      Welcome to the Library Management System
------------------------------------------------------------
Enter 1. To Display
Enter 2. To Borrow
Enter 3. To Return
Enter 4. To Exit
Select a choice from 1 to 4: 3

Please, Enter the name of borrower: Tsunade
               Library management system
                  Borrowed By: Tsunade Uzumaki
Date: 2021-09-09    Time:15:21:00.868633

S.N.      Bookname              Authorname           Price
1.     The Christmas Pig       JK Rowling          $2
2.     The Bench       Meghan Markle            $3

Date:  2021-09-09
Time:  15:55:18.969705
Rate of books borrowed:  $5.0
Is the book return date terminated already?
Press Yes(Y) or No(N).
Y
How long was the book returned late?
3
Total fine: $14.0
In upcoming days submit your book on time. Thank you!
```

Figure 23: Screenshot of complete return process in shell

Test no:	4(b)
Objectives:	To show the return note in the txt file.
Action:	A txt file is created where all the data will be stored and the whole code of return module was run.
Expected result:	Data will be saved in the txt file after running the program.
Actual result:	Data was saved in the txt file after running the program.
Conclusion:	The test is successful.

Table 7: Test 4(b)

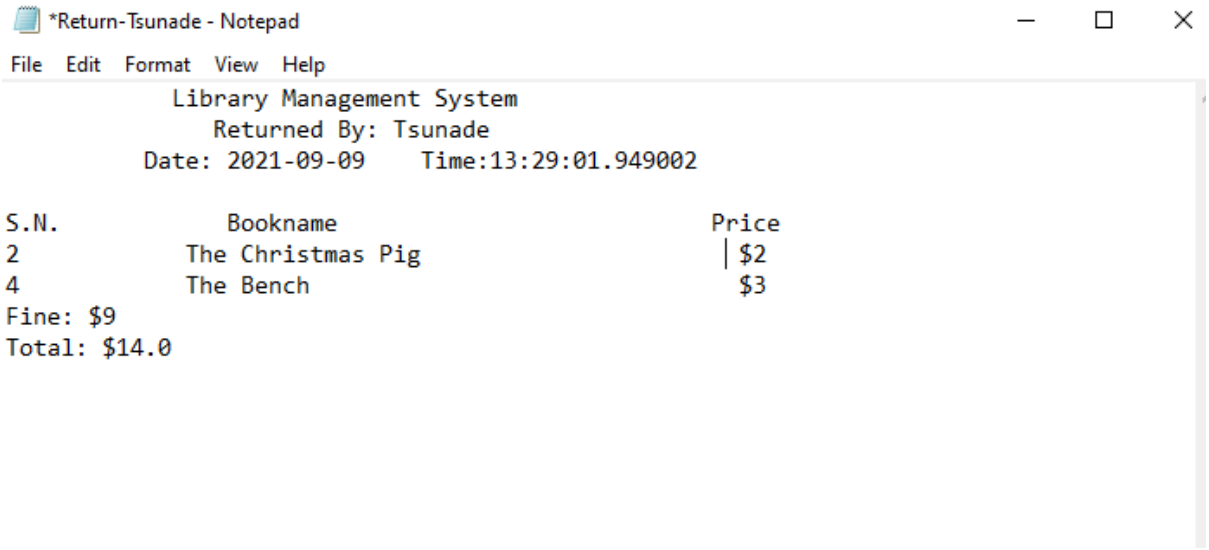

Figure 24: Screenshot of return note in txt file

Test 5 – Show the update in stock

a. Show the quantity being deducted while borrowing the book.
b. Show the quantity being added while returning the book.

Test no:	5(a)
Objectives:	To show the quantity being deducted while borrowing the book.
Action:	Book was borrowed by a client.
Expected result:	The number of borrowed books will be reduced from the total number of books available.
Actual result:	The number of books available in the store was deducted.
Conclusion:	The test is successful.

Table 8: Test 5(a)

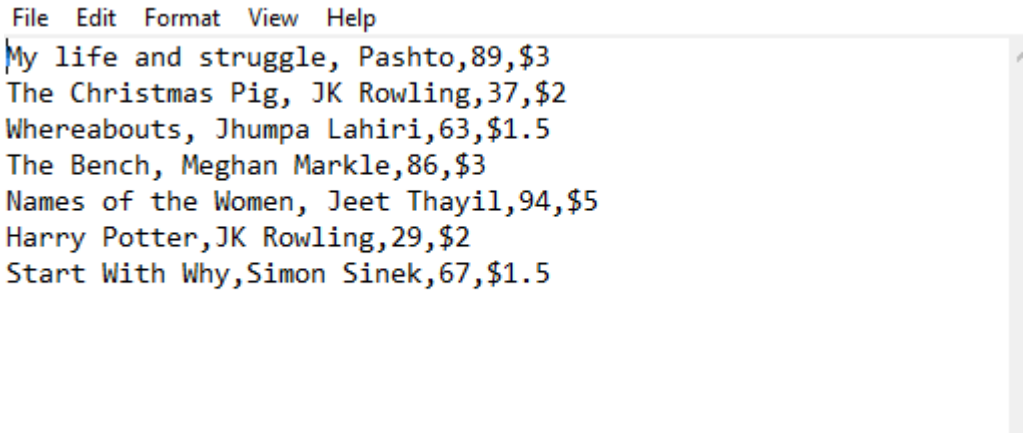

Figure 25: Screenshot of quantity being deducted while borrowing books

Test no:	5(b)
Objectives:	To show the quantity being added while returning the book.
Action:	Book was returned by a client.
Expected result:	The number of books will be added.
Actual result:	The number of books is added.
Conclusion:	The test is successful.

Table 9: Test 5(b)

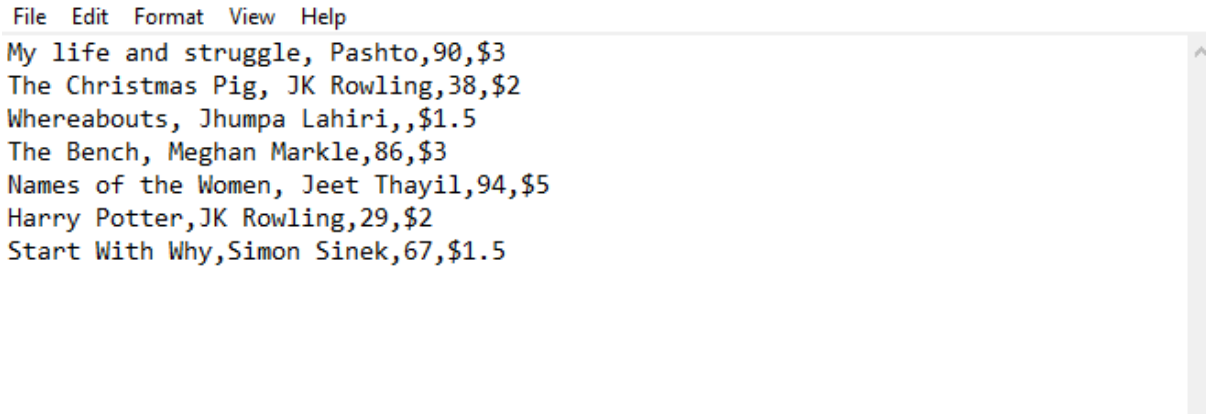

Figure 26: Screenshot of quantity being added while returning the book

Conclusion

To whole up, this coursework was relegated to us for developing a library management system which stores the details of the library. While doing this coursework I needed to confront the challenged particularly in the coding segment as numerous mistakes occurred and as I was new to the theme too I was exceptionally confounded. I was likewise somewhat confused in regards to the algorithm and pseudocode. Yet in order to conquer the confusion and troubles, a lot of explores were finished with respect to the applicable topics. Cent percent exertion was given to finish the undertaking allocated in this topic. Research was done in regards to python programming from the beginning and it was executed in this coursework which helped a lot to achieve the tasks. Regular interaction with instructors, consistent exertion and a lot of explores, going through the lecture slides and surfing in the web assisted with acquiring sound information about python and its purpose. I likewise, became more acquainted with about the various methods which are utilized in the program, I knew about various terms alongside their capabilities.

Despite the fact that it was challenging and troublesome from the outset, the coursework was finished on schedule and submitted on time as well. I had the chance to learn numerous new things and themes which I knew about. It was decent encounter to foster a program utilizing python and it was enjoyable to chip away at this project as well.

Appendix

BookList

My life and struggle, Pashto,90,$3

The Christmas Pig, JK Rowling,38,$2

Whereabouts, Jhumpa Lahiri,,$1.5

The Bench, Meghan Markle,86,$3

Names of the Women, Jeet Thayil,94,$5

Harry Potter,JK Rowling,29,$2

Start With Why,Simon Sinek,67,$1.5

Codes of DateTime

```
def getDate():
    import datetime
    now = datetime.datetime.now
    print("Date: ",now().date())
    return str(now().date())

def getTime():
    import datetime
    now = datetime.datetime.now
    print("Time: ",now().time())
    return str(now().time())
```

Codes of ListSplit

```
def ListSplit():
    global bookname
    global authorname
    global quantity
    global price
    bookname = []
    authorname = []
    quantity = []
    price = []
    with open("BookList.txt","r") as z:
        lines = z.readlines()
        lines = [x.strip('\n') for x in lines]
        for i in range(len(lines)):
            q = 0
            for a in lines[i].split(','):
                if(q == 0):
                    bookname.append(a)
                elif(q == 1):
                    authorname.append(a)
                elif(q == 2):
                    quantity.append(a)
                elif(q == 3):
                    price.append(a.strip("$"))
```

```
            q += 1
```

Codes of Borrow

```
import ListSplit
import DateTime


def borrowbook():
    success = False
    while(True):
        Firstname = input("Please,enter the first name of the borrower: ")
        if Firstname.isalpha():
            break
        print("Please, enter the valid input.")
    while(True):
        Lastname = input("Please,enter the last name of the borrower: ")
        if Lastname.isalpha():
            break
        print("Please, enter the valid input.")


    t = "Borrow-"+Firstname+".txt"
    with open(t,"w+") as z:
        z.write("            Library management system\n")
        z.write("              Borrowed By: "+ Firstname+" "+Lastname+"\n")
```

```
        z.write(            "Date: " + DateTime.getDate()+"    Time:"+
DateTime.getTime()+"\n\n")
        z.write("S.N.      Bookname            Authorname          Price\n")



    while success == False:
        print("Please select an alternatives below:")
        for i in range(len(ListSplit.bookname)):
            print("Enter", i, "to borrow book", ListSplit.bookname[i])


        try:
            a = int(input())
            try:
                if(int(ListSplit.quantity[a])>0):
                    print("Book is accessible in our store.")
                    with open(t,"a") as z:
                        z.write("1.     "+ ListSplit.bookname[a]+"
"+ListSplit.authorname[a]+"          "+"$"+ListSplit.price[a]+"\n")


                    ListSplit.quantity[a] = int(ListSplit.quantity[a])-1
                    with open("BookList.txt","w+") as z:
                        for i in range(7):

z.write(ListSplit.bookname[i]+","+ListSplit.authorname[i]+","+str(ListSplit.quantity[i])+"
,"+"$"+ListSplit.price[i]+"\n")
```

```
            #code for borrowing multiple books
            loop = True
            count = 1
            while loop == True:
                choice = str(input("Do you wish to acquire more books? Anyway you cannot acquire same book twice. Enter Y(Yes) or N(No)."))
                if(choice.upper() == "Y"):
                    count = count + 1
                    print("Please,select an option below:")

                    for i in range(len(ListSplit.bookname)):
                        print("Enter", i, "to borrow book", ListSplit.bookname[i])

                    a = int(input())
                    if(int(ListSplit.quantity[a])>0):
                        print("Book is accessible in our store.")
                        with open(t,"a") as z:
                            z.write(str(count) +".     "+ ListSplit.bookname[a]+"
"+ListSplit.authorname[a]+"            "+"$"+ListSplit.price[a]+"\n")

                        ListSplit.quantity[a] = int(ListSplit.quantity[a])-1
                        with open("BookStock.txt","w+") as z:
                            for i in range(7):
```

```
z.write(ListSplit.bookname[i]+","+ListSplit.authorname[i]+","+str(ListSplit.quantity[i])+"
,"+"$"+ListSplit.price[i]+"\n")
                                success=False
                        else:
                            loop = False
                            break


                    elif (choice.upper() == "N"):
                        print ("Thank you for getting books from us.")
                        print("")
                        loop = False
                        success = True


                    else:
                        print("Please enter a valid input")


                else:
                    print("This book is not accessible in our store")
                    borrowBook()
                    success = False


            except IndexError:
                print("")
                print("Please choose book according to their number.")
```

```
        except ValueError:
            print("")
            print("Please pick as proposed.")
```

Codes of Return

```
import ListSplit
import DateTime
def returnbook():
    name = input("Please, Enter the name of borrower: ")
    a = "Borrow-" + name + ".txt"
    try:
        with open(a,"r") as z:
            lines = z.readlines()
            lines = [a.strip("$") for a in lines]

        with open(a,"r") as z:
            data = z.read()
            print(data)
    except:
        print("The borrower name is incorrect.")
        returnborrow()

    b = "Return-" + name + ".txt"
    with open(b,"w+")as z:
```

```
        z.write("           Library Management System \n")
        z.write("             Returned By: "+ name+"\n")
        z.write("         Date: " + DateTime.getDate()+"    Time:"+
DateTime.getTime()+"\n\n")
        z.write("S.N.          Bookname                  Price \n")



    total = 0.0
    for i in range(7):
        if ListSplit.bookname[i] in data:
            with open(b,"a") as z:
                z.write(str(i+1)+"    "+ListSplit.bookname[i]+"    $"+ListSplit.price[i]+"\n")
                ListSplit.quantity[i]=int(ListSplit.quantity[i])+1
            total += float(ListSplit.price[i])


    print("Rate of books borrowed: "+" "+"$"+str(total))
    print("Is the book return date terminated already?")
    print("Press Yes(Y) or No(N).")


    stat = input()
    if(stat.upper() == "Y"):
        print("How long was the book returned late?")
        day = int(input())
        fine = 3 * day
        with open(b,"a")as z:
```

```
            z.write("Fine: $"+ str(fine)+"\n")
            total = total+fine
            print("Total fine: "+ "$"+str(total))
        with open(b,"a")as z:
            z.write("Total: $"+ str(total))
            print("In upcoming days submit your book on time. Thank you!")
            print("")

        with open("BookList.txt","w+") as z:
            for i in range(7):

z.write(ListSplit.bookname[i]+","+ListSplit.authorname[i]+","+str(ListSplit.quantity[i])+"
,"+"$"+ListSplit.price[i]+"\n")
    else:
        print("Thank you for submitting the book on time.")
        print("")
```

Bibliography

Anon., n.d. *edureka.co.* [Online]
Available at: https://www.edureka.co/blog/data-structures-in-python/
[Accessed 08 09 2021].

Anon., n.d. *geeksforgeeks.* [Online]
Available at: https://www.geeksforgeeks.org/python-dictionary/
[Accessed 08 09 2021].

Anon., n.d. *tutorialspoint.* [Online]
Available at: https://www.tutorialspoint.com/python_data_structure/python_sets.htm
[Accessed 08 09 2021].