LONDON METROPOLITAN UNIVERSITY

islington college
(इस्लिङ्टन कलेज)

Module Code & Module Title

CC4002NA Information Systems

Assessment Weightage & Type

20% Individual Coursework

Year and Semester

2018-19 Autumn

Student Name: Animesh Gautam

London Met ID:

College ID:np01cp4a180083

Assignment Due Date: January 18, 2019

Assignment Submission Date: January 18, 2019

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 marks of zero will be awarded.

Proposal

This proposal is all about developing library management system. This coursework was given to us as an individual task which shows the transaction(borrow/return) that takes place in library management system. The coursework was given in the 8th week and is required to be complete and submitted by 11th week.

- **Purpose**

  The purpose of this coursework is to write a program in python to build a library management system, algorithm and pseudocode for the program. The library management system performs the simple transaction like borrow and return of the books taking the information of book borrower, borrowed book, quantity and price and write it into a file.

- **Problem Statement**

  This program is written for controlling\recording the transaction of a certain quantity of books like 10 or 20.This library management system is for a small library with 10 or 20 books. But this system would not be applicable for a library with huge amount of data and books which is the problem that might be faced.

- **Aims and Objectives**

  The main aim of this coursework is to carry out all the task given in the best way possible by using different functions and data structures. Our objective is to go through our lecture slide, plenty of study, do some research, hard work and dedication to complete the coursework in best way and within given period of time.

- **Proposed approach**

  For carrying out all the task without any error proper research and method of testing would be done. Flowchart would to be drawn to show the way the code would be executed and organized. Pseudocode would be written to prepare rough scratch of the program. Suitable data structure would be used. Algorithm would be written to figure out the way code should be to achieve the objective of program.

- **Target Audience**

This project may be helpful for students, small libraries, teachers, programmers, and to them who have some knowledge of codes, python and understand the way the program gets executed and performs tasks.

- **Hardware and Software requirements**

  There is no restriction on hardware. The program can run even in low end hardware. But for software there must be python idle installed in the computer system.

- **Activity description and timeline**

information collection	1/2/2019	1/5/2019	4
Coursework started	1/6/2019	1/18/2019	12
Programming	1/6/2019	1/16/2019	10
Documentation	1/16/2019	1/18/2019	2
Testing	1/17/2019	1/18/2019	1

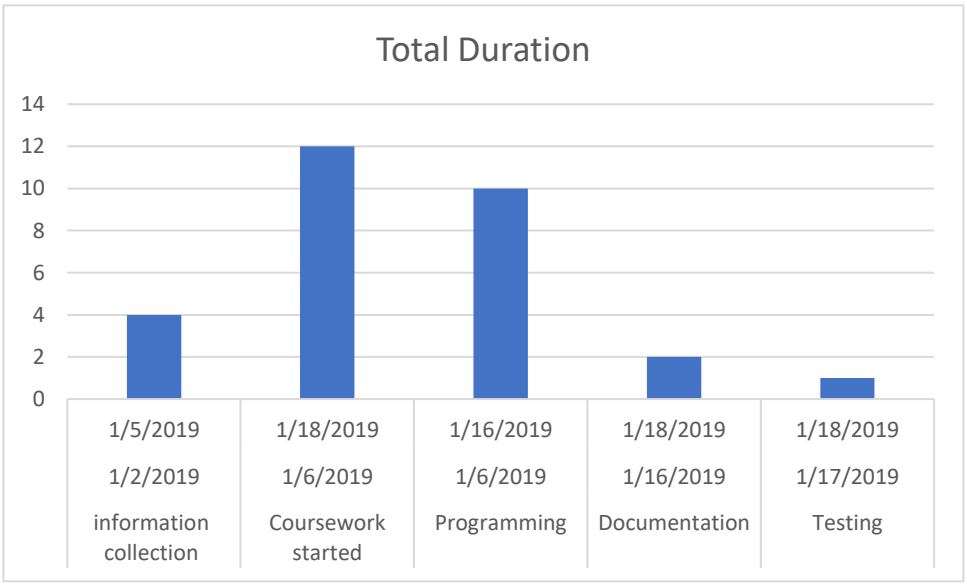

Figure 1-Gantt chart

Contents:

Introduction:

Discussion and Analysis:

Algorithm:

Data types and Data structure:

Program:

Testing:

Research:

Conclusion:

Bibliography:

Introduction

This project is about a library management system. It keeps the records of the books borrowed or returned. This project was not easy as it seems. Several data types and data structure called list, 2d list were needed for developing the project. In this project an input I is asked whether to borrow the books, return the books or exit. If user wants to borrow book, then his/her name is asked which book he /she wants to borrow. After the user is done with borrowing then the quantity is reduced from the list where the list of books was kept, and bill is printed. Detail of user is kept in a txt file and a receipt is printed in a txt file which have the same name as of user. If user wants to return books, then his/her name is asked and checks whether the user had borrowed books or not. If user had borrowed any books, then the books he borrowed are displayed. User is asked which book he want to return and a msg is printed saying book has been returned. After this transaction the quantity of borrowed books is added to the list and list gets updated. The features of the program is that every time the book is borrowed or returned, the txt file where the information of borrower is kept, gets updated and a receipt is written a txt file which is named after the name of user. The program will be able to do the transaction of borrowing and returning.

Discussion and analysis

The tasks assigned to complete coursework was not easy as it looks. It was very difficult to develop the program. The program was developed and designed using different function. Different data types like strings, integers, float were used. Among different data structures, list and 2d list were only used in this program as I feel lists can be easily iterated and used easily. Function like date was used to give the date. Different while loops, if loops were also used to check the conditions. The program was designed in such a way that first, options are shown whether to borrow, return or exit, then if user wants to borrow then, two inputs are asked to user firstly book no, secondly user name. Then the book gets displayed and transaction is completed. If user wants to return then, user name is asked as input and checks whether the user has borrowed any books. If borrowed the book is displayed, asked which book to return and gets returned. All these tasks were successfully complete using python. Python was chosen as a programming language to write a program.

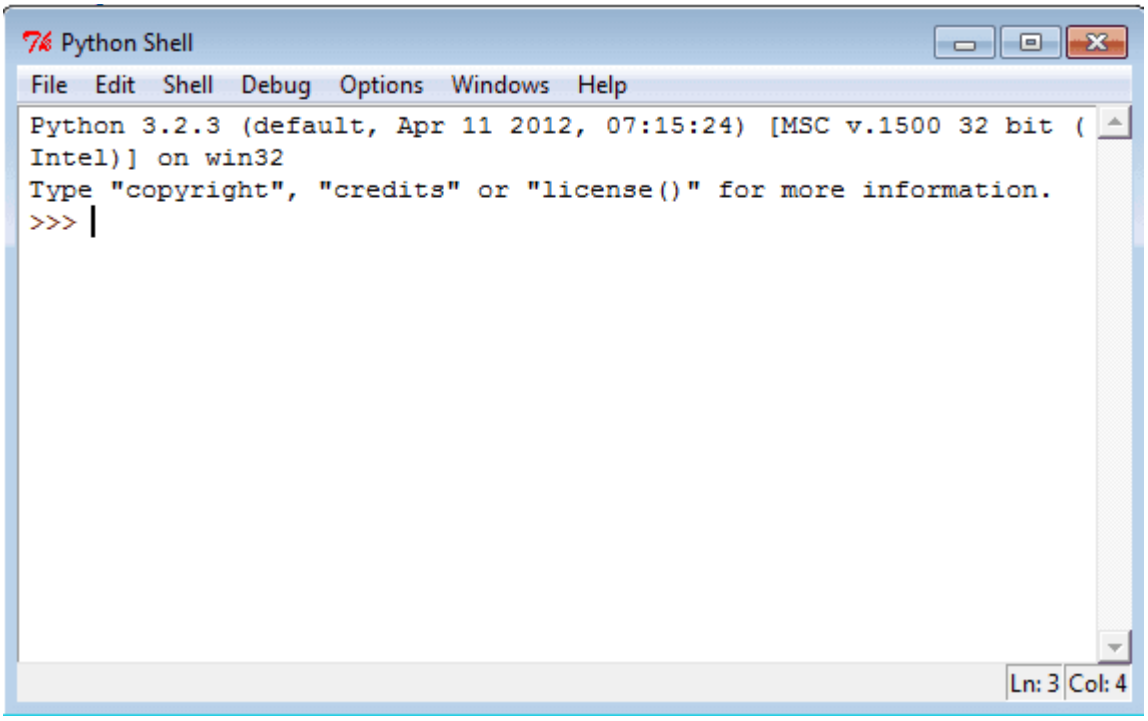

Figure 2-Python IDLE (w3resource, 2018) (Mengri, 2017)

Algorithm

An algorithm is a step wise process of solving a problem. Writing algorithm is the first step for writing a program. In programming, algorithm is the set of well-defined instruction in sequence to solve a problem. The algorithm written for the coursework are as follows:

STEP 1 : Start

STEP 2 : Displays the options available.

STEP 3 : A new variable named user_selection is declared which takes the input.

STEP 4 : Checks if user_selection==1, if the condition is true, then goes to step 5. If the condition is not true, then checks if user-selection==2, if the condition is true then goes to step 8 .If the condition is not true again, then checks if user_selection==0,if the condition is true, then goes to step 14. If the condition is not true, then goes to step 14.

STEP 5 : Calls the function to borrow book. Goes to step 6.

STEP 6 : Display list of books. Go to step 7.

STEP 7 : Ask the bookno, name and quantity. Goes to step 8.

STEP 8 : Reduce quantity from list of books, overwrite and print bill. Goes to step 14.

STEP 9 : Calls the function to return the book. Goes to step 10

STEP 10 : Ask name. Goes to step 11.

STEP 11 : Display book borrowed by user. Goes to step 12.

STEP 12 : Ask bookno, quantity. Goes to step 13.

STEP 13 : Add quantity to list of books and overwrite. Goes to step 14.

STEP 14 : End

Flowchart

Flowchart is a graphical method of designing or diagrammatic representation of algorithm with help of symbols which have their own meaning. It represents an algorithm of process and also makes debugging process easier. Flowcharts have many advantages for programmers.

Pseudocode

Pseudocode is a simple way of writing program so that it is understandable by most of the people. Pseudocode cannot be compiled or run. It just specifies the steps required to complete program and reduce complexity. Pseudocode for the coursework are as follows:

algorithm library_management_system

```
selection=True
while selection==True:
    input user_selection
    if user_selection==1 then
        Function borrow_books()
            input SNO, user_name, quantity
            declare variables book_borrowed, book_author, tot_amount, list, realsno
            list=read list of books.txt file and stores data of file in it
            realsno=SNO-1
            for i=0 to len(list)
                for j=0 to len(list[i])
                    if realsno==list[i] then
                        book_borrowed.append list[i][0]
                        book_author.append list[i][1]
                        tot_amount.append list[i][3]*quantity
                    end if
                end for
            end for
            output user_name, book_borrowed, book_author, tot-amount
```

```
            end function
        selection==False

    if user_selection==2 then
        Function return_books()
            input user_name
            declare list, book_return, book_author_return, quantity_return,
            message
            list=read borrow.txt file and store data of file in it
            for i=0 to len(list)
                for j=0 to len(list[i])
                    if user_name==list[i][0] then
                        book_return.append list[i][1]
                        book_author_return.append list[i][2]
                        quantity_return.append list[i][3]
                    end if
                end for
            end for
            output book_return, book_author_return, quantity_return
            input book_no
            message="Book has been returned"
            output message
        end Function
selection=False
```

(Take10 Minutes, 2015)

Data structures

There are different types of data types and data structures available in python. The different types of data types are integer, string, Boolean, float etc and different types of data structures are list, tuples, dictionaries, and sets. These data types and data structures have their own property and perform various operation. These are the one of the most important part in python. Among these the data types and data structures we used are:

1. Integer(int)
2. String(str)
3. List

1) Integer(int)
   Integer is one of the data types in which numeric values are stored. It can be stored in a variable. For example:
   a=6
   b=2
   In coursework integers are used when any numeric values are to be stored so that it can be used to perform any numeric calculation. Integers are used in these cases because string cannot perform numeric calculations like +, - , * , %.

2) String(str)
   String is one of the data types in which letters, numbers, text and symbols are stored. String data types can be converted to other data types. It can also be stored in a variable. For example:
   Name=python
   City=Kathmandu
   The length of string can also be calculated by using len function. For example:
   len(Name)=6
   len(City)=9

In coursework strings are used when any numeric value or letters or text is to be sorted such that no numeric calculations have to be performed and if the length is needed.

3) List
   Lists are ordered sequence of information denoted by square brackets [], and accessible by index. Lists contains elements which are mutable that it their structure and content can be changed. List indices start at 0 and support negative indexing too, starting at -1from the end. Assigning to an element at an

index changes the value and len function can be used to returns the length of list. Different operations like adding element, concatenation (to combine lists together), adding a list of number to the end, deleting elements at specific index, removing elements at the end of the list, and remove a specific element can be done in lists. We also have a 2D lists as a type of list which is 2-dimensional lists. 2D lists is simply a list of lists where each element is again a list. In 2D lists each element have 2 indices. Lists are efficiently used when we have to store data and the data can be changed, add, delete or modify anytime. For example:

If we have data in lists such that l=[45,60,30,25] and if we have to add any data in the list then it can be done by using operation l.append(78), then it will print l=[45,60,30,25].

Example of 2D lists:
A=[[3,4,5],[7,8,9]]

In coursework list are used when many data are to be stored and that data can be needed at any moment. So in order to access these data list are used .2d list are used in coursework instead of other data structure because the values in 2d list can be easily accessed by giving index position.

Program

This coursework was given to us to develop a library management system that records each transaction. To complete the task lots of research was done, Flowchart, gantt chart, pseudocode, coding was done. In coding the codes were divided into 9 modules each containing different functions with different purpose. The modules are as follows;

1. List of Boks.txt
2. Main.py
3. readfile.py
4. Keepingin2dlist.py
5. display.py
6. borrow_books.py
7. return_books.py
8. function_used.py
9. working_with_file.py

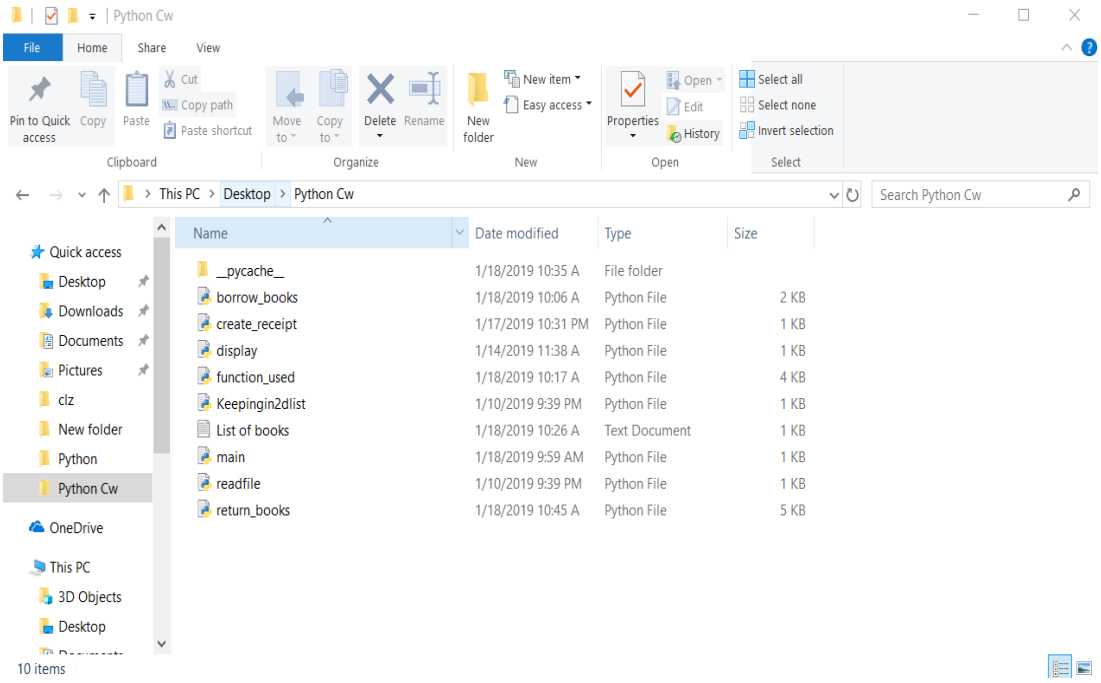

Figure 3-Modules

1. List of books.txt
   This is the file which contains the list of books available in the library with book name, author name, quantity and price.

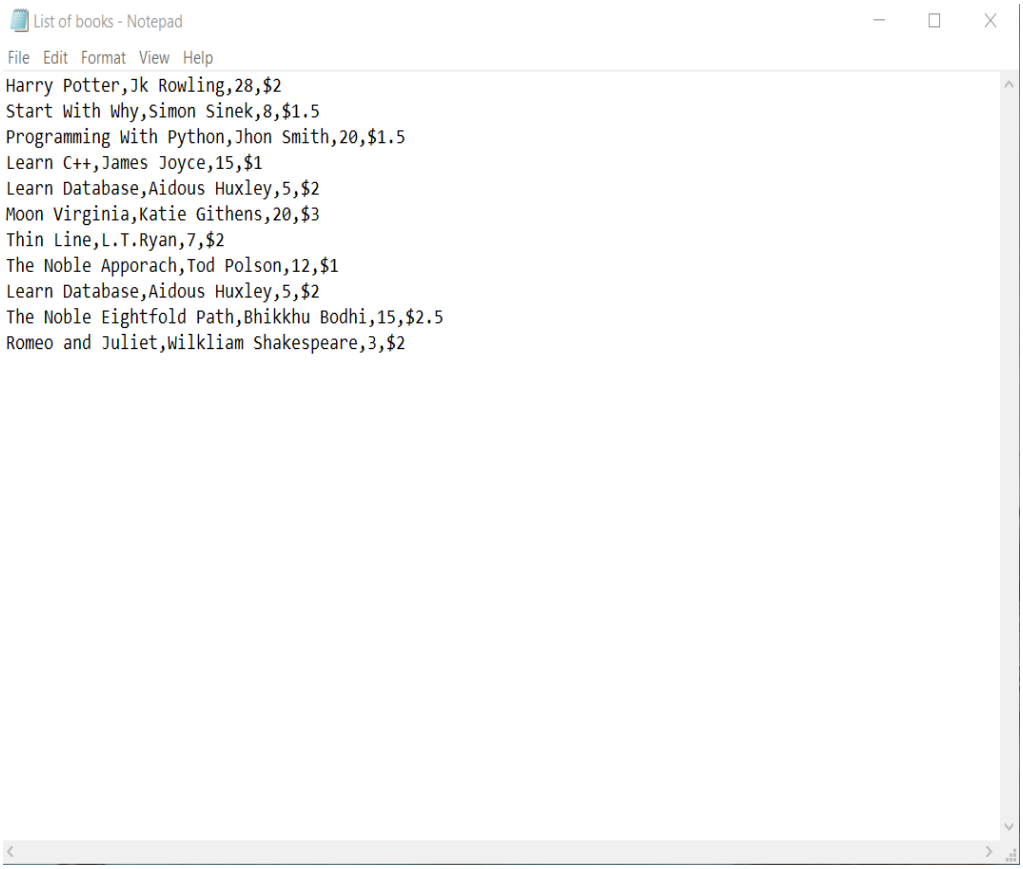

Figure 4-List of books.txt file

2. Main.py
   This is main file of our module. All the functions are called inside this module . This file is to be compiled and run.

3. readfile.py
   In this file a function is written that reads the data from list of books, store it in a variable and return it.

4. Keepingin2dlist.py

   In this file a function is written in which return value of readfile is passed as a parameter and converts it in 2d list. A new variable is created that stores the 2d list and return it

5. display.py
   In this file a function is created that takes 2d list as parameter and display it in a proper sequential manner.

6. borrow_books.py
   In this file different functions are made which have different purpose that helps us to store and print data during the borrowing transaction.
   Different data types and data structures were used in this file.

7. return_books.py
   In this file different functions are made so to get record from data, store it and print it. Different data types and data structures were used in this file.

8. function_used.py
   In this file different functions are created that are used by borrow_books and return_books file. Different data types and data structures were used in this file.

9. working_with_file.py

   In this file different function were created to work with txt file.

Testing

```
1.Do you want to borrow the books?
2.Do you want to return the book?
0.Exit
Choose the option 1 or 2 or 0:1
                          Welcome to the Library
                      Here are the list of the Books

-----------------------------------------------------------------------------------------------
S.NO            Book Available                Author                Quantity        Price
-----------------------------------------------------------------------------------------------
1               Harry Potter                  Jk Rowling            26              $2

2               Start With Why                Simon Sinek           8               $1.5

3               Programming With Python       Jhon Smith            20              $1.5

4               Learn C++                     James Joyce           15              $1

5               Learn Database                Aidous Huxley         5               $2

6               Moon Virginia                 Katie Githens         20              $3

7               Thin Line                     L.T.Ryan              7               $2

8               The Noble Apporach            Tod Polson            12              $1

9               Learn Database                Aidous Huxley         5               $2

10              The Noble Eightfold Path      Bhikkhu Bodhi         15              $2.5

11

-----------------------------------------------------------------------------------------------
Which book do you want to borrow??Please press S.No to borrow book or Press 0 to exit=2
Enter your full name:Animesh Gautam
The Book you borrowed is: Start With Why
Author: Simon Sinek
Enter quantity you want,Less than 2=2
The total amount: 3.0
Do you want to brorwor another book?y/nn
Thank you for letting us serve you
```

```
The total amount: 3.0
Do you want to brorwor another book?y/nn
Thank you for letting us serve you


Here is your Bill
--------------------------------------------------
 Book                             Quantity
--------------------------------------------------
Harry Potter                      2
Start With Why                    2
--------------------------------------------------
 Total Amount:                    7.0
--------------------------------------------------
```