Informatics practices project
2021-22
Bal Bhawan School

Library Management System

SUBMITTED BY:

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GUIDED BY:

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<u>CERTIFICATE</u>

THIS IS TO CERTIFY THAT AYAN KHAN OF CLASS 12TH SCIENCE OF BAL BHAWAN SCHOOL, SHAMLA HILLS, BHOPAL HAS COMPLETED HIS INFORMATICS PRACTICES PROJECT FOR THE SESSION 2021-22 ON THE TOPIC "LIBRARY MANAGEMENT SYSTEM" USING PYTHON – MYSQL RDBMS TECHNOLOGIES.

I CERTIFY THAT THE PROJECT IS IN ACCORDANCE WITH THE GUIDELINES ISSUED BY CENTRAL BOARD OF SECONDARY EDUCATION, INDIA.

EXTERNAL   INTERNAL   PRINCIPAL

<u>MESSAGE</u>

IT IS A SIGN OF CREATIVE ACTIVITY AND COOPERATION, THAT OUR STUDENTS, GUIDED AND INSPIRED BY THE TEACHERS ARE PREPARING THEMSELVES NOT ONLY FOR A BRIGHT FUTURE BUT ALSO TO BECOME A SUCCESSFUL PERSON OF CHARACTER FOR THE NATION.

 I AM DELIGHTED TO KNOW THAT AYAN KHAN OF CLASS XII – SCIENCE HAS COMPLETED HIS PROJECT ON "LIBRARY MANAGEMENT SYSTEM" WITHIN THE STIPULATED TIME PERIOD.

MRS.HUMAIRA ARIF

(PRINCIPAL)

<u>ACKNOWLEDGEMENT</u>

I owe a great many thanks to a great many people who helped and supported me during the making of this project. My deepest thanks to my teachers, **Mr. Abhishek Shrivastava & Mrs. Sudha Nair**, the guides of the project for guiding and correcting various mistakes with attention and care. They have taken pain to go through the project and make necessary correction as and when needed. I express my thanks to the respected principal Mrs. Humaira Arif of Bal Bhavan School, for extending her support. Thanks, and appreciation to all the helpful people for their support. I also extend my heartfelt thanks to my family & well-wishers for their effective encouragement, guidance, and patience throughout the project

CONTENTS

Introduction to python

What is Python?

Python is a popular programming language. It was created by Guido van Rossum, and released in 1991.

It is used for:

● web development (server-side),

● software development,

● mathematics,

● system scripting.

What can Python do?

● Python can be used on a server to create web applications.

● Python can be used alongside software to create workflows.

● Python can connect to database systems. It can also read and modify files.

● Python can be used to handle big data and perform complex mathematics.

● Python can be used for rapid prototyping, or for production-ready software development.

Why Python?

● Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc.).

● Python has a simple syntax similar to the English language.

● Python has syntax that allows developers to write programs with fewer lines than some other programming languages.

● Python runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that prototyping can be very quick.

● Python can be treated in a procedural way, an object-oriented way or a functional way.

Good to know

● The most recent major version of Python is Python 3, which we shall be using in this tutorial. However, Python 2, although not being updated with anything other than security updates, is still quite popular.

● In this tutorial Python will be written in a text editor. It is possible to write Python in an Integrated Development Environment, such as Thonny, Pycharm, Netbeans or Eclipse which are particularly useful when managing larger collections of Python files.

Python Syntax compared to other programming languages

● Python was designed for readability, and has some similarities to the English language with influence from mathematics.

● Python uses new lines to complete a command, as opposed to other programming languages which often use semicolons or parentheses.

● Python relies on indentation, using whitespace, to define scope; such as the scope of loops, functions and classes. Other

programming languages often use curly-brackets for this purpose.

<u>MYSQL</u>

MySQL is freely available opensource Relational Database management System (RDBMS) that uses Structured Query Language (SQL). It is downloadable from site www.mysql.org In a MySQL database, information is stored in tables. A single MySQL database can contain many tables at once and store thousands of individual records. MySQL provides you with a rich set of features that that support a secure environment for storing, maintaining, and accessing data. MySQL is a fast, reliable, scalable alternative to many of the commercial RDBMS available.

MYSQL-DATABASE-SYSTEM

My SQL database system refers to the combination of a MySQL server instance and a MySQL database. MySQL operates using client/server architecture in which the server runs on the machine containing the database and clients connect to the server over a network. MySQL is a multi-user database system, meaning several users can access the database simultaneously. The sever (MySQL server) listens for client requests coming in over the network and accesses database contents according to those requests and provides that to the clients. Clients are programs that connect to the database server and issue queries in a pre-specified format. MySQL is compatible with the standards-based SQL (Structured Query Language). The client program may contact the server programmatically (meaning a program call the server during execution) or manually.

CLASSIFICATION-OF-SQL-STATEMENTS

SQL provides many different types of commands used for different purposes. SQL commands can be divided into following categories:

(i) Data Definition Language (DDL) Commands:

Commands that allows you to perform tasks related to data definition. Ex-

➢ Creating, altering and dropping
➢ Granting and revoking privileges and roles
➢ Maintenance commands

(ii)Data Manipulation Language (DML) Commands:

Commands that allow you to perform tasks related to data manipulation. Ex:

➢ retrieval, insertion, deletion and modification of data stored in database

(iii) Transaction Control Language (TCL) Commands:

Commands that allow you to manage and control the transaction (a transaction is one complete unit of work involving many steps). Ex:

➢ making changes to database, permanent

➢ undoing changes to database, permanent

➢ creating save points

➢ setting properties for current transactions.

MySQL was created and is supported by MySQL LAB, a company based in Sweden. This company is now a subsidiary of Sun Microsystems, which holds the copyright to most of the codebase. On April 20TH, 2009 Oracle database, announc3e a deal to acquire Sun Microsystems.

The chief inventor of MySQL was Michael Widenius (a.k.a. Monty). MySQL has been named after Monty's daughter My. The

logo of **MySQL**, the dolphine, is named as "Sakila".

FRONT END

The project uses python as its FRONT END, that is it is the part where user interact. The front end basically includes input facilities through which the user interacts. Apart from the user interaction, the front end also contains database objects that form a layer between the user and BACK END.

BACK END

MySQL is used as a BACK END. It handles all database accesses through one or more servers. A Server is a special computer that is responsible for processing requests send to it. It processes all the data and query passed to it and sends result back to the front end where it is displayed to the user.

HARDWARE AND SOFTWARE SPECIFICATION

Minimum Hardware Specification of the machine to be used:

➢ P-1 Processor

➢ 32MB RAM

➢ 1.4inch color monitor

➢ 2.1GB HDD

➢ 233 MHZ CPU Clock Speed

Minimum Software Specification of the machine to be used

(tools & platforms used)

➢ Python 3.6 and above

Project Category:

This project uses GUI provided by Python and MySQL which is a RDBMS.

USER WORKING ANALYSIS

The project is developed by keeping in mind the various day to day problems faced by library workers in managing the affairs of library.

The 'library management system' is build to ease the workload of workers and it allows the user to work in a systematic way and with maximum efficiency.

As you open the application, it asks you write the task to be performed, various tasks can be performed by the application like: –

- ✓ Adding a new book or a new set of books
- ✓ Adding a record for someone who issues a book or a set of books
- ✓ Adding new members
- ✓ Removing books from the system

The application keeps record of all the books available in the database, all the books are given a particular id so as to distinguish them with each other and avoid confusion.

Various information of the book like its price, author name and the number of copies available is also stored in the system. This helps the worker/librarian to keep a track of books available in the library.

The system also has records of its users, each user's personal information like their phone number and address are also stored. Each user is assigned a unique user id which helps in identifying them.

When a user issues new book, this record is stored in the system. while issuing the book, an issue id assigned to the transaction, the system also records the user id and book id of the particular transaction these three creates a unique record. Now while returning the book the same issue id is used to identify the transaction. Once the user has returned the book this data is also stored in the system, this helps in avoiding any future confusions.
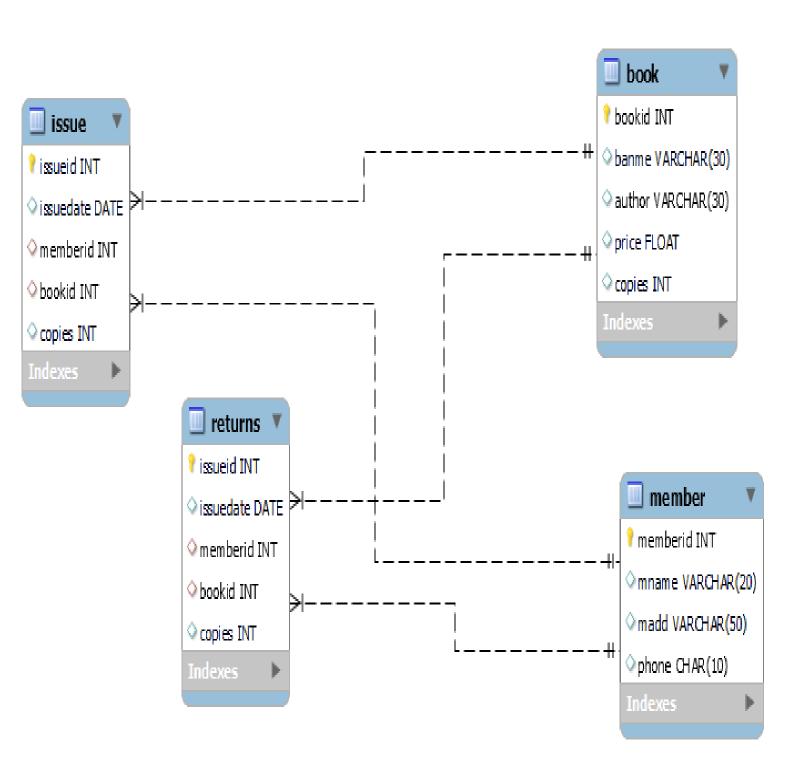
The system also records the issue date and return date.

The application can also be used to add a new member, the new user is required to give name, address, and phone number. He /she is then assigned a unique user id which helps him /her to enjoy various services (like issuing a new book) offered by the system.

The application also provides with option of removing book form the system, if the worker /librarian wants to remove a book they have to give the book id to the system, and the number of books to be removed, the system then identifies the books to be remove and perform the operation.

In conclusion, the application can be used by libraries to increase their efficiency by keeping a record of their books and members and also perform tasks with ease.

ER DIAGRAM

issue
- 🔑 issueid INT
- ◇ issuedate DATE
- ◇ memberid INT
- ◇ bookid INT
- ◇ copies INT

Indexes ▶

book
- 🔑 bookid INT
- ◇ banme VARCHAR(30)
- ◇ author VARCHAR(30)
- ◇ price FLOAT
- ◇ copies INT

Indexes ▶

returns
- 🔑 issueid INT
- ◇ issuedate DATE
- ◇ memberid INT
- ◇ bookid INT
- ◇ copies INT

Indexes ▶

member
- 🔑 memberid INT
- ◇ mname VARCHAR(20)
- ◇ madd VARCHAR(50)
- ◇ phone CHAR(10)

Indexes ▶

CODING AND SCREENSHOTS OF PROJECT

➢ PYTHON: -
1. Coding in idle

```
import mysql.connector as a
con =a.connect(
    host='localhost',
    user='root',
    passwd='ayankhan',
    database='librarymanagement',
    auth_plugin='mysql_native_password'



)



def addbook():
    n=input("enter BOOKID: ")
```

```python
    b=input("enter BOOK NAME : ")
    t=input("enter AUTHOR: ")
    p=input("enter PRICE: ")
    s=input("enter COPIES: ")
    data=(n,b,t,p,s)
    sql="INSERT INTO book
VALUES(%s,%s,%s,%s,%s)"
    c=con.cursor()
    c.execute(sql,data)
    con.commit()
    print("DATA ENTERED SUCCESSFULLY")
    main()

def issueb():
    n=input("ENTER ISSUEID: ")
    r=input("ENTER ISSUEDATE: ")
    q=input("ENTER MEMBERID: ")
    y=input("ENTER BOOKID: ")
    s=input("ENTER COPIES: ")
    x="INSERT                INTO              issue
VALUES(%s,%s,%s,%s,%s)"
    data=(n,r,q,y,s)
    c =con.cursor()
    c.execute(x,data)
    con.commit()
    print("BOOK ISSUED TO: ",q)
    main()


def returnb():
```

```python
    n=input("ENTER ISSUEID: ")
    r=input("ENTER ISSUEDATE: ")
    q=input("ENTER MEMBERID: ")
    Y=input("ENTER BOOKID: ")
    s=input("ENTER COPIES: ")
    x="INSERT              INTO              returns
VALUES(%s,%s,%s,%s,%s)"
    data=(n,r,q,y,s)
    c =con.cursor()
    c.execute(x,data)
    con.commit()
    print("BOOK RETURNED BY: ",q)
    main()

def dbook():
    q=input("ENTER BOOKID: ")
    w="DELETE FROM book WHERE bookid=%s"
    data=(q,)
    c=con.cursor()
    c.execute(w,data)
    con.commit()
    print("succefully removed")
    main()


def newmember():
    q=input("ENTER MEMBERID: ")
    e=input("ENTER MEMBERNAME: ")
    o=input("ENTER ADDRESS: ")
    p=input("ENTER PHONENO: ")
```

```python
    u="INSERT  INTO member
VALUES(%s,%s,%s,%s)"
    data=(q,e,o,p)
    c =con.cursor()
    c.execute(u,data)
    con.commit()
    print("NEW  MEMBERS  DETAILS  ENTERED
SUCCESSFULLY")
    main()


def main():
    print("TASK COMPLETED")
choice = input("ENTER TASK  : ")
if (choice =='add book'):
    addbook()
elif(choice=='issue book'):
        issueb()
elif(choice=='return book'):
    returnb()
elif(choice =="remove book"):
    dbook()
elif(choice =="add new member"):
    newmember()
else:
        print("wrong choice......")
        main()
```
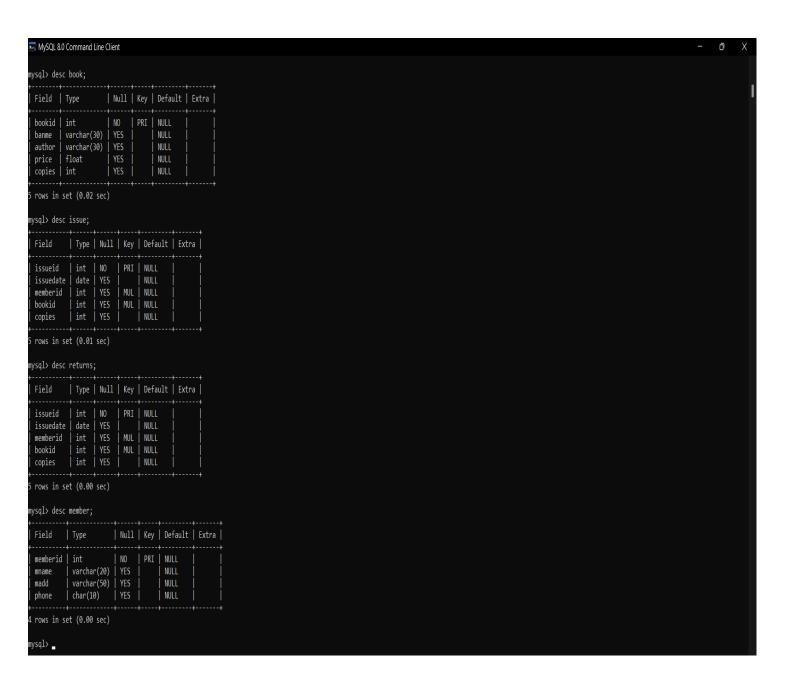
2. RUNNING INTERFACE (WITH VARIOUS TASKS PERFORMED)
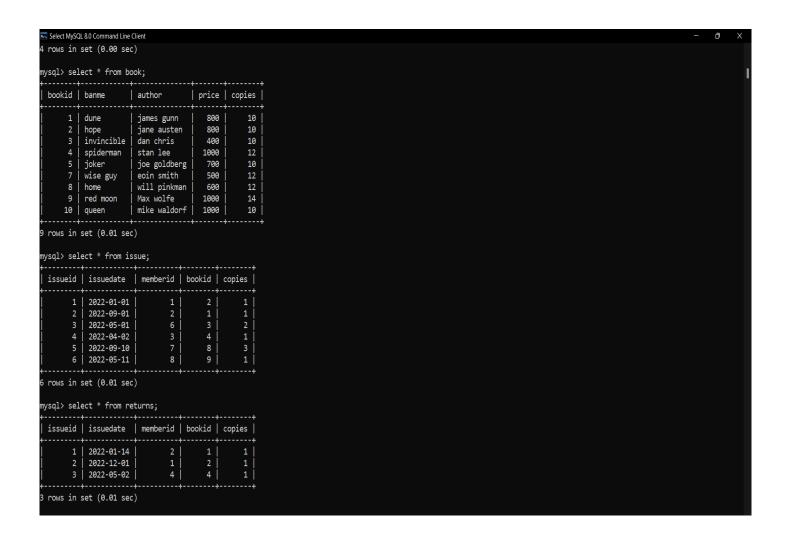
```
IDLE Shell 3.9.6                                                                    —  ☐  X
File  Edit  Shell  Debug  Options  Window  Help
Python 3.9.6 (tags/v3.9.6:db3ff76, Jun 28 2021, 15:26:21) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
==================== RESTART: C:\Users\HP\Desktop\3try.py ====================
ENTER TASK  : add book
enter BOOKID: 9
enter BOOK NAME : red moon
enter AUTHOR: Max wolfe
enter PRICE: 1000
enter COPIES: 14
DATA ENTERED SUCCESSFULLY
TASK COMPLETED
>>>
==================== RESTART: C:\Users\HP\Desktop\3try.py ====================
ENTER TASK  : add new member
ENTER MEMBERID: 8
ENTER MEMBERNAME: bharat singh
ENTER ADDRESS: tt nagar
ENTER PHONENO: 897023998
NEW MEMBERS DETAILS ENTERED SUCCESSFULLY
TASK COMPLETED
>>>
==================== RESTART: C:\Users\HP\Desktop\3try.py ====================
ENTER TASK  : issue book
ENTER ISSUEID: 6
ENTER ISSUEDATE: 2022-05-11
ENTER MEMBERID: 8
ENTER BOOKID: 9
ENTER COPIES: 1
BOOK ISSUED TO:  8
TASK COMPLETED
>>>
==================== RESTART: C:\Users\HP\Desktop\3try.py ====================
ENTER TASK  : add book
enter BOOKID: 10
enter BOOK NAME : queen
enter AUTHOR: mike waldorf
enter PRICE: 1000
enter COPIES: 10
DATA ENTERED SUCCESSFULLY
TASK COMPLETED
>>> |
```

➢ TABLES IN MYSQL

```
MySQL 8.0 Command Line Client                                    —   ☐   X

mysql> desc book;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| bookid | int         | NO   | PRI | NULL    |       |
| banme  | varchar(30) | YES  |     | NULL    |       |
| author | varchar(30) | YES  |     | NULL    |       |
| price  | float       | YES  |     | NULL    |       |
| copies | int         | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
5 rows in set (0.02 sec)

mysql> desc issue;
+-----------+------+------+-----+---------+-------+
| Field     | Type | Null | Key | Default | Extra |
+-----------+------+------+-----+---------+-------+
| issueid   | int  | NO   | PRI | NULL    |       |
| issuedate | date | YES  |     | NULL    |       |
| memberid  | int  | YES  | MUL | NULL    |       |
| bookid    | int  | YES  | MUL | NULL    |       |
| copies    | int  | YES  |     | NULL    |       |
+-----------+------+------+-----+---------+-------+
5 rows in set (0.01 sec)

mysql> desc returns;
+-----------+------+------+-----+---------+-------+
| Field     | Type | Null | Key | Default | Extra |
+-----------+------+------+-----+---------+-------+
| issueid   | int  | NO   | PRI | NULL    |       |
| issuedate | date | YES  |     | NULL    |       |
| memberid  | int  | YES  | MUL | NULL    |       |
| bookid    | int  | YES  | MUL | NULL    |       |
| copies    | int  | YES  |     | NULL    |       |
+-----------+------+------+-----+---------+-------+
5 rows in set (0.00 sec)

mysql> desc member;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| memberid | int         | NO   | PRI | NULL    |       |
| mname    | varchar(20) | YES  |     | NULL    |       |
| madd     | varchar(50) | YES  |     | NULL    |       |
| phone    | char(10)    | YES  |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql>
```

```
4 rows in set (0.00 sec)

mysql> select * from book;
+--------+------------+--------------+-------+--------+
| bookid | banme      | author       | price | copies |
+--------+------------+--------------+-------+--------+
|      1 | dune       | james gunn   |   800 |     10 |
|      2 | hope       | jane austen  |   800 |     10 |
|      3 | invincible | dan chris    |   400 |     10 |
|      4 | spiderman  | stan lee     |  1000 |     12 |
|      5 | joker      | joe goldberg |   700 |     10 |
|      7 | wise guy   | eoin smith   |   500 |     12 |
|      8 | home       | will pinkman |   600 |     12 |
|      9 | red moon   | Max wolfe    |  1000 |     14 |
|     10 | queen      | mike waldorf |  1000 |     10 |
+--------+------------+--------------+-------+--------+
9 rows in set (0.01 sec)

mysql> select * from issue;
+---------+------------+----------+--------+--------+
| issueid | issuedate  | memberid | bookid | copies |
+---------+------------+----------+--------+--------+
|       1 | 2022-01-01 |        1 |      2 |      1 |
|       2 | 2022-09-01 |        2 |      1 |      1 |
|       3 | 2022-05-01 |        6 |      3 |      2 |
|       4 | 2022-04-02 |        3 |      4 |      1 |
|       5 | 2022-09-10 |        7 |      8 |      3 |
|       6 | 2022-05-11 |        8 |      9 |      1 |
+---------+------------+----------+--------+--------+
6 rows in set (0.01 sec)

mysql> select * from returns;
+---------+------------+----------+--------+--------+
| issueid | issuedate  | memberid | bookid | copies |
+---------+------------+----------+--------+--------+
|       1 | 2022-01-14 |        2 |      1 |      1 |
|       2 | 2022-12-01 |        1 |      2 |      1 |
|       3 | 2022-05-02 |        4 |      4 |      1 |
+---------+------------+----------+--------+--------+
3 rows in set (0.01 sec)
```

```
mysql> select * from returns;
+---------+------------+----------+--------+--------+
| issueid | issuedate  | memberid | bookid | copies |
+---------+------------+----------+--------+--------+
|       1 | 2022-01-14 |        2 |      1 |      1 |
|       2 | 2022-12-01 |        1 |      2 |      1 |
|       3 | 2022-05-02 |        4 |      4 |      1 |
+---------+------------+----------+--------+--------+
3 rows in set (0.01 sec)

mysql> select * from member;
+----------+------------------+---------------+------------+
| memberid | mname            | madd          | phone      |
+----------+------------------+---------------+------------+
|        1 | aman sharma      | arora colony  | 9556890986 |
|        2 | rahul shrivastav | sneha colony  | 9987455673 |
|        3 | yusuf khan       | green colony  | 9981234789 |
|        4 | aarav vaid       | arora colony  | 9908204789 |
|        5 | faze mirza       | third street  | 9908277689 |
|        6 | raj shukla       | navin nagar   | 9987853689 |
|        7 | kirti talreja    | jesper colony | 9983474765 |
|        8 | bharat singh     | tt nagar      | 897023998  |
+----------+------------------+---------------+------------+
8 rows in set (0.01 sec)

mysql>
```

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