

1. INTRODUCTION

Have you ever felt sad for not going to the library and borrowing some books during this COVID situation? My friends and I have made an application to solve this problem as we are book worms too and wanted to relax our mind by reading. We are good at programming so we thought of making a library application

This interface supports all members and the librarian to process transactions with computers using Python and MySQL. This system can authorize members and provide details accordingly. To make it secure, features like OTP verification and Captcha codes have also been added to increase overall security and productivity of the library and prevent data theft or mismatches. The librarian can keep track of books and the library members. The Librarian can lend, renew, reserve physical books. A new page namely "e-book" has been added to enable the members to read books from their homes as they would do in the library.

In addition, the members can communicate with the librarian through a built-in mailing system in case they are facing any difficulties from home. Borrowing, returning, renewing of books will be notified to the library members by their email id. This is really a user friendly application to be used in this condition. The latest version of the software includes both a mac and windows version.

Members can now enjoy hassle free and faster process transactions...

2. ABOUT THE PROGRAMMING TOOL USED

The programming language used is python Idle 3.0 in a mac system.

MYSQL has been used for storing data and retrieving data from database.

Python is an interpreted, object oriented, high level programming language. Python has an easy to learn syntax which emphasizes readability and hence reduces the cost of program maintenance to a huge extent. Python is used in many application domains, such as web and internet development, education, etc.

Python was created and released in 1991, by Guido van Rossum as a successor to the ABC programming language. Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system and automatic memory management and has a large and comprehensive standard library.

With the number of advantages python has, here are some key features of python to be noted, its an expressive language, object oriented language, extensible, large number of libraries, integrated, embeddable, GUI programming support, etc.

The following python program also uses a standard GUI library, called tkinter, which when combined with python, provides a fast and easy way to create GUI applications.

3. PROBLEM DEFINITION

The Library Management system is an application software which allows the members to perform seamless transactions, for borrowing, returning books. It also helps in keeping track of overdue books and user management through a user friendly interface.

The existing library management system is simple and isn't secure as humans can easily override the system and perform unauthorized transactions. The existing systems also focus mainly on functionality hence user interaction is limited.

A paradigm shift of the human administration methods to the digital administration methods will add a new and corruption-free dimension to the process of administration. The computer operator has user rights which prevent unauthorized access to database records. In order to improve upon the drawbacks of the current system, we have analysed the system thoroughly.

The new library system allows the members to create accounts which are secured by passwords and Captcha codes and email OTP's. The Library stores all of the private information in an encrypted binary file which is not in the human readable form.

The system also allows users to create an account and keep track of all their transactions. The system also allows the members to communicate with the librarian through a built in mailing system.

In this system, members' credentials can be easily updated. Name, NRIC / Passport Number (Only last 4 characters), phone number and email address can be updated by the librarian whereas sensitive information such as passwords are updated by the members. even if the members forget their password, they can change it anytime.

The librarian's account has also been designed suitably to cater to all the needs of the members. the librarian can perform all transactions for the members and can also update members details, add new books, update and delete information about events which are displayed in the main page. the librarian can also reply to emails.

4. DESIGN REQUIREMENTS

A library management System is essentially a database management system which Caters the needs of various members, and their valuable interactions with the interface to ensure a smooth, and secure process.

Every member has to create an account to borrow a book from the library. The time taken to create an account should take less than 5 minutes to complete with various security features such as OTP's and Passwords, The program is very safe and has the top most priority to protect every information about the members.

This System ensures privacy of the personal information of all the members, which is stored in a binary file unreadable by humans.

Any modifications to be done with respect to the information of the members can be done with the help of the librarian, prior to the knowledge of the members. The librarian is able to keep track of the list of all books borrowed, reserved and also notifies the member if she/he has a borrowed book past the due date.

4.1 Database Structure

S.No	Name of Table	Remark
1	books	Stores information and availability of all physical books present in the library
2	users	Stores information about all registered members
3	reservations	Stores information about all reserved books
4	borrowedbooks	Stores information about all borrowed books
5	messaging	Facilitates the sharing of mails between members and the librarian

Tables

Books:-

Field	Data type	Size
BOOKID	Integer	11
BOOK_Title	char	40
Author	char	40
Publication	char	100
Availability	char	25

Borrowedbooks:-

Field	Data type	Size
LIBID	Integer	11
BOOKID	Integer	11
duedate	date	

Users:-

Field	Data type	Size
LIBID	Integer	11
Username	varchar	40
First_Name	varchar	40
Last_Name	varchar	40
Phone_Number	varchar	20
Identity	varchar	15
email_id	varchar	35

reservations:-

Field	Data type	Size
LIBID	Integer	11
BOOKID	Integer	11

Messaging:-

Field	Data type	Size
Fromid	Integer	11
fromuname	varchar	40
toid	Integer	11
message	text	

4.2 Files

S.No	Name of File	Remark
1	bannerssource	Stores the path and small description for all banners
2	databaseaccounts	Stores information the mysql database
3	encrypteduserdetails	Stores sensitive information of users in a binary file

4.3 Libraries / Modules

S.No	Name of Python Library / Module	Remark
1	tkinter	A built in module used for creating user friendly GUI applications
2	datetime	Datetime module supplies classes to work with date and time. These classes provide a number of functions to deal with dates, times and time intervals
3	webbrowser	The webbrowser module provides a high-level interface to allow displaying Web-based documents to users.
4	time	This module provides various time-related functions
5	random	A built in module which is used for generating a pseudo random number
6	smtplib	A built in module which is used for sending email from the program
7	pickle	A built in module which is used for reading and writing binary files
8	mysql.connector	This module allows us to connect to a database from within python and provides connectivity functionality

5. SYSTEM REQUIREMENTS

The Library Management System will require the following:

Hardware Requirements:

1. Computer
(Windows or Mac operating system)
2. Internet Connection
3. Printer (Optional)
4. Barcode Reader (Optional)

Software

5. python version 3.x

6. FLOWCHART (OVERVIEW OF SYSTEM)





