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Python Basics

Module 4:

MINI-PROJECT:

Library Management System

Mini-Project

Welcome to the Library Management System project!

Hey! Welcome back.

Get ready to turn your Python skills into a practical solution with the Library Management System project! 🌟 We'll code a user-friendly system using Python to manage books, combining Python programming, object-oriented principles, and clean code practices. Whether you love books or coding, this project is for you! Let's create a digital haven for book enthusiasts to browse, borrow, and return books effortlessly.

Ready to start coding your digital library?

Learning objectives

By the end of this Mini-Project, you should be able to:

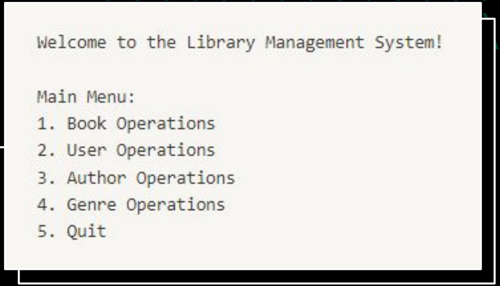
- Apply Python Syntax and Control Structures.
- Demonstrate Object-Oriented Programming (OOP) Principles.
- Practice Clean Code and Modular Design.
- Implement Error Handling and Exception Management.
- Utilize File Handling and Data Storage.
- Enable User Interaction and Input Validation.
- Enhance User Experience with Optional Features (Bonus).
- Document and Test Your Code.
- Version Control and GitHub Usage.
- Collaborate and Seek Assistance.

Project Problem Statement: Library Management System

Welcome to the Library Management System project!
Get ready to apply Python's Object-Oriented Programming (OOP) to build an advanced Library Management System through the command-line app which streamlines book and resource management, tasking you with creating a robust system for browsing, borrowing, returning, and exploring the book collection.

Enhanced User Interface (UI) and Menu

Create an improved, user-friendly command-line interface (CLI) for the Library Management System with separate menus for each class of the system.



```
Welcome to the Library Management System!

Main Menu:
1. Book Operations
2. User Operations
3. Author Operations
4. Genre Operations
5. Quit
```

Class Structure

Implement a class structure that represents key entities in the library management system, including:

Book
User
Author
Genre

Encapsulation

Define private attributes and use getters and setters for necessary data access.

Inheritance and Polymorphism

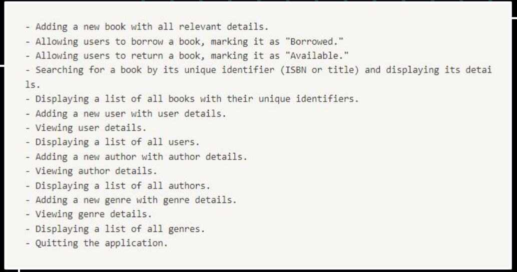
Utilize inheritance to create specialized book categories and overload methods as needed in the subclasses.

Modules

Create separate modules for classes, user interactions, and error handling.

Menu Actions

Implement actions using the classes you've created:



```
- Adding a new book with all relevant details.
- Allowing users to borrow a book, marking it as "Borrowed."
- Allowing users to return a book, marking it as "Available."
- Searching for a book by its unique identifier (ISBN or title) and displaying its detai
ls.
- Displaying a list of all books with their unique identifiers.
- Adding a new user with user details.
- Viewing user details.
- Displaying a list of all users.
- Adding a new author with author details.
- Viewing author details.
- Displaying a list of all authors.
- Adding a new genre with genre details.
- Viewing genre details.
- Displaying a list of all genres.
- Quitting the application.
```

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User Interaction

Utilize the input() function to enable users to interact with the CLI and select menu options.

Error Handling

Implement error handling using try, except, else, and finally blocks.

GitHub Repository

Create a GitHub repository by maintaining a clean and interactive README.md file, and including a link to your GitHub repository in your project documentation.

Optional Bonus Points

Elevate your Library Management System project by incorporating optional bonus features that improve functionality and enhance the user experience:

1. Text File Handling (Bonus)
2. Reservation System (Bonus)
3. Fine Calculation (Bonus)

Project Submission and Tips

Upon completing the project, submit your code, including all source code files, and the README.md file in your GitHub repository. Here you also have some tips to level your project up:

- Design a class hierarchy that represents the library's structure and entities.
- Test your code iteratively to address any potential bugs or issues.
- Collaborate with fellow learners and seek assistance.

Conclusion

By completing this project, you will:

- Enhance your Python programming skills.
- Create a sophisticated Library Management System.
- Mastery of Object-Oriented Programming principles.
- Deal effectively with code organization.

Get ready to build a digital haven for book enthusiasts!

Happy coding! 📚🔍🖥️

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Get ready to build a digital haven for book enthusiasts!

Happy coding! 📚🔍🖥️

Rubric

See the rubric for evaluating the Contact Management System project

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Useful Resources for developing the To-Do List Application project

Python Documentation: Python Documentation
Object-Oriented Programming (OOP) in Python: Python OOP Introduction
Regular Expressions in Python: Python Regular Expressions Tutorial
Working with Files in Python: Reading and Writing Files in Python
GitHub Guides: GitHub Guides
Python Modules: Python Modules Tutorial
Stack Overflow: Stack Overflow

Conclusion

By the completion of the development of the Library Management System project you should be able to:

- Create a digital haven for book enthusiasts.
- Design an enhanced user interface (UI) and menus, implement classes, and apply encapsulation, inheritance, and polymorphism.
- Organize your code and enhance its maintainability by using modules.
- Let users explore, borrow, return, and discover books efficiently from the Library Management System created.
- Implement optional bonus features like text file handling, a reservation system, and fine calculation.

You've not only improved your Python programming skills but also gained valuable experience in software development, problem-solving, and project organization.
So, celebrate your achievement and keep up the fantastic work! 🚀