**CODE GUIDENCE (PYTHON LIBRARY MANAGEMENT SYSTEM)**

**Class Definitions**

**Book Class**

The Book class represents a book in the library.

* **Attributes**:
  + title: The title of the book.
  + author: The author of the book.
  + isbn: The International Standard Book Number, a unique identifier for the book.
  + available: A boolean indicating whether the book is available for borrowing (True by default).
* **Methods**:
  + \_\_init\_\_(self, title, author, isbn): The constructor method initializes a new book instance with the provided title, author, and ISBN. It also sets the availability status to True.
  + \_\_str\_\_(self): The string representation method returns a string describing the book's title, author, ISBN, and availability status.

**Library Class**

The Library class manages a collection of books.

* **Attributes**:
  + books: A list that holds the collection of books in the library.
* **Methods**:
  + \_\_init\_\_(self): The constructor method initializes an empty list to hold the library's books.
  + add\_book(self, book): Adds a book to the library's collection and prints a confirmation message.
  + remove\_book(self, isbn): Removes a book from the library's collection based on its ISBN. If the book is found, it is removed from the list, and a confirmation message is printed. If not, an error message is displayed.
  + list\_books(self): Prints a list of all books in the library. If there are no books, it prints a message indicating that no books are available.
  + borrow\_book(self, isbn): Attempts to borrow a book based on its ISBN. If the book is available, it marks the book as borrowed and prints a confirmation message. If the book is already borrowed, it prints an appropriate message. If the book is not found, it prints an error message.
  + return\_book(self, isbn): Attempts to return a book based on its ISBN. If the book is found and is currently borrowed, it marks the book as available and prints a confirmation message. If the book is already available, it prints an appropriate message. If the book is not found, it prints an error message.

**Main Function**

**main()**

The main function runs the library management system, providing a text-based user interface for interacting with the library.

* **Functionality**:
  + Initializes a Library instance.
  + Displays a menu with options to add, remove, list, borrow, return books, or exit the system.
  + Continuously prompts the user for a choice and performs the corresponding action until the user chooses to exit.
* **Choices**:
  + 1: Prompts the user for book details (title, author, ISBN) and adds the book to the library.
  + 2: Prompts the user for the ISBN of the book to be removed and removes it from the library.
  + 3: Lists all the books in the library.
  + 4: Prompts the user for the ISBN of the book to be borrowed and attempts to borrow it.
  + 5: Prompts the user for the ISBN of the book to be returned and attempts to return it.
  + 6: Exits the system with a goodbye message.
  + Any other input is considered invalid, and the user is prompted to try again.

**Code Execution**

The if \_\_name\_\_ == "\_\_main\_\_": block ensures that the main function is only called when the script is executed directly, not when it is imported as a module in another script. This is a common Python idiom for making code both importable as a module and executable as a script.

**Example Usage**

Here's a simple example of how the program might be used:

1. The user runs the script.
2. The main menu is displayed.
3. The user chooses option 1 to add a book by entering the title, author, and ISBN.
4. The user chooses option 3 to list all books, and the added book is displayed.
5. The user chooses option 4 to borrow a book by entering the ISBN.
6. The user chooses option 5 to return the borrowed book by entering the ISBN.
7. The user chooses option 6 to exit the system.

This implementation provides a basic yet functional library management system that allows users to manage a collection of books interactively.