**User Documentation**

**Overview**

The Library Management System is an application designed to manage library items, authors, and patrons. The system allows librarians to perform various tasks such as adding, editing, and deleting library items and authors, as well as managing patron information. Additionally, it supports borrowing and returning of library items, allowing for an efficient tracking system.

**Classes and Their Working**

**1. LibraryItem Class**

* **Description**: Represents a generic library item.
* **Attributes**:
  + Name: Name of the library.
  + NumOfCopies: Number of copies available.
* **Methods**:
  + borrowItem(Patron): Allows a patron to borrow the item.
  + returnItem(Patron): Allows a patron to return the item.

**2. Book Class (Child Class from LibraryItem)**

* **Description**: Represents a book in the library.
* **Additional Attribute**:
  + book\_type: Type of the book (Printed, Electronic, Audio).

**3. Periodical Class (Child Class from LibraryItem)**

* **Description**: Represents a periodical in the library.
* **Additional Attribute**:
  + periodical\_type: Type of the periodical (Printed, Electronic).

**4. Author Class**

* **Description**: Represents an author.
* **Attributes**:
  + name: Name of the author.
  + Birthday: Date of birth of the author.
  + Books: List of Books by the author.

**5. Patron Class**

* **Description**: Represents a generic patron of the library.
* **Attributes**:
  + name: Name of the patron.
  + address: Address of the patron.
  + phone: Phone number of the patron.
  + borrowed\_items: List of items borrowed by the patron.

**6. Student Class (Child Class from Patron)**

* **Description**: Represents a student patron.
* **Attributes**:
  + StudentID: ID for the Student
  + GradeLevel: The grade level of the student

**7. Employee Class (Child Class from Patron)**

* **Description**: Represents an employee patron.
* **Attributes**:
  + EmployeeID: ID for the employee
  + Department: The department of the employee

**8. Library Class**

* **Description**: Manages the library's operations.
* **Attributes**:
  + items: List of all library items.
  + authors: List of all authors.
  + patrons: List of all patrons.

**9. LibraryMenu Demo**

* + Add Library: Adds a new item to the library.
  + Edit Library Item: Edits an existing library item.
  + Delete Library Item: Deletes a library item.
  + Borrow Library Item: Allows a patron to borrow an item.
  + Return Library Item: Allows a patron to return an item.
  + Exit: Exits out of the menu.

**How to Start/Access the Application**

1. **Install Visual Studio Code**: Ensure you have Visual Studio Code installed on your system.
2. **Copy the Repository**: Copy the provided repository URL and clone the repository on your own system to view/use it.
3. **Run the Script**: Execute the script in your terminal or command prompt and go through the menu options.
4. **Using the Library**: Create an instance of the Library class and use its methods to manage items, authors, and patrons.

**Class Diagram**

A diagram of a library class

Description automatically generatedA diagram of a student class

Description automatically generated

This diagram shows the relationships between the classes, including inheritance and associations. The Library class manages LibraryItem, Author, and Patron instances, while LibraryItem has a composition relationship with Author. The Book and Periodical classes inherit from LibraryItem, and the Student and Employee classes inherit from Patron.

This documentation provides an overview of the Library Management System, explaining the classes and their workings, how to start and use the application, and the class diagram showing the associations between the classes.