Application Overview:

1. Demo.java – This class is the main class to initialize the program/
2. LibraryItem.java – This class manages the properties of each library item (publisher, isbn, id, title, author, and number of copies.
3. Book.java – This class extends LibraryItem class and adds format to it to make it print or electronic.
4. Author.java – This class constructs new authors and stores items written by them into a list.
5. Patron.java – This class manages people visiting the library and stores their name, address, and phone number. This also manages borrowed items
6. Library.java – This manages the classes of LibraryItem, Author, and patron. It adds method to add, edit, delete, find, borrow, and return items. It also adds methods to manage authors and patrons.
7. LibraryMenu.java – The menu to interact with the library

How to start the application

1. Download zip file
2. Open file with compiler
3. Run Demo.java to start application.

Class Diagram:

A diagram of a library

Description automatically generated

File structure:

/LibraryManagementSystem

|-- /src

| |-- /main

| |-- /java

| |-- Author.java

| |-- Book.java

| |-- Library.java

| |-- LibraryItem.java

| |-- Patron.java

| |-- Main.java

|-- /documentation

|-- README.md

The directory would contain a source file, a main file to store all the java files and the addition files of documentation and README.

Setting up the project to use:

1. Navigate to your working directory /LibraryManagementSystem/src/main/java/
2. Make sure you have the Java extension enabled
3. Run the main class – Demo.java (on whatever you decide to run it on) Vscode is what we used to run it.

Database Entities and Relationships

* Authors:
  + AuthorID: Unique identifier for each author (Primary Key).
  + Name: Name of the author.
  + DOB: Date of birth of the author.
* LibraryItems:
  + ItemID: (Primary Key).
  + Title: Title of the library item.
  + AuthorID: Author who wrote the item (Foreign Key)
  + ISBN: International Standard Book Number.
  + Publisher: Publisher of the item.
  + NumberOfCopies: Number of copies available.
* Patrons:
  + PatronID: (Primary Key).
  + Name: Name of the patron.
  + Address: Address of the patron.
  + PhoneNumber: Phone number of the patron.
* BorrowedItems:
  + PatronID: item (Foreign Key).
  + ItemID: (Foreign Key).
  + BorrowDate: Date when the item was borrowed.
  + ReturnDate: Date when the item was returned.

Entity Relationships

Authors (1) <---- (m) LibraryItems

Patrons (1) <---- (m) BorrowedItems (m) ----> (1) LibraryItems

Authors to LibraryItems (Books):

* One-to-Many Relationship
* Each author can write multiple books (library items).

LibraryItems (Books) to Patrons:

* Many-to-Many Relationship
* Multiple patrons can borrow multiple library items (books).

Installation Manual for Library Management System

1. Downloading from GitHub

* Step 1: Open your web browser and go to the GitHub repository for the library management system.
* Step 2: Click on the "Code" button and then select "Download ZIP" to download the project as a ZIP file.
* Step 3: Extract the downloaded ZIP file to a location of your choice

2. Setting Up in Visual Studio Code

* Step 1: Open Visual Studio Code (VS Code) on your computer.
* Step 2: Click on "File" > "Open Folder..." in the top menu.
* Step 3: Navigate to the extracted folder of the library management system project and click "Open".

3. Running the Application

* Step 1: In VS Code, locate the Demo.java file in the project structure.
* Step 2: Right-click on the Demo.java file and select "Run Java" from the menu.
* Step 3: The library management system application should start running, and you can interact with it through the console.