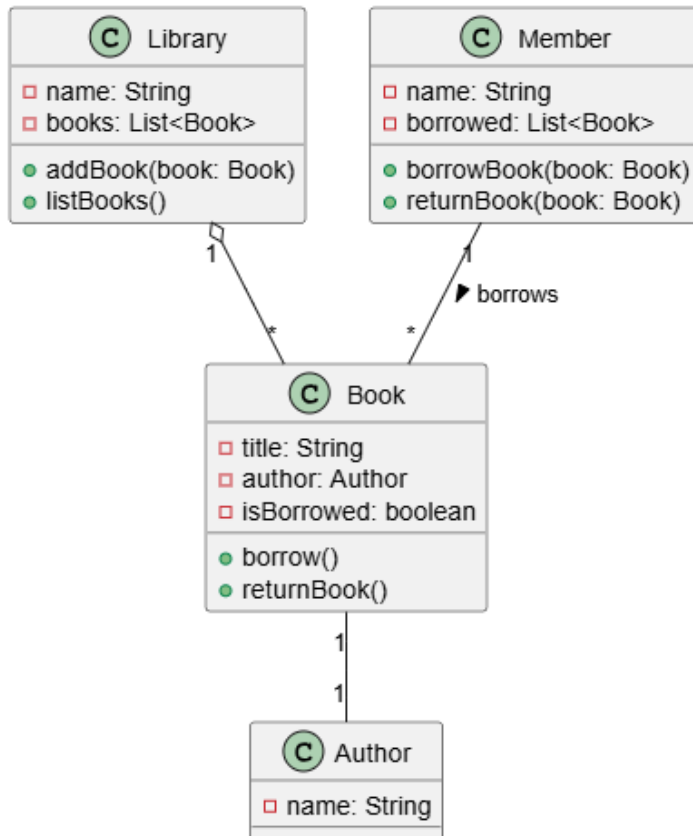


Assignment

Diagram



Code

Author.java

```
Assignment > src > J Author.java > Author
1  public class Author {
2      private String name;
3
4      public Author(String name) {
5          this.name = name;
6      }
7
8      public String getName() {
9          return name;
10     }
11 }
```

Book.java

```
Assignment > src > Book.java > Book
1  public class Book {
2      private String title;
3      private Author author;
4      private boolean isBorrowed;
5
6      public Book(String title, Author author) {
7          this.title = title;
8          this.author = author;
9          this.isBorrowed = false;
10     }
11
12     public String getTitle() {
13         return title;
14     }
15
16     public Author getAuthor() {
17         return author;
18     }
19
20     public boolean isBorrowed() {
21         return isBorrowed;
22     }
23
24     public boolean borrow() {
25         if (!isBorrowed) {
26             isBorrowed = true;
27             return true;
28         }
29         return false;
30     }
31
32     public void returnBook() {
33         isBorrowed = false;
34     }
35
36     public String info() {
37         return "Title: " + title + ", Author: " + author.getName() + ", Borrowed: " + isBorrowed;
38     }
39 }
```

Library.java

```
Assignment > src > Library.java > ...
1  import java.util.ArrayList;
2  import java.util.List;
3
4  public class Library {
5      private String name;    The value of the
6      private List<Book> books;
7
8      public Library(String name) {
9          this.name = name;
10         this.books = new ArrayList<>();
11     }
12
13     public void addBook(Book book) {
14         books.add(book);
15     }
16
17     public void listBooks() {
18         for (Book book : books) {
19             System.out.println(book.info());
20         }
21     }
22
23     public List<Book> getBooks() {
24         return books;
25     }
26 }
```

Member.java

```
Assignment > src > J Member.java > Member
1  import java.util.ArrayList;
2  import java.util.List;
3
4  public class Member {
5      private String name;
6      private List<Book> borrowed;
7
8      public Member(String name) {
9          this.name = name;
10         this.borrowed = new ArrayList<>();
11     }
12
13     public String getName() {
14         return name;
15     }
16
17     public void borrowBook(Book book) {
18         if (book.borrow()) {
19             borrowed.add(book);
20             System.out.println(name + " borrowed " + book.getTitle());
21         } else {
22             System.out.println(book.getTitle() + " is already borrowed.");
23         }
24     }
25
26     public void returnBook(Book book) {
27         if (borrowed.contains(book)) {
28             book.returnBook();
29             borrowed.remove(book);
30             System.out.println(name + " returned " + book.getTitle());
31         } else {
32             System.out.println(name + " did not borrow " + book.getTitle());
33         }
34     }
35
36     public void listBorrowedBooks() {
37         System.out.println("Books borrowed by " + name + ":");
38         for (Book book : borrowed) {
39             System.out.println(book.getTitle());
40         }
41     }
42 }
```

Main

```
Assignment > src > J MainLibrary.java > MainLibrary
1  public class MainLibrary {
2      public static void main(String[] args) {
3          Author a1 = new Author(name:"J.K. Rowling");
4          Author a2 = new Author(name:"George Orwell");
5          Book b1 = new Book(title:"Harry Potter", a1);
6          Book b2 = new Book(title:"1984", a2);
7          Library library = new Library(name:"City Library");
8          library.addBook(b1);
9          library.addBook(b2);
10         Member m1 = new Member(name:"Alice");
11         Member m2 = new Member(name:"Bob");
12         library.listBooks();
13         m1.borrowBook(b1);
14         m2.borrowBook(b1);
15         m2.borrowBook(b2);
16         m1.listBorrowedBooks();
17         m2.listBorrowedBooks();
18         m1.returnBook(b1);
19         m2.borrowBook(b1);
20         library.listBooks();
21     }
22 }
```

Output

```
Title: Harry Potter, Author: J.K. Rowling, Borrowed: false
Title: 1984, Author: George Orwell, Borrowed: false
Alice borrowed Harry Potter
Harry Potter is already borrowed.
Bob borrowed 1984
Books borrowed by Alice:
Harry Potter
Books borrowed by Bob:
1984
Alice returned Harry Potter
Bob borrowed Harry Potter
Title: Harry Potter, Author: J.K. Rowling, Borrowed: true
Title: 1984, Author: George Orwell, Borrowed: true
```