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*Library Management System*

A system of varying tools that enable users to manage a library of books within a database. Interface is user-friendly *with a complete GUI.*

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# Problem Requirements

Java based project with a focus on creating a complete system that enables the operation of an online bookstore. This includes a book inventory management system, customer identification, and order processing. The book inventory management system manages the library of books available in the bookstore, customer identification handles the storing of customer information, and order processing handles the checkout stage for the store based on a built-in shopping cart. The shopping cart is responsible for keeping track of books that the customer is planning on buying.

# Bottom Up Design

## List of nouns

* bookstore
* Inventory
* Book
* Customer
* Order
* Shopping cart

## List of verbs

* Operation of an online bookstore
* Manage book library
* Store customer information
* Handle checkout stage
* Track potential books

## Classes based on nouns & verbs

* Bookstore 🡪 operation of an online bookstore
* Inventory 🡪 manage book library
* Customer 🡪 store customer information
* Order 🡪 handle checkout stage
* Shopping Cart 🡪 track potential books

# Top Down Design

## CRC Cards

|  |  |
| --- | --- |
| Inventory | |
| *Add books*  *Remove books*  *Update book info*  *Book search* | Book |

|  |  |
| --- | --- |
| Book | |
| *Set title*  *Set author*  *Set genre*  *Set price*  *Set availability*  *Get title*  *Get author*  *Get genre*  *Get price*  *Get availability* |  |

|  |  |
| --- | --- |
| ShoppingCart | |
| *add book to cart*  *remove book from cart*  *get shopping cart contents*  *clear shopping cart* | Book |

|  |  |
| --- | --- |
| Order | |
| *add items from shopping cart*  *calculate total cost (tax & discounts)*  *clear items from Order* | ShoppingCart  Book |

|  |  |
| --- | --- |
| Payment | |
| Card verification  Cash verification |  |

|  |  |
| --- | --- |
| Customer | |
| *Set name*  *Set contact details*  *Set address*  *Get name*  *Get contact details*  *Get address*  *Set discount amount* |  |

## Classes Based on CRC Cards

|  |  |  |
| --- | --- | --- |
| Bookstore | | |
| Task | Method | Data needed |
| Register new customers | registerCustomer(Customer cust) | customerFile, Customer object |
| Browse books | browseLibrary() | Inventory object |
| Add book to shopping cart | addToShoppingCart(Customer cust, Book id) | ShoppingCart object |
| Place an order | placeOrder(Customer cust, ShoppingCart cart) | Customer object, ShoppingCart object |
| Add discount amount | addDiscount(Customer cust, double percentage) | Customer object |

|  |  |  |
| --- | --- | --- |
| Inventory | | |
| Task | Method | Data needed |
| Add book | addBook(Book b) | library |
| Remove book | removeBook(Book b) | library |
| Update book info | updateBook(String updateSubject, String newValue) | library |
| Search for a book | searchLibrary(String title) | library |

|  |  |  |
| --- | --- | --- |
| Book | | |
| Task | Method | Data needed |
| Set the title of the book | setTitle(String title) | bookTitle |
| Set the author of the book | setAuthor(String author) | bookAuthor |
| Set the genre of the book | setGenre(String genre) | bookGenre |
| Set the price of the book | setPrice(double price) | bookPrice |
| Set the availability of the book | setAvailability(boolean a) | bookAvailability |
| Get the title of the book | getTitle() | bookTitle |
| Get the author of the book | getAuthor() | bookAuthor |
| Get the genre of the book | getGenre() | bookGenre |
| Get the price of the book | getPrice() | bookPrice |
| Get the availability of the book | getAvailability() | bookAvailability |

|  |  |  |
| --- | --- | --- |
| Customer | | |
| Task | Method | Data needed |
| Set the customer’s name | setName(String name) | custName |
| Set the customer’s contact | setContact(String phoneNumber, String emailAddress) | custNumber  custEmail |
| Set the customer’s address | setAddress(String address) | custAddress |
| Set the discount amount | setDiscount(int amount) | discount |
| Get the customer’s name | getName() | custName |
| Get the customer’s contact | getContact() | custNumber+custEmail |
| Get the customer’s address | getAddress() | custAddress |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| ShoppingCart | | |
| Task | Method | Data needed |
| Add Book to shopping cart | addToCart(Book item) | cart |
| Remove book from shopping cart | removeFromCart(Book item) | cart |
| Get shopping cart contents | getCart() | cart |
| Clear cart contents | clearCart() | cart |

|  |  |  |
| --- | --- | --- |
| Order | | |
| Task | Method | Data needed |
| Add items from shopping cart to order | finalizeShoppingCart() | Cart, orderList |
| Calculate additional costs in order | calcFinalCosts() | orderList |
| Clear items in Order | clearOrder() | orderList |

|  |  |  |
| --- | --- | --- |
| Payment | | |
| Task | Method | Data needed |
| Check if credit card is valid | validateCard(String cardNumber, String date) | cardNumber |
| Check cash amount | validateCash(double amount) | cashAmount |

# UML Diagram

A diagram of a computer

Description automatically generated