**Case Study: Online Bookstore Management System**

**Context:**

You are required to develop a console-based Online Bookstore Management System using Core Java. The application will allow users to manage book inventory, process orders, and perform various business operations related to online bookstore management. The application will utilize Java Collections for storing book records and order information, implement Object-Oriented Programming principles, and include exception handling to manage potential errors.

**Requirements:**

**Features:**

1. **Add and Remove Books:**
   * Allow administrators to add new books to the inventory.
   * Allow administrators to remove books from the inventory.
2. **Update Book Details:**
   * Allow administrators to update details of existing books, such as price and quantity.
3. **Search for Books:**
   * Allow users to search for books by title, author, or category.
   * Display the search results with book details.
4. **Process Orders:**
   * Allow users to place orders for books.
   * Update book quantities and inventory status accordingly.

**Classes and Objects:**

1. **Book Class:**
   * Attributes: id, title, author, category, price, quantity.
   * Methods: Constructors, getters and setters, toString method.
2. **Order Class:**
   * Attributes: id, bookId, quantity, orderDate, status (pending, shipped, delivered).
   * Methods: Constructors, getters and setters, toString method.
3. **BookstoreManager Class:**
   * Attributes: HashMap<Integer, Book> books, ArrayList<Order> orders.
   * Methods:
     + addBook(Book b): Adds a new book to the inventory.
     + removeBook(int bookId): Removes a book from the inventory.
     + updateBook(int bookId, Book updatedBook): Updates details of an existing book.
     + searchBooks(String keyword): Searches for books based on the keyword.
     + placeOrder(int bookId, int quantity): Places an order for books.
     + processOrder(int orderId): Processes an order (updates status and book quantities).
     + Helper methods for input validation and exception handling.

**Deliverables:**

1. Complete source code for the Online Bookstore Management System.
2. Documentation including:
   * How to run the application.
   * Instructions for each feature.
   * Explanation of the exception handling implemented.
3. A brief report on the application design and how Object-Oriented principles were applied.