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Comparison Error Checklist

Online Library Management System

Error Checklist for Online Library Management System

1. **Member Validation:** Incorrect handling of member registration and login.
2. **Book Availability Check:** Failing to check if the desired book is available for borrowing.
3. **Overdue Books:** Not tracking or handling overdue books effectively.
4. **Loan Limit Check:** Not enforcing the loan limit per member.
5. **Fine Calculation:** Incorrect calculation of fines for late returns.
6. **Reservation Handling:** Not managing book reservations correctly.
7. **Book Return Processing:** Incorrect processing of returned books

Version 1: Basic Online Library Management System (with multiple flaws)

- **Book Availability Check**

  In this Java example, the system checks if a book is available but does not update the availability status correctly, allowing multiple users to borrow the same book.

```java
public class LibrarySystem {
    public static void main(String[] args) {
        int totalBooks = 100;
        int booksBorrowed = 95;
        borrowBook(totalBooks, booksBorrowed);
    }

    public static void borrowBook(int totalBooks, int booksBorrowed) {
        if (booksBorrowed < totalBooks) {
            System.out.println("Book borrowed");
            booksBorrowed++;
        } else {
            System.out.println("Book not available");
        }
    }
}
```

Test Cases for Version 1: Basic Online Library Management System

Test	Test Case Description	Input Data	Expected	Verdict
1	**Overdue Books**	5 books overdue, return 1 book late	"Overdue not tracked"	Failed
2	**Book Availability Check**	100 books, 95 borrowed, borrow 1 book	"Book borrowed"	Passed
3	**Loan Limit Check**	5 books allowed, 5 borrowed, borrow 1 more	"Loan limit exceeded"	Failed
4	**Fine Calculation**	1 book, 10 days late	"Incorrect fine calculated"	Failed
5	**Reservation Handling**	100 books, 1 available, 1 reservation	"Reservation not honored"	Failed

Version 2: Improved Online Library Management System (corrected)

- **Book Availability Check**

  In this improved Java example, the system correctly updates and checks the availability status of books, preventing multiple issues.

```java
public class ImprovedLibrarySystem {
    public static void main(String[] args) {
        int totalBooks = 100;
        int booksBorrowed = 95;
        borrowBook(totalBooks, booksBorrowed);
    }

    public static void borrowBook(int totalBooks, int booksBorrowed) {
        if (booksBorrowed < totalBooks) {
            booksBorrowed++;
            System.out.println("Book borrowed");

        } else {
            System.out.println("Book not available");
        }
    }
}
```

Test Cases for Version 2: Improved Online Library Management System

Test	Test Case Description	Input Data	Expected	Verdict
1	**Overdue Books**	5 books overdue, return 1 book late	"Overdue handled correctly"	Passed
2	**Book Availability Check**	100 books, 95 borrowed, borrow 1 book	"Book borrowed"	Passed
3	**Loan Limit Check**	5 books allowed, 5 borrowed, borrow 1 more	"Cannot borrow more books"	Passed
4	**Fine Calculation**	1 book, 10 days late	"Correct fine calculated"	Passed
5	**Reservation Handling**	100 books, 1 available, 1 reservation	"Reservation honored"	Passed