Debugging Log

# Defect Information

**Defect ID:** Bug 3 – Double fine incurred to patron

**Priority:** Major

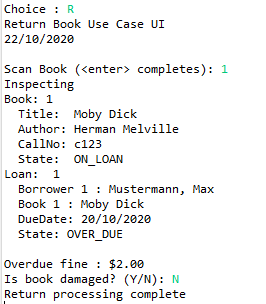
**Status:** VERIFIED

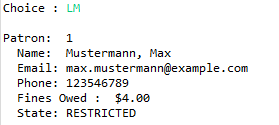
**Last updated:** 2020-10-18

**Assigned to:** Sam Johnson

## Reported Issue

When a fine is incurred the amount of fine applied to the patron is double the reported fine.





# Replication

## Setup

* Patron created with data as per Test Data
* Patron state is CAN\_BORROW
* Patron fines are 0.0
* Book created with data as per Test Data
* Book state is AVAILABLE
* Recorded Patron ID and Book ID

## Tear down

* Remove library.obj file
* Remove calendar.obj file

## Steps

|  |  |  |
| --- | --- | --- |
| **#** | **Test Action** | **Expected Results** |
| 1 | Enter ‘L’ at the main menu, and press Enter | Borrow Book use case UI starts. Prompt to swipe Patron card. |
| 2 | Enter Patron ID, press Enter | Prompted to scan book. |
| 3 | Enter Book ID, press Enter | Prompted to scan another book. |
| 4 | Press Enter | System displays Final Borrowing List. Prompts to Commit Loans. |
| 5 | Enter ‘Y’, press Enter | Completed Borrowing List displayed, prompted to enter any key to exit. |
| 6 | Press Enter | Main menu displayed |
| 7 | Enter ‘T’, press Enter | Prompted to enter the number of days |
| 8 | Enter Number of Days (4), press Enter | Displays new date followed by main menu |
| 9 | Enter ‘R’, press Enter | Return Book use case UI starts. Prompt to scan book. |
| 10 | Enter Book ID, press Enter | Displays inspecting book, book details, and loan details. Prompted to confirm if book is damaged. |
| 11 | Enter ‘N’, press Enter | Main menu is displayed |
| 12 | Enter ‘LM’, press Enter | Patron List is displayed. Bug Evident:  Patron fines are $4.00 when they should be $2.00 |

## Test Data

| **Description** | | **Data** |
| --- | --- | --- |
| Patron 1 | Last name | Mustermann |
| First name | Max |
| Email | max.mustermann@example.com |
| Phone | 123456789 |
| Book 1 | Author | Herman Melville |
| Title | Moby Dick |
| Call Number | c123 |
| Number of Days | | 4 |

# Simplification/Tracing

<List test script actions taken to complete use case>

|  |  |
| --- | --- |
| **Hypothesis #1** | |
| Defect occurs within ReturnBookControl.dischargeLoan() | |
| **Expected State** | **Actual State** |
| Patron finesPayable is 0.0 before and 4.0 after | Patron fines are already 2.0 before and are 4.0 after |
| **Conclusion** | |
| Hypothesis disproven. Defect begins prior to ReturnBookControl.dischargeLoan() as finesPayable has already been set to 2.0 (the correct fine) and then gets increased to 4.0. | |

**Screenshots/Comments:**

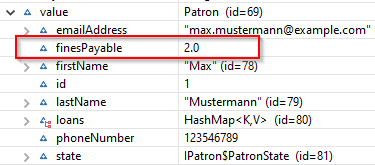


Figure 1: State before Library.dischargeLoan()

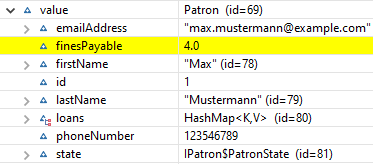


Figure 2: State after Library.dischargeLoan()

Fine appears to be added twice. Once prior to ReturnBookControl.dischargeLoan() and once during.

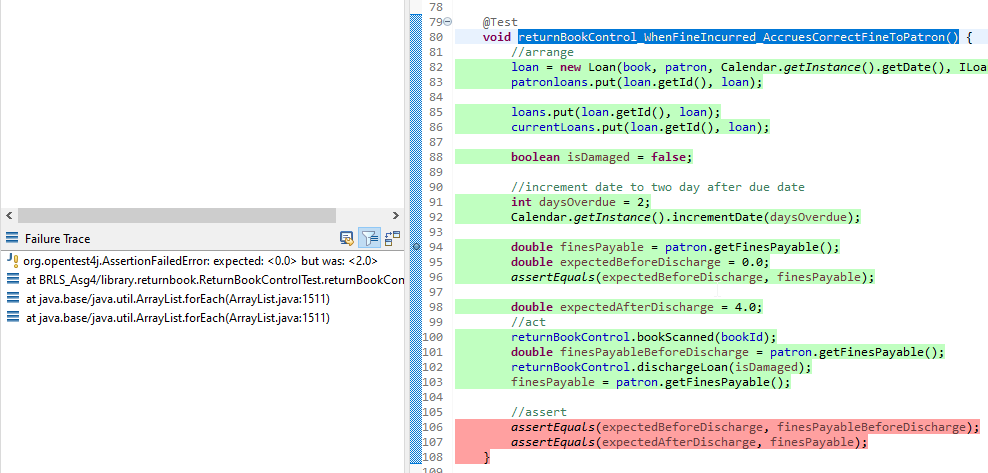
|  |  |
| --- | --- |
| **Hypothesis #2** | |
| Defect occurs between calls to ReturnBookControl.bookScanned() and ReturnBookControl.dischargeLoan() | |
| **Expected State** | **Actual State** |
| Patron fines Payable is 0.0 before and 4.0 after | FinesPayable is 0.0 before and 4.0 after |
| **Conclusion** | |
| Hypothesis confirmed. | |

**Screenshots/Comments:**

Fines should not be accrued to Patron until the loan is actually discharged. Can write a an automated test that exercises bookScanned() and dischargeLoan(). Test that fines are nil after bookScanned() and correct after dischargeLoan().

Created Automated Test:

returnBookControl\_WhenFineIncurred\_AccruesCorrectFineToPatron()



# Resolution

Tracing through ReturnBookControl.bookScanned() reveals that Patron.incurFine() is called. This is also called in dischargeLoan(), thus patron is fined twice.



Figure : incurFine() called in bookScanned()

Patron should only be fined when loan is discharged. To rectify the defect, remove the call to incurFine() at line 53.

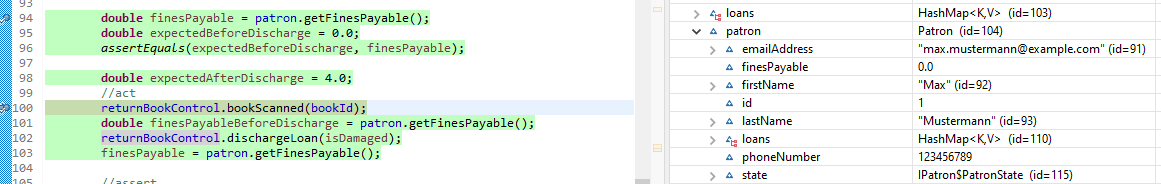


Figure : finesPayable at 0.0 before bookScanned()

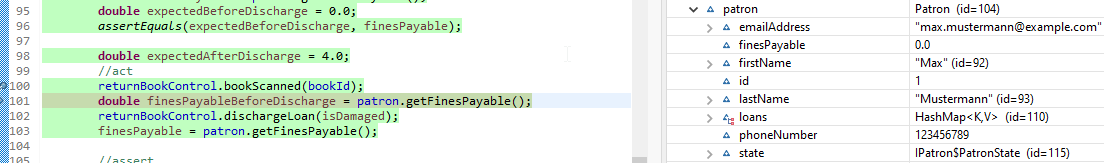


Figure : finesPayable at 0.0 after bookScanned()

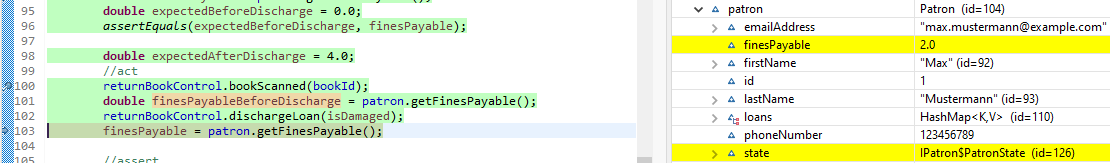


Figure : finesPayable changed to 2.0 after dischargeLoan()

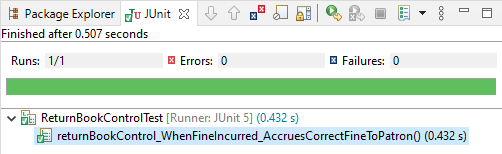


Figure : Automated test results

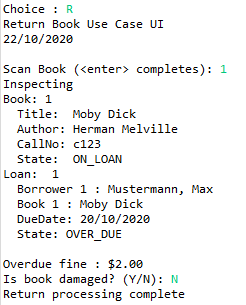


Figure : Returning two days overdue

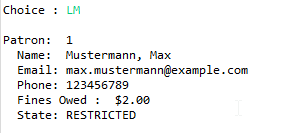


Figure : Patron fines after returning two days overdue

# Regression Testing

Checked returning on time, one day overdue, having multiple books on loan and returning, and returning a damaged book. Fines appear correct in both display and as accrued to patron in all tests.

Note: No UI display of damage fee after inspection of returned book, raise with stakeholders.