



Software Testing Report

Team # 3

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Appendix E: Test Cases:

Test Case 1: Issue Book

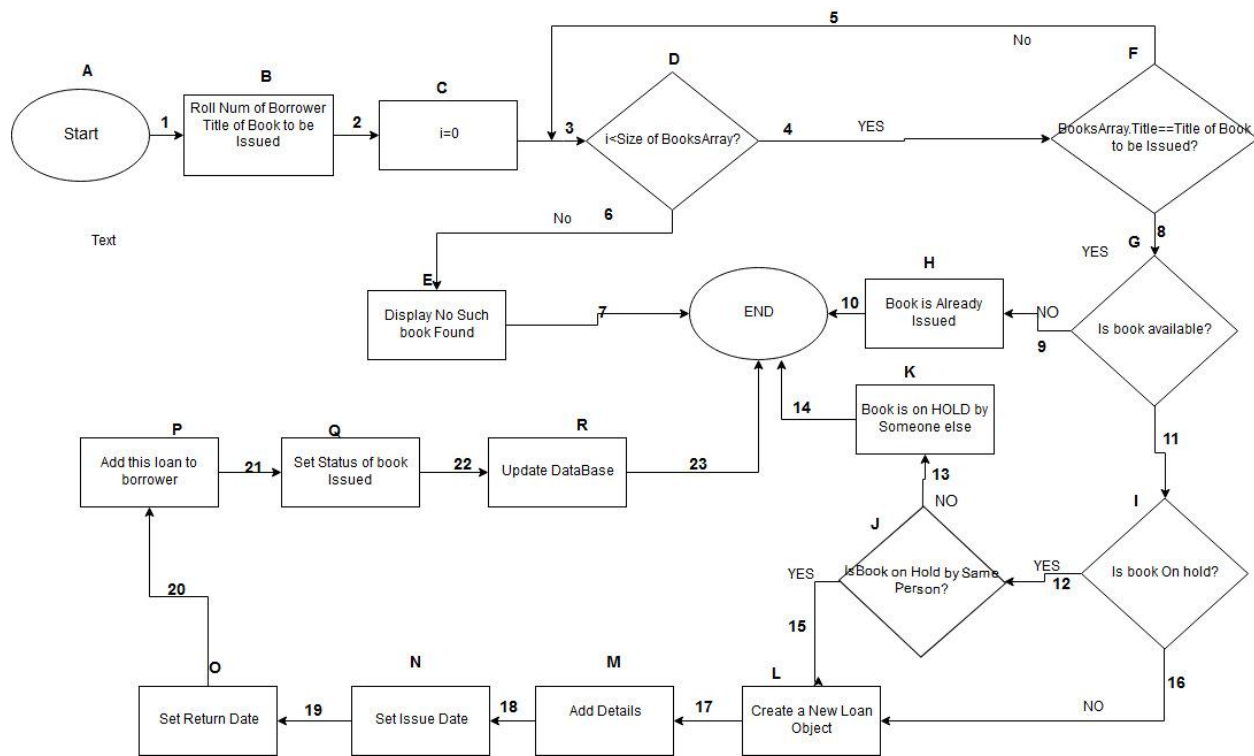


Figure 1: Flow Chart of Issue Book

Statement Coverage:

- A1->B2->C3->D4->F8->G11->I12->J15->L17->M18->N19->O20->P21->Q22->R23

Statement Coverage = $15/23 \times 100 = 66\%$ approx.

Branch Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F8->G9->H10
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D5->F8->G11->I12->J13->K14
- A1->B2->C3->D5->F8->G11->I16->L17->M18->N19->O20->P21->Q22->R23
- A1->B2->C3->D5->F8->G11->I12->J15->L17->M18->N19->O20->P21->Q22->R23

Path Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F8->G9->H10
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D5->F8->G11->I12->J13->K14
- A1->B2->C3->D5->F8->G11->I12->J15->L17->M18->N19->O20->P21->Q22->R23
- A1->B2->C3->D5->F8->G11->I16->L17->M18->N19->O20->P21->Q22->R23

Test Cases for Issue Book:

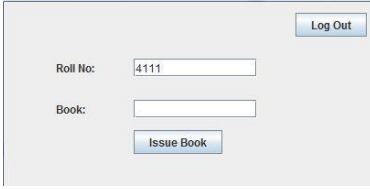
Identifier	TC-1.1
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when no book title is given.
Pre-condition(s)	Student's roll number is provided.
Input data	<p>This is the input data where roll number is provided but book title is missing.</p> 
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page.
Expected result(s)	Error Message(Book title is missing)
Actual Result(s)	Error Message(Book title is missing)
Post-condition(s)	User will re-enter the book title to continue

Table 1: TC-1.1

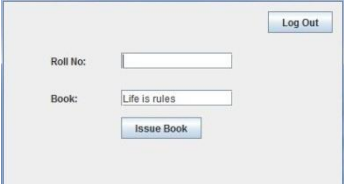
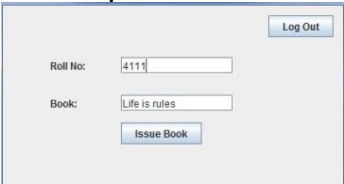
Identifier	TC-1.2
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when no roll number is given.
Pre-condition(s)	Title of book is provided.
Input data	<p>This is the input data where roll number is missing but book title is provided.</p> 
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page.
Expected result(s)	Error Message(Roll number is missing)
Actual Result(s)	Error Message(Roll number is missing)
Post-condition(s)	User will enter the roll number to continue.

Table 1: TC-1.2

Identifier	TC-1.3
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when both the requirements are provided.
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where roll number and book title is provided.</p> 
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page.
Expected result(s)	It will be redirected to success page.

Actual Result(s)	It will be redirected to success page.
Post-condition(s)	User will press ok to proceed further.

Table 3: TC-1.3

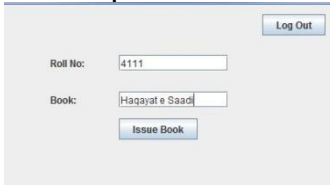
Identifier	TC-1.4
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the requested book is not in the list.
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where roll number and book title is provided.</p> 
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System will show message that book not found.
Actual Result(s)	System responded Book not found.
Post-condition(s)	User can request for some other book.

Table 4: TC-1.4

Identifier	TC-1.5
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the roll number is incorrect.
Pre-condition(s)	Title of book and roll number is provided.
Input data	This is the input data where wrong roll number is provided.


	
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System will show message roll number is incorrect.
Actual Result(s)	System responded roll number is incorrect
Post-condition(s)	User will enter correct roll number to proceed.

Table 5: TC-1.5

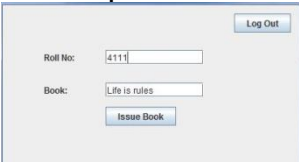
Identifier	TC-1.6
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the book is not available(already issued).
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where roll number and book title is provided.</p> 
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System should respond book is already issued(book is not currently available)..
Actual Result(s)	System responded book is already issued(book is not currently available)..
Post-condition(s)	User can ask for some other book.

Table 6: TC-1.6

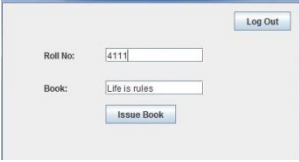
Identifier	TC-1.7
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the book is not on hold by this person
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where roll number and book title is provided.</p> 
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System should respond Book is on Hold by someone.
Actual Result(s)	System responded Book is on Hold by someone.
Post-condition(s)	User can ask for some other book or can come back later to check again.

Table 7: TC-1.7

Test Case 2: Renew Book

Flow Chart

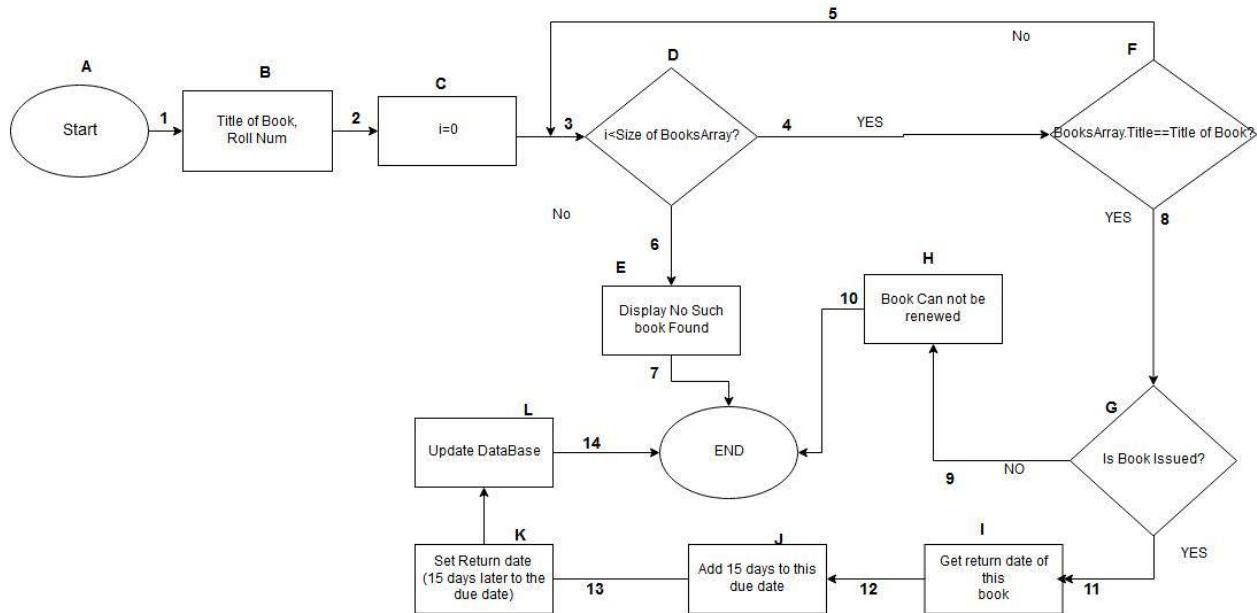


Figure 2: Flow Chart of renew book

Statement Coverage:

- A1->B2->C3->D4->F8->G22->I22->J23-> K24->L25->End
- Statement Coverage= $\frac{22}{23} \times 200 = 85\%$ approx.

Brach Coverage:

- A1->B2->C3->D4->F8->G22->I22->J23-> K24->L25->End
- A1->B2->C3->D4->F5->D6->E7->End
- A1->B2->C3->D6->E7->End
- A1->B2->C3->D4->F8->G29->H20->End

Path Coverage

- A1->B2->C3->D4->F8->G22->I22->J23-> K24->L25->End
- A1->B2->C3->D4->F5->D6->E7->End
- A1->B2->C3->D6->E7->End
- A1->B2->C3->D4->F8->G29->H20->End

Cyclomatic Complexity

Number of nodes =N= 23

Number of Edges= E= 25

Interconnected Components=P = 2

Cyclomatic Complexity= (E-N)+2P

Cyclomatic Complexity = 25 – 23 + 2(2) = 4

Test Cases for Renew Book:


Identifier	TC-2.1
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when no book title is given.
Pre-condition(s)	Student's roll number is provided.
Input data	<p>This is the input data where roll number is provided but book title is missing.</p> 
Detailed steps	Pressing renew book will issue the book to the roll number provided. It will redirect to success page.
Expected result(s)	Error Message(Book title is missing)
Actual Result(s)	Error Message(Book title is missing)
Post-condition(s)	User will re-enter the book title to continue

Table 8: TC-2.1

Identifier	TC-2.2
Priority	High



Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when no roll number is given.
Pre-condition(s)	Title of book is provided.
Input data	<p>This is the input data where roll number is missing but book title is provided.</p> 
Detailed steps	Pressing renew book will issue the book to the roll number provided. It will redirect to success page.
Expected result(s)	Error Message(Roll number is missing)
Actual Result(s)	Error Message(Roll number is missing)
Post-condition(s)	User will enter the roll number to continue.

Table 9: TC-2.2

Identifier	TC-2.3
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when both the requirements are provided correctly.
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where roll number and book title is provided.</p> 
Detailed steps	Pressing renew book will renew the book to the roll

	number provided if he has issued the book. It will redirect to success page.
Expected result(s)	It will be redirected to success page.
Actual Result(s)	It will be redirected to success page.
Post-condition(s)	User will press ok to proceed further.

Table 10: TC-2.3


Identifier	TC-2.4
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the requested book is not in the list.
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where roll number and book title is provided.</p> 
Detailed steps	Pressing renew book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System will show message that book not found.
Actual Result(s)	System responded Book not found.
Post-condition(s)	User can not renew that book as it is not present .He will enter book correctly.

Table 11: TC-2.4

Identifier	TC-2.5
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.



Short description	This test case is to check when the roll number is incorrect.
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where wrong roll number is provided.</p> 
Detailed steps	Pressing renew book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System will show message roll number is incorrect.
Actual Result(s)	System responded roll number is incorrect
Post-condition(s)	User will enter correct roll number to proceed.

Table 12: TC-2.5

Identifier	TC-2.6
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the book is not issued by person who wants to renew.
Pre-condition(s)	Title of book and roll number is provided.
Input data	<p>This is the input data where roll number and book title is provided.</p> 
Detailed steps	Pressing renew book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System should respond book is issued by someone

	else(book is not currently available)..
Actual Result(s)	System responded book is already issued by someone else(book is not currently available)..

Table 13: TC-2.6

Test Case 3: Remove Book

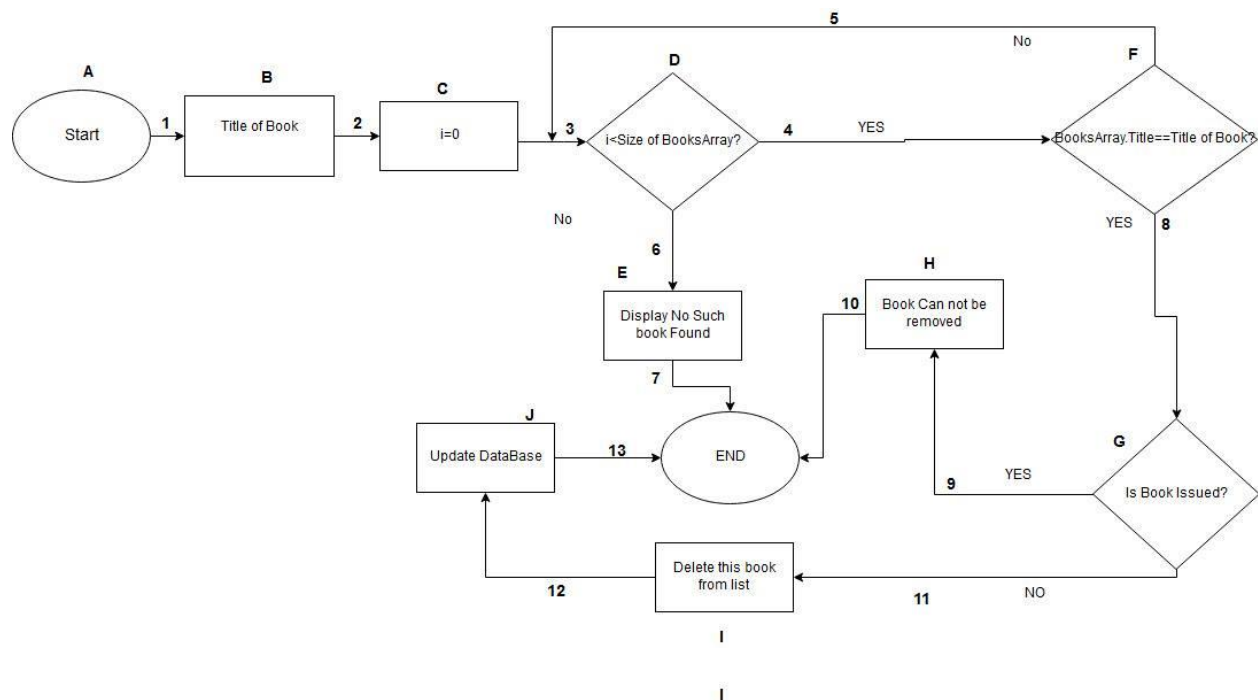


Figure 3: Flow Chart of Remove Book

Statement Coverage:

- A1->B2->C3->D4->F8->G11->I12->J13

Statement Coverage=9/11 x 100= 81% approx.

Branch Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F8->G9->H10
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D4->F8->G11->I12->J13

Path Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F8->G9->H10
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D5->F8->G11->I12->J13

Cyclomatic Complexity

Number of nodes =N= 11

Number of Edges= E= 13

Interconnected Components=P = 1

Cyclomatic Complexity= (E-N)+2P

Cyclomatic Complexity = 13 – 11 + 2(1) = 4

Test Cases for Remove Book:

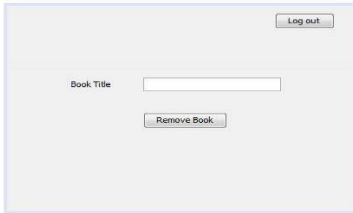
Identifier	TC-3.1
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when no book title is given.
Pre-condition(s)	Clerk or librarian is on remove page.
Input data	<p>This is the input data where book title is missing.</p> 
Detailed steps	Pressing remove book will remove the book from the list of books. It will redirect to success page.
Expected result(s)	Error Message(Book title is missing)
Actual Result(s)	Error Message(Book title is missing)
Post-condition(s)	User will re-enter the book title to continue

Table 14: TC-3.1



Identifier	TC-3.2
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the title of book is provided.
Pre-condition(s)	Clerk or librarian is on remove page.
Input data	<p>This is the input data where book title is provided.</p> 
Detailed steps	Pressing remove book will remove the book from the list of books. It will redirect to success page.
Expected result(s)	It will be redirected to success page.
Actual Result(s)	It will be redirected to success page.
Post-condition(s)	User will press ok to proceed further.

Table 15: TC-3.2

Identifier	TC-3.3
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the requested book to be removed is not in the list.
Pre-condition(s)	Title of book is provided.
Input data	<p>This is the input data where book title is provided.</p> 

Detailed steps	Pressing remove book will remove the book from the list of books in the library. It will redirect to success page if book is issued successfully.
Expected result(s)	System will show message that book not found.
Actual Result(s)	System responded Book not found.
Post-condition(s)	User can request for some other book.

Table 16: TC-3.3

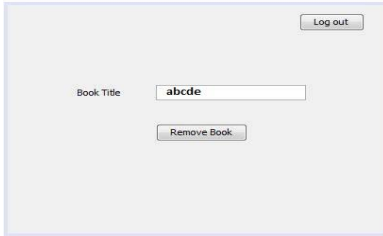
Identifier	TC-3.4
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the requested book is issued to any student.
Pre-condition(s)	Title of book is provided.
Input data	<p>This is the input data where book title is provided.</p> 
Detailed steps	Pressing remove book will remove the book from the list of books in the library. It will redirect to success page if book is removed successfully.
Expected result(s)	System should respond that book is issued to some student hence it cannot be removed now.
Actual Result(s)	System responded book is issued, it can be removed when it is returned by student.
Post-condition(s)	User can ask for some other book.

Table 17: TC-3.4


Identifier	TC-3.5
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the requested book is on hold by student.
Pre-condition(s)	Title of book is provided.
Input data	<p>This is the input data where book title is provided.</p> 
Detailed steps	Pressing remove book will remove the book from the list of books in the library. It will redirect to success page.
Expected result(s)	System should respond that book is on hold by some student hence it cannot be removed now.
Actual Result(s)	System responded book is on hold by some student, it can be removed when it is not on hold state.
Post-condition(s)	User can request for some other book.

Table 18: TC-3.5

Identifier	TC-3.6
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the requested book is removed.
Pre-condition(s)	Title of book is provided.


Input data	<p>This is the input data where book title is provided.</p> 
Detailed steps	Pressing remove book will remove the book from the list of books in the library. It will redirect to success page.
Expected result(s)	System should remove that book from the list of books in library and display success message.
Actual Result(s)	System responded that book is removed from the list of books in library using a success message.
Post-condition(s)	User will be shown success message.

Table 19: TC-3.6

Test Case 4: Return Book

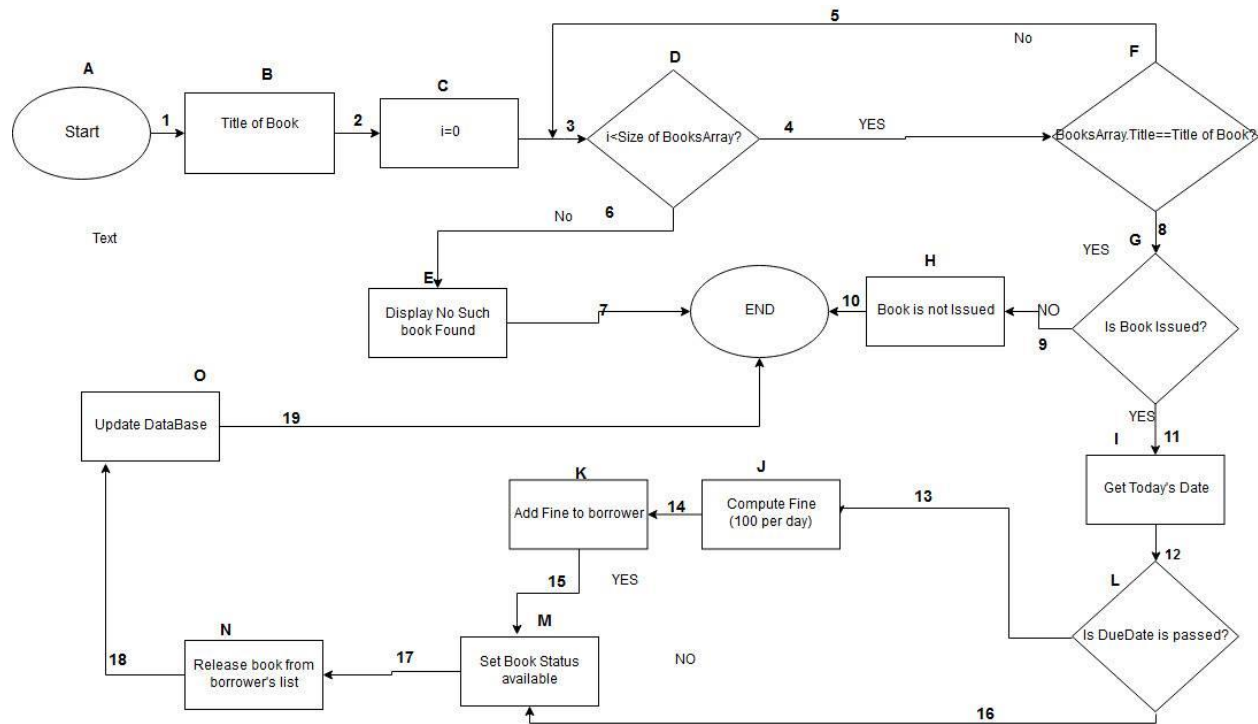


Figure 1: Flow Chart of Return Book

Statement Coverage:

- A1->B2->C3->D4->F8->G11->I12->L16->M17->N18->O19

Statement Coverage = $\frac{12}{16} \times 100 = 75\%$ approx.

Branch Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F8->G9->H10
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D5->F8->G11->I12->L13->J14->K15->M17->N18->O19
- A1->B2->C3->D5->F8->G11->I12->L16->M17->N18->O19

Path Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F8->G9->H10
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D5->F8->G11->I12->L13->J14->K15->M17->N18->O19
- A1->B2->C3->D5->F8->G11->I12->L16->M17->N18->O19

Cyclomatic Complexity

Number of nodes =N= 16

Number of Edges= E= 19

Interconnected Components=P = 1

Cyclomatic Complexity= (E-N)+2P

Cyclomatic Complexity = $19 - 16 + 2(1) = 5$

Test Cases for Return Book:


Identifier	TC-4.1
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when no book title is given.
Pre-condition(s)	-
Input data	<p>This is the input data where book title is missing.</p> 
Detailed steps	Pressing return book will return the book from the roll number on which it was provided. It will change the status of book to available and It will redirect to success page.
Expected result(s)	Error Message(Book title is missing)
Actual Result(s)	Error Message(Book title is missing)
Post-condition(s)	User will re-enter the book title to continue

Table 20: TC-4.1

Identifier	TC-4.2
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when book title is given.


Pre-condition(s)	Book title is provided
Input data	<p>This is the input data where book title is provided.</p> 
Detailed steps	Pressing return book will return the book from the roll number on which it was provided. It will change the status of book to available and It will redirect to success page.
Expected result(s)	It will be redirected to success page.
Actual Result(s)	It will be redirected to success page.
Post-condition(s)	User will press ok to proceed further.

Table 21: TC-4.2


Identifier	TC-4.3
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the requested book is not in the list.
Pre-condition(s)	Title of book is provided.
Input data	<p>This is the input data where book title is provided.</p> 
Detailed steps	Pressing return book will return the book from the roll number on which it was provided. It will change the status of book to available and It will redirect to success page.
Expected result(s)	System will show message that book not found.
Actual Result(s)	System responded Book not found.
Post-condition(s)	User can enter correct name for that book.

Table 22: TC-4.3


Identifier	TC-4.4
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check if the book is not issued.
Pre-condition(s)	Title of book is provided.
Input data	<p>This is the input data where book is not issued before.</p> 
Detailed steps	Pressing return book will return the book from the roll number on which it was provided. It will change the status of book to available and It will redirect to success page.
Expected result(s)	System will show message This book is not issued.
Actual Result(s)	System responded this book not issued.
Post-condition(s)	User will enter correct name for return book

Table 23: TC-4.4

Identifier	TC-4.5
Priority	High
Related requirements(s)	Clerk or librarian will be users of this function.
Short description	This test case is to check when the due date of book is already passed.
Pre-condition(s)	Title of book is provided.
Input data	This is the input data where due date of book is already passed.

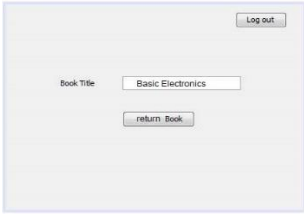
	
Detailed steps	Pressing issue book will issue the book to the roll number provided. It will redirect to success page if book is issued successfully.
Expected result(s)	System should compute fine
Actual Result(s)	System computes fine in accordance with number of days
Post-condition(s)	User will pay that fine

Table 24: TC-4.5

Test Case 5: Search Book

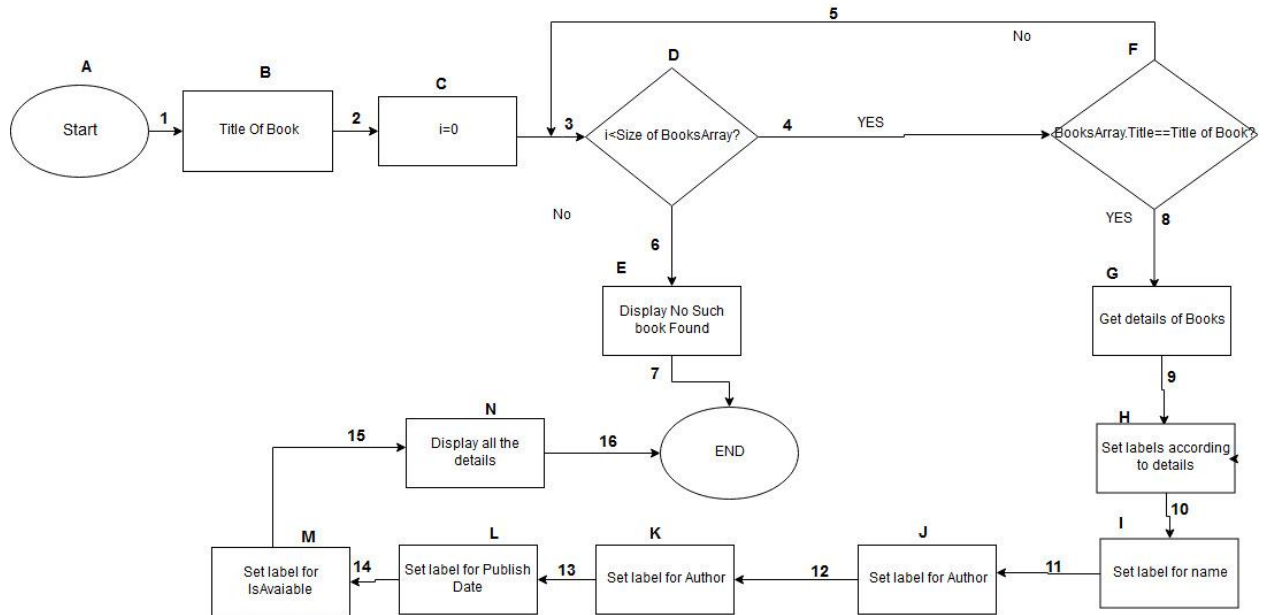


Figure 5: Flow Chart of Search Book

Statement Coverage:

- A1->B2->C3->D4->F8->G9->H10->I11->J12->K13->L14->M15->N16

Statement Coverage = $\frac{13}{16} \times 100 = 81.25\%$.

Brach Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D4->F8->G9->H10->I11->J12->K13->L14->M15->N16

Path Coverage:

- A1->B2->C3->D6->E7
- A1->B2->C3->D4->F5->D6->E7
- A1->B2->C3->D4->F8->G9->H10->I11->J12->K13->L14->M15->N16

Cyclomatic Complexity

Number of nodes = N = 15

Number of Edges = E = 16

Interconnected Components = P = 1

Cyclomatic Complexity = $(E - N) + 2P$

Cyclomatic Complexity = $16 - 15 + 2(1) = 2$

Test Cases for Search Book:

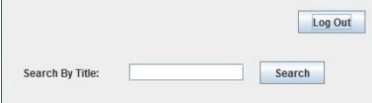
Identifier	TC-5.1
Priority	High
Related requirements(s)	Clerk, librarian and borrower will be users of this function.
Short description	This test case is to check when no book title is given in search field.
Pre-condition(s)	Clerk, librarian and borrower are logged in.
Input data	<p>This is the input data where roll number is provided but book title is missing.</p> 
Detailed steps	Pressing search will redirect to the page containing all the details of the book.
Expected result(s)	Error Message(Book title is missing)
Actual Result(s)	Error Message(Book title is missing)
Post-condition(s)	User will re-enter the book title to continue

Table 25: TC-5.1


Identifier	TC-5.2
Priority	High
Related requirements(s)	Clerk, librarian and borrower will be users of this function.
Short description	This test case is to check when invalid book title is provided
Pre-condition(s)	Clerk, librarian and borrower are logged in.
Input data	This is the input data where book title is wrongly provided. 
Detailed steps	Pressing search will redirect to the page containing all the details of the book.
Expected result(s)	Error Message(Book title is invalid)
Actual Result(s)	Error Message(Book title is invalid)
Post-condition(s)	User will enter the title again to continue

Table 36: TC-5.2


Identifier	TC-5.3
Priority	High
Related requirements(s)	Clerk, librarian and borrower will be users of this function.
Short description	This test case is to book is not found.
Pre-condition(s)	Title of book is provided.
Input data	This is the input data where valid book title is provided. 
Detailed steps	Pressing search will redirect to the page containing all the details of the book.
Expected result(s)	It will be redirected to success page.
Actual Result(s)	It will be redirected to success page.
Post-condition(s)	User will press ok to proceed further.

Table 27: TC-5.3


Identifier	TC-5.4
Priority	High
Related requirements(s)	Clerk, librarian and borrower will be users of this function.
Short description	This test case is to check when the requested book is found
Pre-condition(s)	Title of book is provided.
Input data	This is the input data where book title is provided. 
Detailed steps	Pressing search will redirect to the page containing all the details of the book.
Expected result(s)	System will redirect to page containing book's information.
Actual Result(s)	System redirected to page containing information of book.
Post-condition(s)	User can proceed further.

Table 28: TC-5.4