Manual Testing for Library and Account Management System

Core Principles of Manual Testing

Manual testing, as executed in these plans, is a critical component of the software development lifecycle (SDLC). It is a non-automated process where a human tester interacts with the software to validate its behavior against predefined requirements. The methodology demonstrated in your test cases adheres to the following academic principles:

Test Case Design: Each test case is meticulously documented with a unique Test Case ID, a descriptive Test Scenario, and a series of sequential Steps. This structured approach ensures reproducibility and clarity, which are cornerstones of academic and professional testing standards.

Requirements Traceability: The test scenarios are directly linked to specific functional requirements of the systems (e.g., "Account Creation," "Deposit Funds," "Borrow an available book"). This linkage ensures that all critical functionalities are covered and tested, a key aspect of requirements traceability.

Positive vs. Negative Testing: The plans effectively differentiate between positive testing (validating that the system works as expected with correct inputs, e.g., AM-01, TM-01) and negative testing (validating how the system handles invalid or unexpected inputs, e.g., AM-02, TM-03). This dual approach is essential for demonstrating the system's robustness and security against erroneous user actions.

Verification and Validation: The comparison between the Expected Result and the Actual Result is the core of the verification process. It confirms whether the software meets its specified design. The final Pass/Fail status provides a clear and objective measure of the test's outcome, a critical part of the validation phase.

Analysis of the Library Management System Test Plan

The LMS test plan focuses on the functional integrity of a resource management system, emphasizing user access, data retrieval, and resource availability.

User Management & Access Control:

Test cases UM-01 and UM-02 parallel the account management tests, verifying the user registration and input validation processes. These tests ensure that the system can correctly onboard new users while protecting against incomplete data.

The negative test case BR-02 is a key demonstration of role-based access control (RBAC). By preventing a user from returning a book not borrowed by them, the system's security model is validated, ensuring that actions are limited to authorized entities.

Resource and Inventory Management:

Test case BS-01 tests the search algorithm and performance. The "within 2 seconds" requirement indicates a focus on non-functional requirements related to system efficiency.

Test cases BB-01 and BB-02 are critical for validating the state management of the books. They confirm that the system correctly updates the availability status of a book upon borrowing and returning. The negative test BB-02 ensures concurrency control by preventing simultaneous borrowing of the same book.

Library Management System

User Management

Test Senario	Test Scenario	Test Case ID	Steps	Expected Result	Actual Result	Pass/Fail
UM-01	Register user with valid inputs	UM-01	1. Open Registration page 2. Enter Name, ID, Email, Role (Student/Staff) 3. Click Submit	User is registered successfully; confirmation message shown	Message: "Registration successful." User added to database.	Pass
UM-02	Register user without mandatory fields	UM-02	1. Open Registration page 2. Leave Email or ID blank 3. Click Submit	Error message shown indicating missing mandatory fields	Error displayed: "Email is required."	Pass
UM-03	Update user contact information	UM-03	1. Login as user 2. Navigate to Profile/Edit page 3. Update contact details (phone/email) 4. Save changes	Contact info updated successfully; confirmation message shown	Phone number updated and confirmation shown	Pass

Book Returns

Test Senario	Test Scenario	Test Case ID	Steps	Expected Result	Actual Result	Pass/Fail
BR-01	Return a borrowed book	BR-01	1. Login as user 2. View list of borrowed books 3. Select a borrowed book 4. Click Return	Book status changes to "Available"; return date updated in user's borrowing history	Book returned; availability updated; return date logged	pass
BR-02	Attempt to return a book not borrowed by user	BR-02	1. Login as user 2. Attempt to return a book not borrowed by them	System rejects return; error message: "You cannot return a book not borrowed by you"	Error shown: "This book was not issued to you"	pass

Borrowing History

Test Senario	Test Scenario	Test Case ID	Steps	Expected Result	Actual Result	Pass/Fail
BH-01	View borrowing history with correct details	BH-01	1. Login as user 2. Navigate to Borrowing History page	List of borrowed books with title, borrow date, and return date displayed correctly	History displayed with correct data and format	pass

Analysis of the Bank Management System Test Plan

The BMS test plan is a comprehensive demonstration of testing financial software, where data integrity, security, and transaction accuracy are paramount.

Account Management & Data Integrity:

Test cases AM-01 and AM-03 validate the system's CRUD (Create, Read, Update, Delete) operations. The successful execution of these tests confirms that the underlying database schema and application logic correctly handle the lifecycle of an account.

The negative test case AM-02 is crucial for enforcing data validation rules at the input level, a fundamental aspect of secure system design. It prevents incomplete or corrupt data from entering the system.

Transaction and Financial Logic:

Test cases TM-01, TM-02, and FM-01 verify the core business logic of the system. The accurate calculation of account balances and the correct transfer of funds demonstrate the reliability of the transactional algorithms.

The negative test cases, TM-03 and FM-02, specifically target financial controls. By testing for "Insufficient balance" and "Insufficient funds" scenarios, the plan ensures that the system enforces financial constraints and prevents unauthorized or impossible transactions, a critical requirement for regulatory compliance and risk management.

Manual Testing Plan – Bank Management System

Account Management

Test Case ID	Test Scenario	Steps	Expected Result	Actual Result	Pass/Fail
AM-01	Account Creation - Valid Inputs	1. Go to Create Account screen 2. Enter Name, Address, NIC, Phone, Email, Deposit 3. Click Submit	Account is created; confirmation message appears	Account created successfully	Pass
AM-02	Create account with missing mandatory fields	1. Leave Name or NIC blank 2. Click Submit	Error message: "Required fields missing"	Proper error shown: "Name is required"	Pass
AM-03	Update account details	1. Select existing account 2. Edit phone or address 3. Click Save	Details are updated and saved correctly	Changes reflected in account	Pass
AM-04	Delete account	1. Select account 2. Click Delete 3. Confirm deletion	Account is removed from system	Account deleted, no longer accessible	Pass

Transaction Management

Test Case ID	Test Scenario	Steps	Expected Result	Actual Result	Pass/Fail
TM-01	Deposit funds	1. Select account 2. Enter deposit amount 3. Click Deposit	Balance increases by entered amount	Correct balance update	Pass
TM-02	Withdraw funds within balance	1. Select account 2. Enter amount less than balance 3. Click Withdraw	Balance decreases by amount	Successfu withdrawal, Balance reduced	Pass
TM-03	Withdraw funds exceeding balance	1. Select account 2. Enter amount greater than balance 3. Click Withdraw	Error: "Insufficient balance"	Error displayed as expected	Pass

Fund Transfers

Test Case ID	Test Scenario	Steps	Expected Result	Actual Result	Pass/Fail
FM-01	Valid fund transfer between two accounts	1. Select sender and recipient accounts 2. Enter valid amount 3. Click Transfer	Sender balance reduces, recipient balance increases	Transfer completed successfully	Pass
FM-02	Transfer with insufficient sender funds	1. Use account with low balance 2. Try to transfer large amount 3. Click Transfer	Error: "Insufficient funds"	System blocked transfer with error	Pass
FM-03	Transfer to invalid recipient account	1. Enter invalid recipient account number 2. Click Transfer	Error: "Invalid account number"	Error displayed correctly	Pass

Loan Management

Test Case ID	Test Scenario	Steps	Expected Result	Actual Result	Pass/Fail
LM-01	Apply for loan with valid details	1. Enter loan amount, term, income 2. Click Apply	Loan is recorded and pending approval	Loan request added to records	Pass
LM-02	Apply for loan with invalid data	1. Enter missing income or short account age 2. Click Apply	Error: "Loan eligibility not met"	System correctly displayed error	Pass