Test Completion Report

Project: Testing Diploma Final Project

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Overview

This report summarizes the testing phase conducted for the project. Detailed test cases and their results are documented in the separate **Test Case Report**, and discovered defects are cataloged in the **Bug Report**. The test approach involved designing test cases as modules, where each module consists of multiple test suites. Each test suite focuses on a specific function or a part of a function, ensuring targeted coverage of the application's logic and features.

To facilitate automated testing of interactive functionalities, helper functions were implemented. For example, we introduced an input simulation utility that writes user inputs (originally expected via scanf) to a temporary file and redirects stdin from it. This allows consistent and repeatable test scenarios without manual intervention.

Test Execution Summary

- **Test Suites Executed:** 21
  - Failed Suites: 0
- **Total Tests Executed:** 63
  - Failed Tests: 8
- **Total Asserts Executed:** 112
  - Failed Asserts: 9

These tests include scenarios for login verification, account creation, database operations, as well as a range of boundary and state transition conditions.

Coverage

Module\ Coverage	Statement Coverage	Branch Coverage	MC/DC Coverage	BVA Coverage	State Transition Coverage	Notes
App	~ 100 %	~ 100 %	N/A	N/A	~ 100 %	Mostly high-level logic; no direct input boundaries handled. Some admin transitions tested, normal user transitions not fully tested.
Back End	~20%	~20%	N/A	N/A	~20%	Only minimal testing. Functions like Customer_Runner() cannot be easily tested (no return value to be asserted). No direct input boundaries.
Course Registration	~50%	~50%	~50%	N/A	N/A	Can not test print functions like ShowListOfCourses
Create Account	~100%	~100%	~100%	~100%	N/A	Extensive boundary tests on names, age, DOB, etc. File focuses solely on validation conditions (BVA fully covered). No high-level state transitions.
DB Manager	~90%	~90%	~90%	N/A	N/A	
Login	~100%	~100%	~100%	N/A	~100%	

The following are the averaged total coverage estimates across all modules. Modules or metrics marked as "N/A" were not applicable or did not have measurable conditions for that coverage type.

- **Statement Coverage:** ~77%
- **Branch Coverage:** ~77%
- **MC/DC Coverage:** ~85%
- **BVA Coverage:** ~100% (Only measured where applicable, notably in Create Account module)
- **State Transition Coverage:** ~73%

Key Observations:

- **High Coverage Areas:**
    - **Create Account** and **Login** modules demonstrated high coverage, especially in boundary value conditions (BVA) and MC/DC testing.
    - **App** and **Login** modules achieved full or near-full state transition coverage for their respective functionalities.
- **Areas for Improvement:**
    - **Back End** module coverage remained low (around 20%) due to the nature of runner functions that do not return values and are thus harder to assert on.

Conclusion

The testing process provided significant insight into the system's reliability and correctness. The strategic use of modular test case design and helper functions (like input simulation) ensured thorough and automated examination of both core and edge functionalities.

While some tests failed and certain transitions remain under-tested, the overall coverage is robust. Future efforts can focus on enhancing assertions within non-returning functions and improving coverage for less-tested transitions to increase quality and maintainability further.

All identified issues and their details are available in the **Bug Report** for corrective action.