**Hospital Management System Testing Report**

**1. Introduction**

This report presents the testing process and results for the db\_manager.py module, Admin Controller, and Doctor Controller of the Hospital Management System. The goal of this testing is to verify database connectivity, table creation, data integrity, authentication mechanisms, security measures, and controller functionalities.

**2. Testing Methodology**

The testing was conducted in a controlled local development environment using structured test cases. Each test case includes an objective, expected outcome, and actual results. The test cases cover database operations, authentication, security, and administrative and medical functionalities.

**3. Testing Environment**

The tests were executed under the following conditions:

* **Operating System:** Windows 10
* **Database:** SQLite 3
* **Python Version:** 3.x
* **Testing Framework:** unittest
* **Dependencies:** sqlite3, hashlib, logging

**4. Test Results**

**4.1 Database Connection Test**

**Objective:** Verify that the database connection is established successfully.

**Expected Result:** The connection should be successful and return a valid connection object.

**Actual Result:** Connection successful.

**4.2 Table Creation Test**

**Objective:** Ensure that all required tables are created successfully.

**Expected Result:** The database should contain all necessary tables.

**Actual Result:** All tables were created successfully.

**4.3 User Authentication Test**

**Objective:** Validate that users can log in with correct credentials and are denied access with incorrect ones.

**Expected Result:** Valid users should authenticate successfully; invalid users should be rejected.

**Actual Result:** Authentication functioned as expected.

**4.4 Data Insertion Test**

**Objective:** Verify that user and medical records can be inserted correctly into the database.

**Expected Result:** Data should be inserted without errors and retrievable.

**Actual Result:** Data insertion and retrieval were successful.

**4.5 Security Test (Password Hashing)**

**Objective:** Ensure that passwords are stored securely in hashed format.

**Expected Result:** Passwords should not be stored in plain text and should be securely hashed.

**Actual Result:** Password hashing was verified.

**4.6 Error Handling Test**

**Objective:** Check how the system handles database connection failures.

**Expected Result:** Errors should be logged and managed without system crashes.

**Actual Result:** Error handling mechanisms were found to be effective.

**4.7 Admin Controller Test**

**Objective:** Assess administrative functionalities such as user management, role assignment, and system configuration.

**Expected Result:** Admins should be able to create, update, delete users, assign roles, and modify system settings.

**Actual Result:** Administrative functions performed as expected.

**4.8 Doctor Controller Test**

**Objective:** Validate that doctors can access patient records, update medical histories, and manage appointments.

**Expected Result:** Doctors should be able to retrieve, modify, and manage patient records effectively.

**Actual Result:** Doctor functionalities were successfully tested.

**5. Conclusion**

The testing confirmed that the db\_manager.py module, Admin Controller, and Doctor Controller function correctly, ensuring database integrity, authentication, and security measures. All critical functionalities performed as expected. Routine testing and system monitoring are recommended to maintain optimal performance and system reliability.