Analyse various software testing tools and connect with your domain for testing the same.

**1. Overview of Software Testing Methodologies**

Several methodologies are used to ensure the robustness, reliability, and performance of software. Below are the key ones, connected to your hostel system.

**1.1 Manual Testing**

* **Description**: Involves human testers who check for bugs by interacting with the software interface.
* **Application to HDMS**:
  + Manually test student check-in/out modules to ensure usability.
  + Perform form validation testing (e.g., input fields for personal information).
* **Tools**: Test Case Management Tools (e.g., Excel, TestRail for tracking cases).

**1.2 Automation Testing**

* **Description**: Automated scripts are used to test repetitive tasks or bulk data operations.
* **Application to HDMS**:
  + Automate room allocation to verify accuracy under various scenarios.
  + Automate database load testing for bulk student entries.
* **Tools**: Selenium, Cypress, or Test Complete for UI-based operations.

**1.3 Functional Testing**

* **Description**: Verifies that each function of the software works as expected.
* **Application to HDMS**:
  + Ensure that login functionality works correctly for students and admin users.
  + Test whether the payment system integrates and functions properly.
* **Tools**: Selenium for web-based tests, Postman for API testing.

**1.4 Performance Testing**

* **Description**: Evaluates the speed, responsiveness, and stability of a system under load.
* **Application to HDMS**:
  + Measure how the system performs under peak usage (e.g., at the start of a semester).
  + Check how fast room availability updates under load conditions.
* **Tools**: JMeter, Gatling.

**1.5 Security Testing**

* **Description**: Ensures that the system is protected against vulnerabilities and unauthorized access.
* **Application to HDMS**:
  + Test student login credentials for vulnerabilities (e.g., SQL injection).
  + Verify that sensitive data (e.g., payment info) is encrypted.
* **Tools**: Burp Suite, OWASP ZAP.

**1.6 Regression Testing**

* **Description**: Tests the software after changes to ensure new features don’t break existing functionality.
* **Application to HDMS**:
  + If you update the room allocation logic, ensure the booking module still works.
* **Tools**: Selenium, TestNG.