**Unit Testing in School Management System with NUnit and Moq in C#**

**Introduction:**

This write-up provides a step-by-step guide on how to perform unit testing for a school data repository using the NUnit testing framework and Moq, a mocking framework. The objective is to create classes for students, subjects, and teachers, implement a repository for retrieving data by ID, and then write unit tests to ensure the repository functions correctly. This practice will help validate the behavior of the repository and ensure the reliability of data retrieval operations.

**Step 1: Install NUnit and Moq Packages**

Ensure you have NUnit and Moq packages installed in your project to enable unit testing. You can do this using the NuGet Package Manager in Visual Studio.

**Step 2: Create Classes for Students, Subjects, and Teachers**

Create classes for students, subjects, and teachers, each with relevant properties (e.g., ID and Name).

**Step 3: Create Unit Tests for Adding Data**

Write unit tests to verify that you can add values to the properties of these classes. Ensure that the properties are correctly set and retrieved.

**Step 4: Implement a Repository**

Create a repository class that encapsulates data retrieval operations. This class will typically have methods to fetch students, subjects, and teachers by ID. Implement the logic to interact with data sources, such as databases or in-memory collections.

**Step 5: Write Mock Tests for Data Retrieval**

Create a mock test class to test the repository's data retrieval methods (e.g., `GetStudentById`, `GetSubjectById`, and `GetTeacherById`). In these tests, use Moq to mock the repositories and simulate data retrieval. Verify that the repository correctly retrieves and returns data.

**Conclusion:**

Unit testing is an essential practice in software development to ensure that your code functions as expected. In this guide, we demonstrated how to perform unit testing for a school data repository using NUnit and Moq. By following these steps, you can systematically test the behavior of your repository and verify that it correctly handles data retrieval operations. This helps improve the reliability and robustness of your school data management application.