Unit Testing

Josh Wilcox (jw14g24@soton.ac.uk)

March 3, 2025

Contents

1 White box and Black Box

1.1 White Box

- Internal structure known
- Emphasis on whether methods work correctly
- Requires programming and implementation knowledge
- Usually done internally
- Requires code access

1.2 Black box

- Used to test software without knowledge of internal structure
- Emphasis on the relationship between the **behaviour** of input and outpuit
- Does not require programming and implementation knowledge
- Performed by end users and testers

2 Unit, Integration, and System Testing

2.1 Unit Testing

- Testing code in small isolated pieces
- Can be done anytime in the development process
- Is a *white box* strategy
- Done by developers

2.2 Integration Testing

- Repeating tests on a combination of larger collections of code units
- Done after unit but before system testing
- Uses both whitebox and blackbox testing
- Executed by testers

2.3 System Testing

- Testing the entirety of a developed system
- Done at the end of the development cycle
- Is blackbox
- Done by end users and developers

3 Testing in isolation

- The **seam** - boundary between the unit *being tested* and other classes that the unit collaborates with
- **Isolation** - All collaborating objects on the other side of the seam must be replaced by *mock* data

3.1 Stubs and Mocks

3.1.1 Stubs

- The simulation of a real object with the *minimum* number of methods required for a test

3.1.2 Mock

- Simulated objects that mimic the behabiour of real objects

3.2 Uses of each

- **Stub** - Used for *state verification*
- **Mock** - Used for *behaviour verification*