# Using the 3A (Arrange, Act, Assert) Pattern in Testing Guidelines

1. **Arrange: Setup Your Test Environment**
   * **Description:** In this section, all necessary objects, dependencies, and data are initialized and prepared. This involves creating instances of classes, setting initial values, and configuring mocks or stubs if necessary.

##### Example:

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1. **Act: Execute the Functionality Being Tested**
   * **Description:** In this section, there is the executing of the method or functionality that is under test. It should be a single, focused action that triggers the behaviour you want to validate.

##### Example:

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1. **Assert: Verify the Outcome**
   * **Description**: In this section, the outcomes of the act step are verified against the expected results. Assertions are used to ensure the test conditions meet the expected behaviour.

##### Example:

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1. **Alignment with BDD User Stories in Gherkin Syntax**
   * **Description:** The AAA pattern maps directly to the Given-When-Then structure used in BDD (Behaviour-Driven Development). "Given" corresponds to "Arrange," "When" to "Act," and "Then" to "Assert." This alignment helps ensure that tests are clear, concise, and easy to understand.

##### Example User Story in Gherkin:

Feature: Calculator addition

Scenario: Add two numbers

Given a calculator

And the numbers 5 and 3

When the numbers are added

Then the result should be 8

1. **Practical Example: Integrating AAA with BDD**
   * **Description:** Here, we integrate the AAA pattern with a Gherkin-based BDD framework like Cucumber.js in a TypeScript environment. The steps in the Gherkin file correspond to methods in the test implementation.
   * **Example:**

##### Gherkin Feature File:

Feature: Calculator addition

Scenario: Add two numbers

Given a calculator

And the numbers 5 and 3

When the numbers are added

Then the result should be 8

##### Step Definitions :

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##### Explanation of How AAA Aligns with BDD User Stories

* **Given -> Arrange:** The "Given" steps in Gherkin are used to set up the initial context or preconditions for the scenario, which aligns with the "Arrange" phase in AAA where you set up your test environment.
* **When -> Act:** The "When" step describes the action that triggers the behaviour being tested, corresponding to the "Act" phase where the functionality is executed.
* **Then -> Assert:** The "Then" step outlines the expected outcome or result of the action, matching the "Assert" phase where the actual result is compared to the expected result.

Following this structured approach, will ensure that the tests are well-organized, readable, and maintainable, while also leveraging the clarity and behaviour-focused nature of BDD with the simplicity and effectiveness of the AAA testing pattern.