Unit testing in C++

What should we do?

Why unit testing is important ?

Unit testing **ensures that all code meets quality standards before it's deployed**.

This ensures a reliable engineering environment where quality is paramount.

Over the course of the product development life cycle, unit testing saves time and money, and helps developers write better code, more efficiently.

What, How and why ?

- Understanding unit tests and its purpose..
- How to write unit tests (AAA)
- Characteristics of unit test

Why write unit test?

To test the functionality of the code

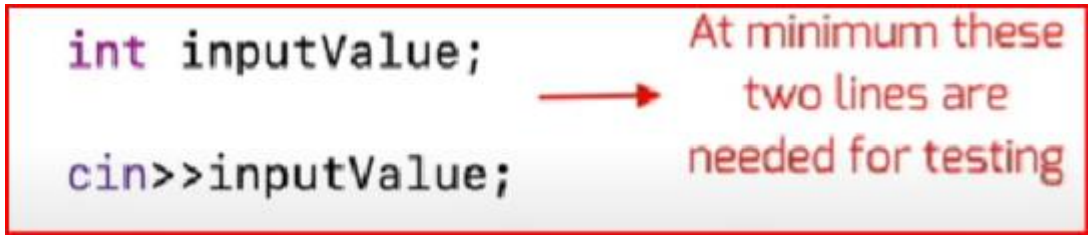
Whether it is functioning according to specification

What is the meaning of unit in unit testing ?

A type of metric

Depends on the programmer

What is meant by a code that can be executed independently ?



Needs at least some input and output for the code to work Independently

Unit test are...

- Tests that are written for testing a unit of code
- One unit test runs independently of any other tests or code
- External dependencies are managed using Doubles(MOcks/Fakes,stubs)
- Should complete within Miliseconds

Writing unit tests

Arrange – Act – Asserts (AAA)

```
int Sum(int a, int b) {
    return a + b;
}
```

```
TEST(SUM_TEST, Test_1) {
    // Arrange
    int first_value = 100, Second_value = 200;
    // Act
    int result = Sum(first_value, Second_value);
    // Assert
    ASSERT_EQ (result, (first_value + Second_value));
}
```

Test doubles

Used in lieu with external dependencies

DB web API

Easy to simulate various scenarios

Mocks, Stubs, Fakes

What is mocks in testing?

Mocking is **a process used in unit testing when the unit being tested has external dependencies**. The purpose of mocking is to isolate and focus on the code being tested and not on the behavior or state of external dependencies.

What is fakes ?

In unit testing, fakes or test doubles are **classes or components that replace external dependencies**. Fakes simulate successful or failed scenarios to test the logic around the real dependencies they replace

What is a stub?

A stub is **a small piece of code that takes the place of another component during testing**. The benefit of using a stub is that it returns consistent results, making the test easier to write. And you can run tests even if the other components are not working yet.