Unit Tests (Presentation #2)

Special Topics (CS3001)

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A Brief Introduction

- Good code is broken into many functions.

- In a perfect world, these functions would always produce the right results.

- Unfortunately, this isn't a perfect world.

- Unit tests allow to test all these blocks to guarantee correctness.

Prior Knowledge

- I started writing unit tests last semester for my internship (in C#).
- However, they were small and minimal.

Goals

- To become fluent in several unit testing frameworks.
- To become better at penetration testing of functions.

Tangible Evidence
Python Unit Tests (AI)

```python
def test_grid_size(self):
    not_long_enough = [list(range(2)), list(range(2)), list(range
        (2))]

    rows, columns = 5, 7
    just_right = [list(range(columns)) for i in range(rows)]

    self.assertRaises(AssertionError, MechanicalMatch.grid_size,
        not_tall_enough)

    grid_rows, grid_columns = MechanicalMatch.grid_size(
        just_right)
    self.assertEqual(grid_rows, rows)
    self.assertEqual(grid_columns, columns)
```

Tangible Evidence
C++ Unit Tests (Numerical Modeling)

```cpp
SECTION("Stream Operator") {
    auto polarPair = PolarPair<R, Theta>(defaultModulus,
        defaultArgument);
    std::stringstream expected, actual;

    polarPair.setPrecision(6);

    expected << std::setprecision(6) << std::fixed << "(" <<
        defaultModulus << ", " << defaultArgument << ")";
    actual << polarPair;

    REQUIRE(expected.str() == actual.str());
}
```

Tangible Evidence
C# Unit Tests (Work)

I can't shared source code from my work because of security reasons/non disclosure agreements.

Resources

- Online resources.
  - C++ Unit Tests.
  - C# Unit Tests.
  - Python Unit Tests.

- Looking at other people's source code.

- Discussing ideas with boss and coworkers.

Goal Accomplishment

- Since the beginning of the semester, I have drastically become better at writing unit tests.

- I am fluent in writing unit tests in C++, C#, and Python.

- Although I have gotten better at writing unit tests, I could progress a lot more.

In Closing

Thank you for having me! All question, comments, and insults can be directed towards me:

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