Implementing C# Unit Testing using Visual Studio 2019 and .NET 5

Why You Need Unit Testing

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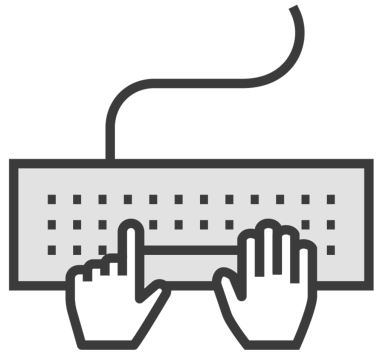psheriff@pdsa.com   www.pdsa.com

Course Overview

- **Unit testing tools in Visual Studio**
- **Build your first unit tests**
- **Learn to use Assert classes**
- **Create data-driven tests**
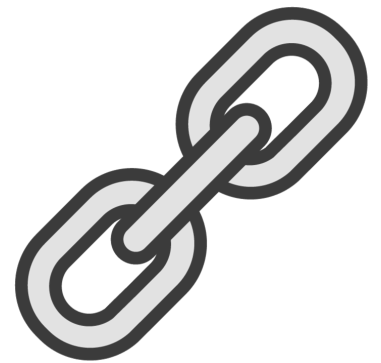- **Automate tests using command line**

I assume you...

- Are a C# developer
- Are familiar with Visual Studio
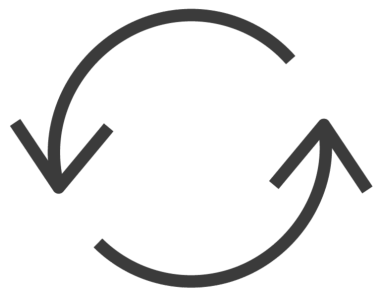- Want to learn to build unit tests

What Is Unit Testing?
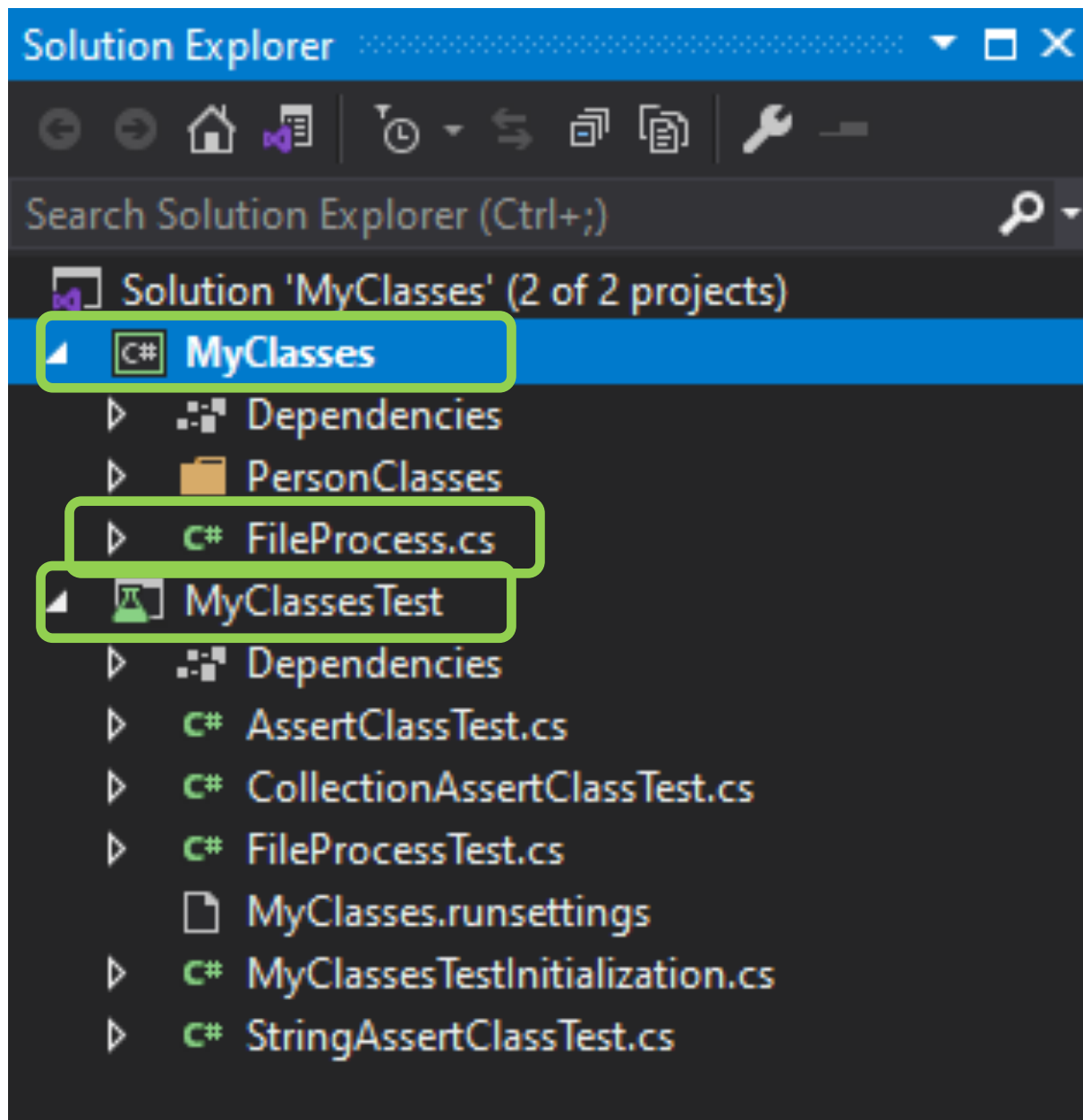
Write method(s) to test methods in your class

Include all if, case, do, until, while, for, etc.

Regression testing

Overview of Creating and Running Unit Tests

File > New Project
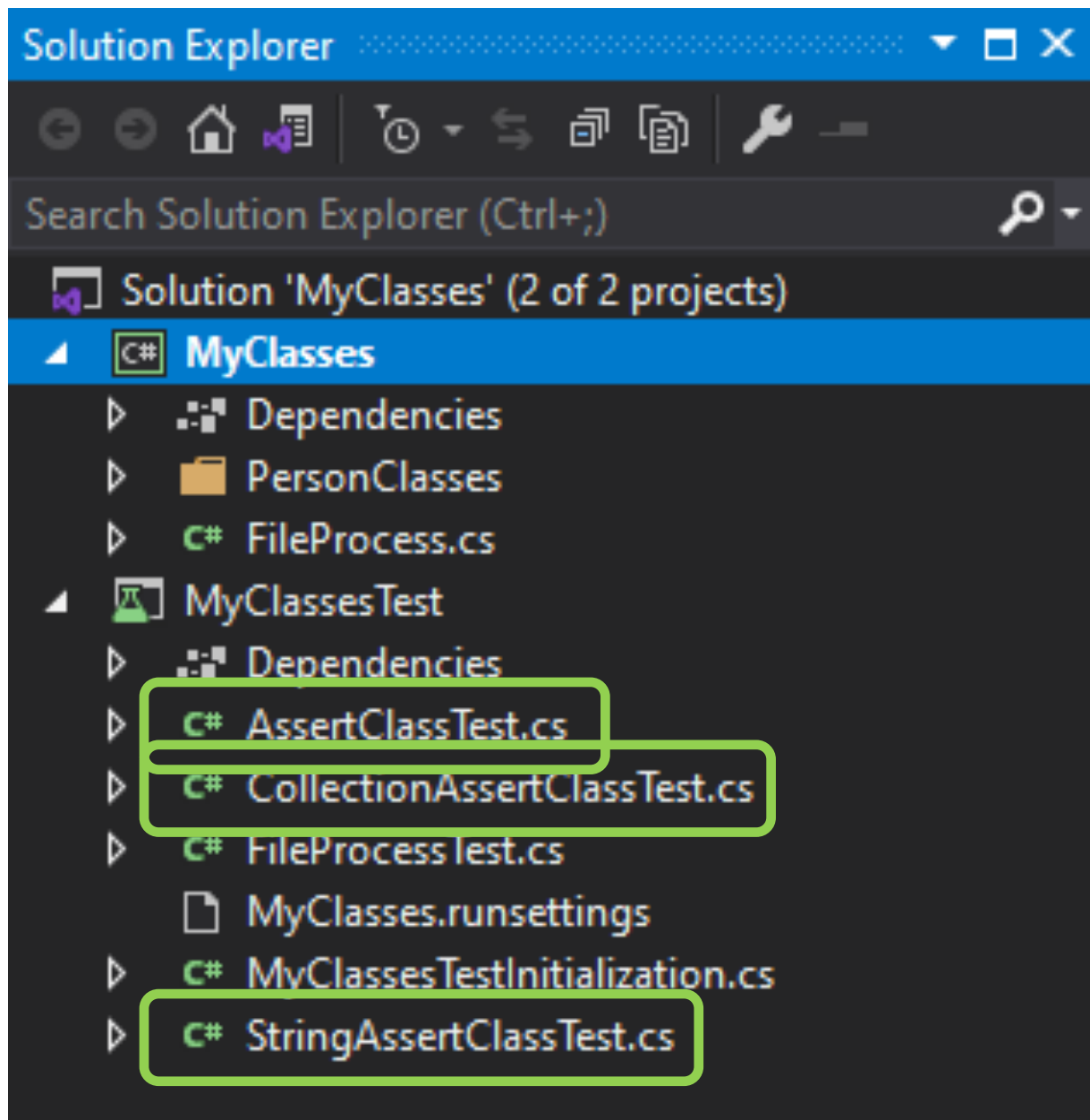- **Class library**
- **FileProcess class**

Unit test project
- **Several unit test classes**

Build a series of unit tests step-by-step

Run tests and see success or failure
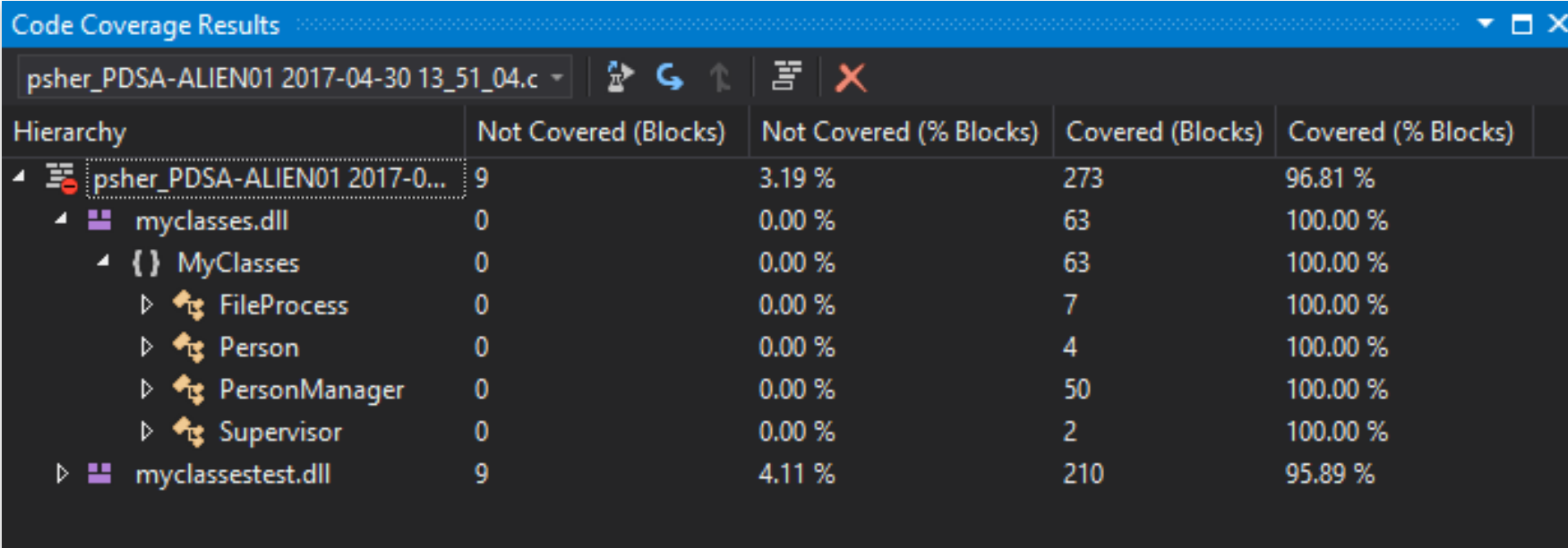
Use different Assert classes

- **Assert**
- **StringAssert**
- **CollectionAssert**

Code Coverage
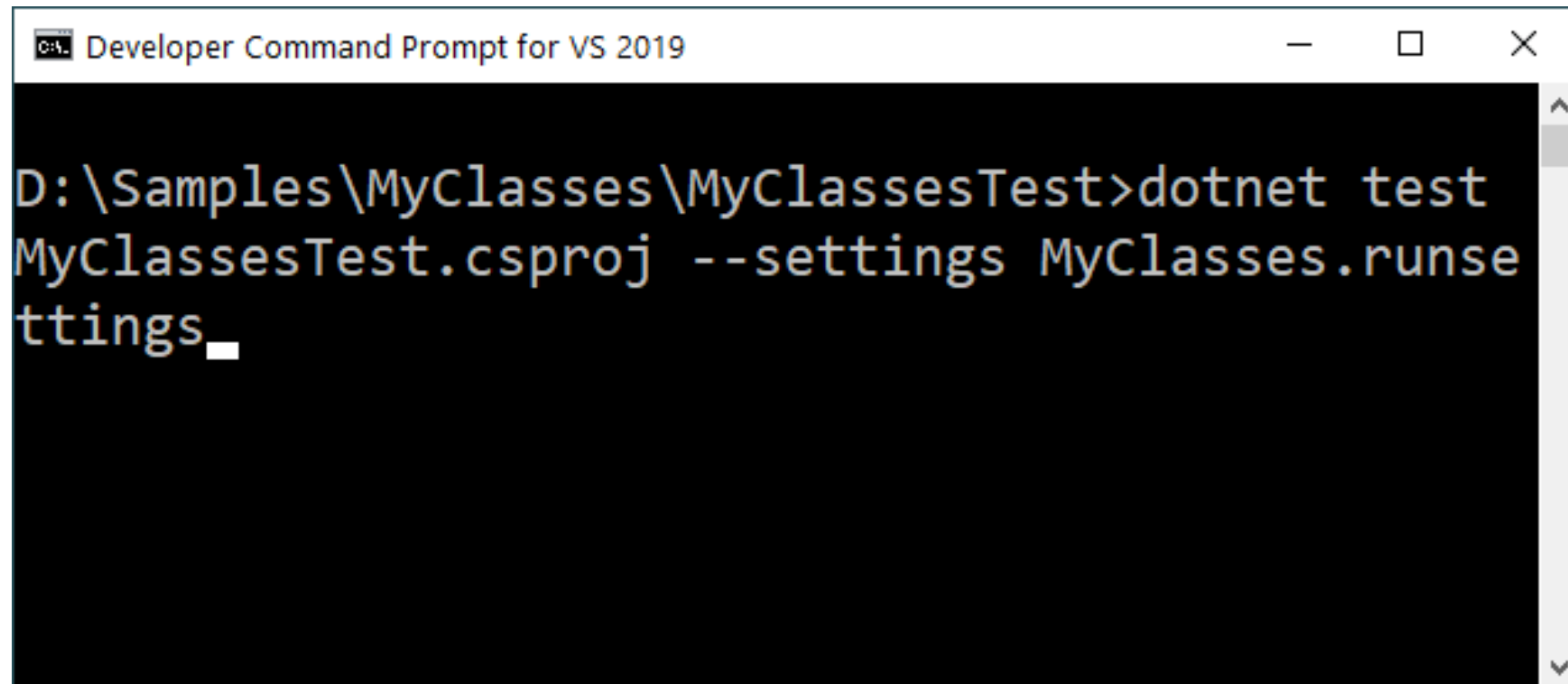
Identifies areas of code not tested

Built-in to enterprise edition of Visual Studio
- **Not available in community edition**

Command Line

Automate tests

Command line utility
– **dotnet test**

Why Unit Testing

Why Test Code?

Ensure code works

Under varying circumstances

With different inputs

Why Test Code?

Improve quality

Helps you focus on quality

Break code into smaller chunks

You add more error handling

Methods of Unit Testing

QA Department Testing

Advantages	Disadvantages
Think of different things to test	Regression testing time intensive
Can test UI code easier	Setup and tear down time intensive
Less start-up time/cost	Frustrating and boring

Automated Testing

Advantages	Disadvantages
Repeatable	More time up-front
Better code coverage	Only as good as dev who develops test
Regression testing is faster	Harder to test UI
Automate setup and tear down	

Which Approach?

Combination of both

QA should work with developers

Help create unit tests

Help with setup and tear down

Help with UI testing

Testing Tools

Unit test framework

Set of classes and tools

In all editions of Visual Studio

Data-driven testing

Read data from table to guide testing

dotnet test

Automate tests

Command line utility

Log results

Code coverage

Determines if any methods have not been tested

Enterprise Edition only

Module Summary

– **Unit testing helps with...**
  - **Code quality**
  - **Regression testing**
– **Use a combination of QA and unit testing**
– **Great tools available in Visual Studio**

– **Search for unit testing at www.pdsa.com/blog**

Up Next:
Your First Unit Tests