Automate iOS tests with XCUITest framework

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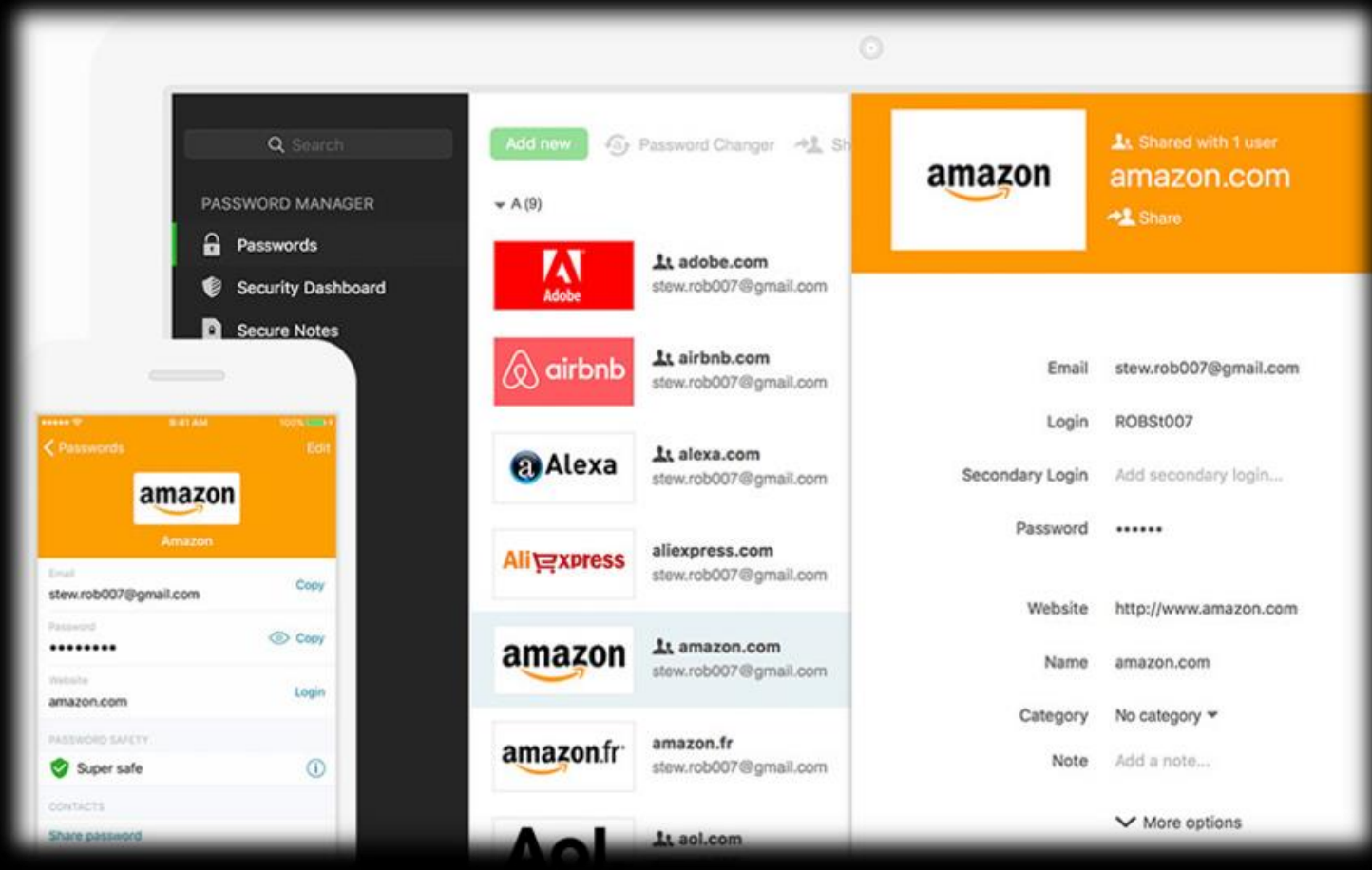
@Dashlane

What is Dashlane ?

Dashlane is a Password Manager, that helps you manage your identity and your payments in a simple and secure way everywhere.



Agenda

- What are the tools we need ?
- The 2 ways to write a test ?
- How to parallelize test runs ?
- How to run tests and integrate them in CI ?

What is XCUITest? 🤔

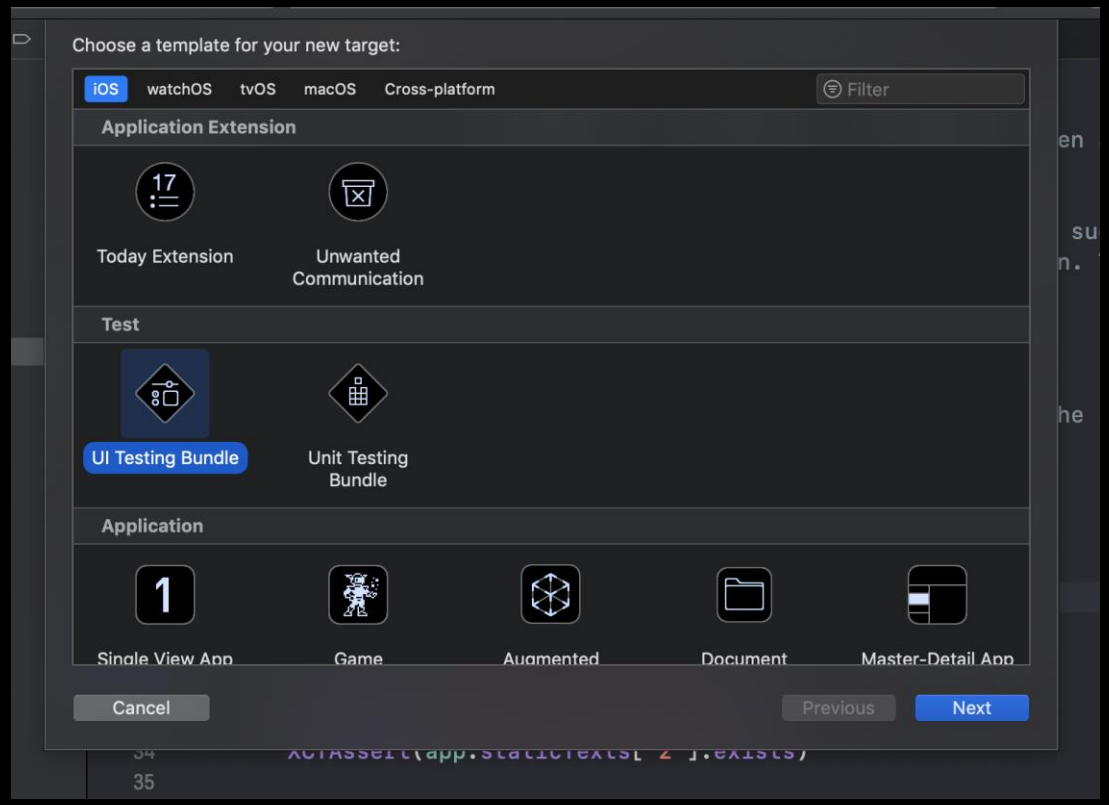
- A test framework that comes with Xcode by Apple
- It is used to test native apps (Swift, Objective-C)
- It allows interacting with an app's UI elements

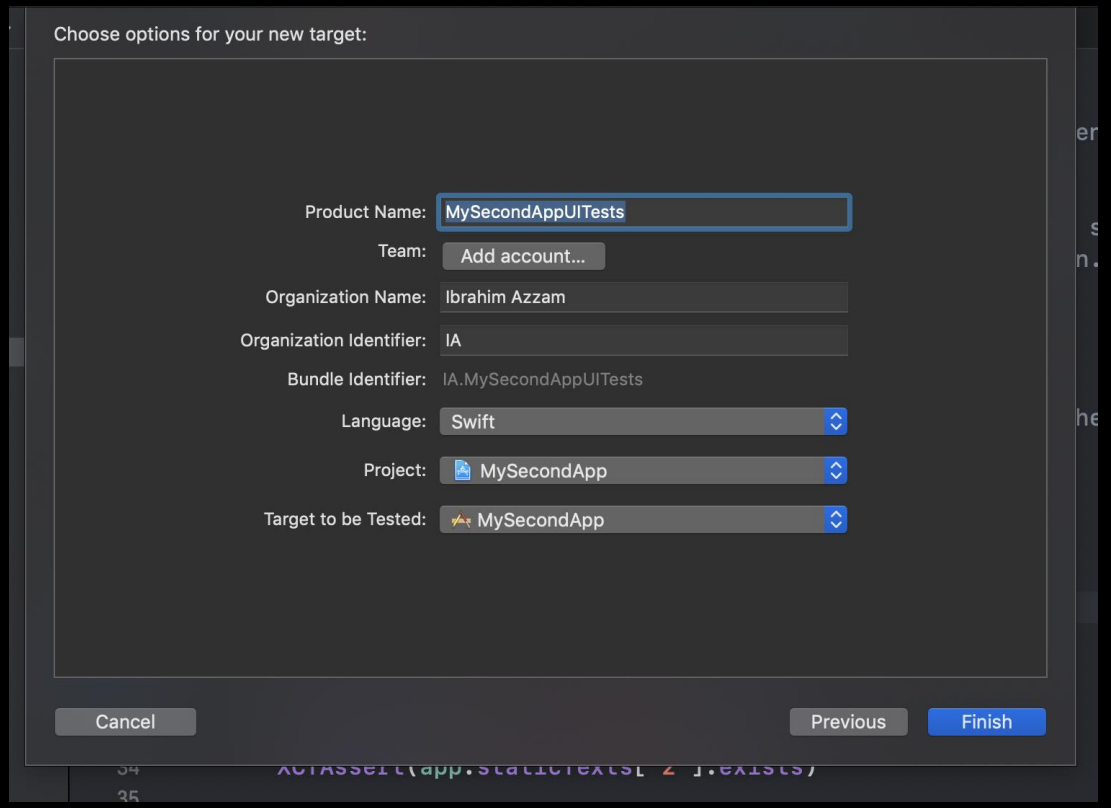
What is Swift? 🤔

- Swift is a programming language created by Apple in 2014
- It is modern, fast and easy to learn
- It is used to write tests in XCUITest for Apple apps

Add to existing project

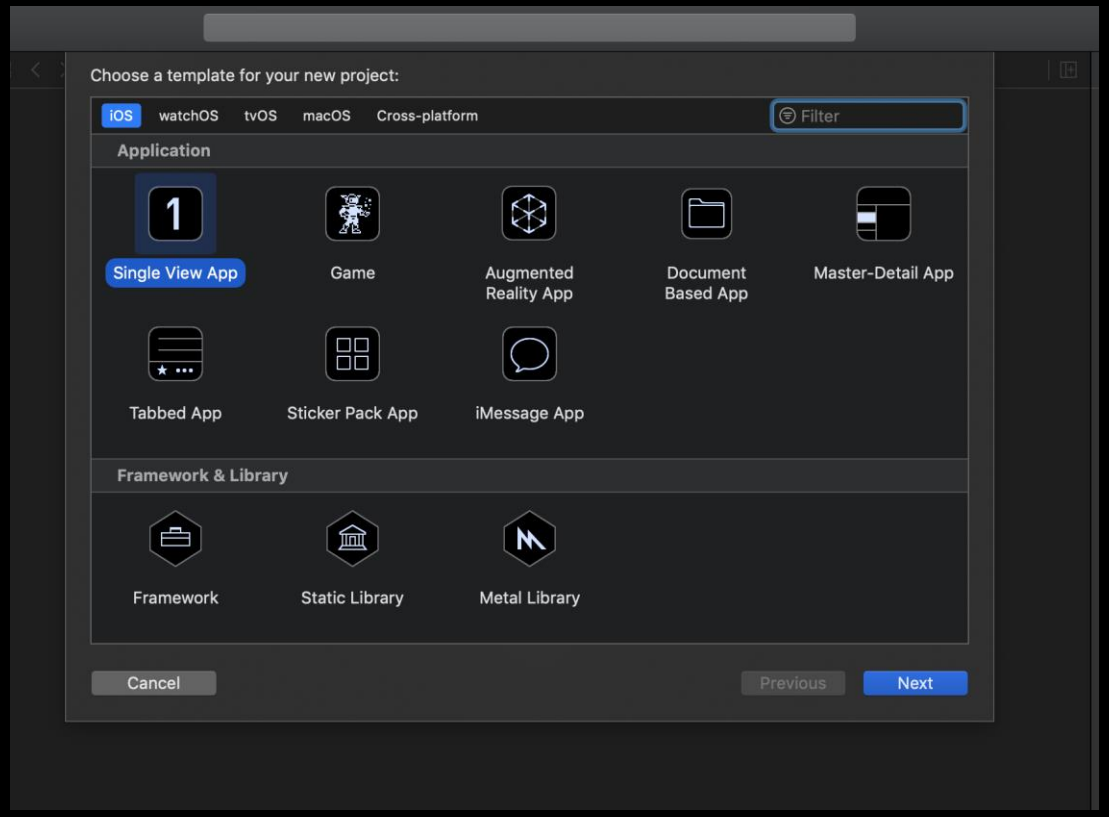
1. Open your Xcode project
2. Go to: **File -> New -> Target**
3. Select **iOS UI Testing Bundle** and hit **Next**:

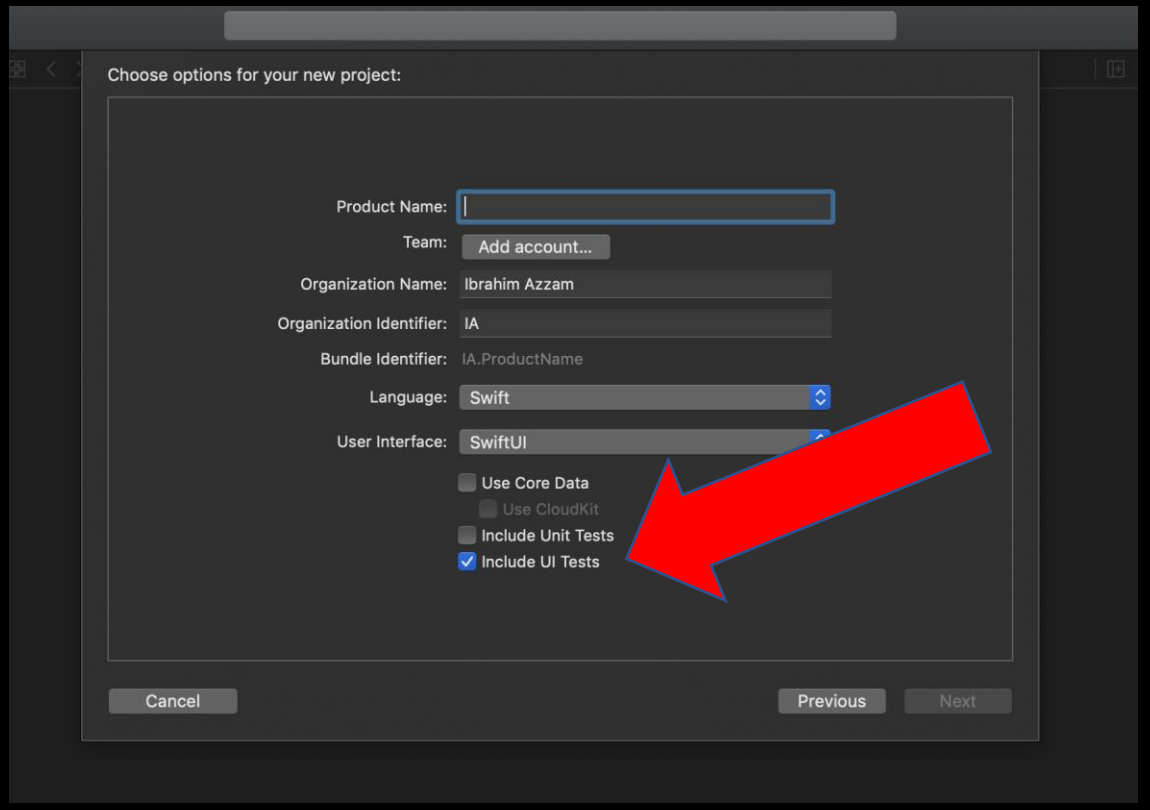




Create new project

1. Open Xcode
2. Go to: **File -> New -> Project**
3. Select **Single View App** and hit **Next**:

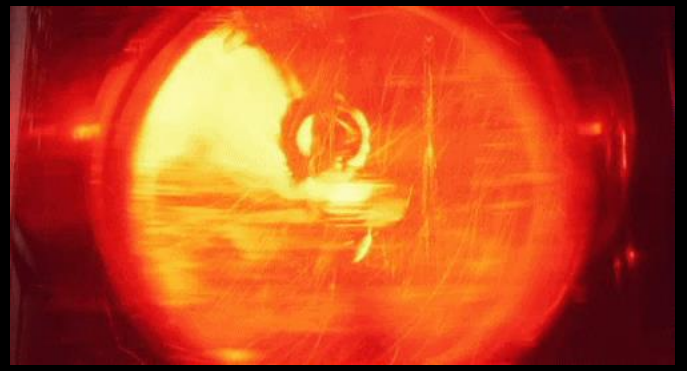




'NameOfTheApp'UITests.swift

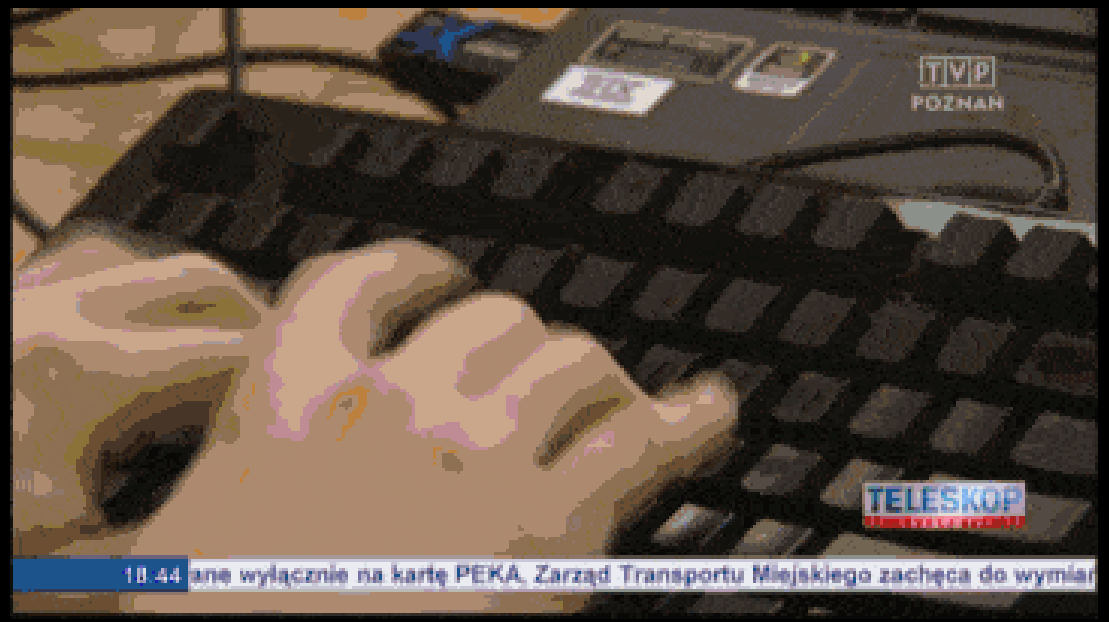
- It contains the template code with sample test
- It also contains a setUp() and tearDown()methods
- It will contain the tests that are grouped into classes

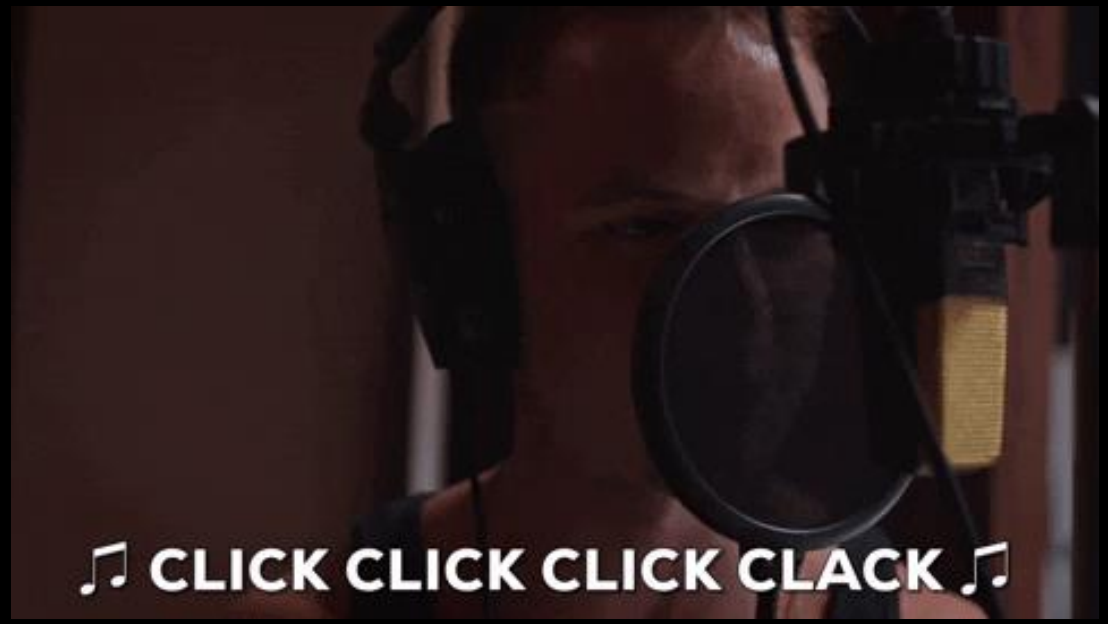
WARNING



Your test methods always have to start with « test », otherwise you won't be able to run them

The 2 ways of writing a Test Case?





Launch App 

```
class UITests: XCTestCase {
    let app = XCUIApplication()


    override func setUp() {
        super.setUp()

        app.launch()
    }
}
```

XCUIELEMENT Class

```
func tap()
func doubleTap()
func twoFingerTap()
func tap(withNumberOfTaps: UInt, numberOfTouches: UInt)
func press(forDuration: TimeInterval)
func press(forDuration: TimeInterval, thenDragTo: XCUIElement)
func swipeLeft()
func swipeRight()
func swipeUp()
func swipeDown()
func pinch(withScale: CGFloat, velocity: CGFloat)
func rotate(CGFloat, withVelocity: CGFloat)
...
```

How to Tap a Button ?

```
app.buttons["Click here"].tap()
```

How to Type Text into a Text Field ?

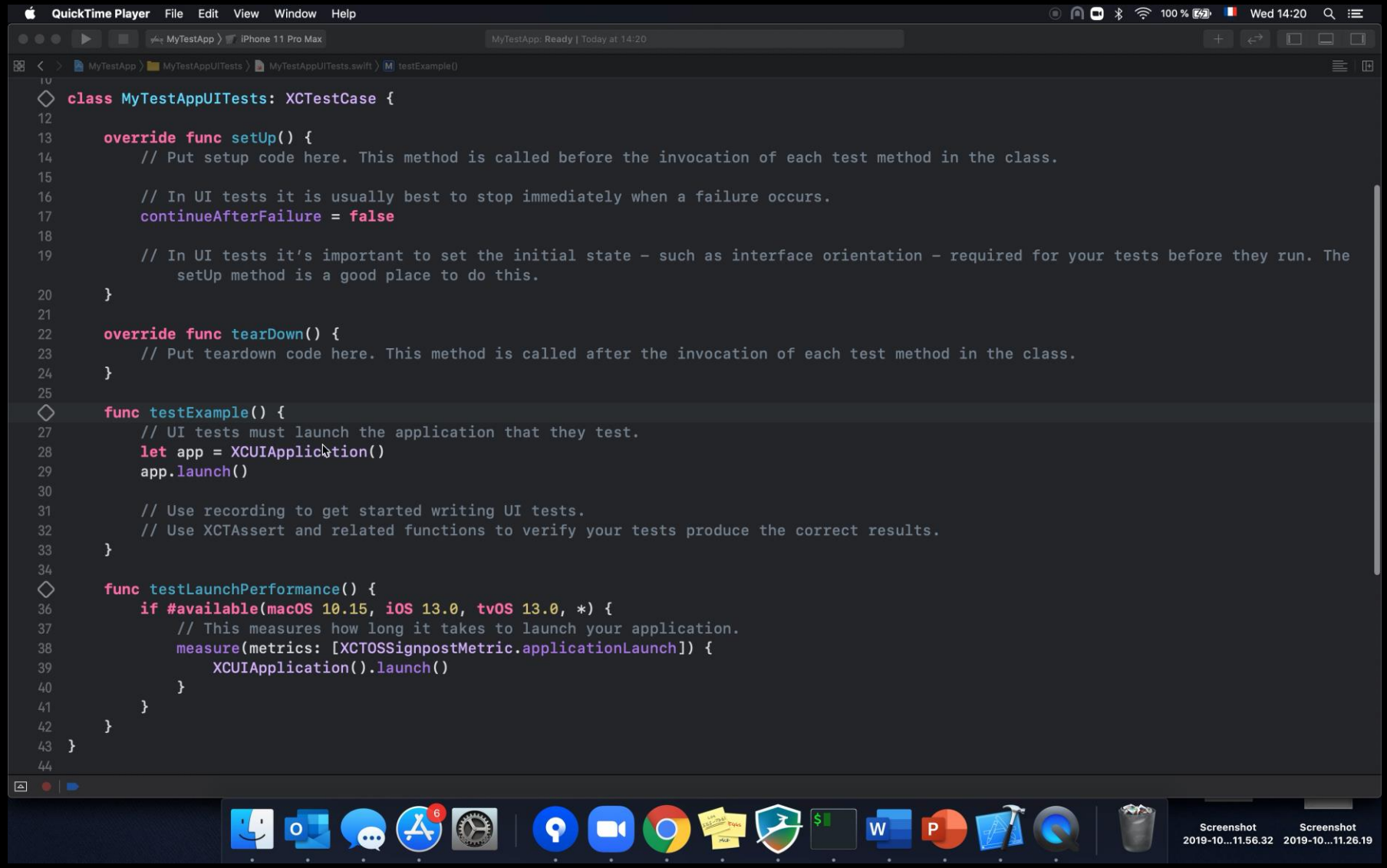
```
let textField = app.textFields["First Name"]
textField.tap()
textField.typeText("John")
```

How to Assert an Element Exists ?

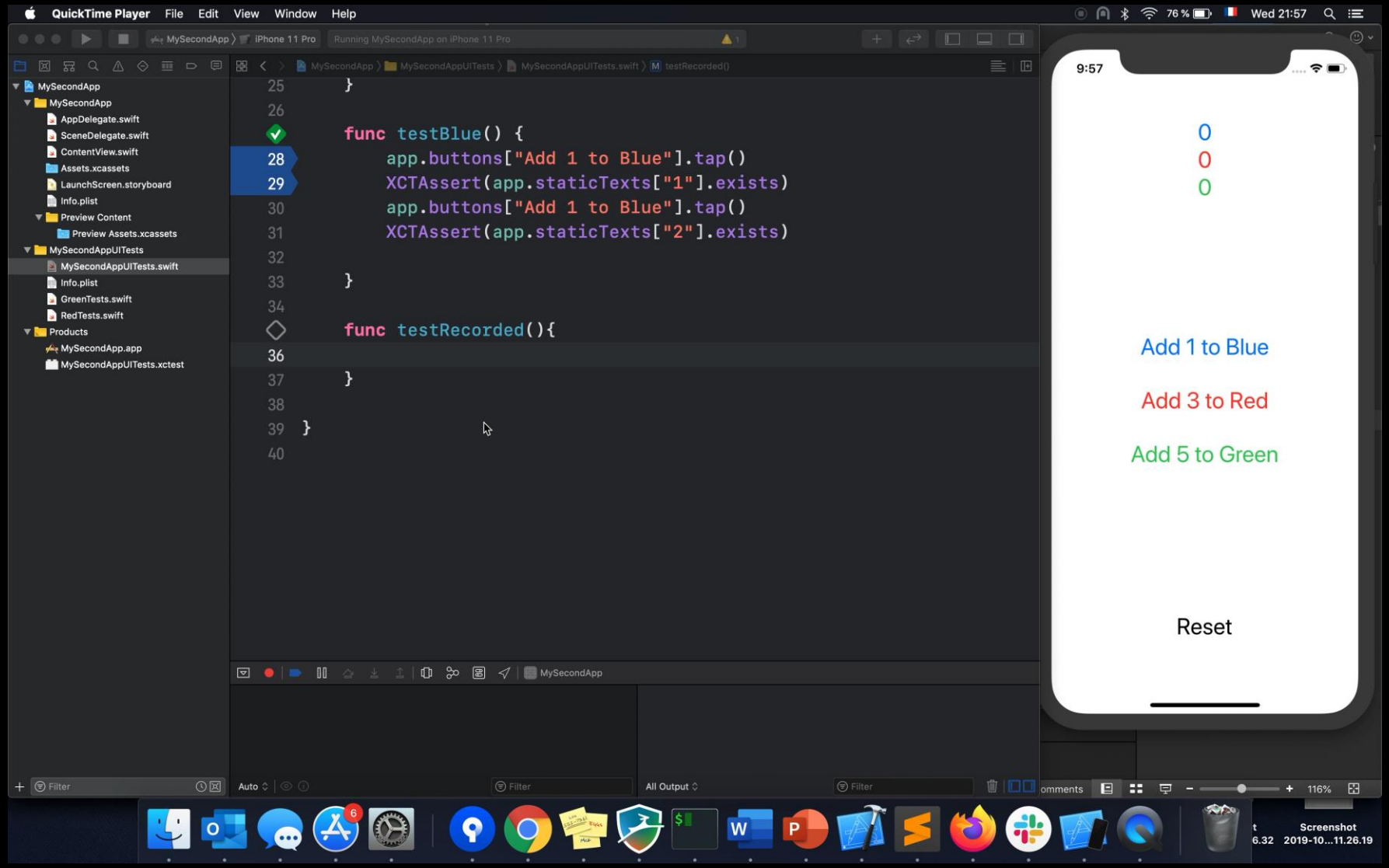
```
XCTAssert(app.staticTexts["Some Text"].exists)
```

We’re Ready to Create Our First Test Case

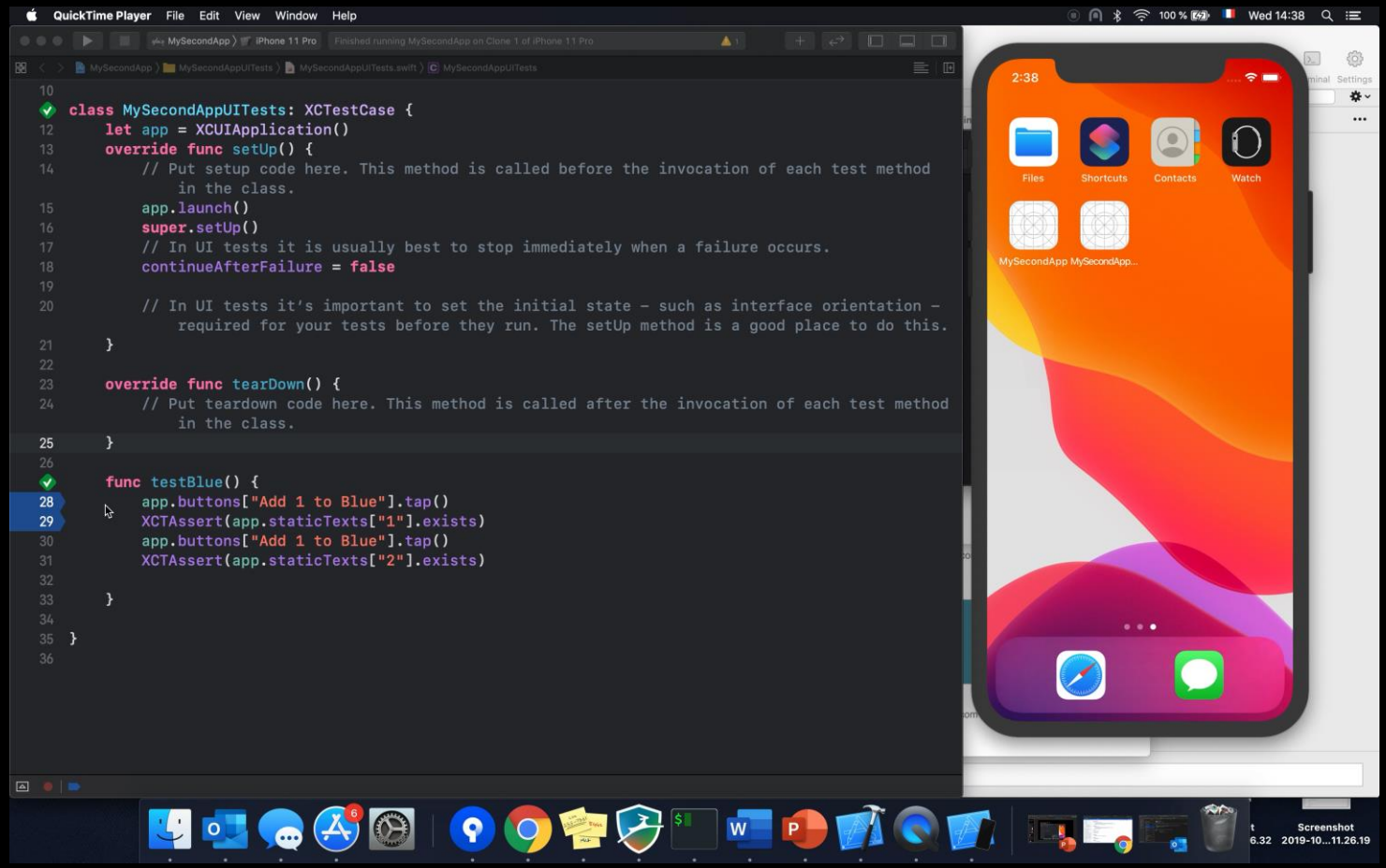
First Test Case



What about recording ?



Run tests


QuickTime Player File Edit View Window Help
Wed 14:38
MySecondApp iPhone 11 Pro
Finished running MySecondApp on Clone 1 of iPhone 11 Pro
MySecondApp MySecondAppUITests MySecondAppUITests.swift MySecondAppUITests
class MySecondAppUITests: XCTestCase {
let app = XCUIApplication()
override func setUp() {
// Put setup code here. This method is called before the invocation of each test method in the class.
app.launch()
super.setUp()
// In UI tests it is usually best to stop immediately when a failure occurs.
continueAfterFailure = false
// In UI tests it's important to set the initial state - such as interface orientation - required for your tests before they run. The setUp method is a good place to do this.
}
override func tearDown() {
// Put teardown code here. This method is called after the invocation of each test method in the class.
}
func testBlue() {
app.buttons["Add 1 to Blue"].tap()
XCTAssert(app.staticTexts["1"].exists)
app.buttons["Add 1 to Blue"].tap()
XCTAssert(app.staticTexts["2"].exists)
}
}
2:38
Files
Shortcuts
Contacts
Watch
MySecondApp
MySecondApp...
Settings
Screenshot 2019-10...11.26.19

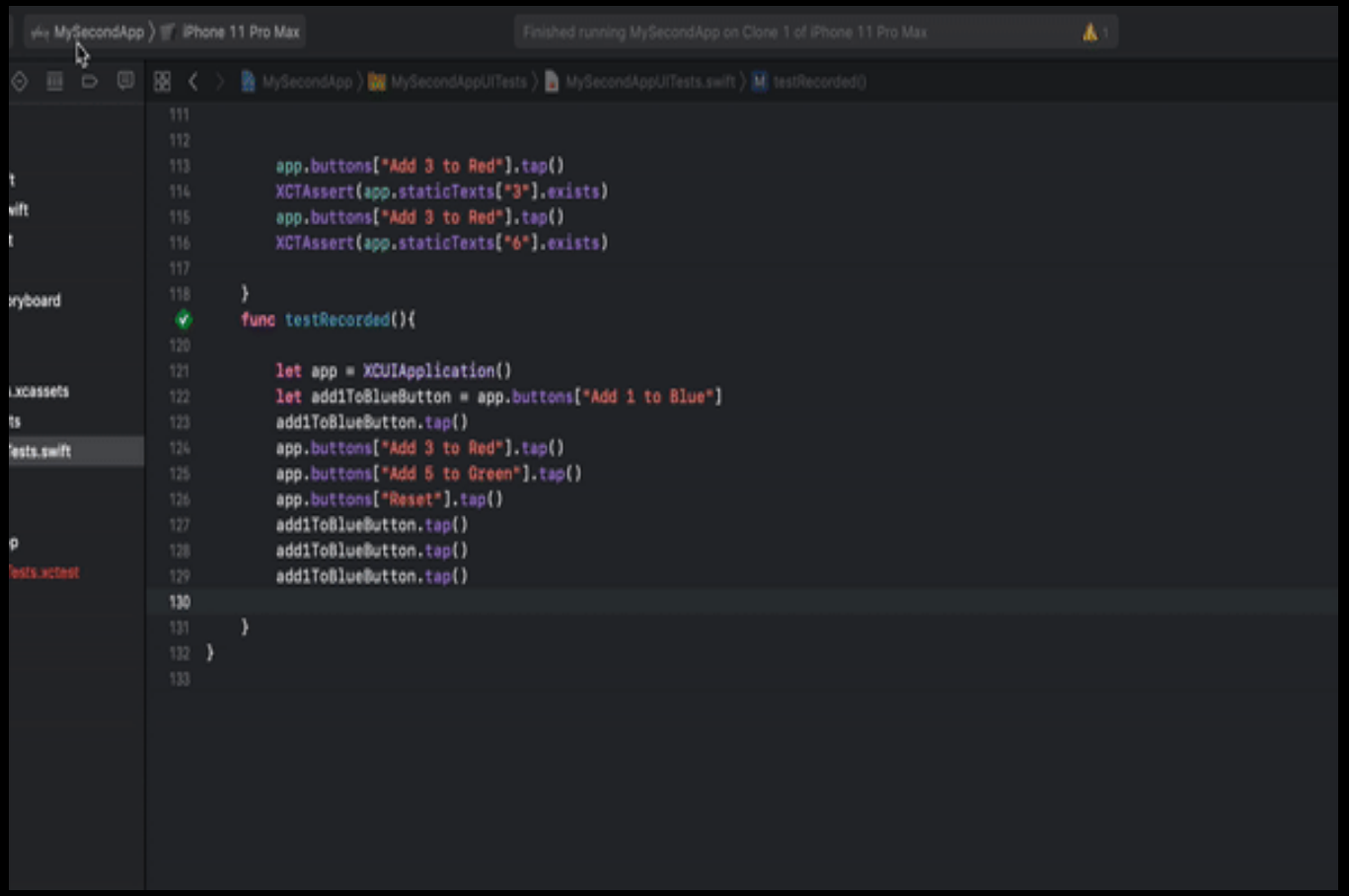
What happens when you have more than 1 test ?

Parallel Testing

Parallel testing allows multiple tests to be run simultaneously, with the main advantage being dramatically shortened XCTest and XCUITest times.

How to enable parallel testing

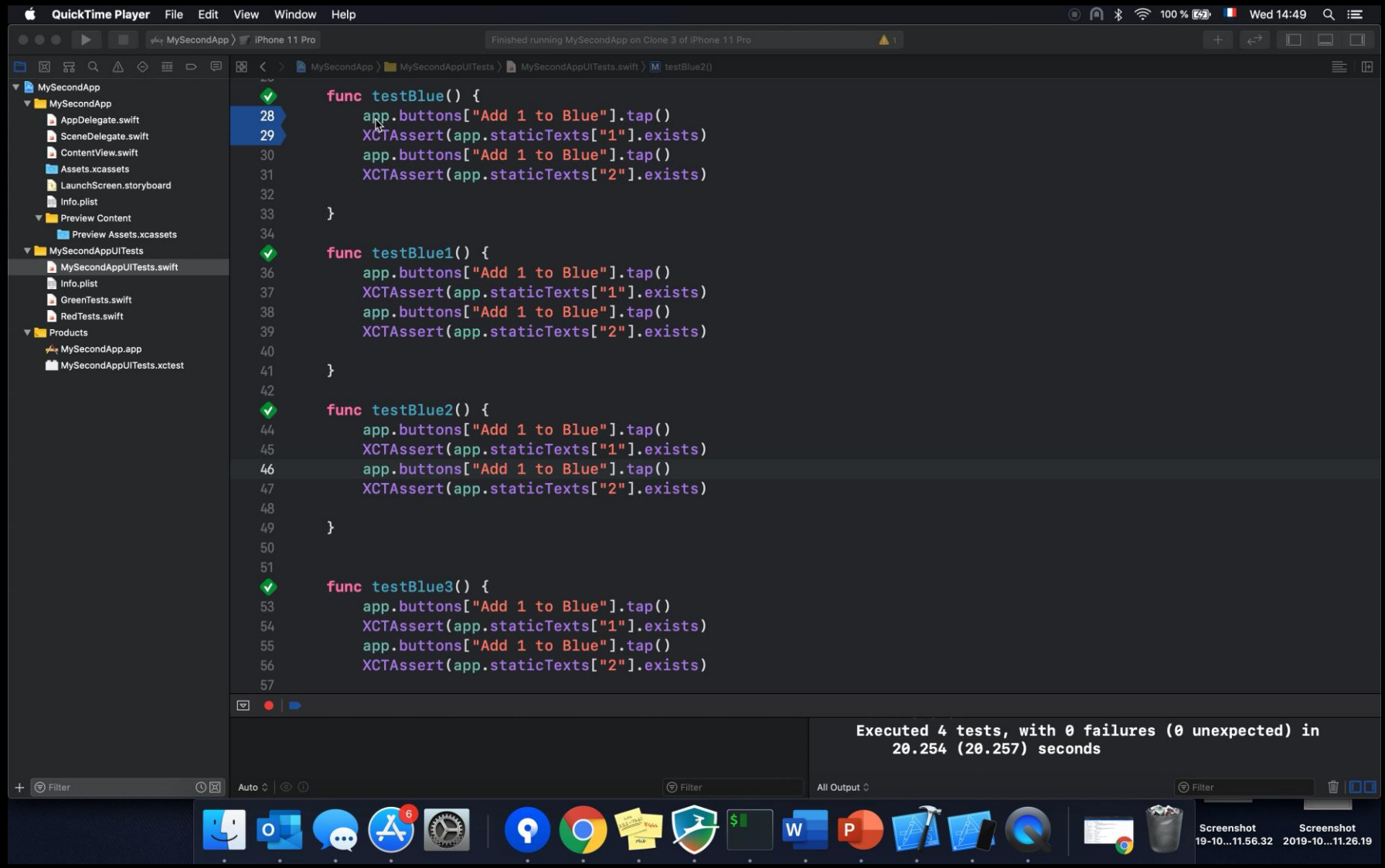
1. Select your target scheme in Xcode, and "Edit Scheme..."
2. Find the settings for "Test", and press on the "Info" tab
3. You'll see a list of your Unit and UI tests, press on the associated "Options..." button
4. Select "Execute in parallel on Simulator"
5. Optionally select "Randomize execution order"



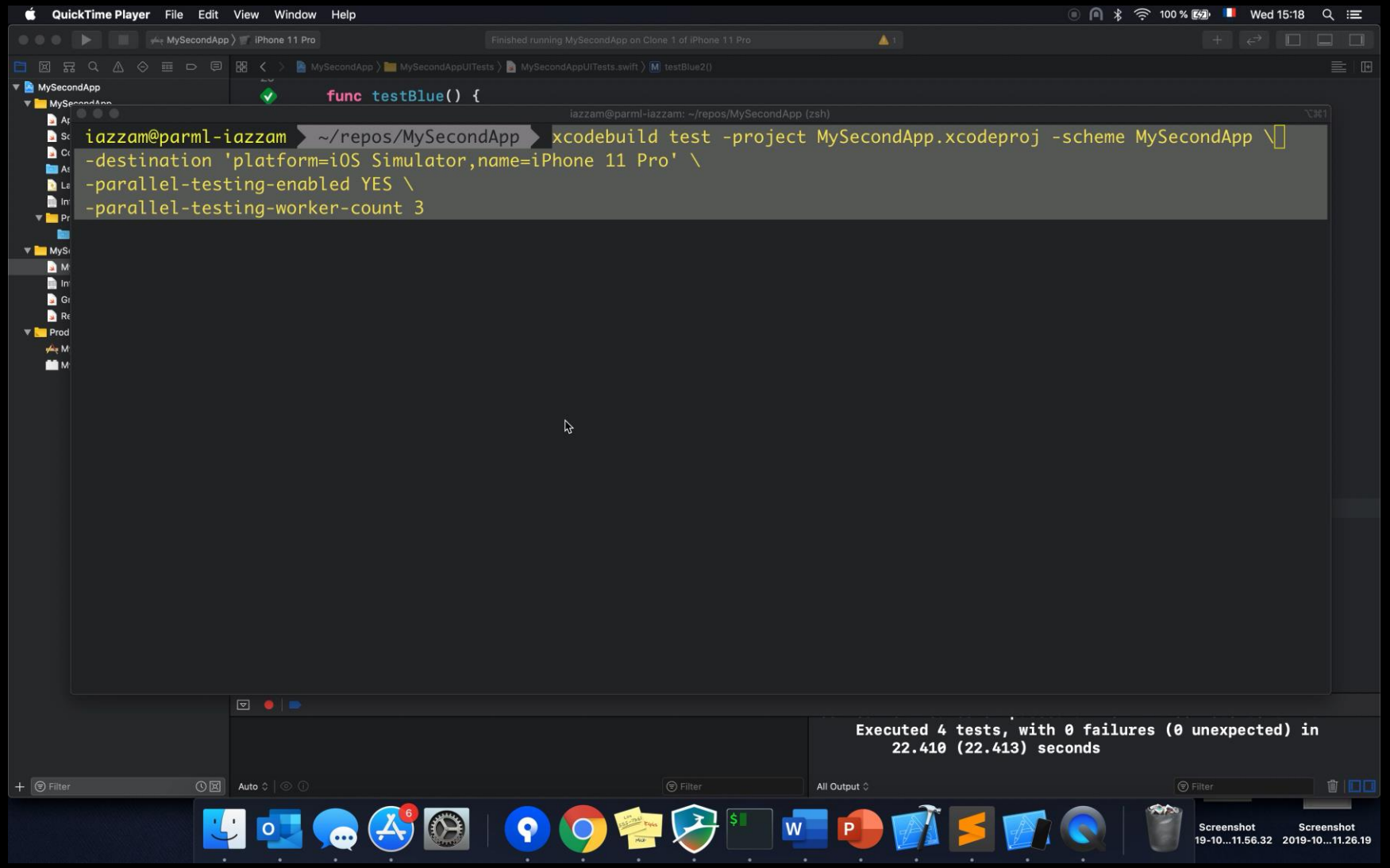
Considerations

- Independent tests
- Not suitable for Performance tests
- Enough resources on the machine

Run parallelized tests from XCode



And from command line (used for CI)



How much

- On 1 device: 58
- On 3 devices: 2

- 48%

More things to explore

- Run tests under different configurations with Test plans
- Use more of xcodebuild, xcresulttool, and xccov in CI
- Visual regression testing

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@azzamibrahim