CS121 Tutorial 5

Intro to testing in Xcode!

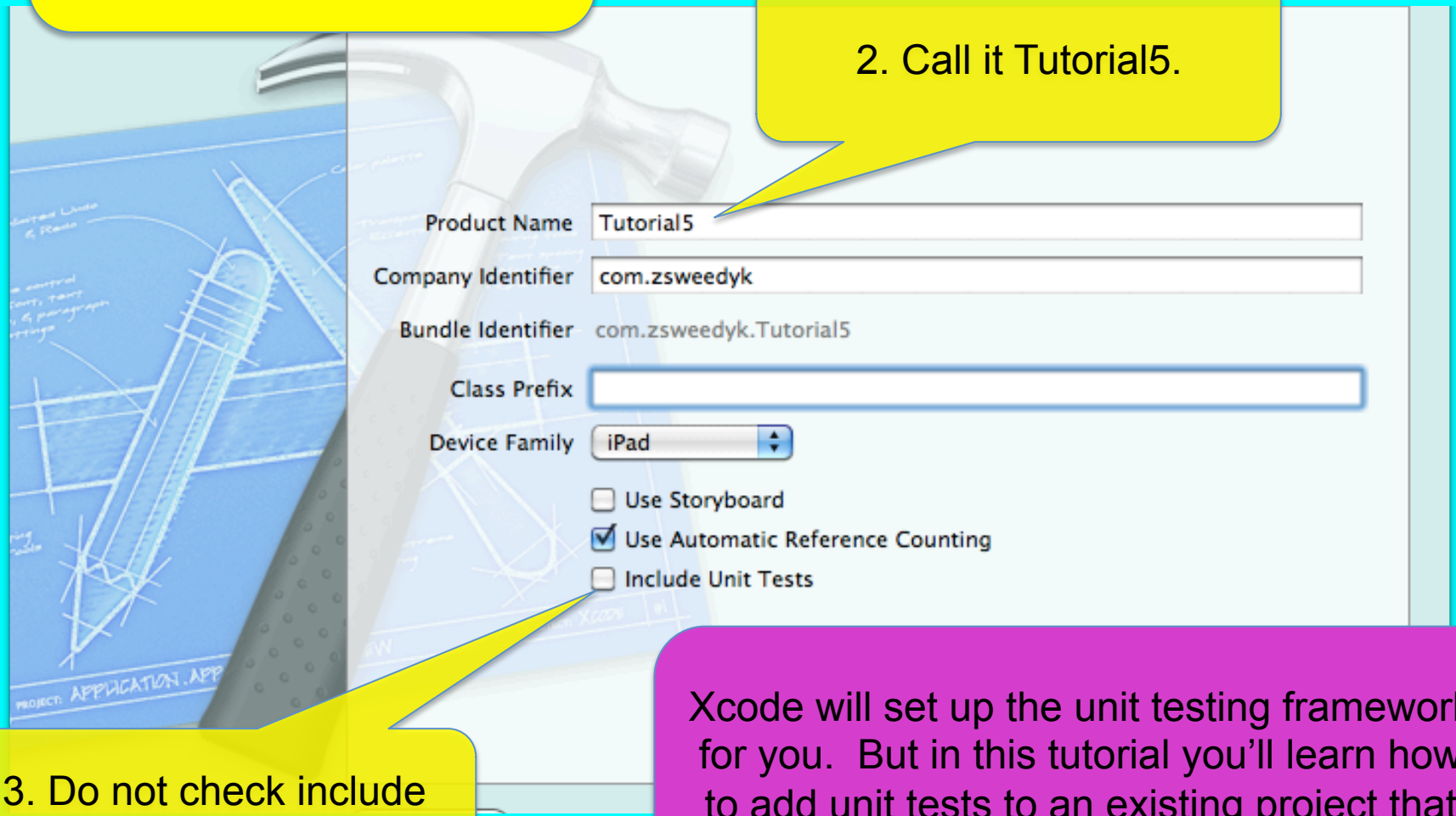
Purple bubbles give you information you'll need to know.

Yellow Bubbles tell you what to do.

Orange bubbles tell you what you're not expected to understand yet. ☺

1. Create a new IOS single view app for the iPad.

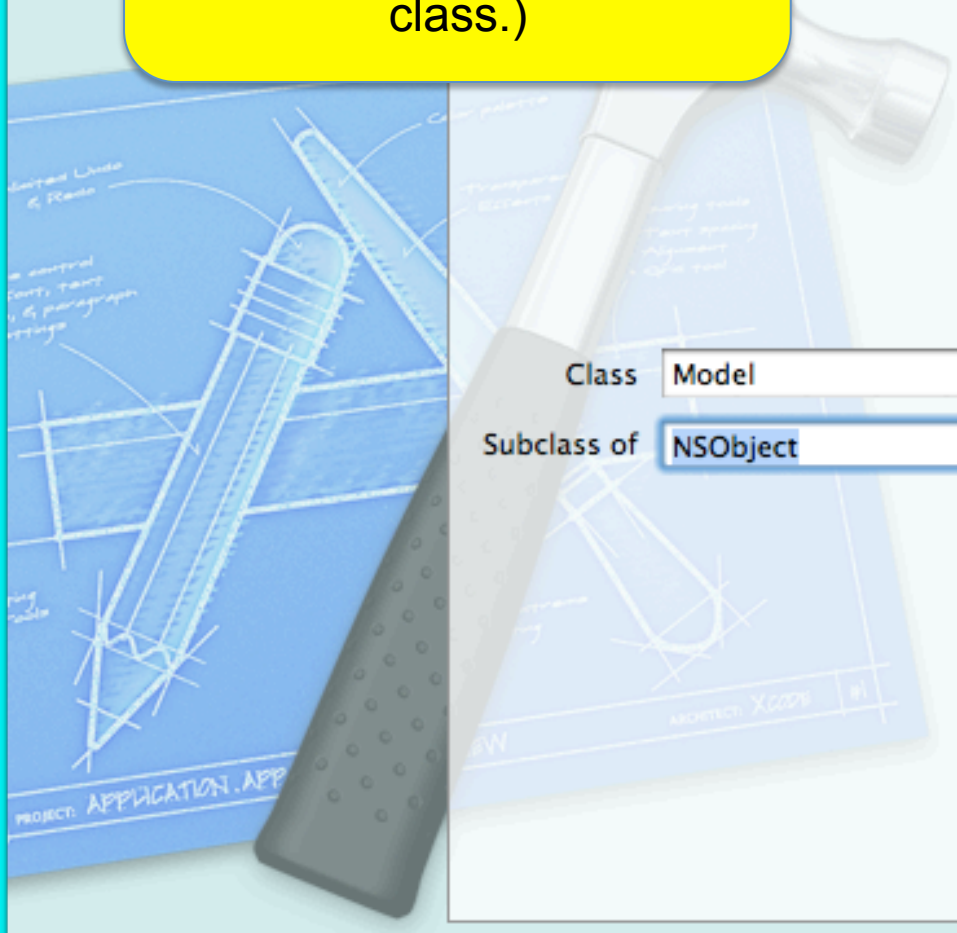
2. Call it Tutorial5.



3. Do not check include unit tests.

Xcode will set up the unit testing framework for you. But in this tutorial you'll learn how to add unit tests to an existing project that isn't set up for the tests.

Add a new Model class to the object. (It should use NSObject as its base class.)



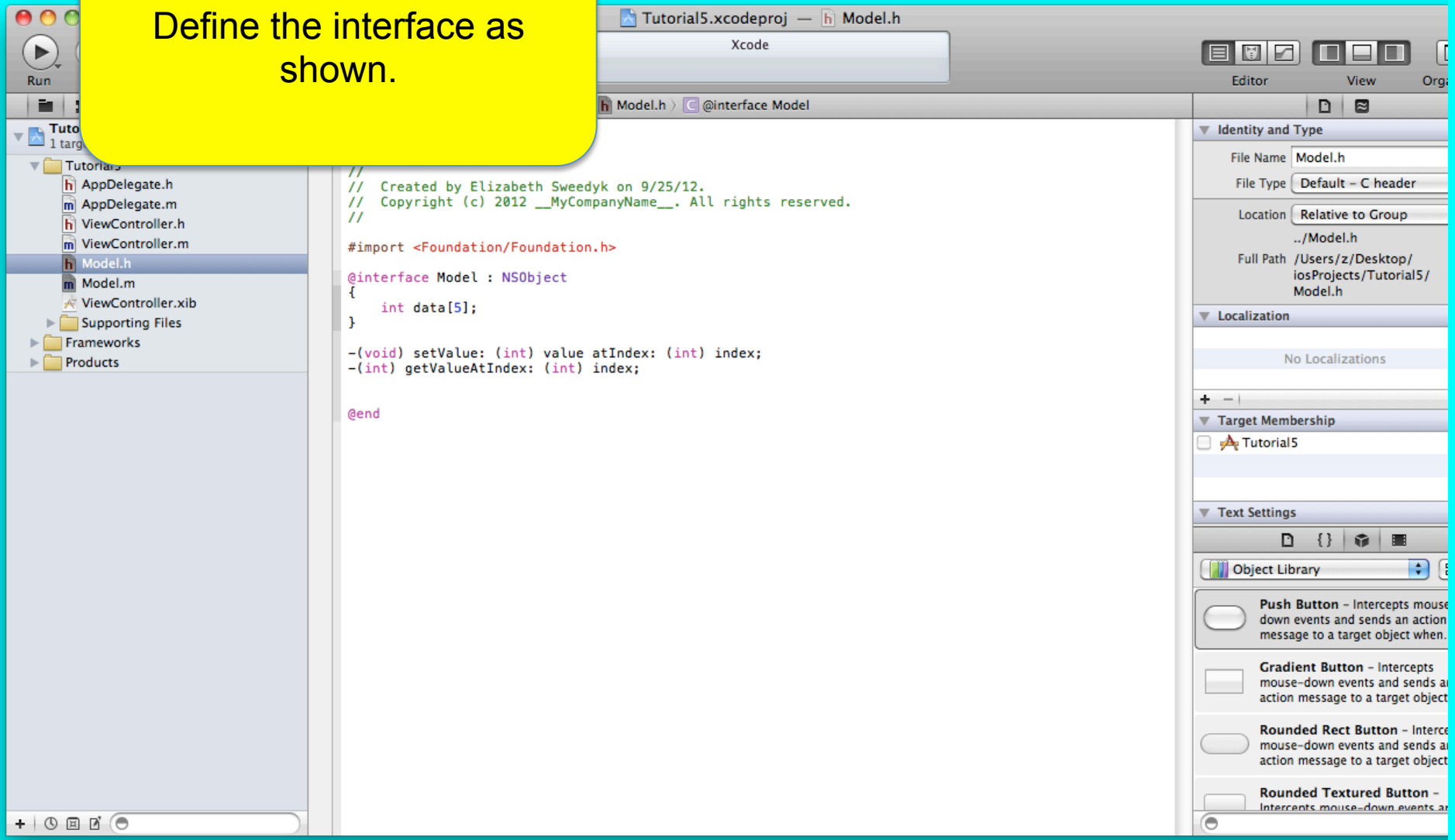
your new file:

Class: Model

Subclass of: NSObject

Cancel | Previous | Next

Define the interface as shown.



Implement the class as shown. Then run to make sure there are no problems.

Tutorial5.xcodeproj — Model.m

ild unitTests: **Succeeded** | 9/25/12 at 9:38 AM

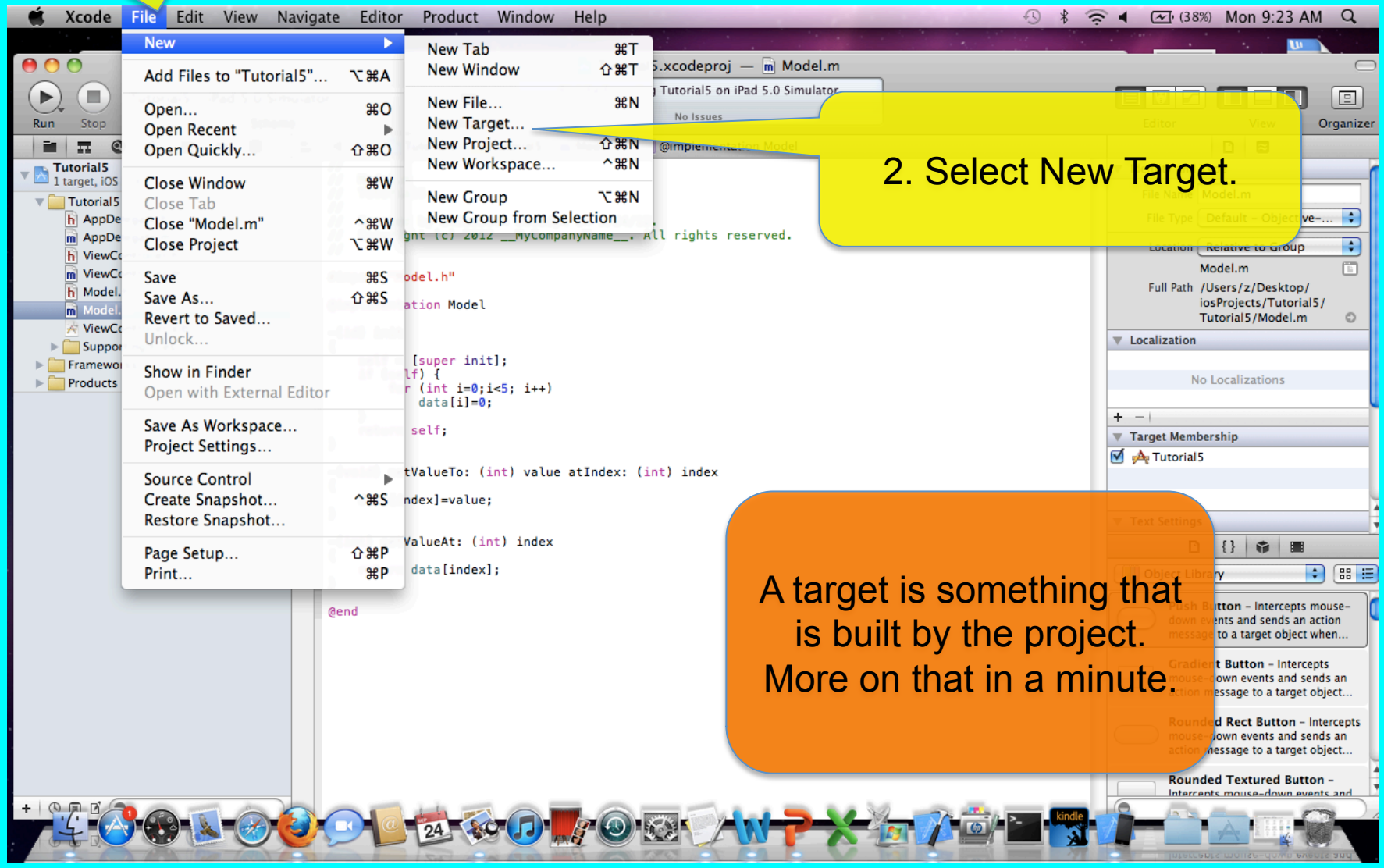
Editor View Orga

eAtIndex:

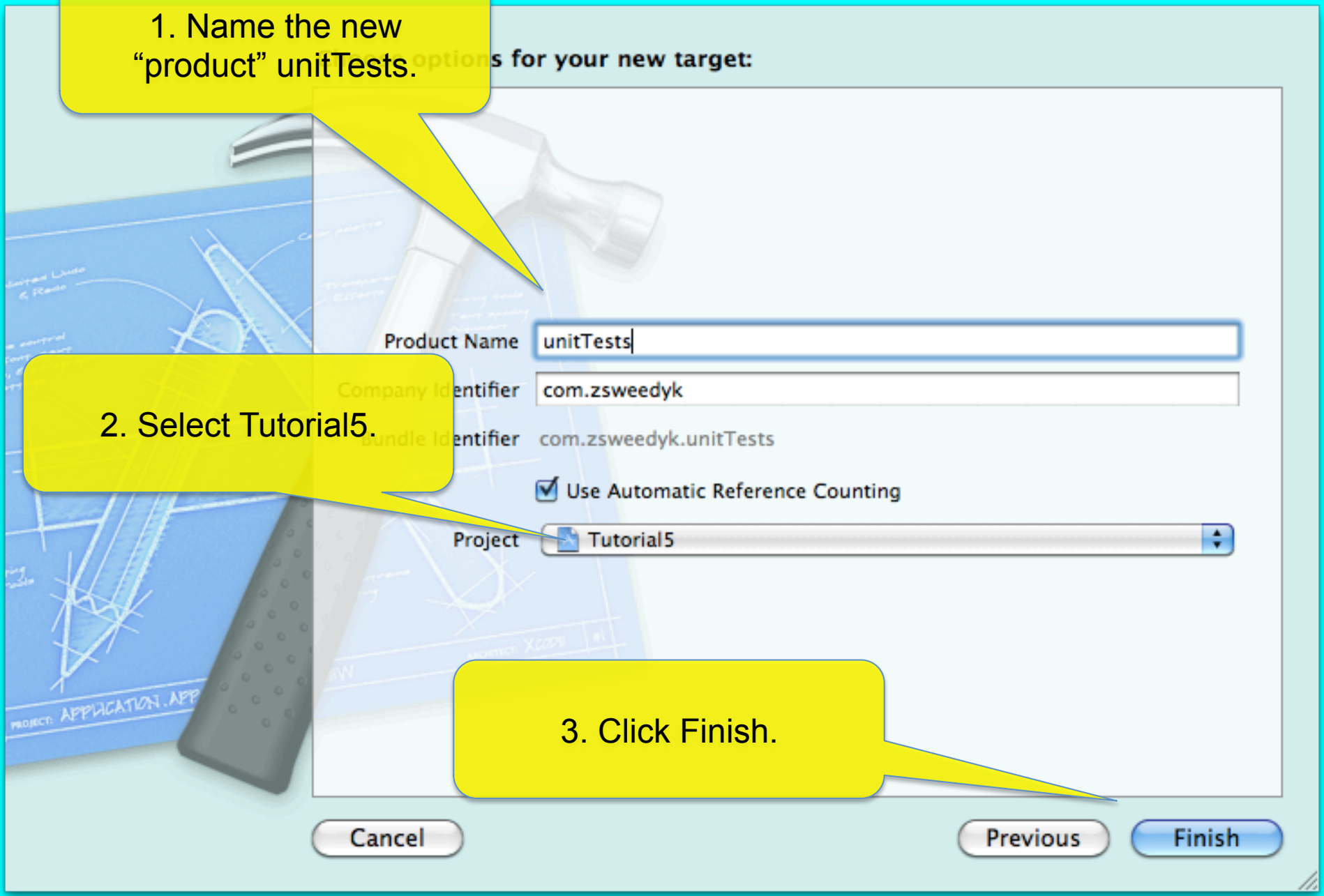
```
//
//  Model.m
//  Tutorial5
//  Copyright (c) 2012 __MyCompanyName__. All rights reserved.
//

#import "Model.h"

@implementation Model

-(id) init
{
    self = [super init];
    if (self)
    {
        for (int i=0; i<5; i++)
            data[i]=0;
    }
    return self;
}

-(void) setValue: (int) value atIndex: (int) index
{
    data[index]=value;
}

-(int) getValueAtIndex: (int) index
{

    return data[index];
}

@end
```

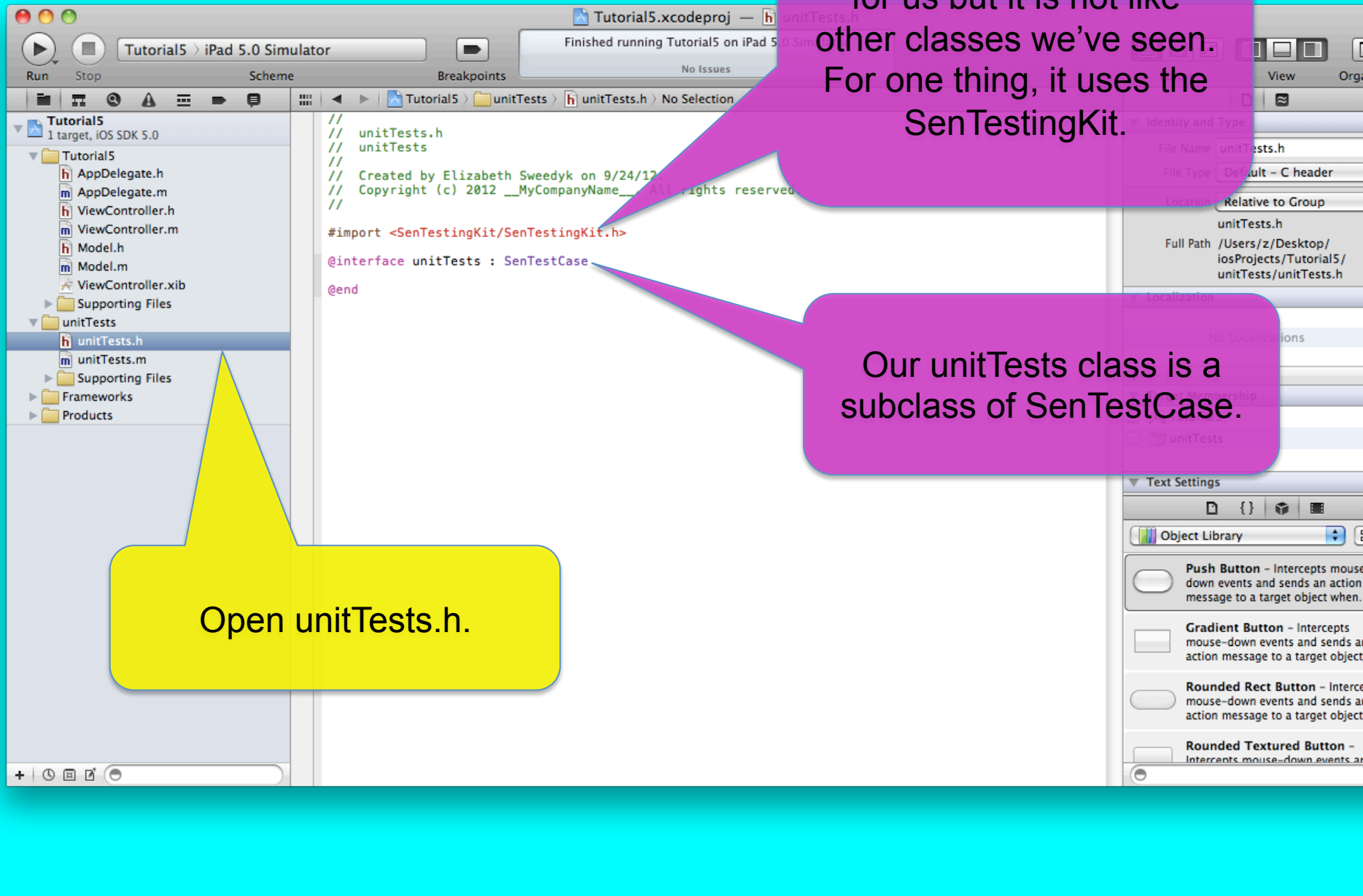
We do advocate test-driven development but that isn't the point of this lab. Here we are showing you how to build tests for existing code.

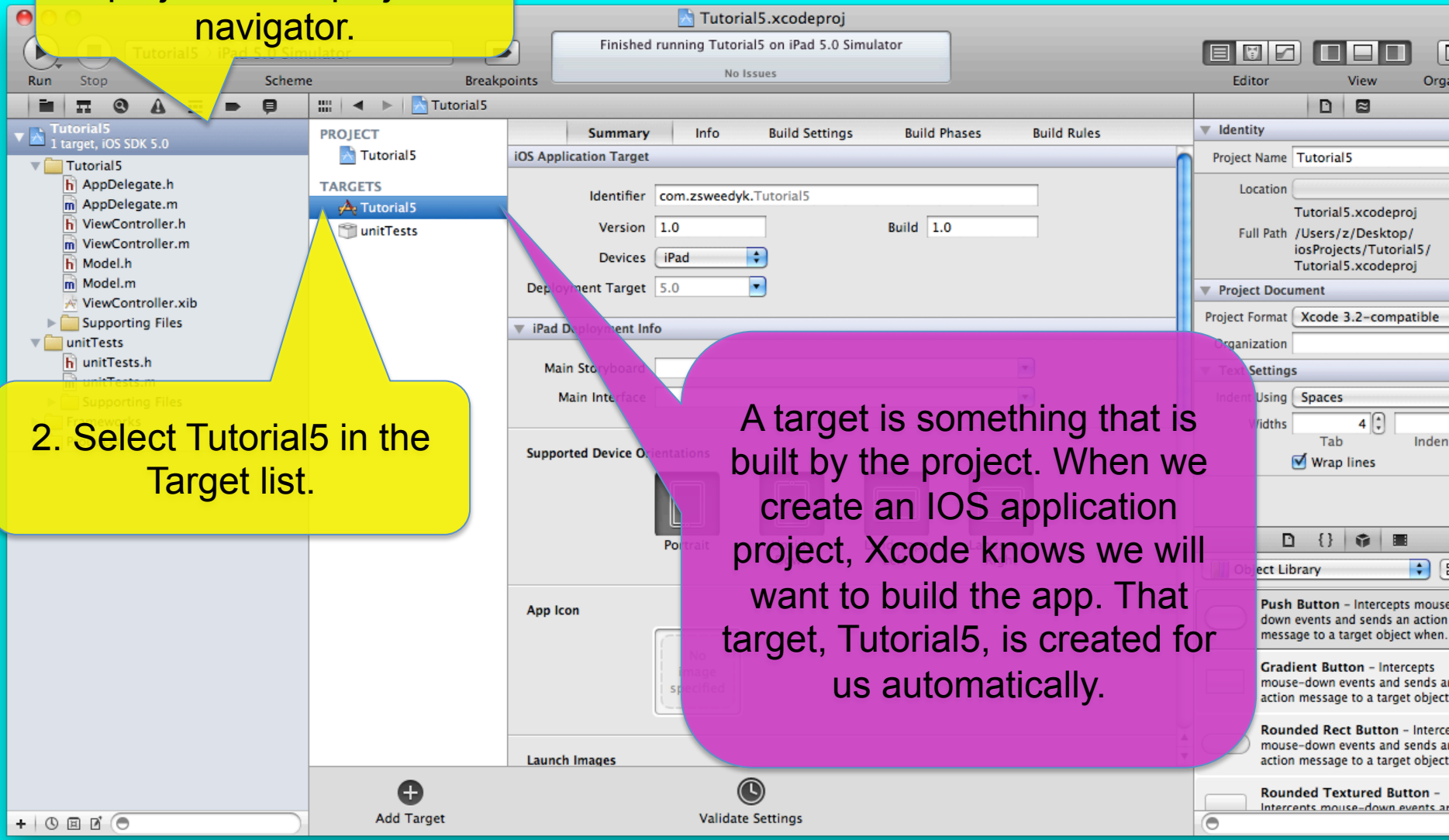
1. Select File then New.

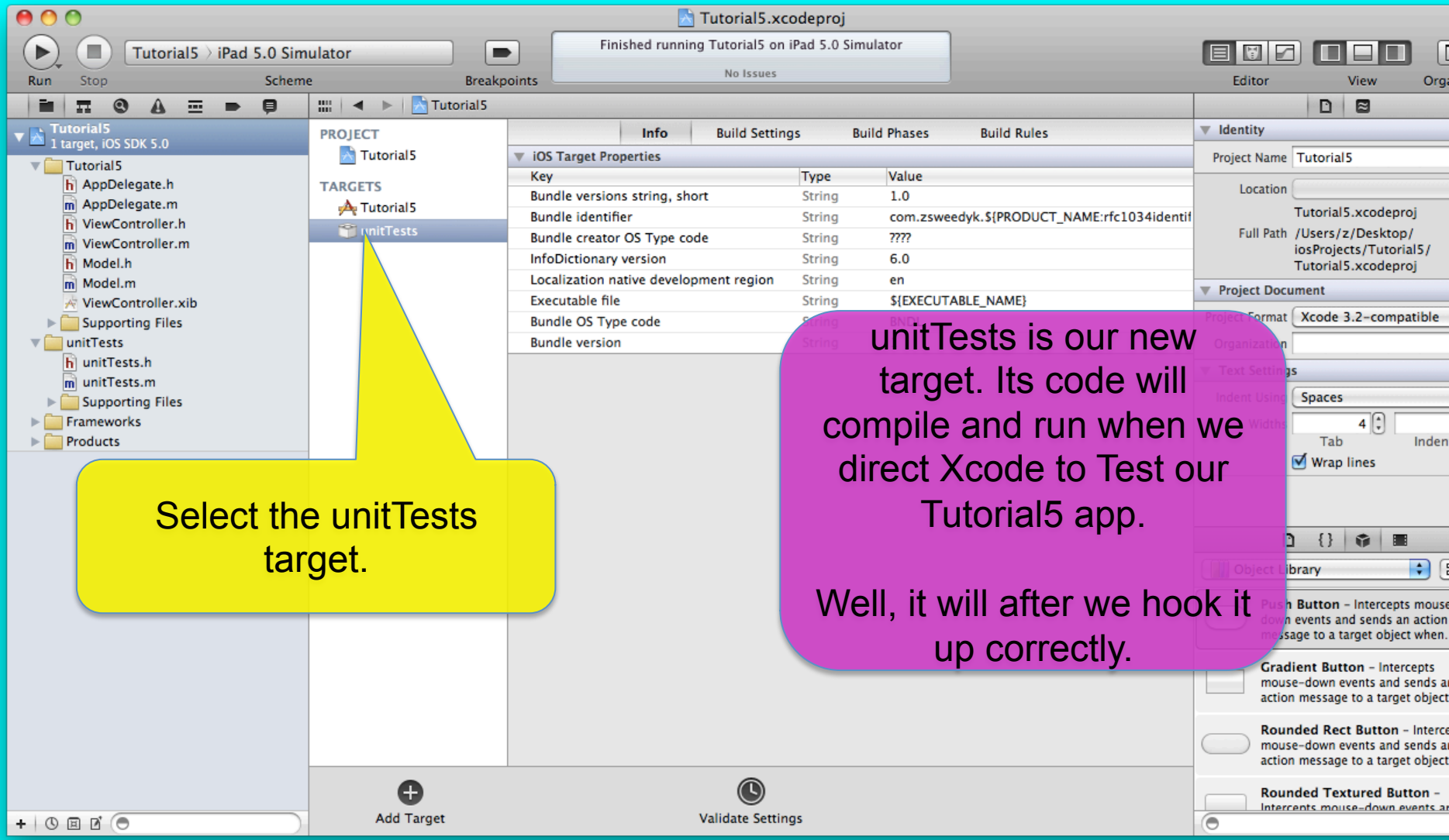


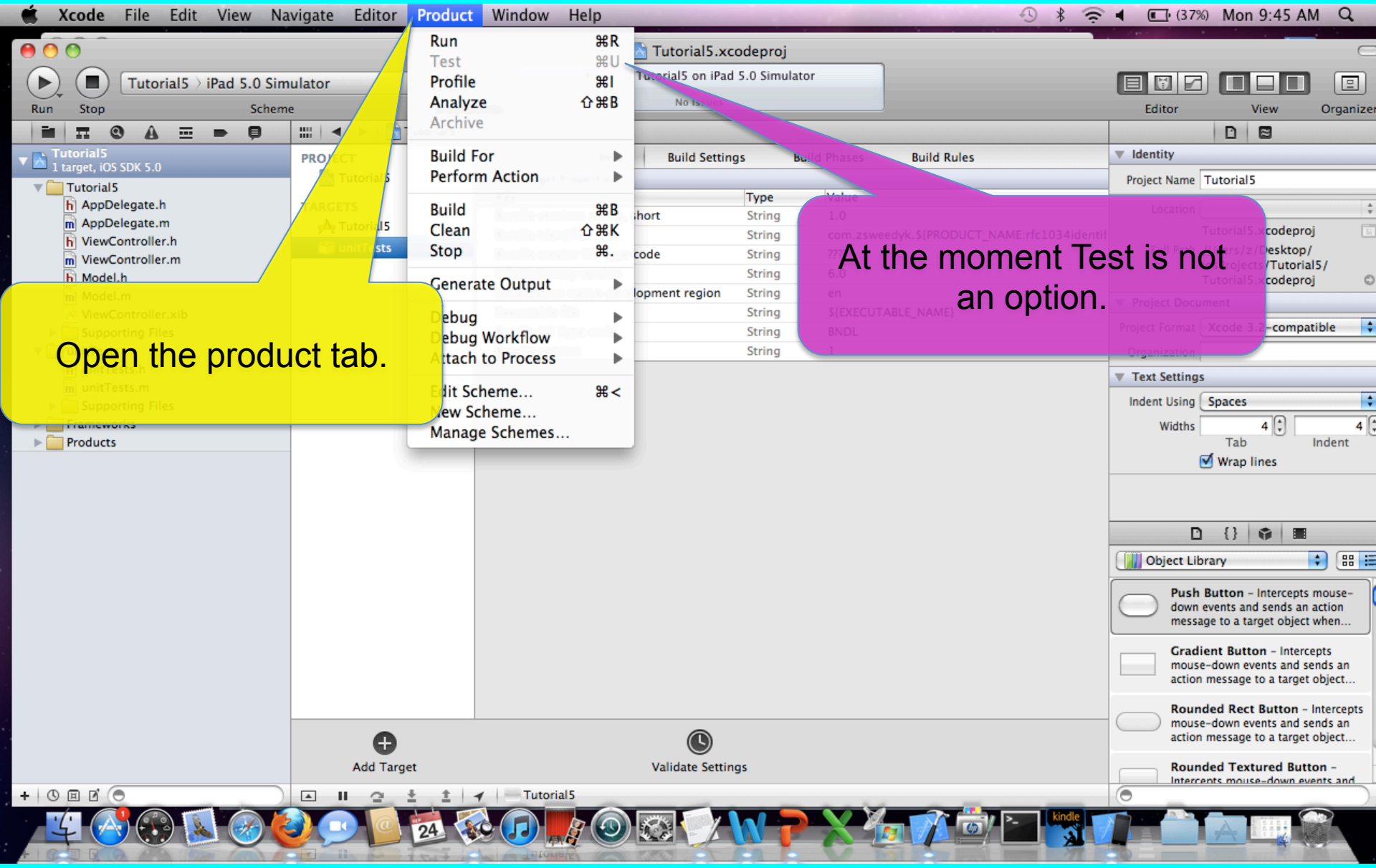

1. Select Other.
arget:
Other
Mac OS X
Application
Framework & Library
Application Plug-in
System Plug-in
Other
Cocoa Touch Unit Testing Bundle
Aggregate
2. Cocoa Touch Unit Testing Bundle.
Cocoa Touch Unit Testing Bundle
OCUnit.
3. Click Next.
Cancel
Previous
Next

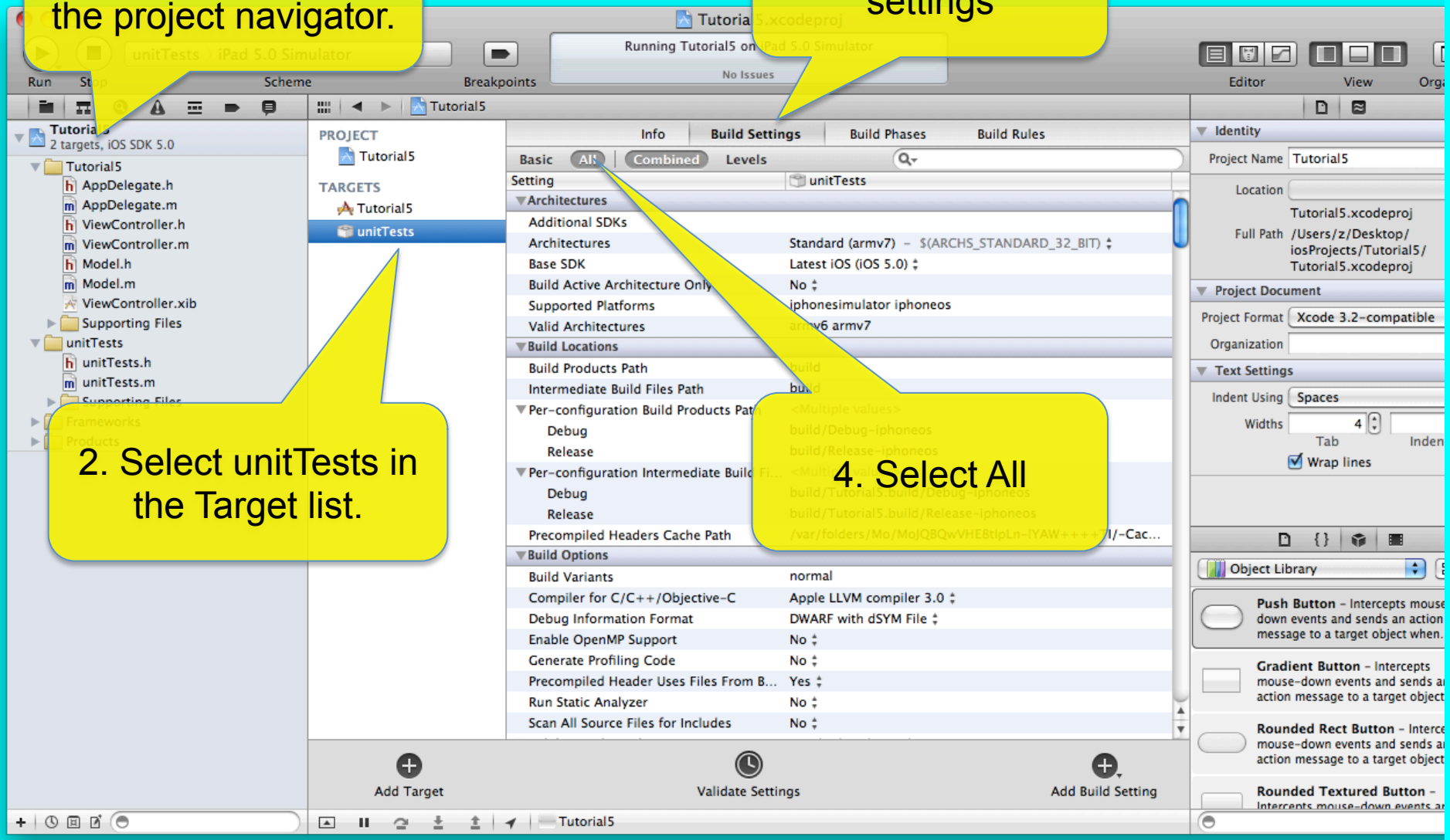

1. Name the new “product” unitTests.
s for your new target:
Product Name
unitTests
com.zsweedyk
com.zsweedyk.unitTests
Use Automatic Reference Counting
Project
Tutorial5
2. Select Tutorial5.
3. Click Finish.
Cancel
Previous
Finish

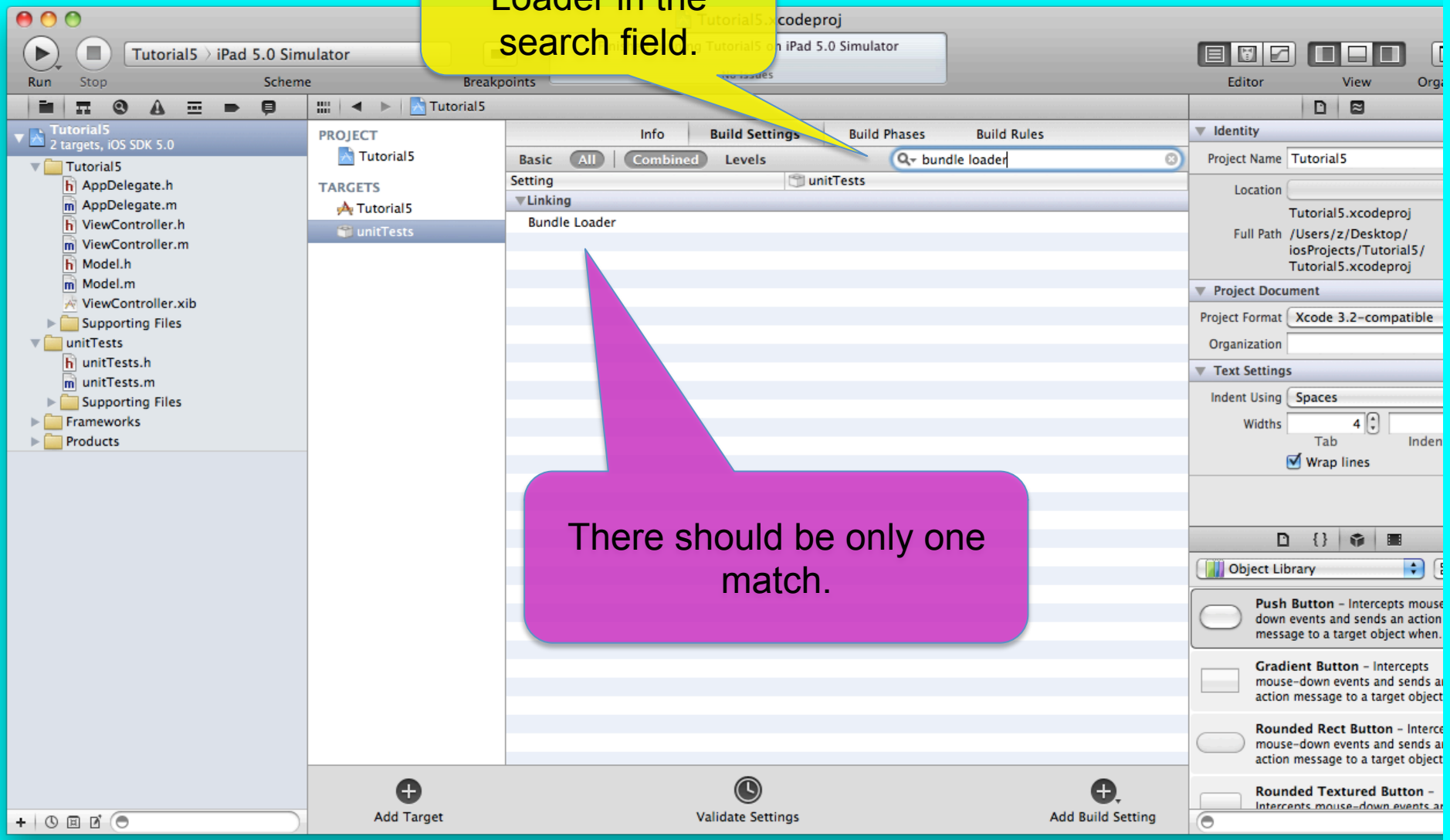

Xcode built a new class for us but it is not like other classes we've seen. For one thing, it uses the SenTestingKit.
Our unitTests class is a subclass of SenTestCase.
Open unitTests.h.
Tutorial5.xcodeproj
Tutorial5 › iPad 5.0 Simulator
Run
Stop
Scheme
Breakpoints
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Tutorial5
1 target, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
Tutorial5 › unitTests › unitTests.h › No Selection
//
// unitTests.h
// unitTests
//
// Created by Elizabeth Sweedyk on 9/24/12.
// Copyright (c) 2012 __MyCompanyName__. All rights reserved.
//
#import <SenTestingKit/SenTestingKit.h>
@interface unitTests : SenTestCase
@end
Identity and Type
File Name unitTests.h
File Type Default – C header
Location Relative to Group
unitTests.h
Full Path /Users/z/Desktop/iosProjects/Tutorial5/unitTests/unitTests.h
Localization
No Localizations
Target Membership
unitTests
Text Settings
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when...
Gradient Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Rect Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Textured Button – Intercepts mouse-down events and

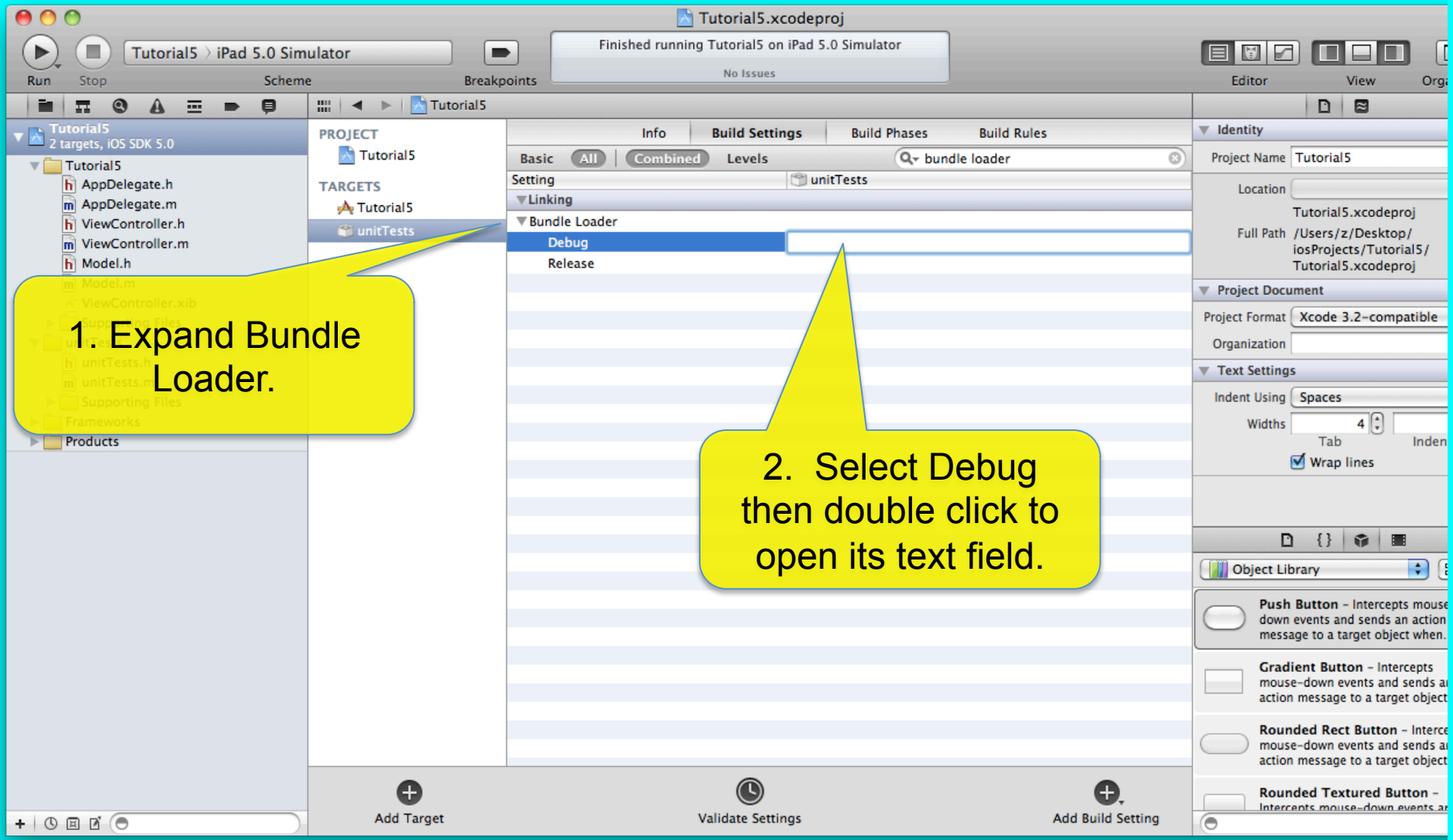

1. Select the tutorial project in the project navigator.
2. Select Tutorial5 in the Target list.
A target is something that is built by the project. When we create an IOS application project, Xcode knows we will want to build the app. That target, Tutorial5, is created for us automatically.
Tutorial5.xcodeproj
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Run
Stop
Scheme
Breakpoints
Editor
View
Tutorial5
1 target, iOS SDK 5.0
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
PROJECT
TARGETS
unitTests
Summary
Info
Build Settings
Build Phases
Build Rules
iOS Application Target
Identifier
com.zsweedyk.Tutorial5
Version
1.0
Build
1.0
Devices
iPad
Deployment Target
5.0
Main Storyboard
Supported Device Orientations
Portrait
App Icon
Launch Images
Add Target
Validate Settings
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Settings
Using
Spaces
Widths
4
Tab
Wrap lines
Push Button – Intercepts mouse down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Interce mouse-down events and sends a action message to a target object
Rounded Textured Button –

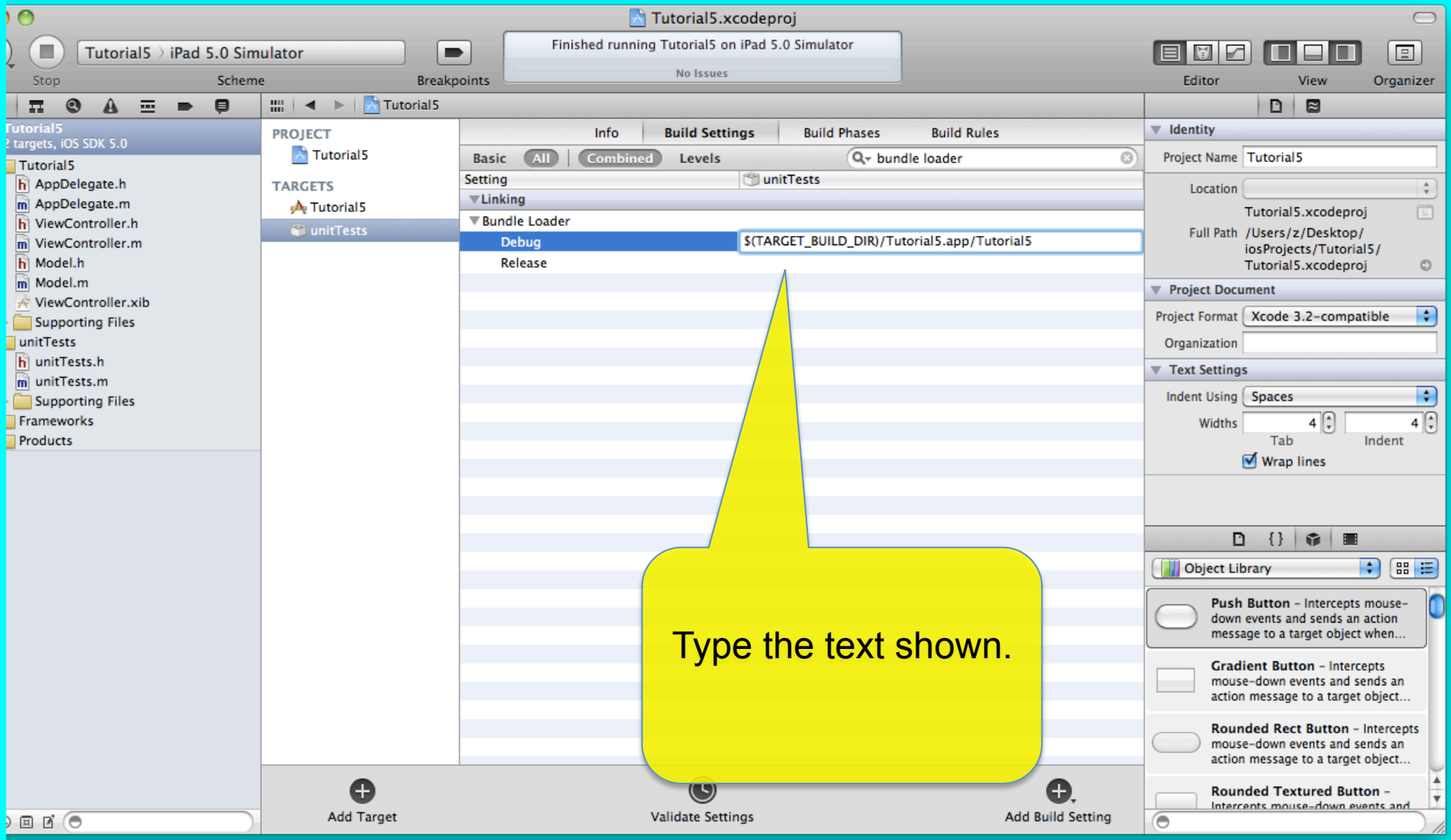

Tutorial5.xcodeproj
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Editor
View
Tutorial5
1 target, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
iOS Target Properties
Key
Type
Value
Bundle versions string, short
String
1.0
Bundle identifier
String
com.zsweedyk.${PRODUCT_NAME:rfc1034identif
Bundle creator OS Type code
String
????
InfoDictionary version
String
6.0
Localization native development region
String
en
Executable file
String
${EXECUTABLE_NAME}
Bundle OS Type code
Bundle version
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Xcode 3.2-compatible
Spaces
Tab
Wrap lines
Add Target
Validate Settings
Select the unitTests target.
unitTests is our new target. Its code will compile and run when we direct Xcode to Test our Tutorial5 app.
Well, it will after we hook it up correctly.

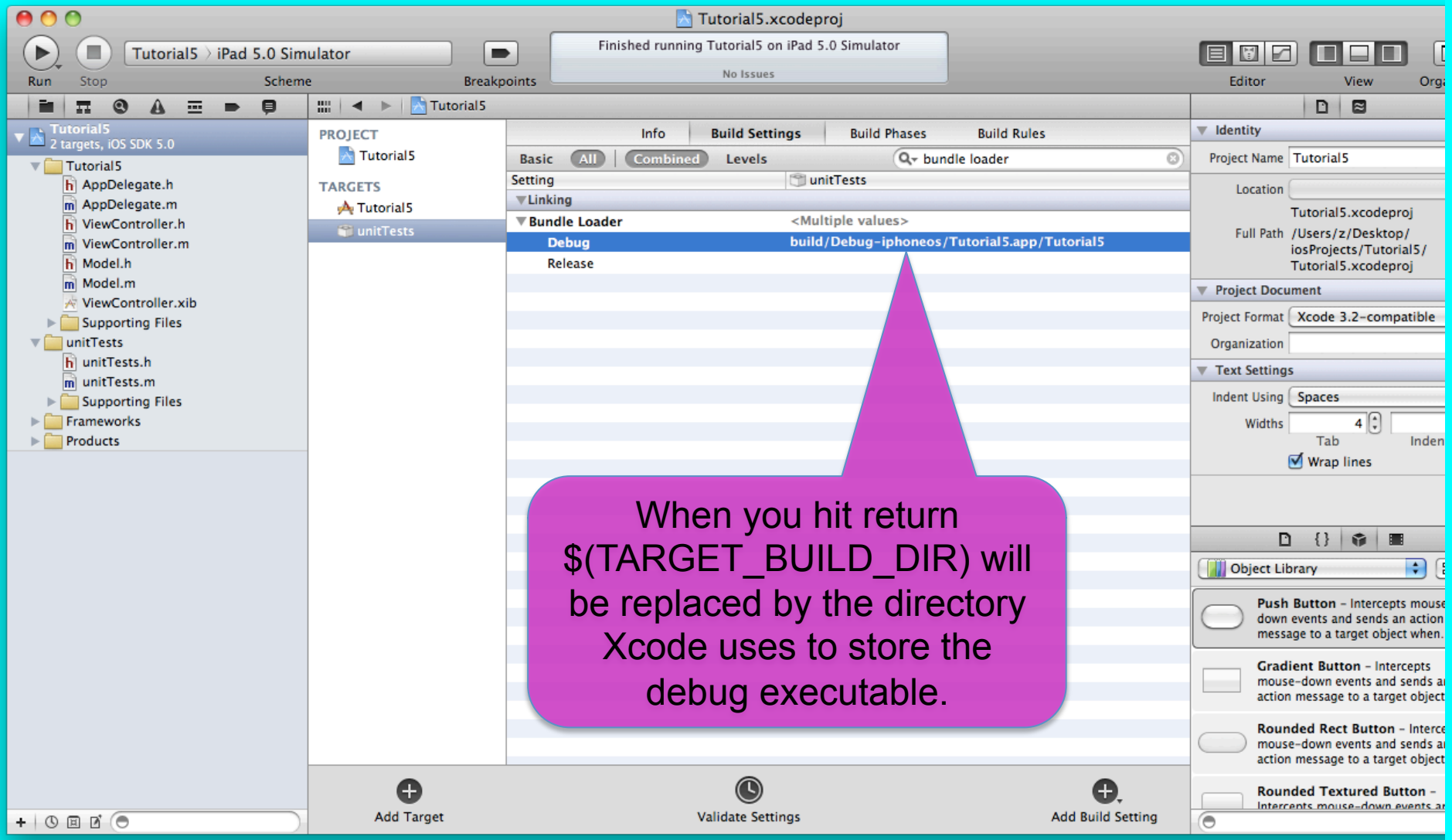

Xcode File Edit View Navigate Editor Product Window Help
Run ⌘R
Test ⌘U
Profile ⌘I
Analyze ⇧⌘B
Archive
Build For
Perform Action
Build ⌘B
Clean ⇧⌘K
Stop ⌘.
Generate Output
Debug
Debug Workflow
Attach to Process
Edit Scheme... ⌘<
New Scheme...
Manage Schemes...
Open the product tab.
At the moment Test is not an option.
Tutorial5.xcodeproj
Tutorial5 iPad 5.0 Simulator
Run
Stop
Scheme
Editor
View
Organizer
Tutorial5
1 target, iOS SDK 5.0
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Products
Build Settings
Build Rules
Identity
Project Name Tutorial5
Text Settings
Indent Using Spaces
Widths 4 4
Tab Indent
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when...
Gradient Button – Intercepts mouse-down events and sends an action message to a target object...
Rounded Rect Button – Intercepts mouse-down events and sends an action message to a target object...
Rounded Textured Button –
Add Target
Validate Settings

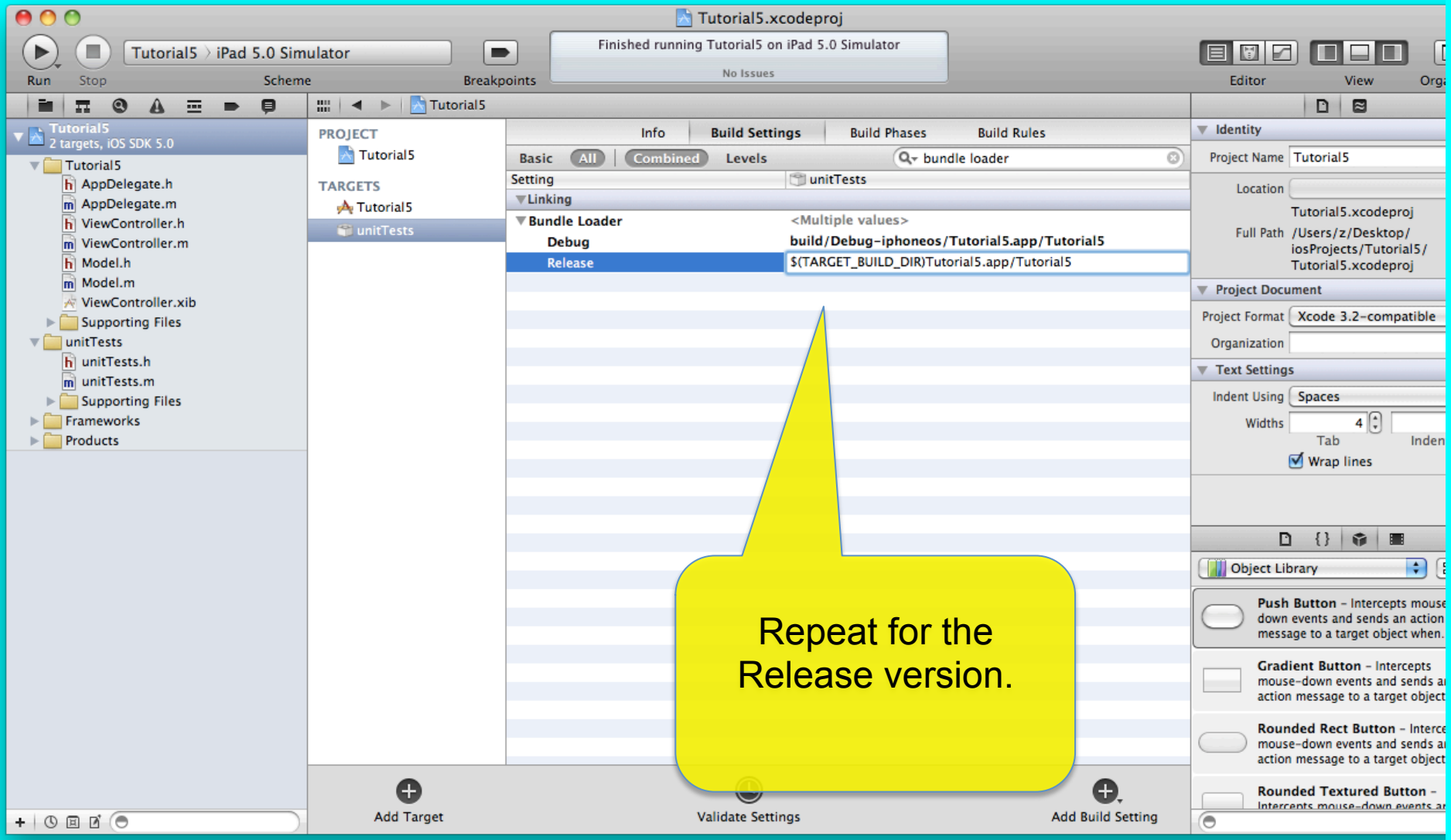

1. Select Tutorial5 in the project navigator.
3. Select Build settings
2. Select unitTests in the Target list.
4. Select All
Run
Stop
Scheme
Breakpoints
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
Setting
unitTests
Architectures
Additional SDKs
Architectures
Standard (armv7) – $(ARCHS_STANDARD_32_BIT)
Base SDK
Latest iOS (iOS 5.0)
Build Active Architecture Only
No
Supported Platforms
iphonesimulator iphoneos
Valid Architectures
armv6 armv7
Build Locations
Build Products Path
Intermediate Build Files Path
Per-configuration Build Products Path
Debug
build/Debug-iphoneos
Release
build/Release-iphoneos
Per-configuration Intermediate Build Files
Debug
Release
Precompiled Headers Cache Path
Build Options
Build Variants
normal
Compiler for C/C++/Objective-C
Apple LLVM compiler 3.0
Debug Information Format
DWARF with dSYM File
Enable OpenMP Support
No
Generate Profiling Code
No
Precompiled Header Uses Files From B...
Yes
Run Static Analyzer
No
Scan All Source Files for Includes
No
Add Target
Validate Settings
Add Build Setting
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when...
Gradient Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Rect Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Textured Button –

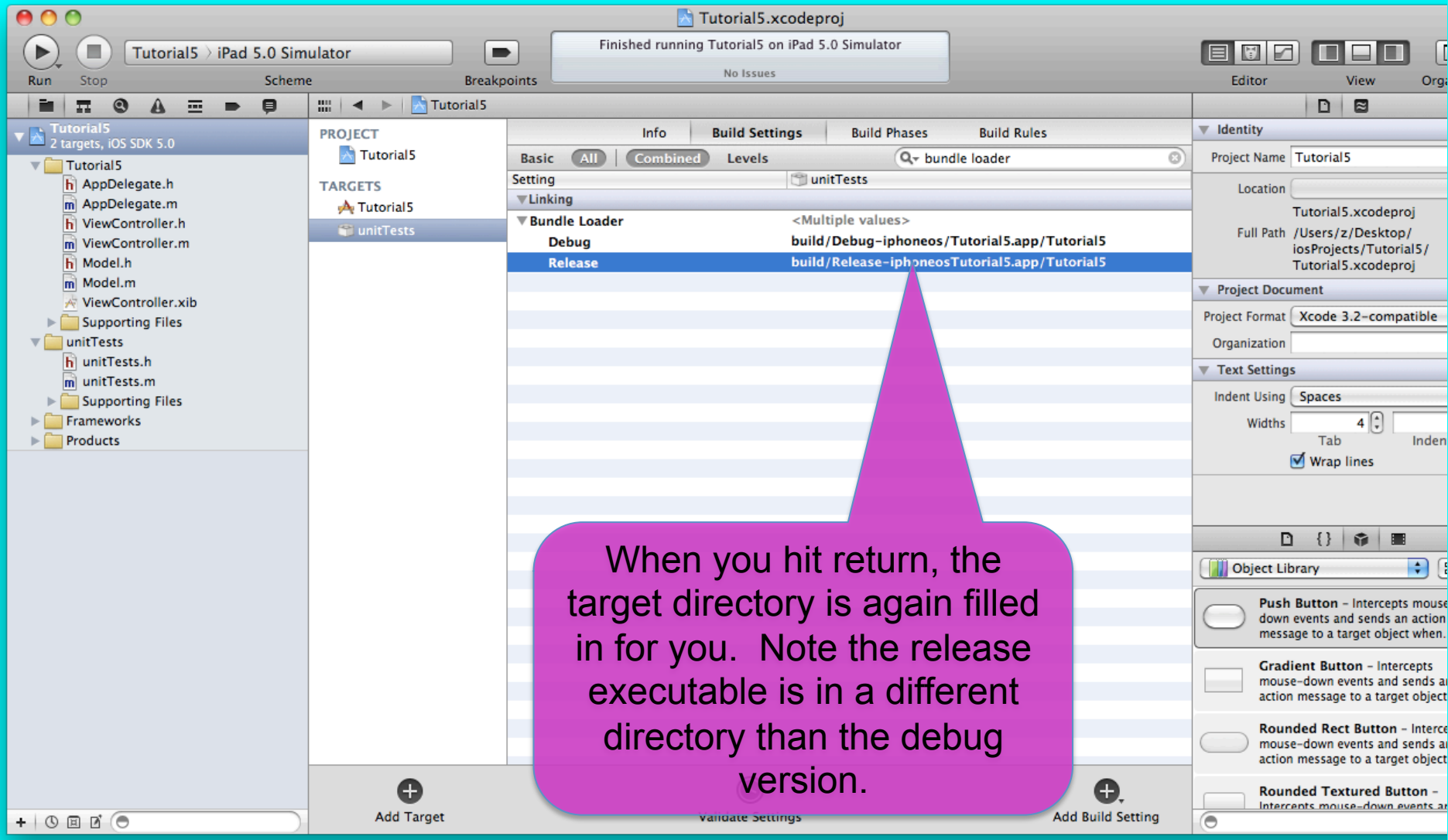

Type Bundle Loader in the search field.
Tutorial5 › iPad 5.0 Simulator
Run
Stop
Scheme
Breakpoints
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
bundle loader
Setting
unitTests
Linking
Bundle Loader
There should be only one match.
Add Target
Validate Settings
Add Build Setting
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Textured Button –

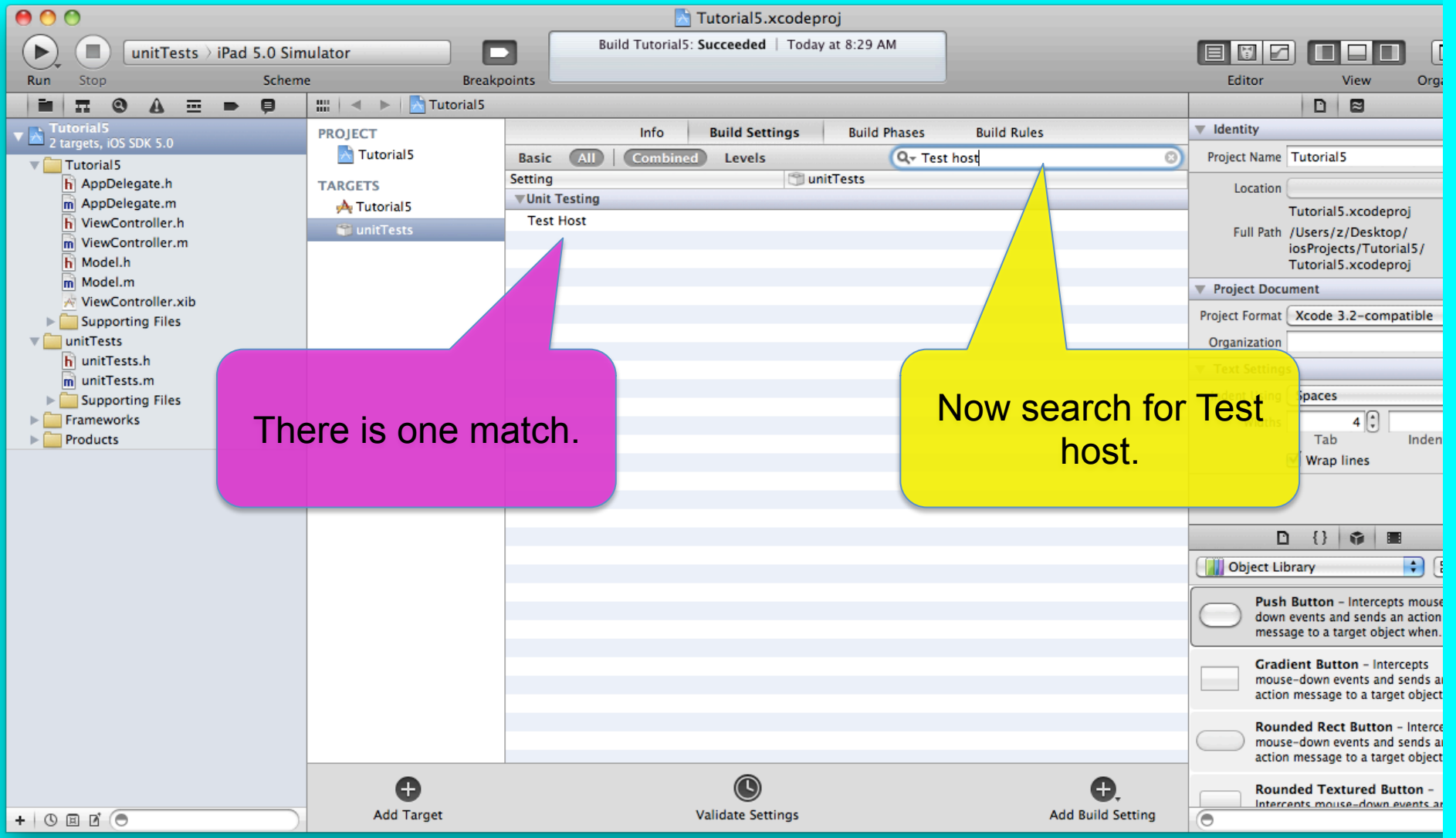

Tutorial5.xcodeproj
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
bundle loader
Setting
unitTests
Linking
Bundle Loader
Debug
Release
1. Expand Bundle Loader.
2. Select Debug then double click to open its text field.
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Rect Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Textured Button –
Add Target
Validate Settings
Add Build Setting

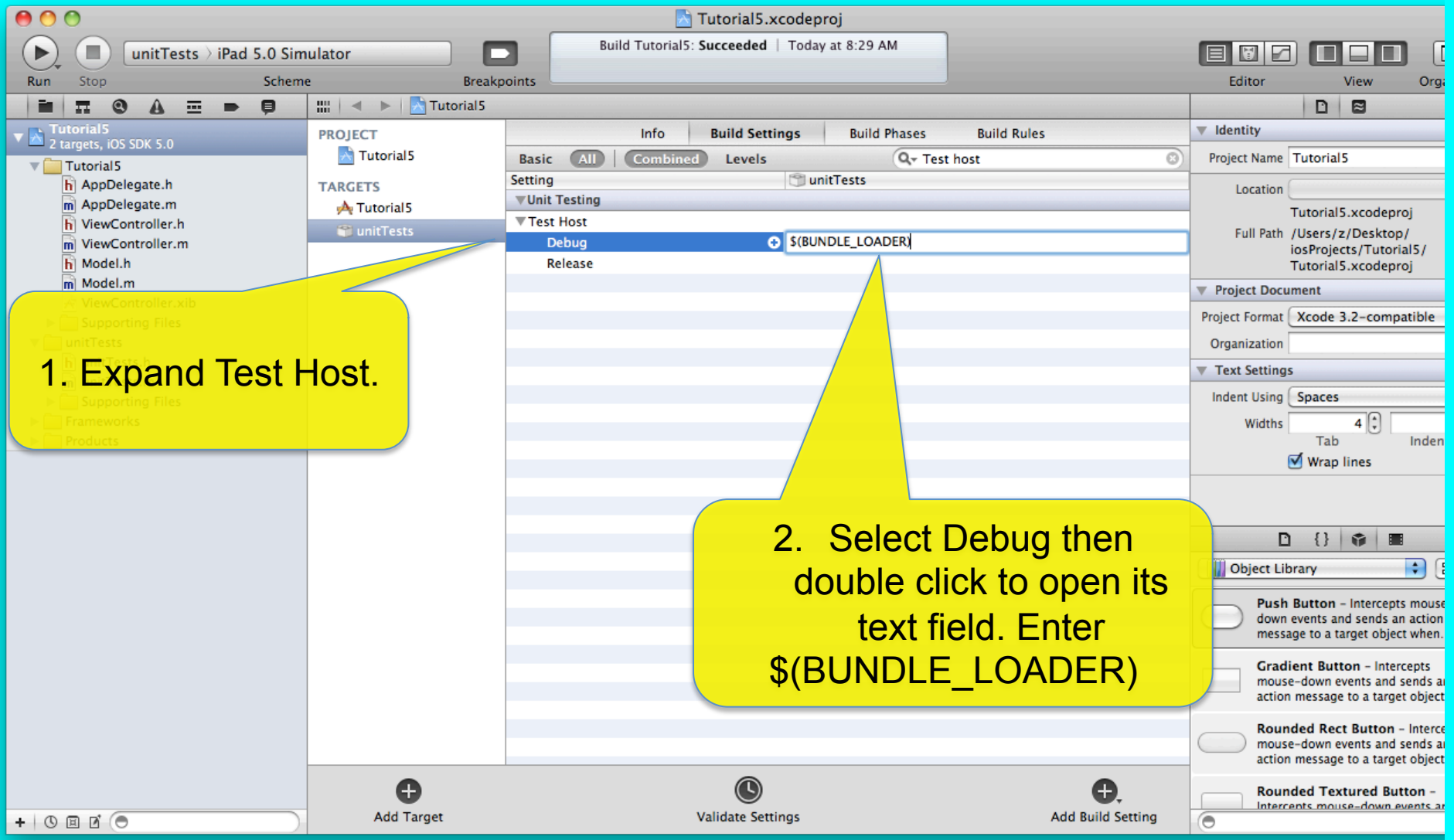

Tutorial5.xcodeproj
Tutorial5 › iPad 5.0 Simulator
Stop
Scheme
Breakpoints
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Editor
View
Organizer
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
bundle loader
Setting
unitTests
Linking
Bundle Loader
Debug
$(TARGET_BUILD_DIR)/Tutorial5.app/Tutorial5
Release
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
4
Tab
Indent
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when...
Gradient Button – Intercepts mouse-down events and sends an action message to a target object...
Rounded Rect Button – Intercepts mouse-down events and sends an action message to a target object...
Rounded Textured Button –
Add Target
Validate Settings
Add Build Setting
Type the text shown.

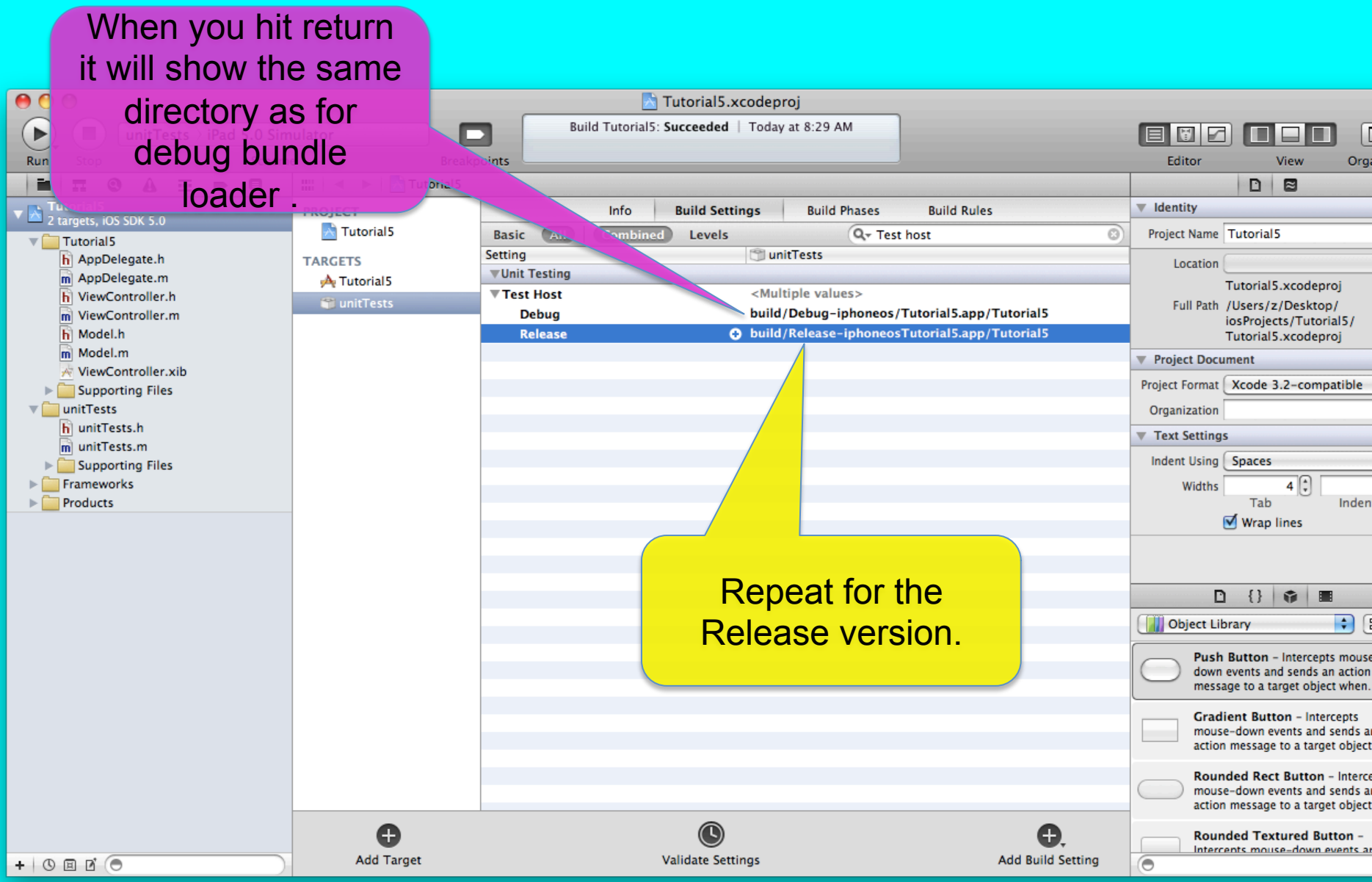

Tutorial5.xcodeproj
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
bundle loader
Setting
unitTests
Linking
Bundle Loader
<Multiple values>
Debug
build/Debug-iphoneos/Tutorial5.app/Tutorial5
Release
When you hit return $(TARGET_BUILD_DIR) will be replaced by the directory Xcode uses to store the debug executable.
Add Target
Validate Settings
Add Build Setting
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Textured Button –

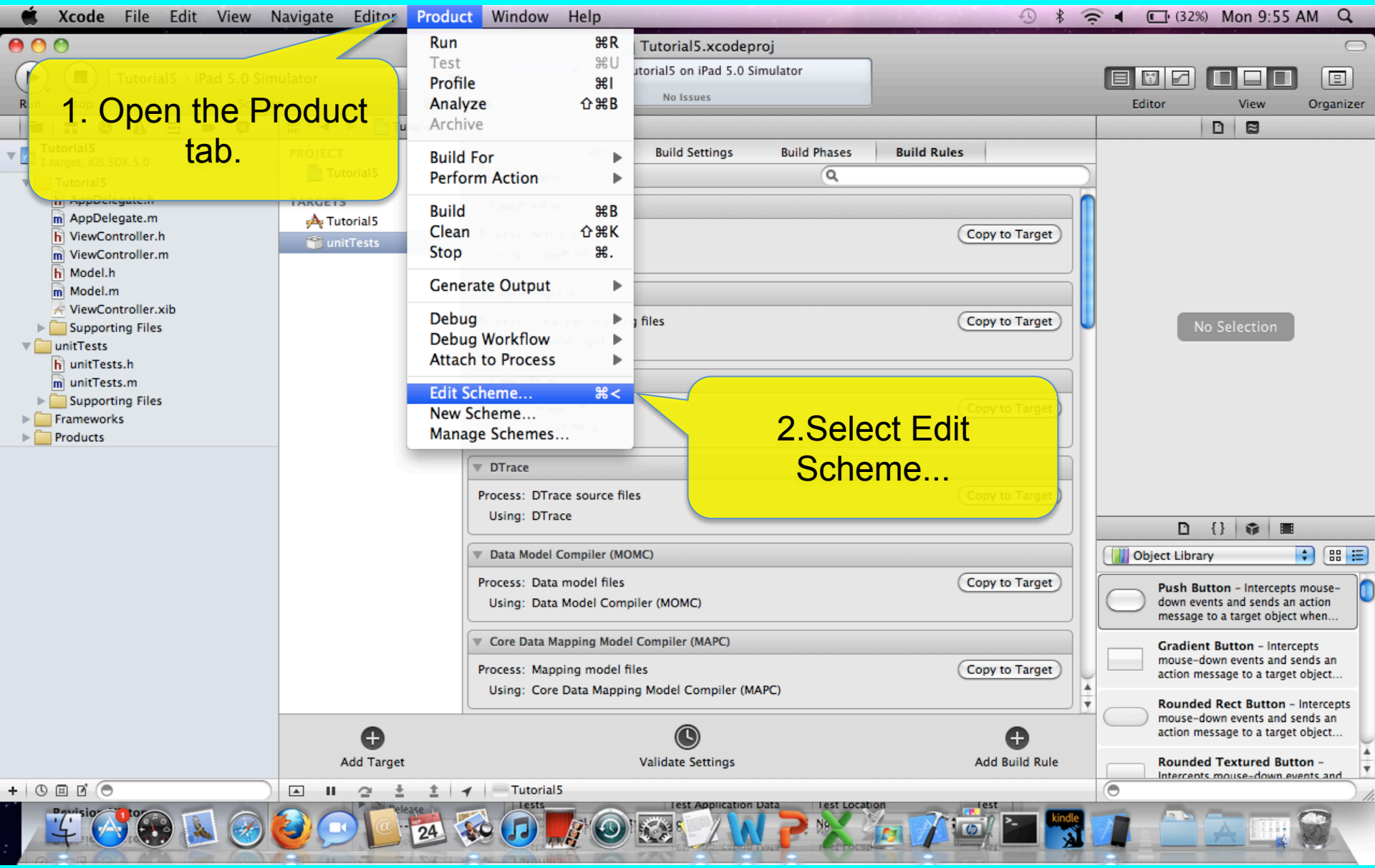

Tutorial5.xcodeproj
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
bundle loader
Setting
unitTests
Linking
Bundle Loader
<Multiple values>
Debug
build/Debug-iphoneos/Tutorial5.app/Tutorial5
Release
$(TARGET_BUILD_DIR)Tutorial5.app/Tutorial5
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Rect Button – Intercepts mouse-down events and sends an action message to a target object
Rounded Textured Button –
Add Target
Validate Settings
Add Build Setting
Repeat for the Release version.

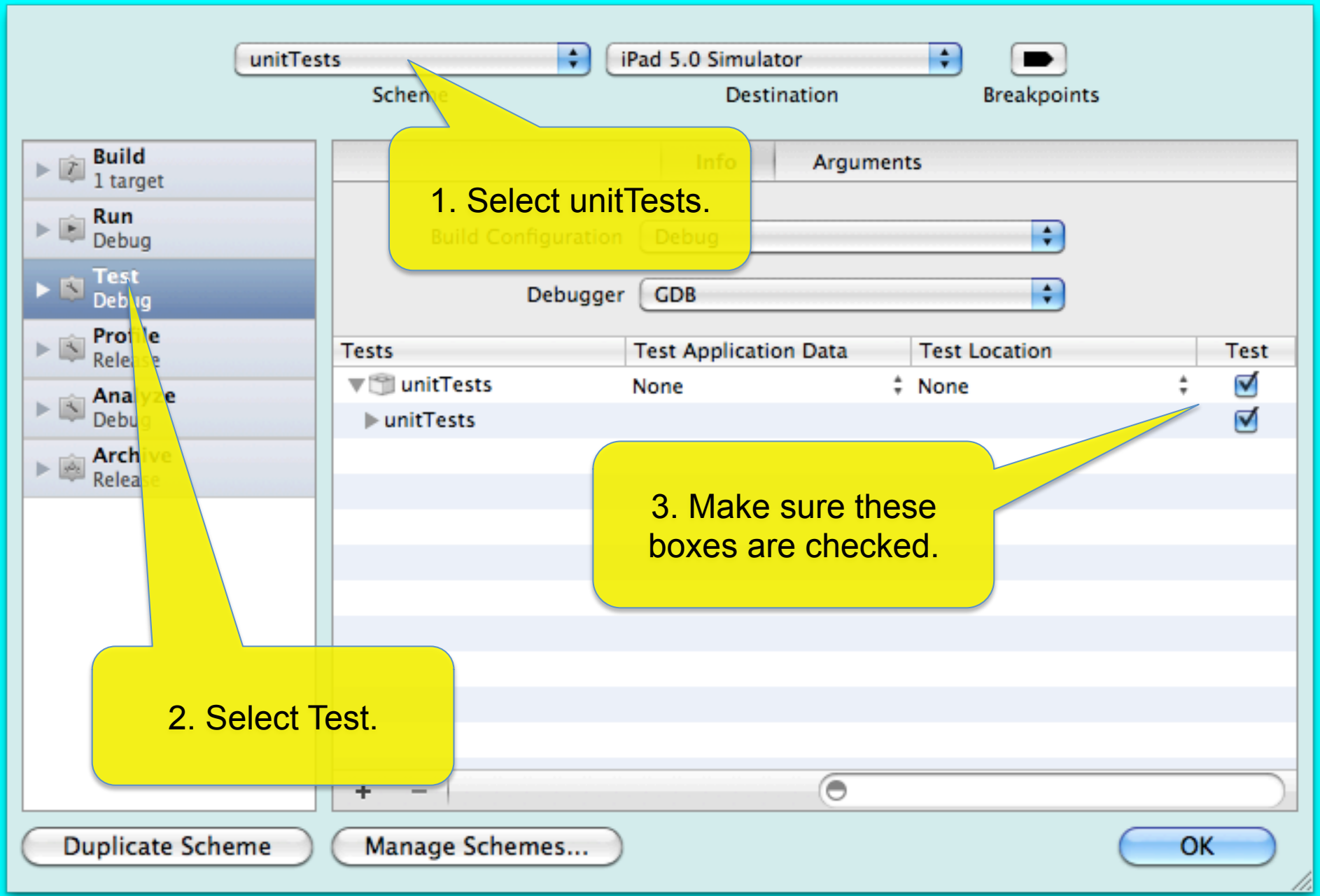

Tutorial5.xcodeproj
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished running Tutorial5 on iPad 5.0 Simulator
No Issues
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
bundle loader
Setting
unitTests
Linking
Bundle Loader
<Multiple values>
Debug
build/Debug-iphoneos/Tutorial5.app/Tutorial5
Release
build/Release-iphoneosTutorial5.app/Tutorial5
When you hit return, the target directory is again filled in for you. Note the release executable is in a different directory than the debug version.
Add Target
Add Build Setting
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Interce mouse-down events and sends a action message to a target object
Rounded Textured Button –

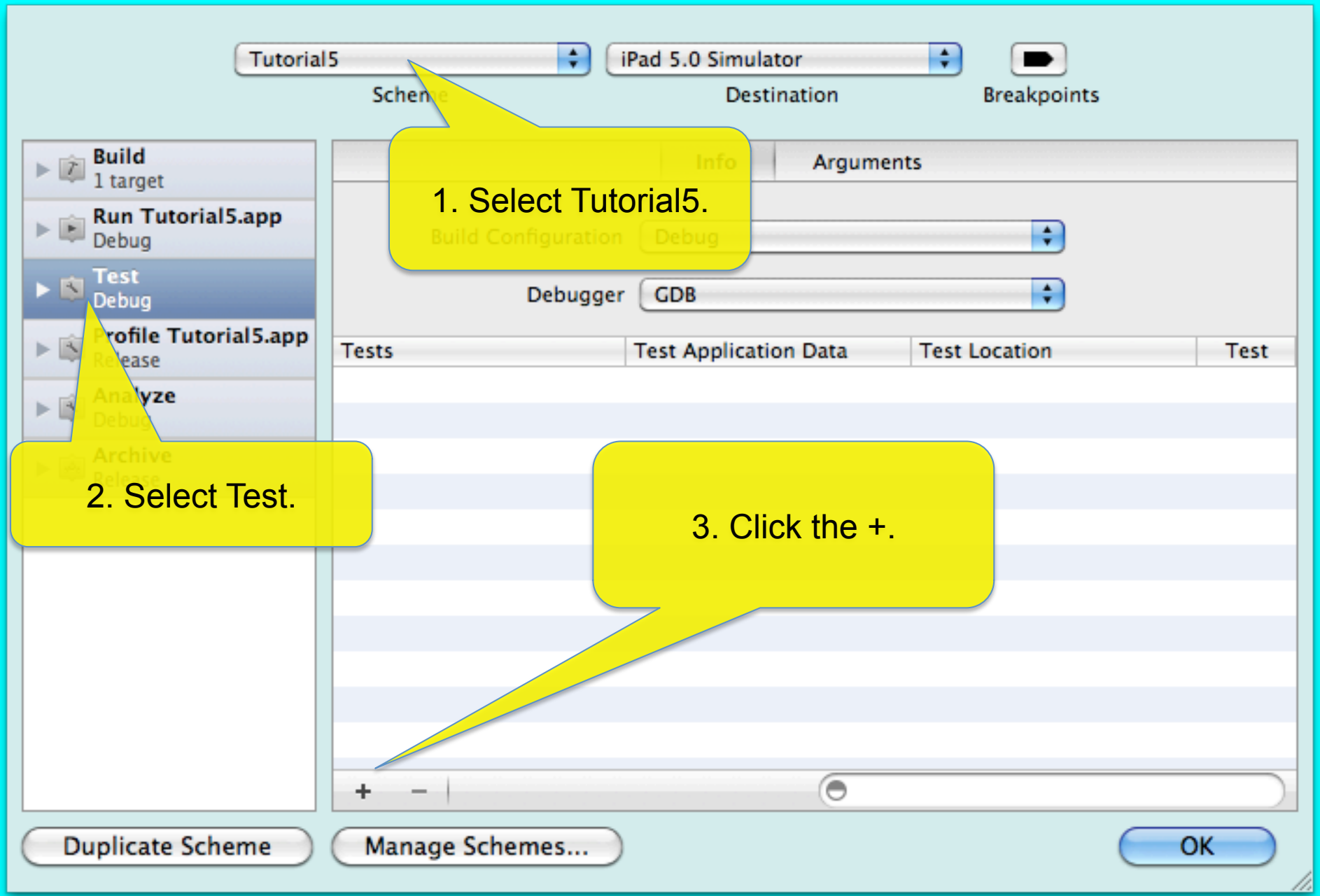

Tutorial5.xcodeproj
Run
Stop
unitTests › iPad 5.0 Simulator
Scheme
Breakpoints
Build Tutorial5: Succeeded | Today at 8:29 AM
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
Test host
Setting
unitTests
Unit Testing
Test Host
There is one match.
Now search for Test host.
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Tab
Wrap lines
Object Library
Push Button – Intercepts mouse down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Interce mouse-down events and sends a action message to a target object
Rounded Textured Button –
Add Target
Validate Settings
Add Build Setting

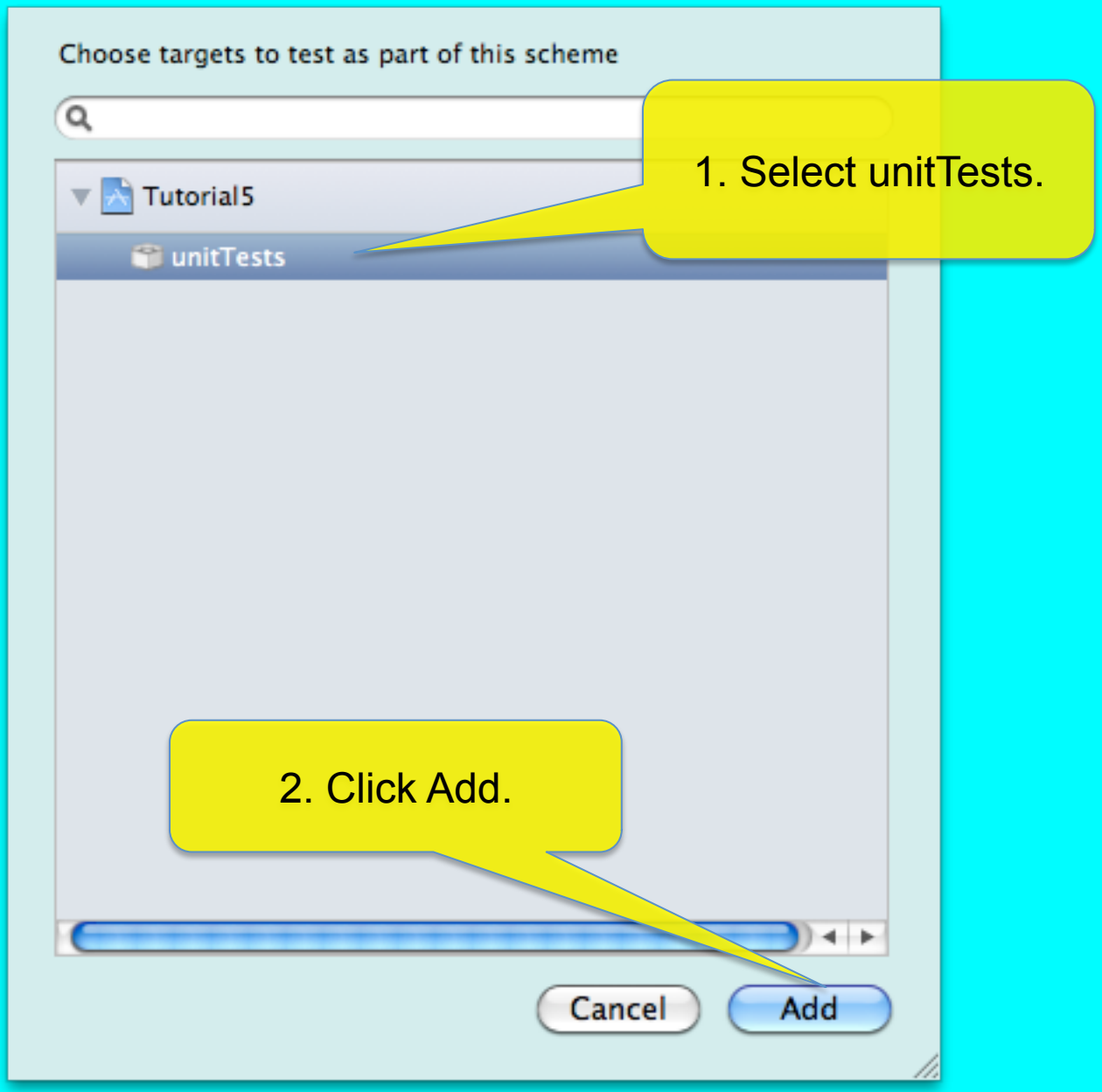

Tutorial5.xcodeproj
Run
Stop
unitTests › iPad 5.0 Simulator
Scheme
Breakpoints
Build Tutorial5: Succeeded | Today at 8:29 AM
Editor
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
PROJECT
Tutorial5
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
All
Combined
Levels
Test host
Setting
unitTests
Unit Testing
Test Host
Debug
$(BUNDLE_LOADER)
Release
1. Expand Test Host.
2. Select Debug then double click to open its text field. Enter $(BUNDLE_LOADER)
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button
Gradient Button
Rounded Rect Button
Rounded Textured Button
Add Target
Validate Settings
Add Build Setting

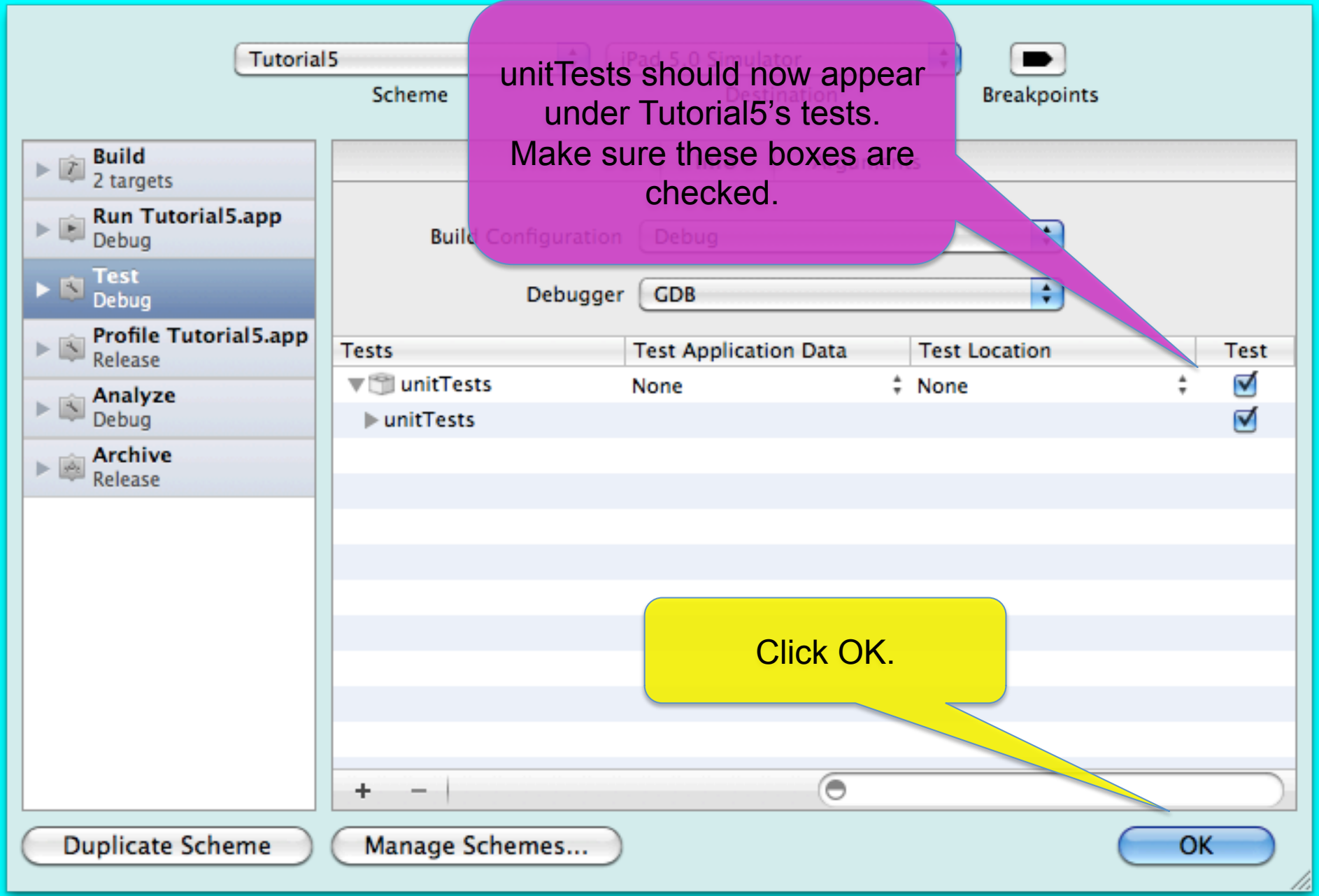

When you hit return it will show the same directory as for debug bundle loader .
Tutorial5.xcodeproj
Build Tutorial5: Succeeded | Today at 8:29 AM
Run
Stop
Editor
View
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
TARGETS
Tutorial5
unitTests
Info
Build Settings
Build Phases
Build Rules
Basic
Levels
Test host
Setting
unitTests
Unit Testing
Test Host
<Multiple values>
Debug
build/Debug-iphoneos/Tutorial5.app/Tutorial5
Release
build/Release-iphoneosTutorial5.app/Tutorial5
Repeat for the Release version.
Add Target
Validate Settings
Add Build Setting
Identity
Project Name
Tutorial5
Location
Tutorial5.xcodeproj
Full Path
/Users/z/Desktop/iosProjects/Tutorial5/Tutorial5.xcodeproj
Project Document
Project Format
Xcode 3.2-compatible
Organization
Text Settings
Indent Using
Spaces
Widths
4
Tab
Wrap lines
Object Library
Push Button - Intercepts mouse down events and sends an action message to a target object when.
Gradient Button - Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button - Interce mouse-down events and sends a action message to a target object
Rounded Textured Button -

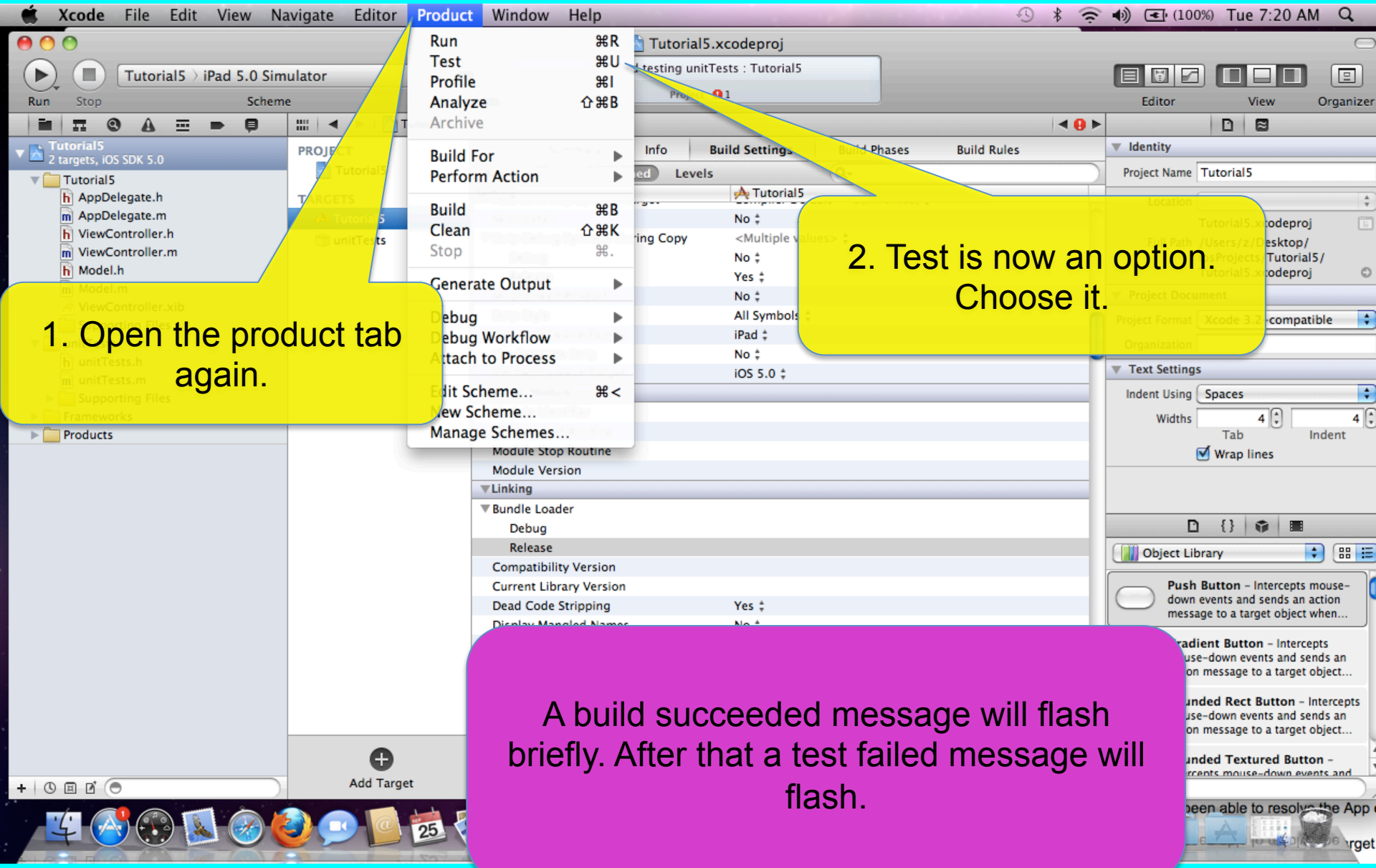

1. Open the Product tab.
Product
Run ⌘R
Test ⌘U
Profile ⌘I
Analyze ⇧⌘B
Archive
Build For
Perform Action
Build ⌘B
Clean ⇧⌘K
Stop ⌘.
Generate Output
Debug
Debug Workflow
Attach to Process
Edit Scheme... ⌘<
New Scheme...
Manage Schemes...
2.Select Edit Scheme...
Tutorial5.xcodeproj
Build Settings
Build Phases
Build Rules
Copy to Target
DTrace
Process: DTrace source files
Using: DTrace
Data Model Compiler (MOMC)
Process: Data model files
Using: Data Model Compiler (MOMC)
Core Data Mapping Model Compiler (MAPC)
Process: Mapping model files
Using: Core Data Mapping Model Compiler (MAPC)
Add Target
Validate Settings
Add Build Rule
No Selection
Object Library
Push Button – Intercepts mouse-down events and sends an action message to a target object when...
Gradient Button – Intercepts mouse-down events and sends an action message to a target object...
Rounded Rect Button – Intercepts mouse-down events and sends an action message to a target object...
Rounded Textured Button –

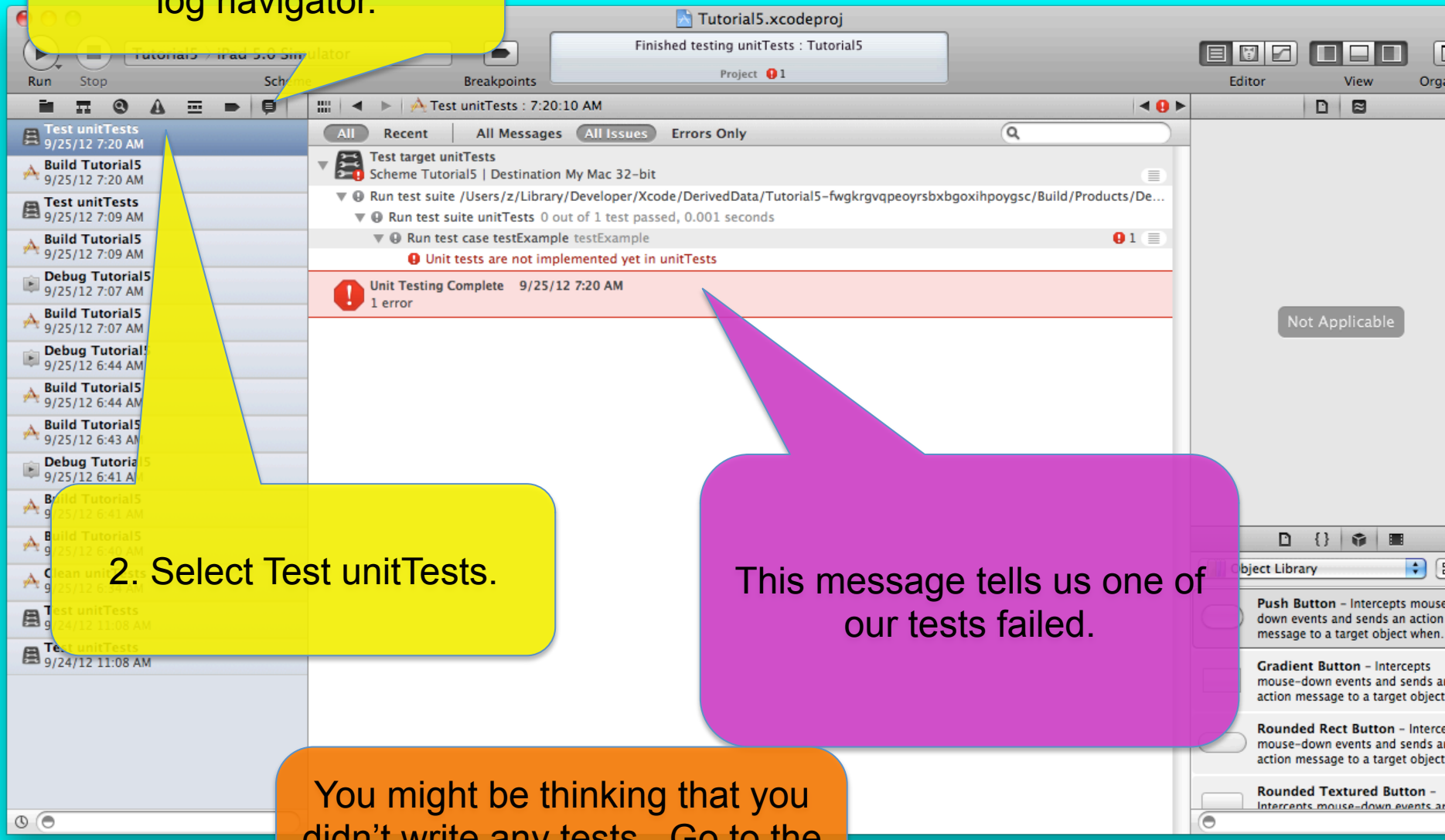

unitTests
iPad 5.0 Simulator
Destination
Breakpoints
Build
1 target
Run
Debug
Test
Debug
Arguments
1. Select unitTests.
Debugger
GDB
Tests
Test Application Data
Test Location
Test
unitTests
None
None
unitTests
3. Make sure these boxes are checked.
2. Select Test.
Duplicate Scheme
Manage Schemes...
OK


Tutorial5
iPad 5.0 Simulator
Scheme
Destination
Breakpoints
Build
1 target
Run Tutorial5.app
Debug
Test
Debug
Profile Tutorial5.app
Release
Archive
Info
Arguments
Build Configuration
Debug
Debugger
GDB
Tests
Test Application Data
Test Location
Test
1. Select Tutorial5.
2. Select Test.
3. Click the +.
Duplicate Scheme
Manage Schemes...
OK

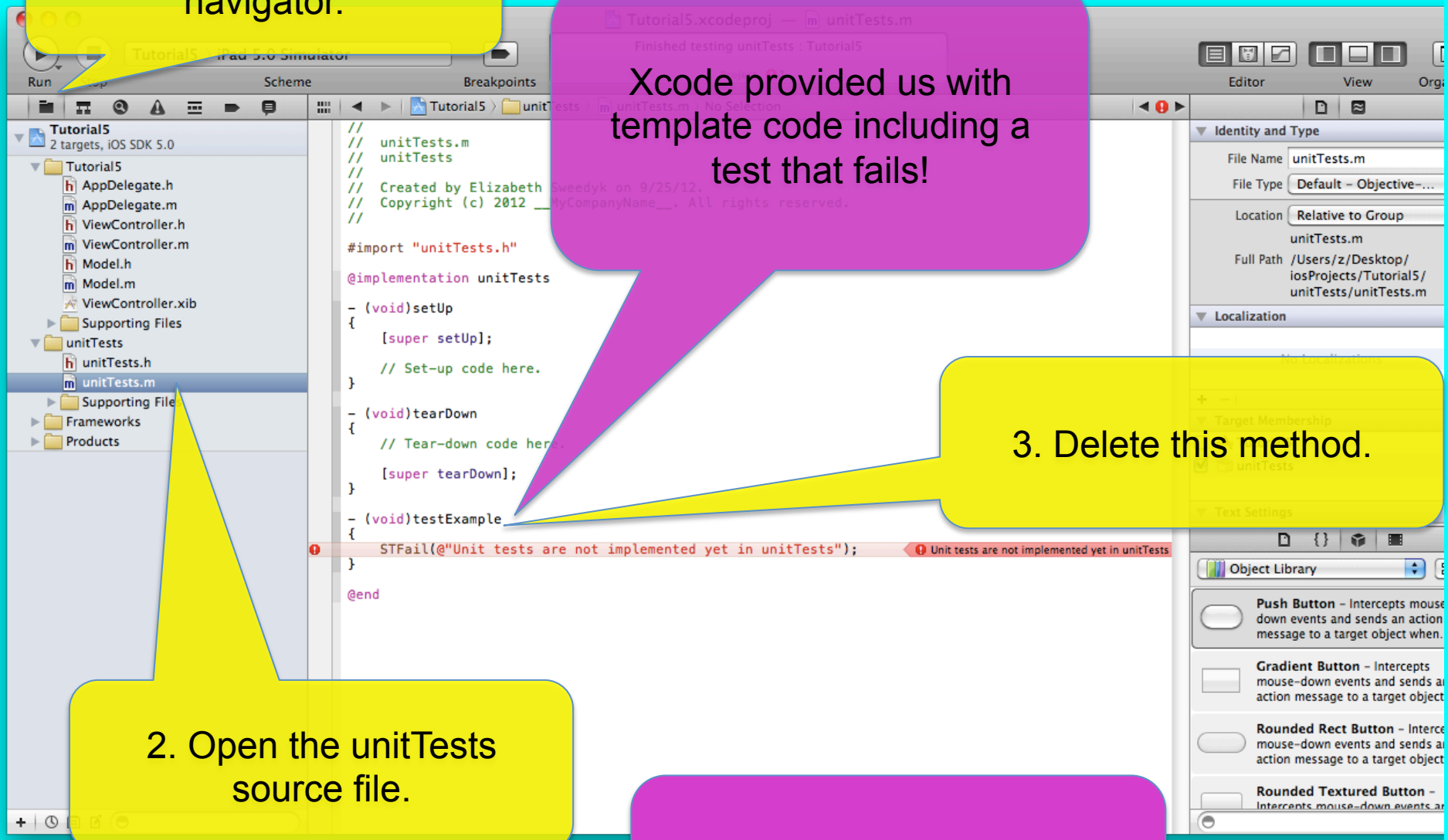

Choose targets to test as part of this scheme
Tutorial5
unitTests
1. Select unitTests.
2. Click Add.
Cancel
Add


Tutorial5
Scheme
Breakpoints
unitTests should now appear under Tutorial5's tests. Make sure these boxes are checked.
Build
2 targets
Run Tutorial5.app
Debug
Test
Debug
Profile Tutorial5.app
Release
Analyze
Debug
Archive
Release
Debugger
GDB
Tests
Test Application Data
Test Location
Test
unitTests
None
None
unitTests
Click OK.
Duplicate Scheme
Manage Schemes...
OK


Xcode File Edit View Navigate Editor Product Window Help
Run ⌘R
Test ⌘U
Profile ⌘I
Analyze ⇧⌘B
Archive
Build For
Perform Action
Build ⌘B
Clean ⇧⌘K
Stop ⌘.
Generate Output
Debug
Debug Workflow
Attach to Process
Edit Scheme... ⌘<
New Scheme...
Manage Schemes...
1. Open the product tab again.
2. Test is now an option. Choose it.
A build succeeded message will flash briefly. After that a test failed message will flash.


1. Click here to open the log navigator.
Tutorial5.xcodeproj
Finished testing unitTests : Tutorial5
Project 1
Run
Stop
Breakpoints
Editor
View
Test unitTests : 7:20:10 AM
All
Recent
All Messages
All Issues
Errors Only
Test target unitTests
Scheme Tutorial5 | Destination My Mac 32-bit
Run test suite /Users/z/Library/Developer/Xcode/DerivedData/Tutorial5-fwgkrgvqpeoyrsbxbgoxihpoygsc/Build/Products/De...
Run test suite unitTests 0 out of 1 test passed, 0.001 seconds
Run test case testExample testExample
Unit tests are not implemented yet in unitTests
Unit Testing Complete 9/25/12 7:20 AM
1 error
Test unitTests 9/25/12 7:20 AM
Build Tutorial5 9/25/12 7:20 AM
Test unitTests 9/25/12 7:09 AM
Build Tutorial5 9/25/12 7:09 AM
Debug Tutorial5 9/25/12 7:07 AM
Build Tutorial5 9/25/12 7:07 AM
Build Tutorial5 9/25/12 6:44 AM
Build Tutorial5 9/25/12 6:43 AM
Test unitTests 9/24/12 11:08 AM
Not Applicable
Push Button - Intercepts mouse
Gradient Button - Intercepts
Rounded Rect Button - Interce
Rounded Textured Button -
2. Select Test unitTests.
This message tells us one of our tests failed.
You might be thinking that you didn't write any tests. Go to the next slide to see what happened.

1. Open the project navigator.

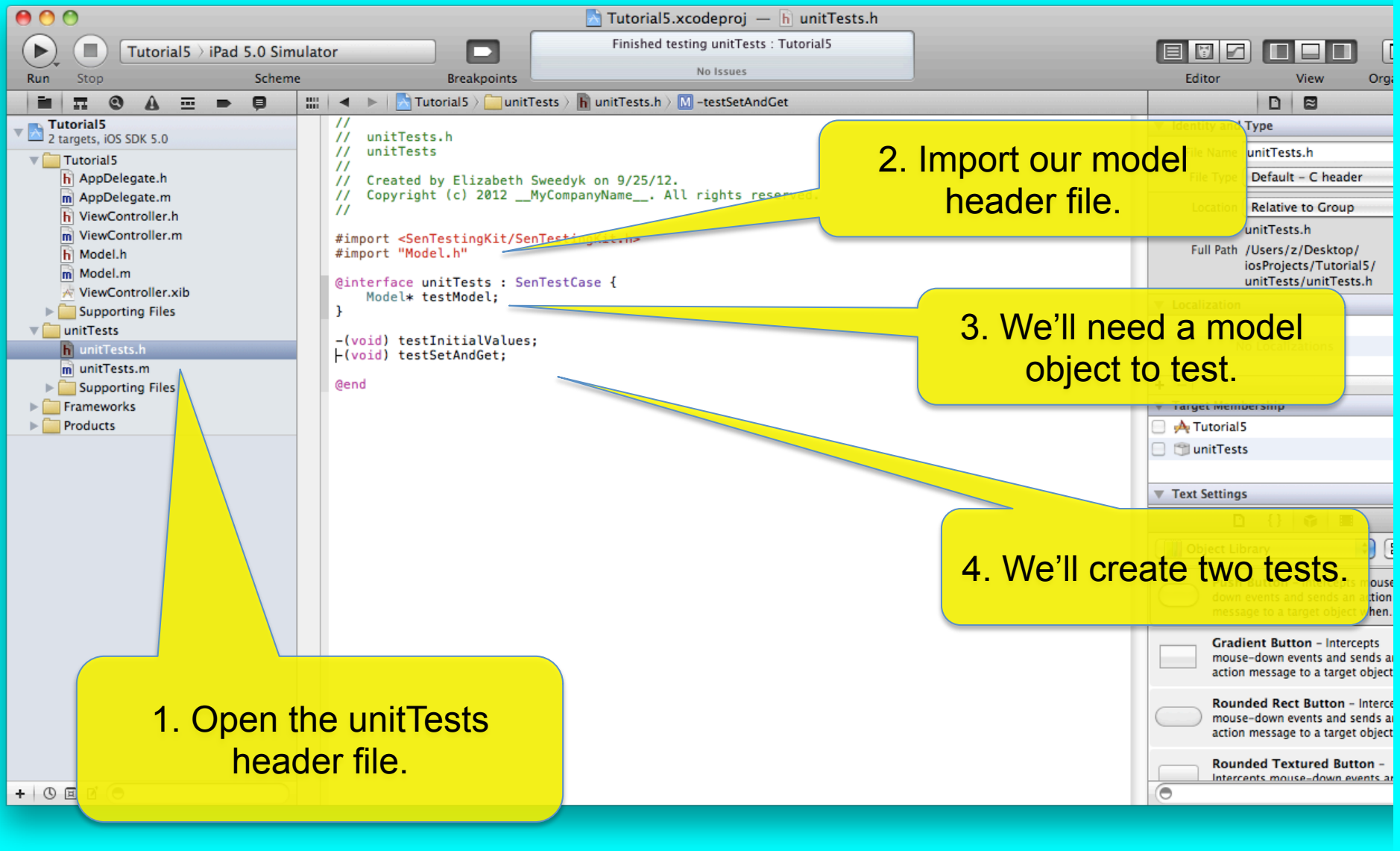


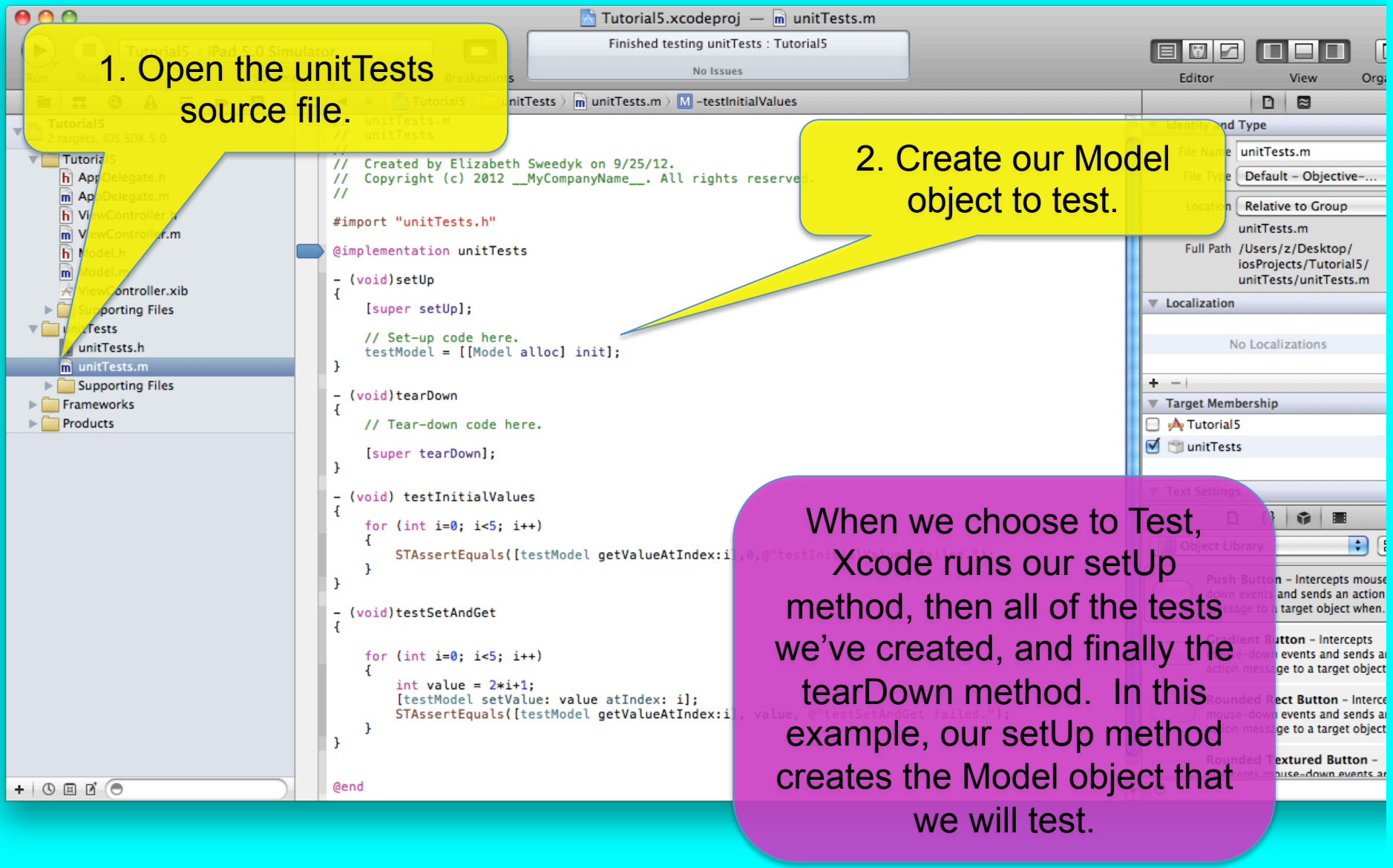
Xcode provided us with template code including a test that fails!

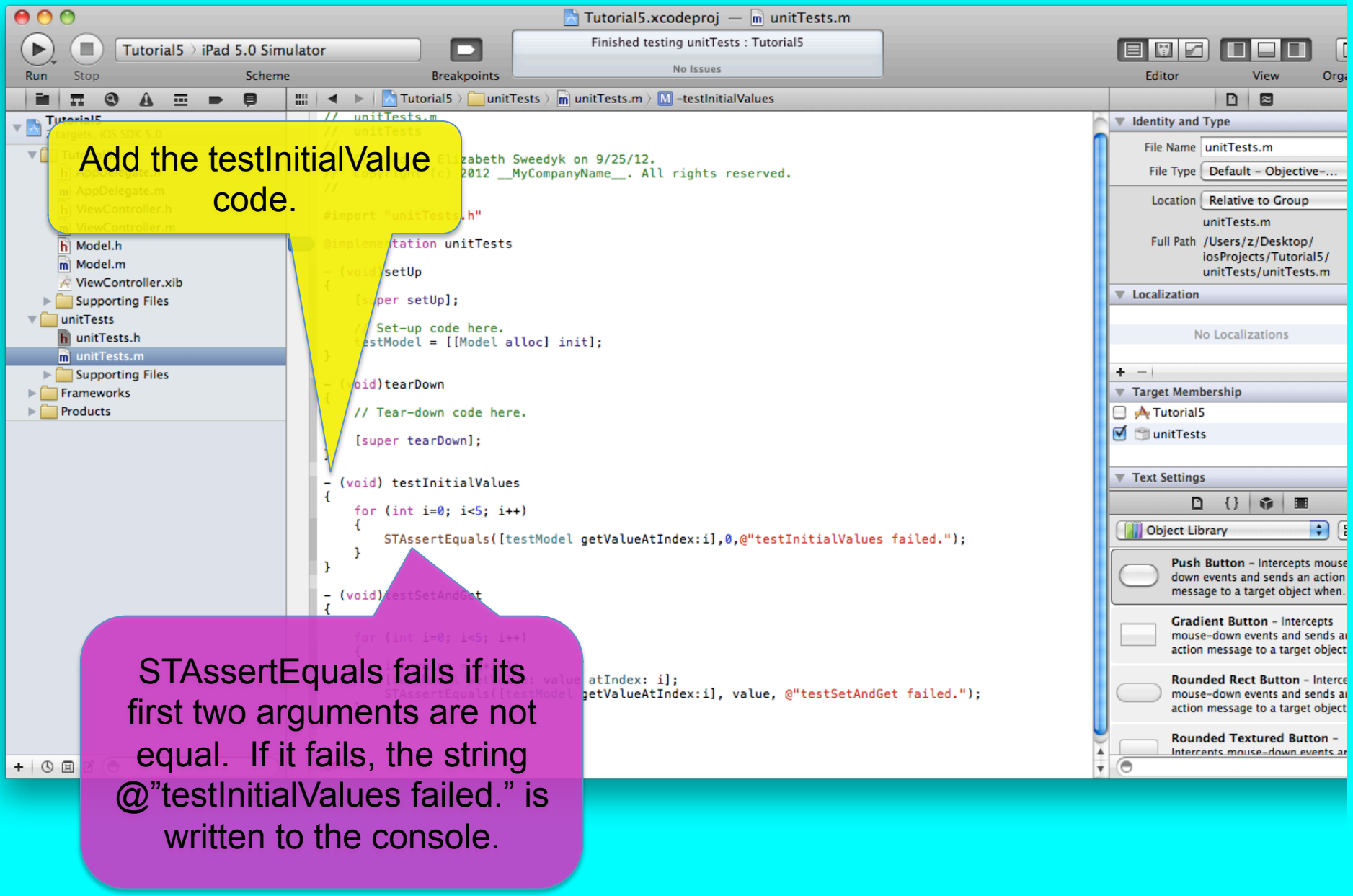
3. Delete this method.

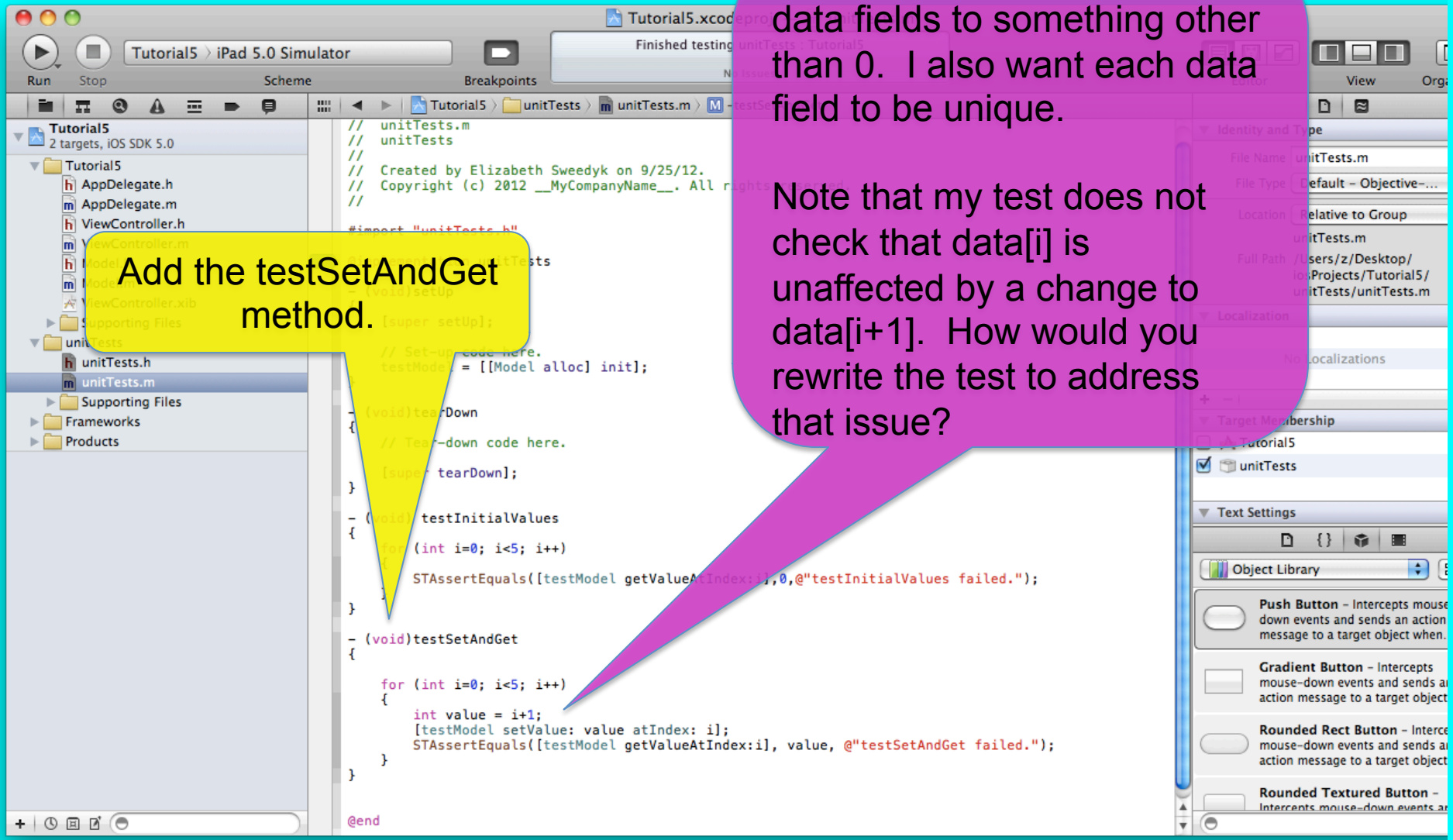
2. Open the unitTests source file.

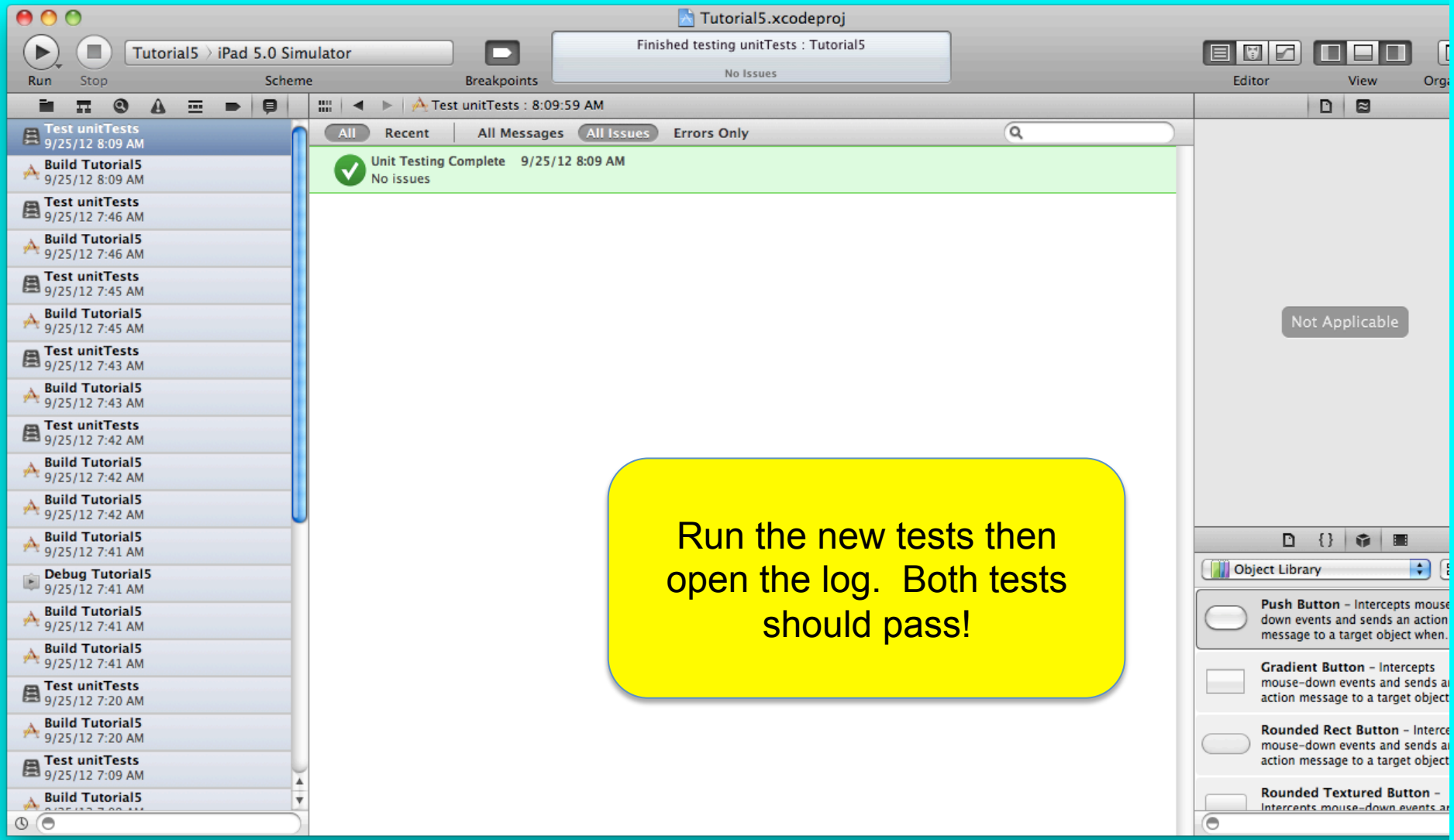
Next we'll write some real tests that should pass.

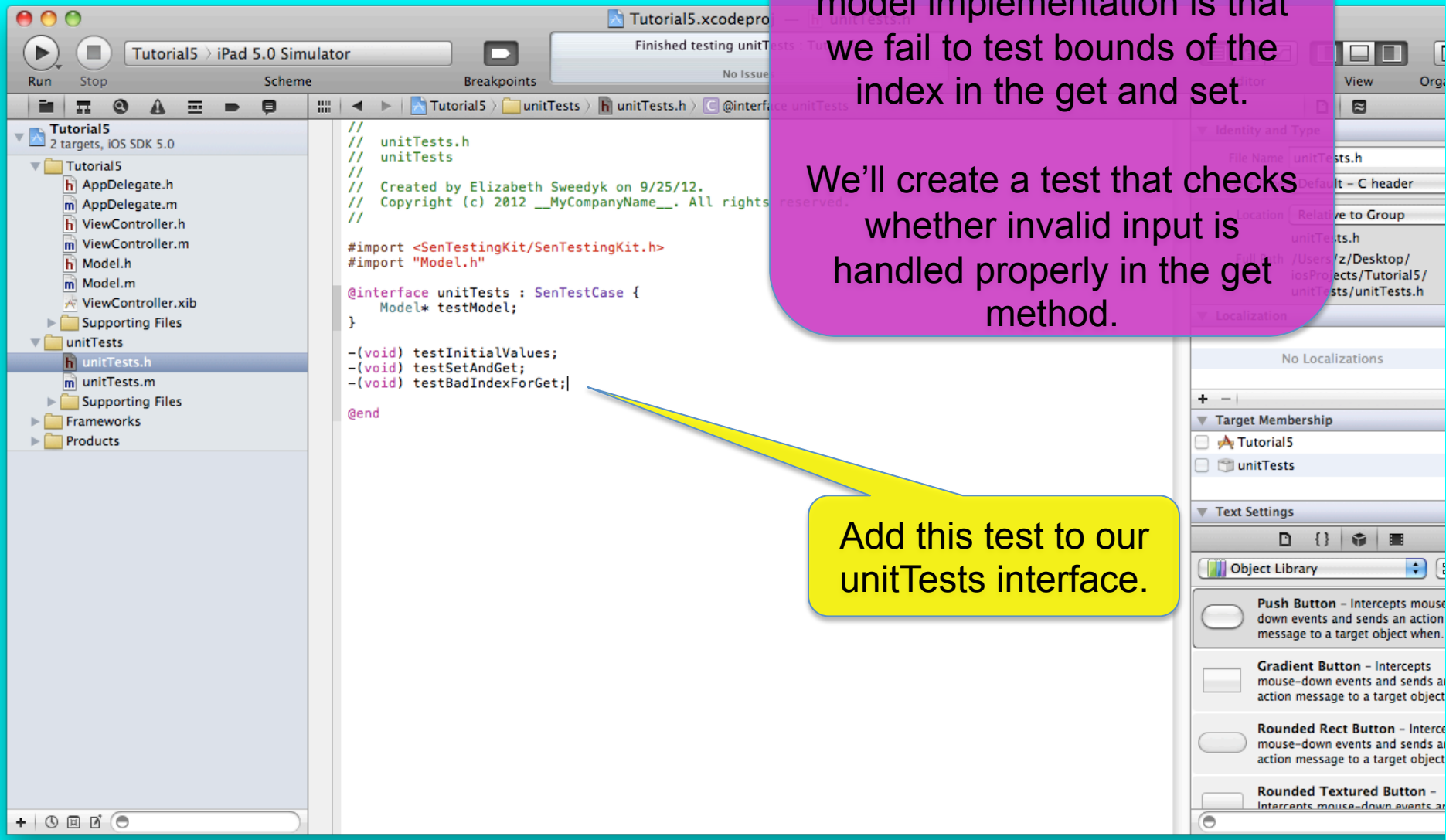

Tutorial5.xcodeproj — unitTests.h
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished testing unitTests : Tutorial5
No Issues
Editor
View
Tutorial5 › unitTests › unitTests.h › -testSetAndGet
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
//
// unitTests.h
// unitTests
//
// Created by Elizabeth Sweedyk on 9/25/12.
// Copyright (c) 2012 __MyCompanyName__. All rights reserved.
//
#import "Model.h"
@interface unitTests : SenTestCase {
Model* testModel;
}
-(void) testInitialValues;
-(void) testSetAndGet;
@end
Type
unitTests.h
Default – C header
Relative to Group
unitTests.h
Full Path /Users/z/Desktop/iosProjects/Tutorial5/unitTests/unitTests.h
Tutorial5
unitTests
Text Settings
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Interce mouse-down events and sends a action message to a target object
Rounded Textured Button –
2. Import our model header file.
3. We'll need a model object to test.
4. We'll create two tests.
1. Open the unitTests header file.

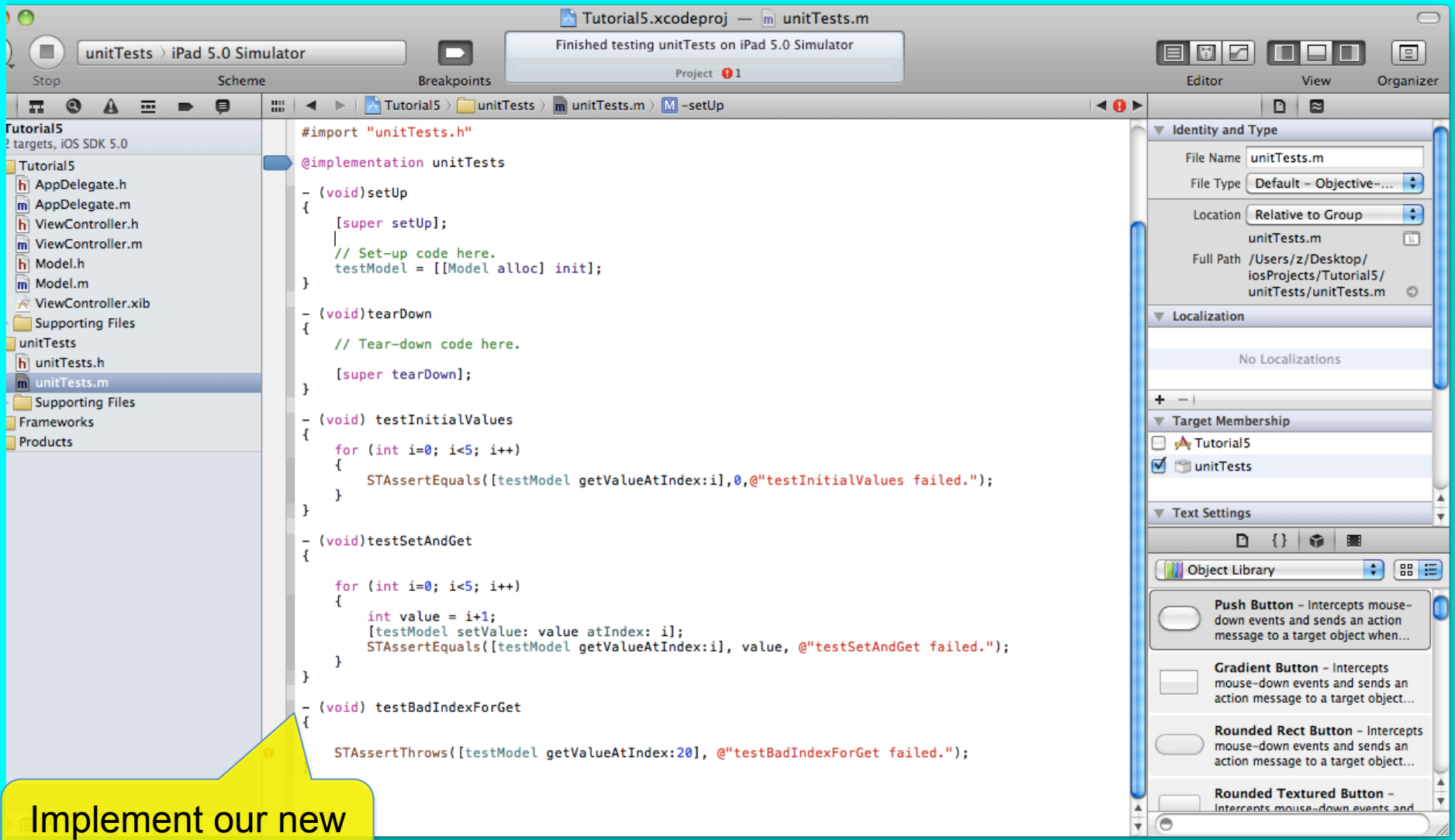

1. Open the unitTests source file.
2. Create our Model object to test.
When we choose to Test, Xcode runs our setUp method, then all of the tests we've created, and finally the tearDown method. In this example, our setUp method creates the Model object that we will test.
Tutorial5.xcodeproj — unitTests.m
Finished testing unitTests : Tutorial5
No Issues
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
// Created by Elizabeth Sweedyk on 9/25/12.
// Copyright (c) 2012 __MyCompanyName__. All rights reserved.
#import "unitTests.h"
@implementation unitTests
- (void)setUp
{
[super setUp];
// Set-up code here.
testModel = [[Model alloc] init];
}
- (void)tearDown
{
// Tear-down code here.
[super tearDown];
}
- (void) testInitialValues
{
for (int i=0; i<5; i++)
{
STAssertEquals([testModel getValueAtIndex:i
}
}
- (void)testSetAndGet
{
for (int i=0; i<5; i++)
{
int value = 2*i+1;
[testModel setValue: value atIndex: i];
STAssertEquals([testModel getValueAtIndex:i
}
}
@end
Editor
View
unitTests.m
Full Path /Users/z/Desktop/iosProjects/Tutorial5/unitTests/unitTests.m
Localization
No Localizations
Target Membership
Tutorial5
unitTests


Tutorial5.xcodeproj — unitTests.m
Tutorial5 › iPad 5.0 Simulator
Finished testing unitTests : Tutorial5
No Issues
Run
Stop
Scheme
Breakpoints
Editor
View
Tutorial5 › unitTests › unitTests.m › -testInitialValues
Add the testInitialValue code.
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
// unitTests.m
// unitTests
// Elizabeth Sweedyk on 9/25/12.
// Copyright (c) 2012 __MyCompanyName__. All rights reserved.
#import "unitTests.h"
@implementation unitTests
- (void)setUp
{
[super setUp];
// Set-up code here.
testModel = [[Model alloc] init];
}
- (void)tearDown
{
// Tear-down code here.
[super tearDown];
}
- (void) testInitialValues
{
for (int i=0; i<5; i++)
{
STAssertEquals([testModel getValueAtIndex:i],0,@"testInitialValues failed.");
}
}
- (void)testSetAndGet
{
for (int i=0; i<5; i++)
{
value atIndex: i];
getValueAtIndex:i], value, @"testSetAndGet failed.");
Identity and Type
File Name unitTests.m
File Type Default - Objective-...
Location Relative to Group
unitTests.m
Full Path /Users/z/Desktop/iosProjects/Tutorial5/unitTests/unitTests.m
Localization
No Localizations
Target Membership
Tutorial5
unitTests
Text Settings
Object Library
Push Button - Intercepts mouse down events and sends an action message to a target object when.
Gradient Button - Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button - Interce mouse-down events and sends a action message to a target object
Rounded Textured Button -
STAssertEquals fails if its first two arguments are not equal. If it fails, the string @"testInitialValues failed." is written to the console.

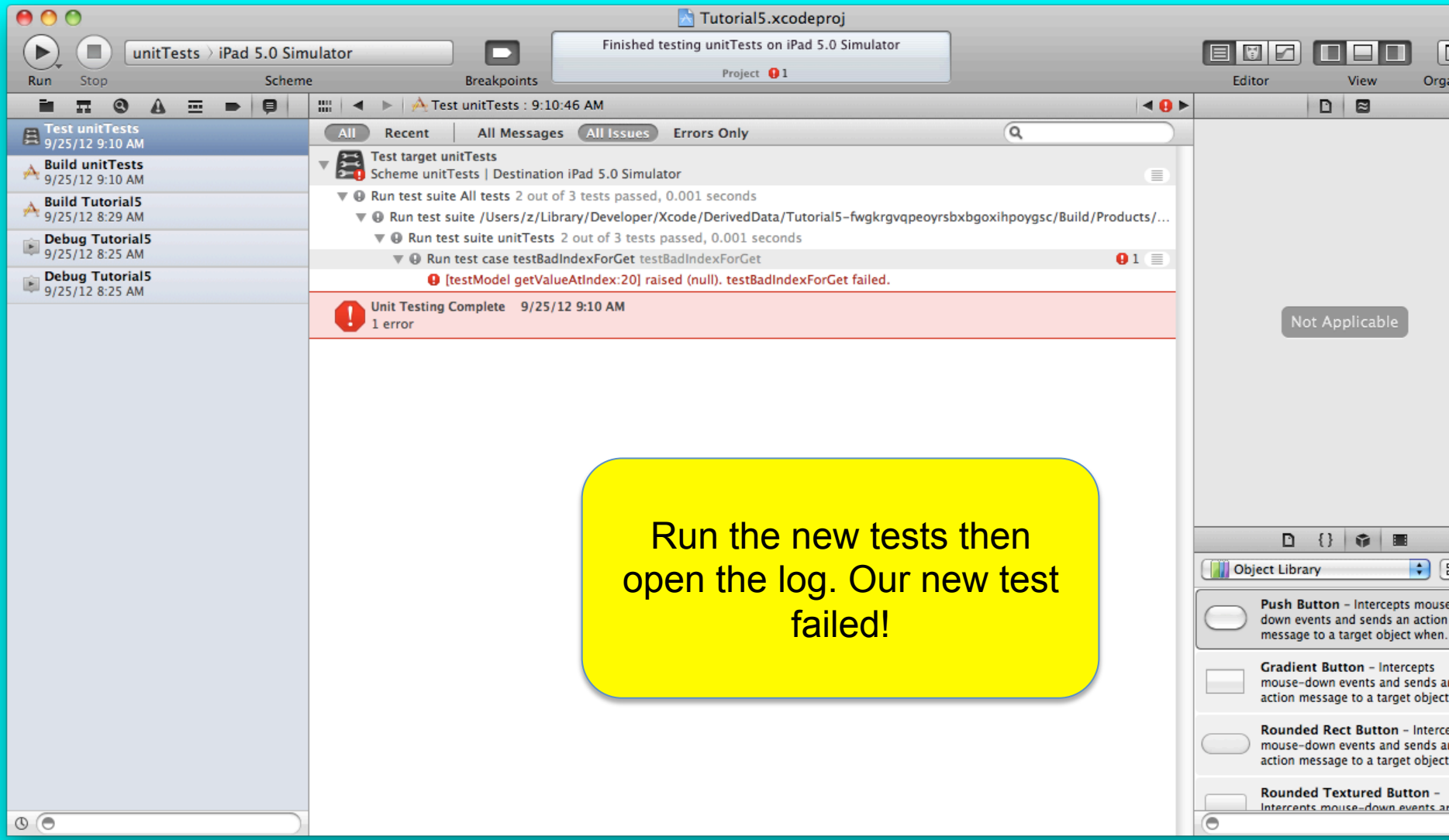

Add the testSetAndGet method.
I want to set the value of the data fields to something other than 0. I also want each data field to be unique.
Note that my test does not check that data[i] is unaffected by a change to data[i+1]. How would you rewrite the test to address that issue?
Tutorial5.xcodeproj
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished testing
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
Tutorial5 › unitTests › unitTests.m
// unitTests.m
// unitTests
//
// Created by Elizabeth Sweedyk on 9/25/12.
// Copyright (c) 2012 __MyCompanyName__. All rights reserved.
//
#import "unitTests.h"
- (void)setUp
{
[super setUp];
// Set-up code here.
testModel = [[Model alloc] init];
}
- (void)tearDown
{
// Tear-down code here.
[super tearDown];
}
- (void)testInitialValues
{
for (int i=0; i<5; i++)
{
STAssertEquals([testModel getValueAtIndex:i],0,@"testInitialValues failed.");
}
}
- (void)testSetAndGet
{
for (int i=0; i<5; i++)
{
int value = i+1;
[testModel setValue: value atIndex: i];
STAssertEquals([testModel getValueAtIndex:i], value, @"testSetAndGet failed.");
}
}
@end
Identity and Type
File Name unitTests.m
File Type Default – Objective-...
Location Relative to Group
unitTests.m
Full Path /Users/z/Desktop/iosProjects/Tutorial5/unitTests/unitTests.m
Localization
No Localizations
Target Membership
Tutorial5
unitTests
Text Settings
Object Library
Push Button – Intercepts mouse down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Textured Button –


Tutorial5.xcodeproj
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished testing unitTests : Tutorial5
No Issues
Editor
View
Test unitTests : 8:09:59 AM
All
Recent
All Messages
All Issues
Errors Only
Unit Testing Complete 9/25/12 8:09 AM
No issues
Test unitTests 9/25/12 8:09 AM
Build Tutorial5 9/25/12 8:09 AM
Test unitTests 9/25/12 7:46 AM
Build Tutorial5 9/25/12 7:46 AM
Test unitTests 9/25/12 7:45 AM
Build Tutorial5 9/25/12 7:45 AM
Test unitTests 9/25/12 7:43 AM
Build Tutorial5 9/25/12 7:43 AM
Test unitTests 9/25/12 7:42 AM
Build Tutorial5 9/25/12 7:42 AM
Build Tutorial5 9/25/12 7:42 AM
Build Tutorial5 9/25/12 7:41 AM
Debug Tutorial5 9/25/12 7:41 AM
Build Tutorial5 9/25/12 7:41 AM
Build Tutorial5 9/25/12 7:41 AM
Test unitTests 9/25/12 7:20 AM
Build Tutorial5 9/25/12 7:20 AM
Test unitTests 9/25/12 7:09 AM
Build Tutorial5
Run the new tests then open the log. Both tests should pass!
Not Applicable
Object Library
Push Button – Intercepts mouse down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Interce mouse-down events and sends a action message to a target object
Rounded Textured Button –

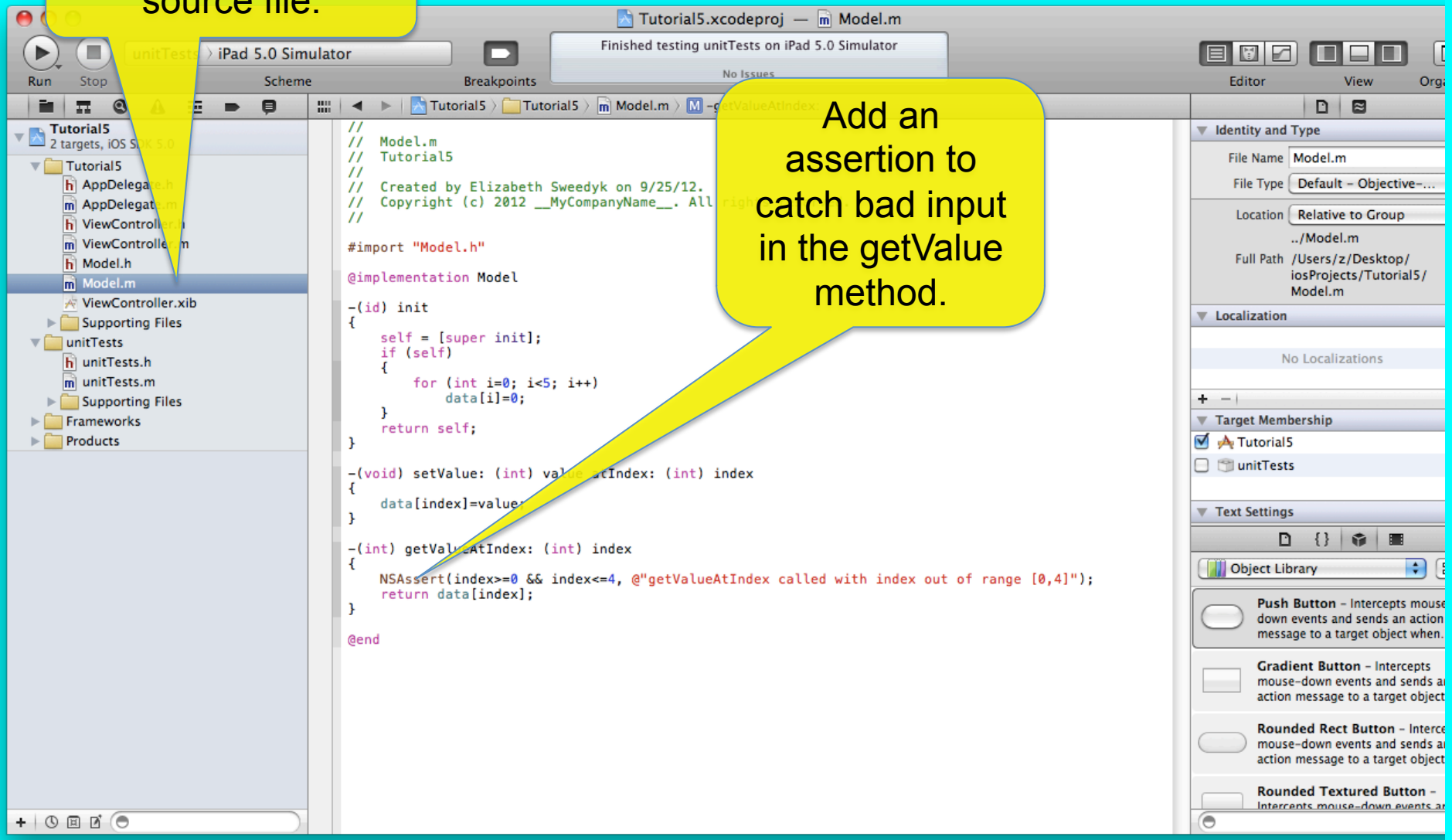

One shortcoming of our model implementation is that we fail to test bounds of the index in the get and set.
We'll create a test that checks whether invalid input is handled properly in the get method.
Add this test to our unitTests interface.
Tutorial5.xcodepro
Run
Stop
Tutorial5 › iPad 5.0 Simulator
Scheme
Breakpoints
Finished testing unitT
No Issue
View
Tutorial5
2 targets, iOS SDK 5.0
Tutorial5
AppDelegate.h
AppDelegate.m
ViewController.h
ViewController.m
Model.h
Model.m
ViewController.xib
Supporting Files
unitTests
unitTests.h
unitTests.m
Supporting Files
Frameworks
Products
Tutorial5 › unitTests › unitTests.h
//
// unitTests.h
// unitTests
//
// Created by Elizabeth Sweedyk on 9/25/12.
// Copyright (c) 2012 __MyCompanyName__. All rights reserved.
//
#import <SenTestingKit/SenTestingKit.h>
#import "Model.h"
@interface unitTests : SenTestCase {
Model* testModel;
}
-(void) testInitialValues;
-(void) testSetAndGet;
-(void) testBadIndexForGet;
@end
Identity and Type
File Name unitTests.h
Default – C header
Location Relative to Group
unitTests.h
/Users/z/Desktop/iosProjects/Tutorial5/unitTests/unitTests.h
Localization
No Localizations
Target Membership
Tutorial5
unitTests
Text Settings
Object Library
Push Button – Intercepts mouse down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Interce mouse-down events and sends a action message to a target object
Rounded Textured Button –



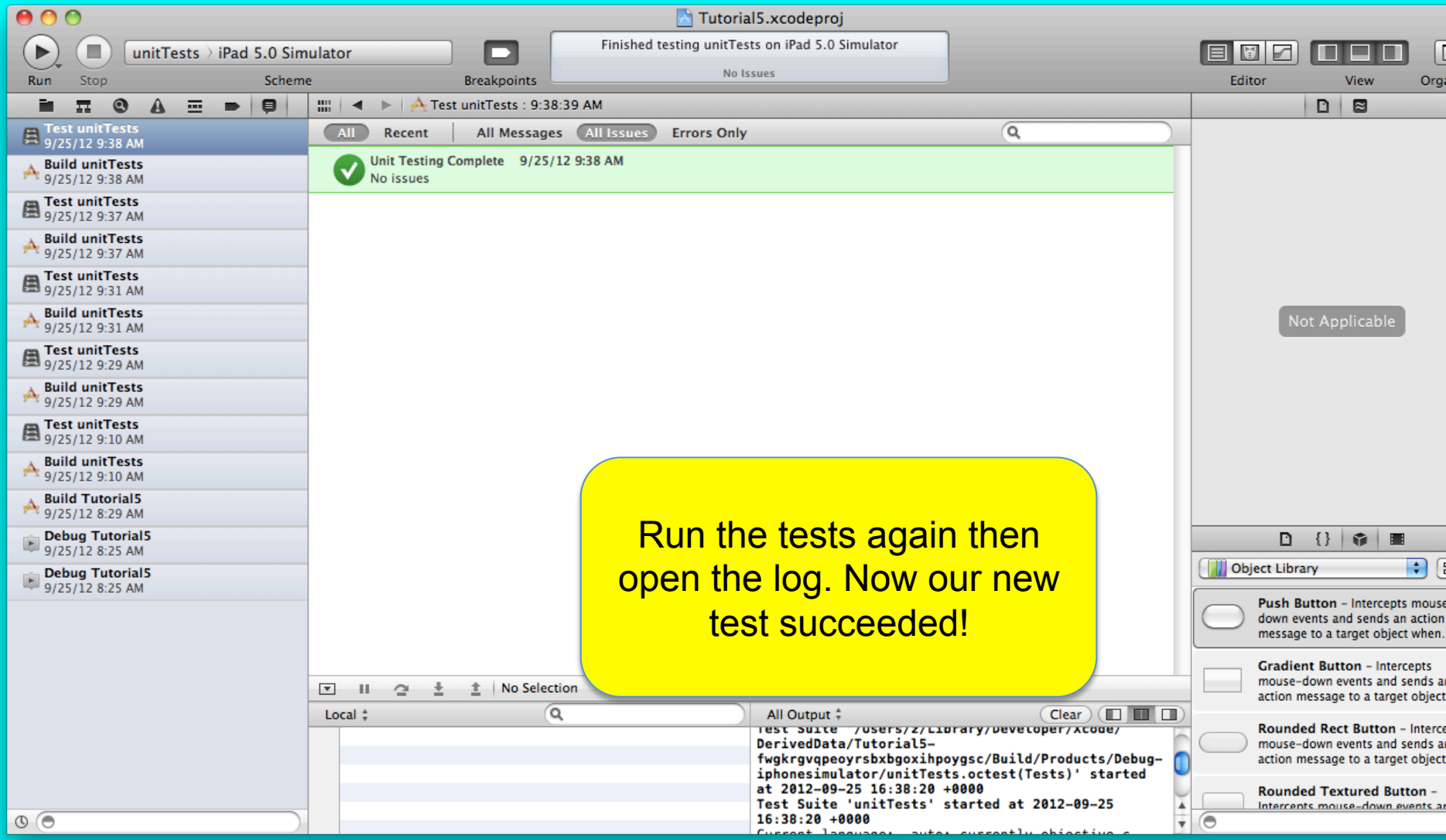
Implement our new test.


Tutorial5.xcodeproj
Run
Stop
unitTests › iPad 5.0 Simulator
Scheme
Breakpoints
Finished testing unitTests on iPad 5.0 Simulator
Project 1
Editor
View
Test unitTests : 9:10:46 AM
Test unitTests 9/25/12 9:10 AM
Build unitTests 9/25/12 9:10 AM
Build Tutorial5 9/25/12 8:29 AM
Debug Tutorial5 9/25/12 8:25 AM
Debug Tutorial5 9/25/12 8:25 AM
All
Recent
All Messages
All Issues
Errors Only
Test target unitTests
Scheme unitTests | Destination iPad 5.0 Simulator
Run test suite All tests 2 out of 3 tests passed, 0.001 seconds
Run test suite /Users/z/Library/Developer/Xcode/DerivedData/Tutorial5-fwgkrgvqpeoyrsbxbgoxihpoygsc/Build/Products/...
Run test suite unitTests 2 out of 3 tests passed, 0.001 seconds
Run test case testBadIndexForGet testBadIndexForGet
1
[testModel getValueAtIndex:20] raised (null). testBadIndexForGet failed.
Unit Testing Complete 9/25/12 9:10 AM
1 error
Not Applicable
Object Library
Push Button – Intercepts mouse
down events and sends an action
message to a target object when.
Gradient Button – Intercepts
mouse-down events and sends a
action message to a target object
Rounded Rect Button – Interce
mouse-down events and sends a
action message to a target object
Rounded Textured Button –
Run the new tests then open the log. Our new test failed!

1. Open our Model source file.



Add an assertion to catch bad input in the getValue method.


Tutorial5.xcodeproj
Run
Stop
unitTests › iPad 5.0 Simulator
Scheme
Breakpoints
Finished testing unitTests on iPad 5.0 Simulator
No Issues
Editor
View
Test unitTests : 9:38:39 AM
All
Recent
All Messages
All Issues
Errors Only
Unit Testing Complete 9/25/12 9:38 AM
No issues
Test unitTests 9/25/12 9:38 AM
Build unitTests 9/25/12 9:38 AM
Test unitTests 9/25/12 9:37 AM
Build unitTests 9/25/12 9:37 AM
Test unitTests 9/25/12 9:31 AM
Build unitTests 9/25/12 9:31 AM
Test unitTests 9/25/12 9:29 AM
Build unitTests 9/25/12 9:29 AM
Test unitTests 9/25/12 9:10 AM
Build unitTests 9/25/12 9:10 AM
Build Tutorial5 9/25/12 8:29 AM
Debug Tutorial5 9/25/12 8:25 AM
Debug Tutorial5 9/25/12 8:25 AM
Not Applicable
Run the tests again then open the log. Now our new test succeeded!
No Selection
Local
All Output
Clear
DerivedData/Tutorial5-fwgkrgvqpeoyrsbxbgoxihpoygsc/Build/Products/Debug-iphonesimulator/unitTests.octest(Tests)' started at 2012-09-25 16:38:20 +0000
Test Suite 'unitTests' started at 2012-09-25 16:38:20 +0000
Object Library
Push Button – Intercepts mouse down events and sends an action message to a target object when.
Gradient Button – Intercepts mouse-down events and sends a action message to a target object
Rounded Rect Button – Interce mouse-down events and sends a action message to a target object
Rounded Textured Button –

Update the tests as follows:

1. setUp should fail if testModel is not allocated (i.e. it gets a nil pointer). Check out the link below for STAssert options that will be useful.
2. Add another test to check that the setValue method
   a. Checks that the index is valid
   b. Checks that the value is non-negative
3. Fix our Model implementation as needed so that all tests pass.

Appendix B at the following link gives the STAssert macros that are available.

https://developer.apple.com/library/ios/#documentation/DeveloperTools/Conceptual/UnitTesting/00-About_Unit_Testing/about.html