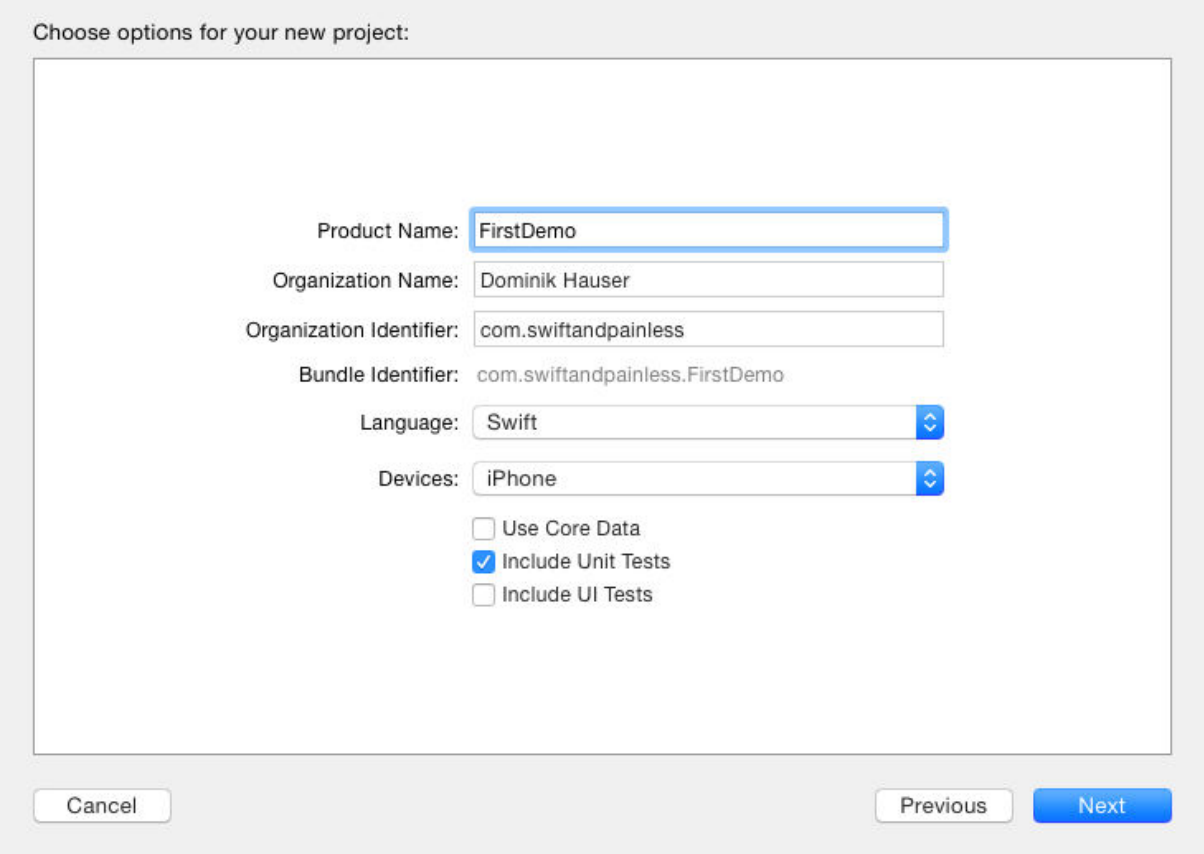
Chapter 1: Your First Unit Tests



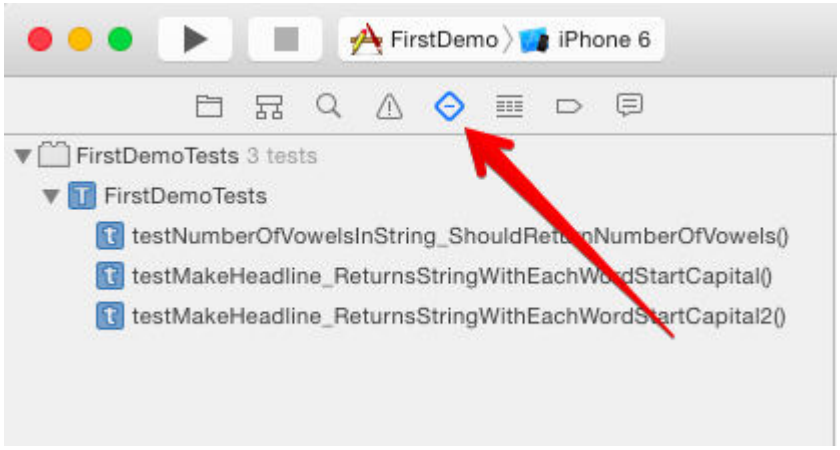

```
23
24      func testNumberOfVowelsInString_ShouldReturnNumberOfVowels() {
25          let viewController = ViewController()
26
27          let string = "Dominik"
28
29          let numberOfVowels = viewController.numberOfVowelsInString(string)
30
31          XCTAssertEqual(numberOfVowels, 3, "should find 3 vowels in Dominik")
32      }
33
34
35  }
36
```

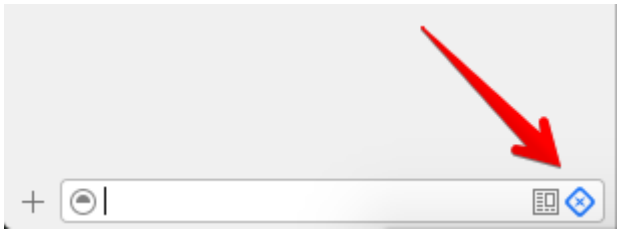
```
23
24      func testNumberOfVowelsInString_ShouldReturnNumberOfVowels() {
25          let viewController = ViewController()
26
27          let string = "Dominik"
28
29          let numberOfVowels = viewController.numberOfVowelsInString(string)
30
31          XCTAssertEqual(numberOfVowels, 4, "should find 4 vowels in Dominik")
32      }
33
34
35  }
36
```

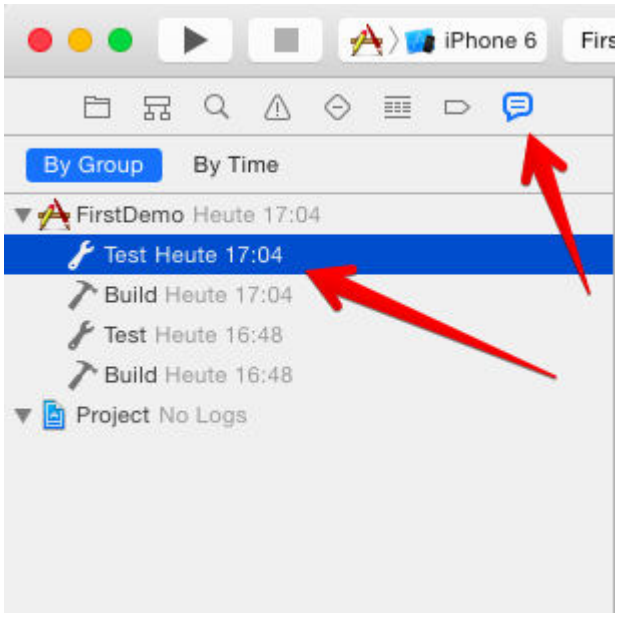
XCTAssertEqual failed: ("Optional(3)") is not equal to ("Optional(4)") - should find 4 vowels in Dominik

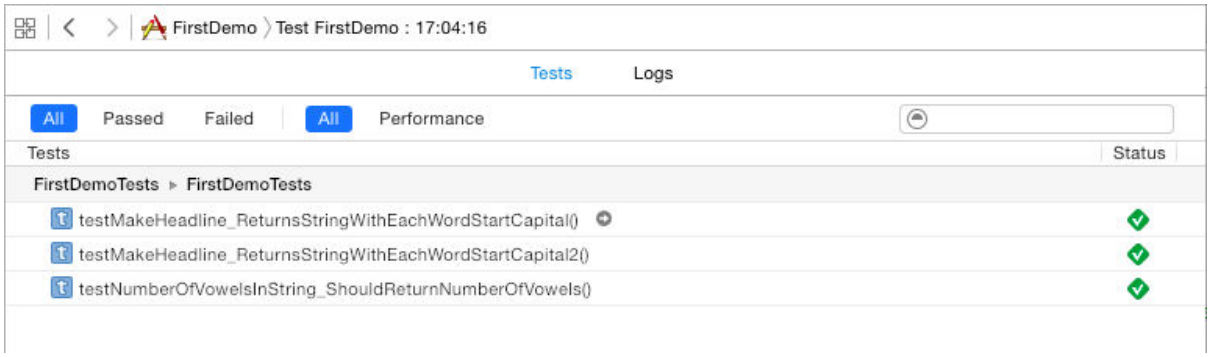
```
Test Suite 'FirstDemoTests' started at 2015-08-27 20:54:19.225
Test Case '-[FirstDemoTests.FirstDemoTests
testNumberOfVowelsInString_ShouldReturnNumberOfVowels]' started.
/Users/dom/Documents/development/book/FirstDemo/FirstDemoTests/FirstDemoTests.swift:
31: error: -[FirstDemoTests.FirstDemoTests
testNumberOfVowelsInString_ShouldReturnNumberOfVowels] : XCTAssertEqual failed:
("Optional(3)") is not equal to ("Optional(4)") - should find 4 vowels in Dominik
Test Case '-[FirstDemoTests.FirstDemoTests
testNumberOfVowelsInString_ShouldReturnNumberOfVowels]' failed (0.027 seconds).
Test Suite 'FirstDemoTests' failed at 2015-08-27 20:54:19.252.
     Executed 1 test, with 1 failure (0 unexpected) in 0.027 (0.027) seconds
Test Suite 'FirstDemoTests.xctest' failed at 2015-08-27 20:54:19.253.
     Executed 1 test, with 1 failure (0 unexpected) in 0.027 (0.028) seconds
Test Suite 'All tests' failed at 2015-08-27 20:54:19.253.
```

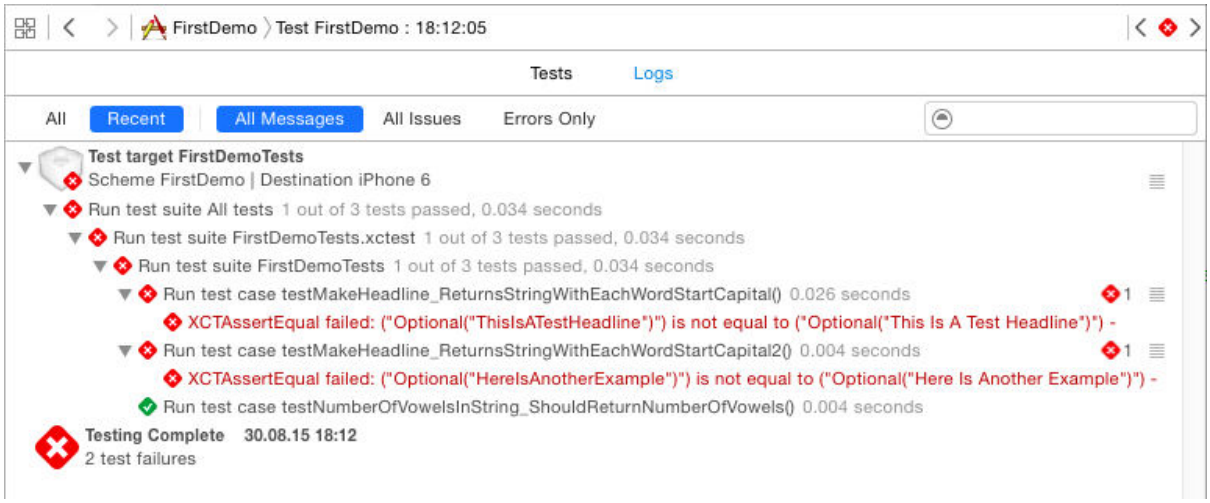
All Output



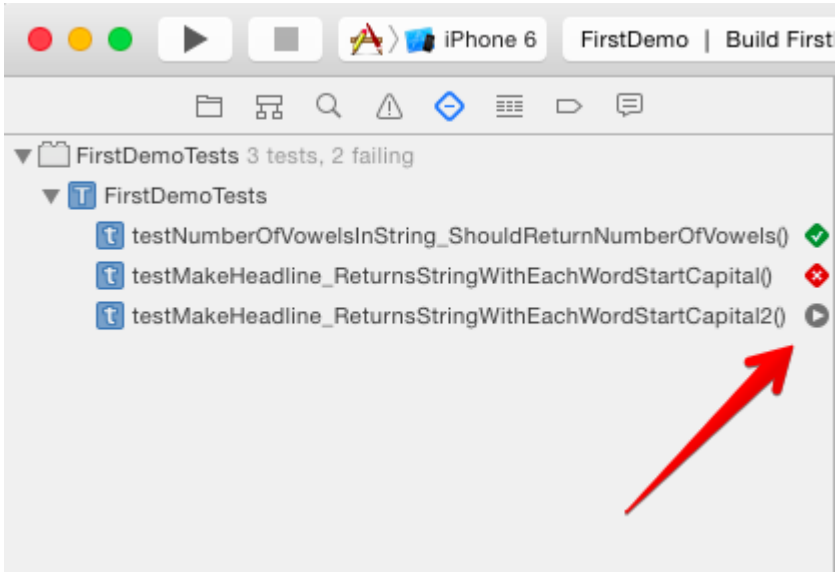


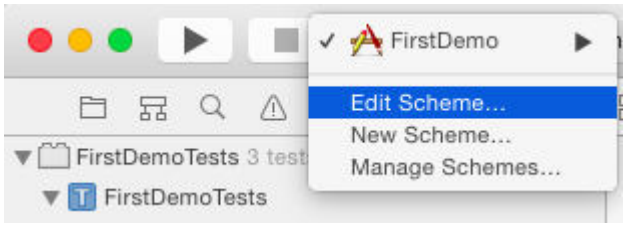

iPhone 6
By Group
By Time
FirstDemo Heute 17:04
Test Heute 17:04
Build Heute 17:04
Test Heute 16:48
Build Heute 16:48
Project No Logs

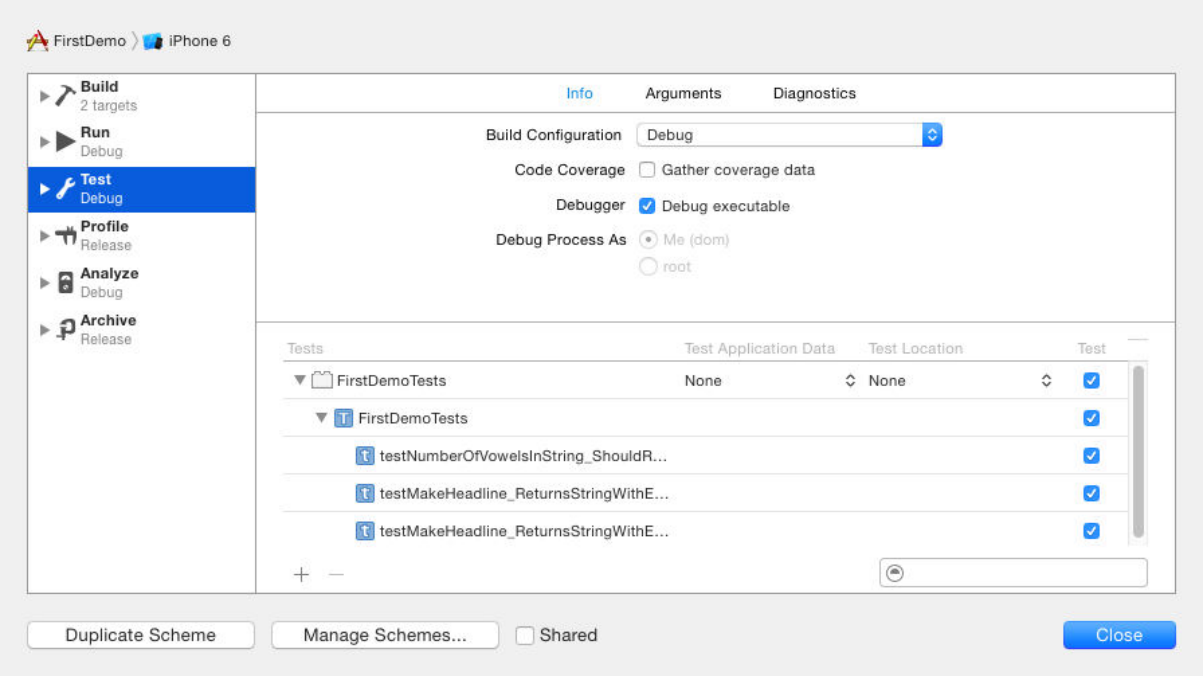

FirstDemo 〉Test FirstDemo : 17:04:16
Tests
Logs
All
Passed
Failed
All
Performance
Tests
Status
FirstDemoTests ▸ FirstDemoTests
testMakeHeadline_ReturnsStringWithEachWordStartCapital()
testMakeHeadline_ReturnsStringWithEachWordStartCapital2()
testNumberOfVowelsInString_ShouldReturnNumberOfVowels()


FirstDemo 〉Test FirstDemo : 18:12:05
Tests
Logs
All
Recent
All Messages
All Issues
Errors Only
Test target FirstDemoTests
Scheme FirstDemo | Destination iPhone 6
Run test suite All tests 1 out of 3 tests passed, 0.034 seconds
Run test suite FirstDemoTests.xctest 1 out of 3 tests passed, 0.034 seconds
Run test suite FirstDemoTests 1 out of 3 tests passed, 0.034 seconds
Run test case testMakeHeadline_ReturnsStringWithEachWordStartCapital() 0.026 seconds
XCTAssertEqual failed: ("Optional("ThisIsATestHeadline")") is not equal to ("Optional("This Is A Test Headline")") -
Run test case testMakeHeadline_ReturnsStringWithEachWordStartCapital2() 0.004 seconds
XCTAssertEqual failed: ("Optional("HereIsAnotherExample")") is not equal to ("Optional("Here Is Another Example")") -
Run test case testNumberOfVowelsInString_ShouldReturnNumberOfVowels() 0.004 seconds
Testing Complete 30.08.15 18:12
2 test failures

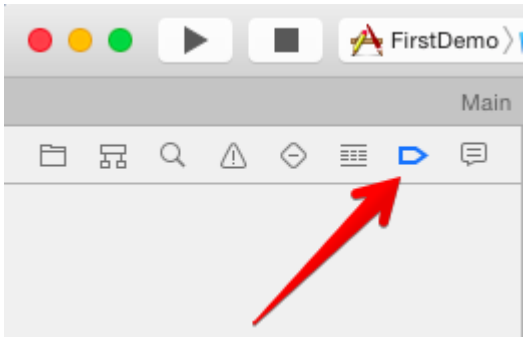
```
34
35      func testMakeHeadline_ReturnsStringWithEachWordStartCapital() {
            let inputString =       "this is A test headline"
            let expectedHeadline =  "This Is A Test Headline"
38
39          let result = viewController.makeHeadline(inputString)
40          XCTAssertEqual(result, expectedHeadline)
41      }
42
43      func testMakeHeadline_ReturnsStringWithEachWordStartCapital2() {
44          let inputString =       "Here is another Example"
45          let expectedHeadline =  "Here Is Another Example"
46
47          let result = viewController.makeHeadline(inputString)
48          XCTAssertEqual(result, expectedHeadline)
49      }
50
```

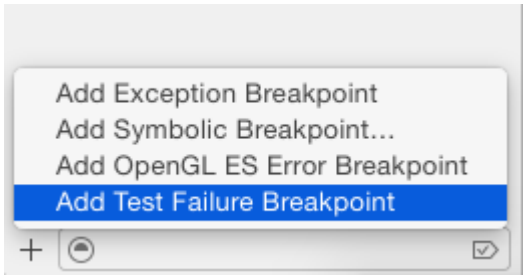




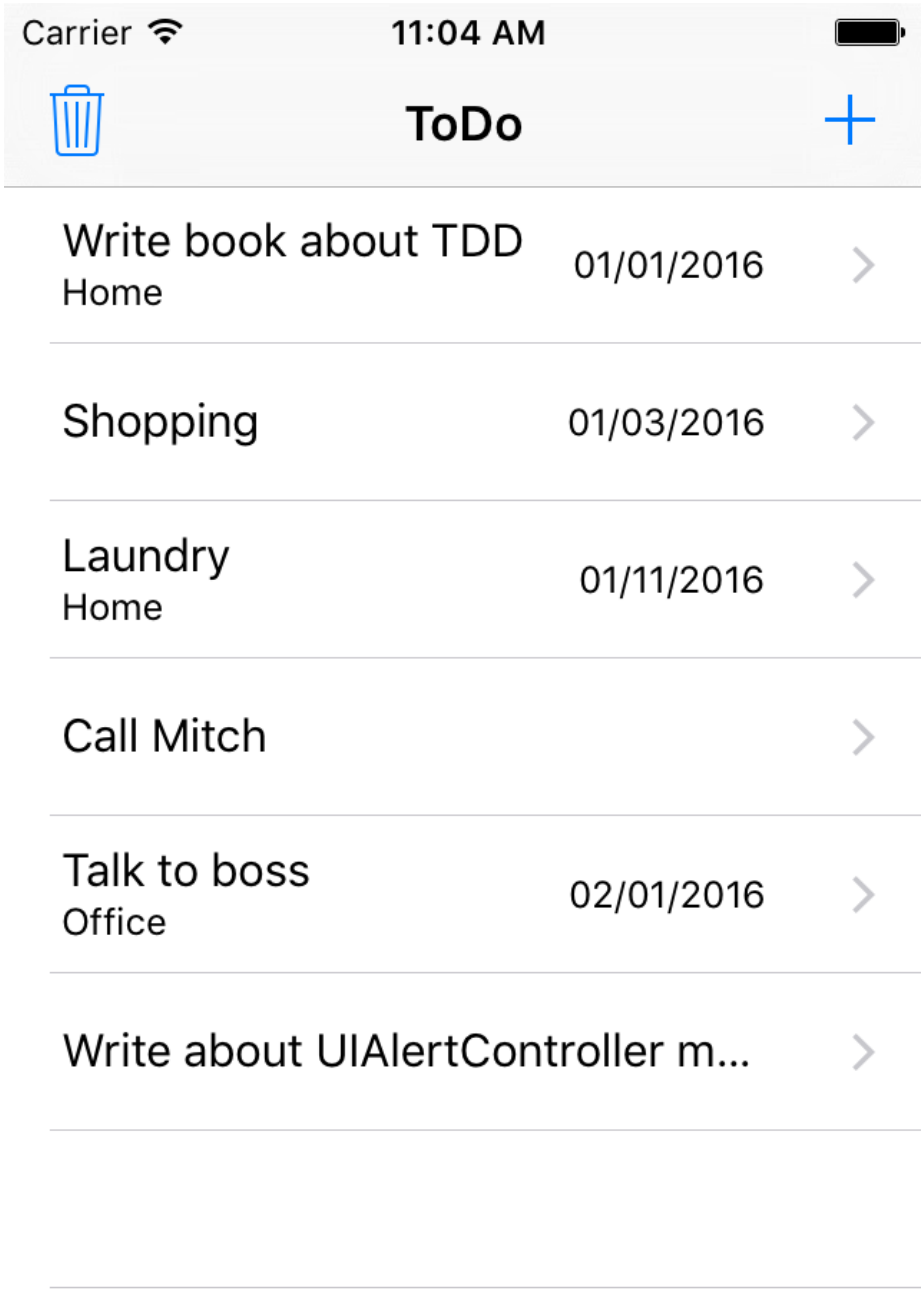


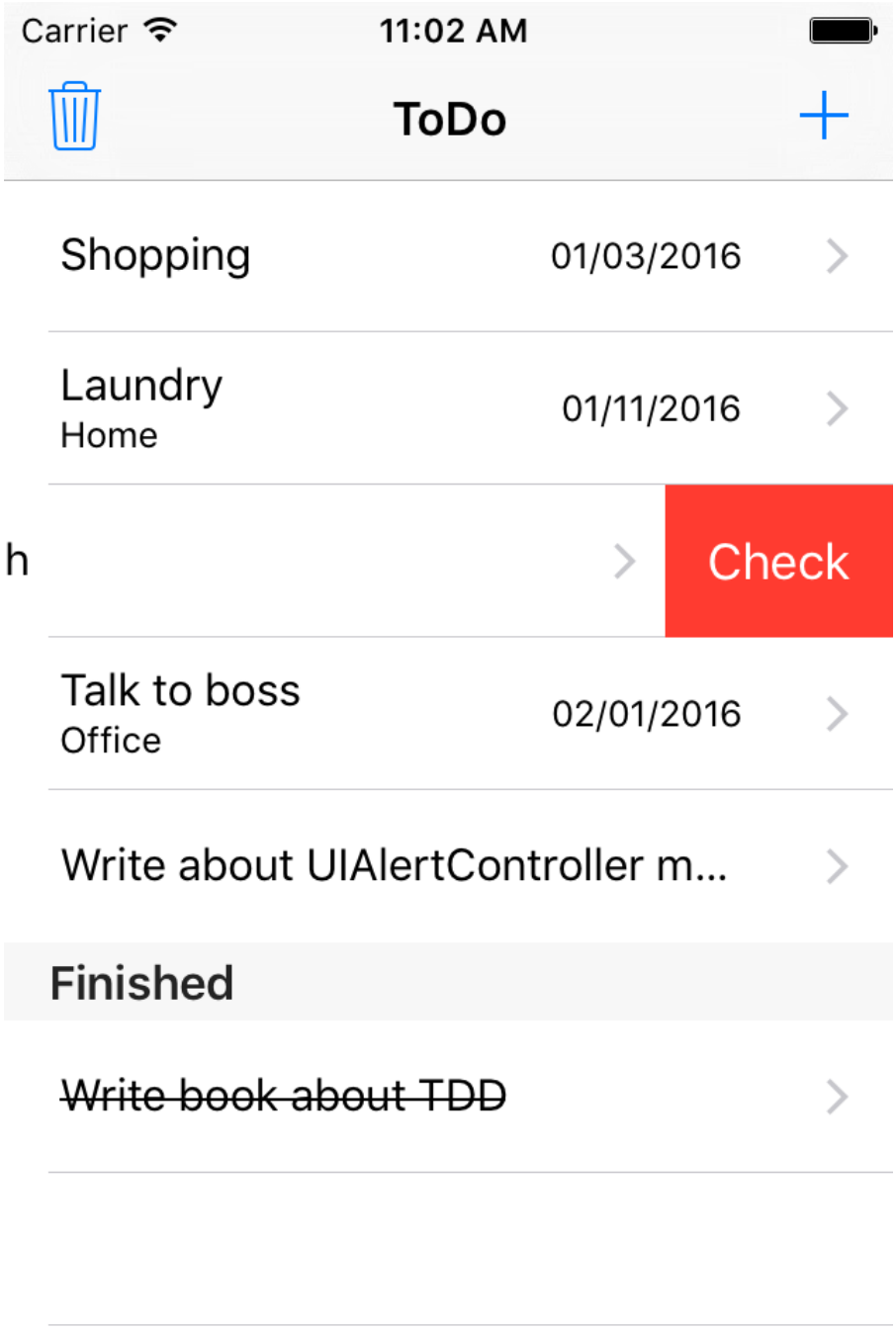

```
42
43      func testMakeHeadline_ReturnsStringWithEachWordStartCapital2() {
44          let inputString =       "Here is another Example"
45          let expectedHeadline =  "Here iS Another Example"
46
47          let result = viewController.makeHeadline(inputString)
48          XCTAssertEqual(result, expectedHeadline)
49      }  XCTAssertEqual failed: ("Optional("Here Is Another Example")") is not equal to ("Optional("Here iS Another Example")") -
50
```





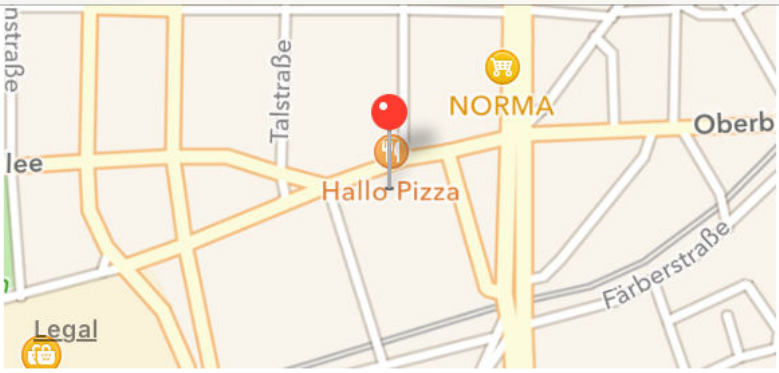
Chapter 2: Planning and Structuring Your Test-Driven iOS App




Carrier
11:02 AM
ToDo
Shopping
01/03/2016
Laundry
Home
01/11/2016
h
Check
Talk to boss
Office
02/01/2016
Write about UIAlertController m...
Finished
Write book about TDD

Carrier 1:43 PM

ToDo



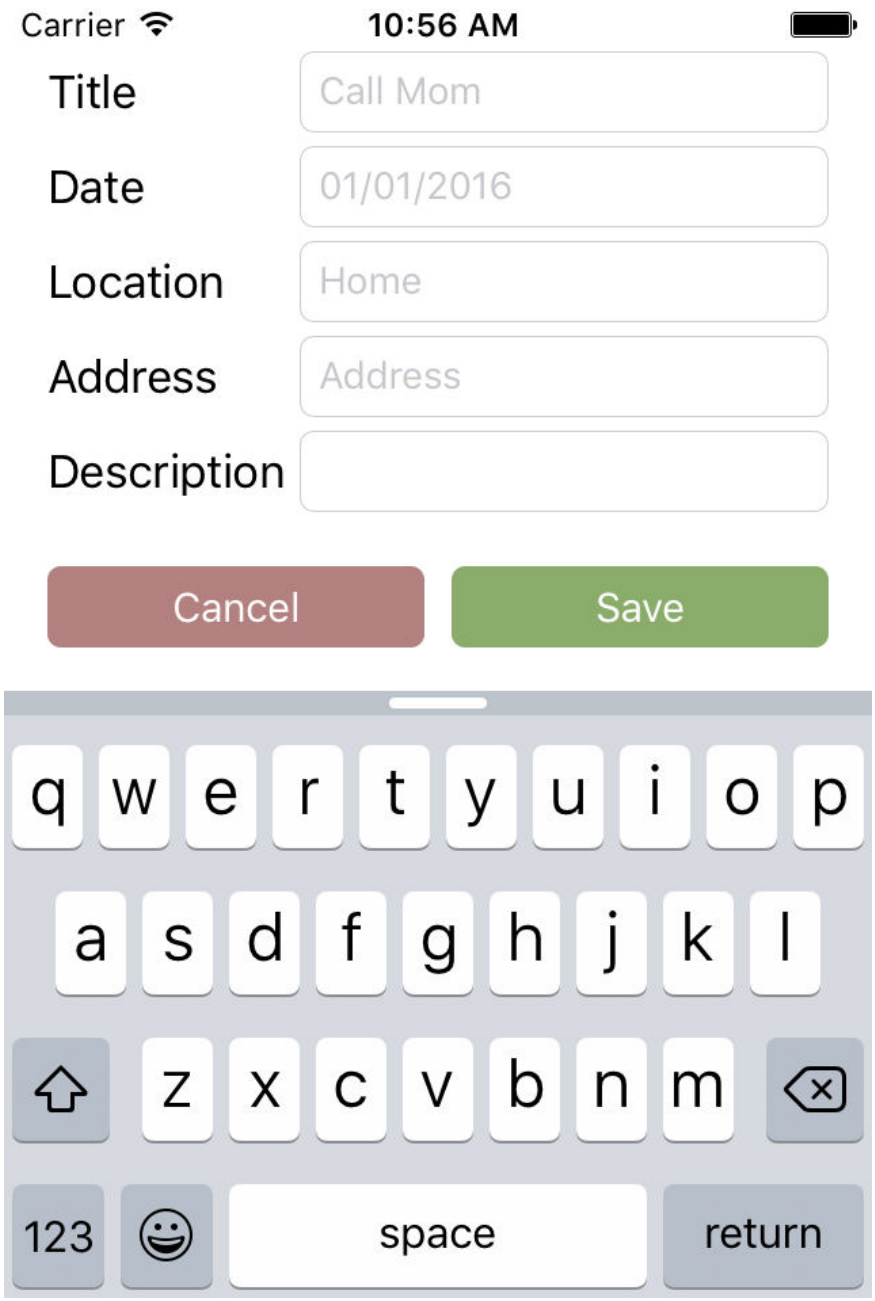
Talk to boss

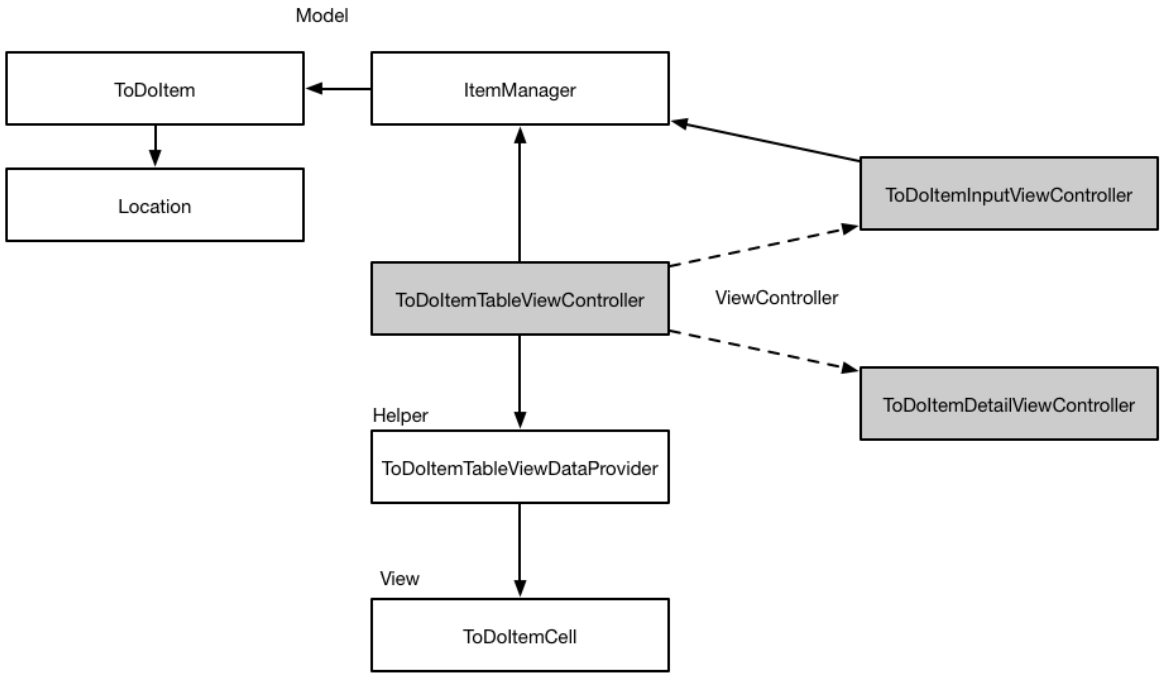
02/01/2016

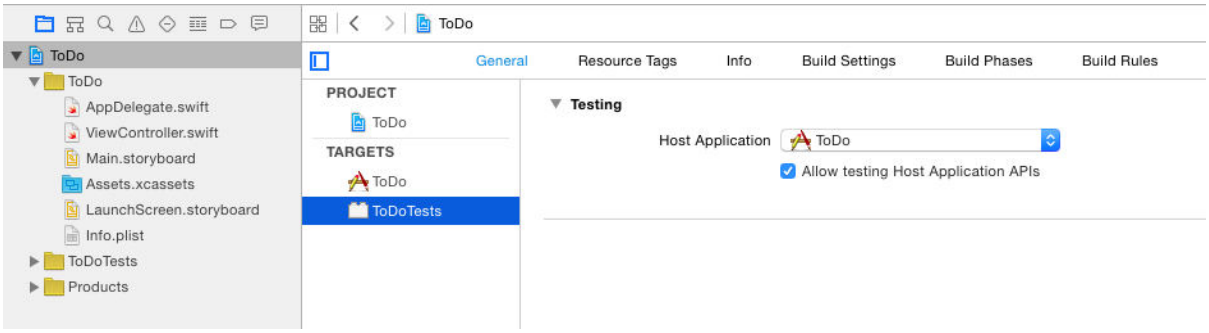
Office

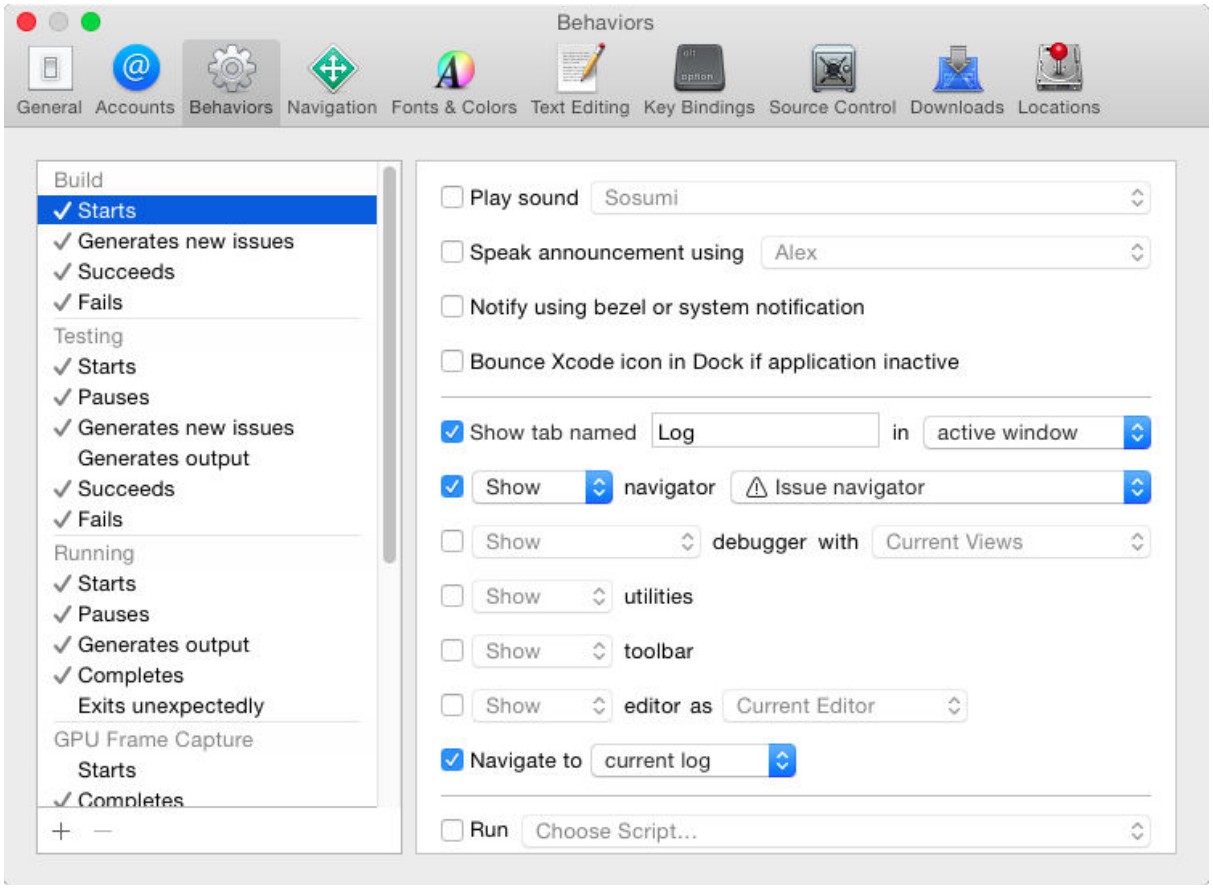
Talk about: The last project. What went wrong. What was good. How to avoid missing deadlines in the future. (Bring cookies.)

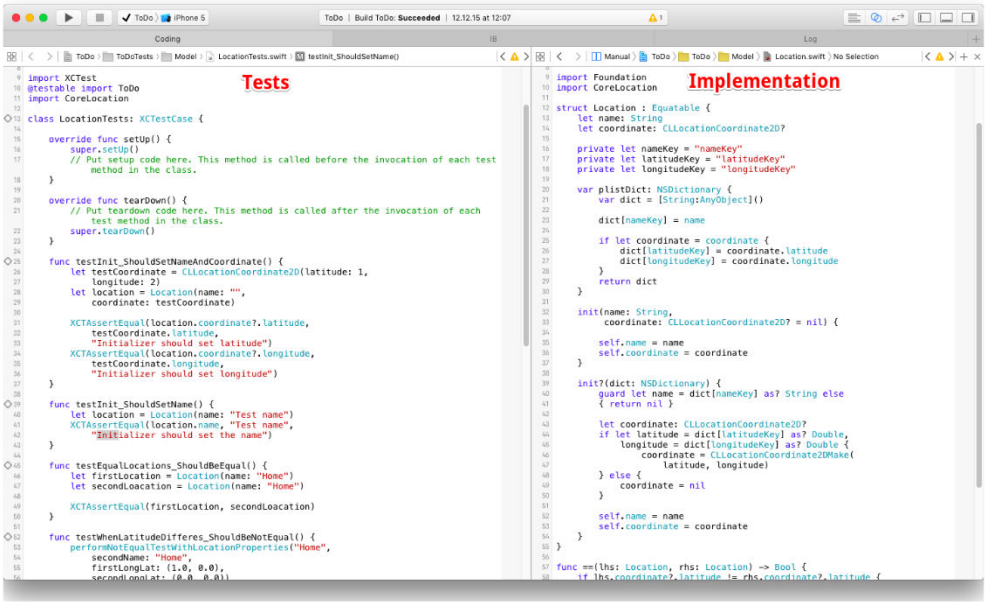
Check


Carrier
10:56 AM
Title
Call Mom
Date
01/01/2016
Location
Home
Address
Address
Description
Cancel
Save
q w e r t y u i o p
a s d f g h j k l
z x c v b n m
123
space
return


Model
ToDoItem
ItemManager
Location
ToDoItemInputViewController
ToDoItemTableViewController
ViewController
ToDoItemDetailViewController
Helper
ToDoItemTableViewDataProvider
View
ToDoItemCell


ToDo
ToDo
AppDelegate.swift
ViewController.swift
Main.storyboard
Assets.xcassets
LaunchScreen.storyboard
Info.plist
ToDoTests
Products
ToDo
General
Resource Tags
Info
Build Settings
Build Phases
Build Rules
PROJECT
ToDo
TARGETS
ToDo
ToDoTests
Testing
Host Application
ToDo
Allow testing Host Application APIs


Behaviors
General
Accounts
Behaviors
Navigation
Fonts & Colors
Text Editing
Key Bindings
Source Control
Downloads
Locations
Build
Starts
Generates new issues
Succeeds
Fails
Testing
Starts
Pauses
Generates new issues
Generates output
Succeeds
Fails
Running
Starts
Pauses
Generates output
Completes
Exits unexpectedly
GPU Frame Capture
Starts
Completes
Play sound
Sosumi
Speak announcement using
Alex
Notify using bezel or system notification
Bounce Xcode icon in Dock if application inactive
Show tab named
Log
in
active window
Show
navigator
Issue navigator
Show
debugger with
Current Views
Show
utilities
Show
toolbar
Show
editor as
Current Editor
Navigate to
current log
Run
Choose Script...

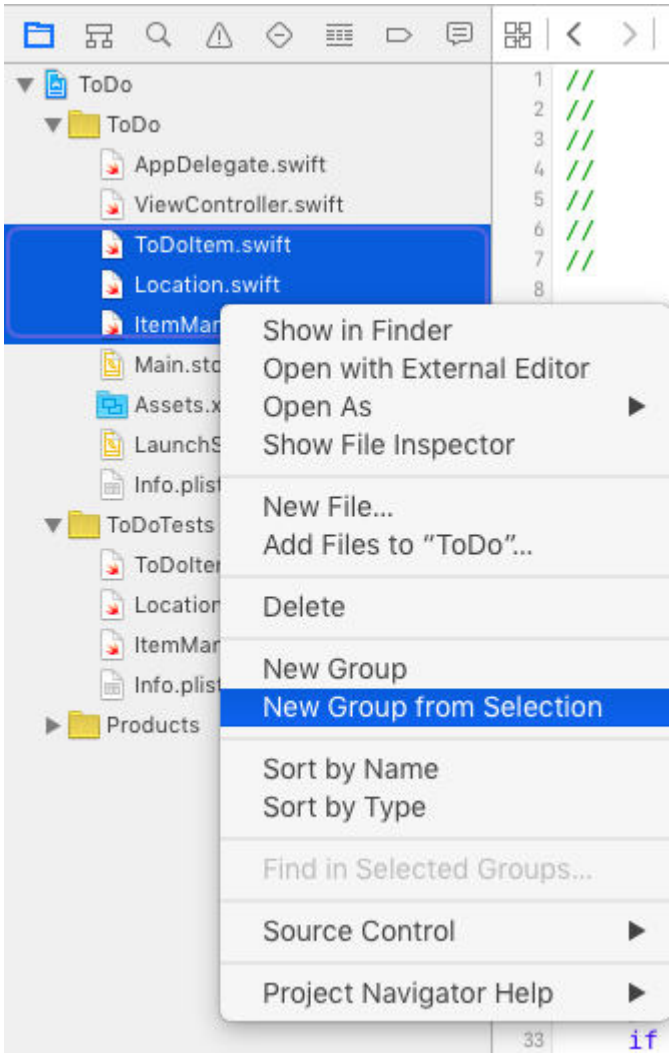

Tests
Implementation

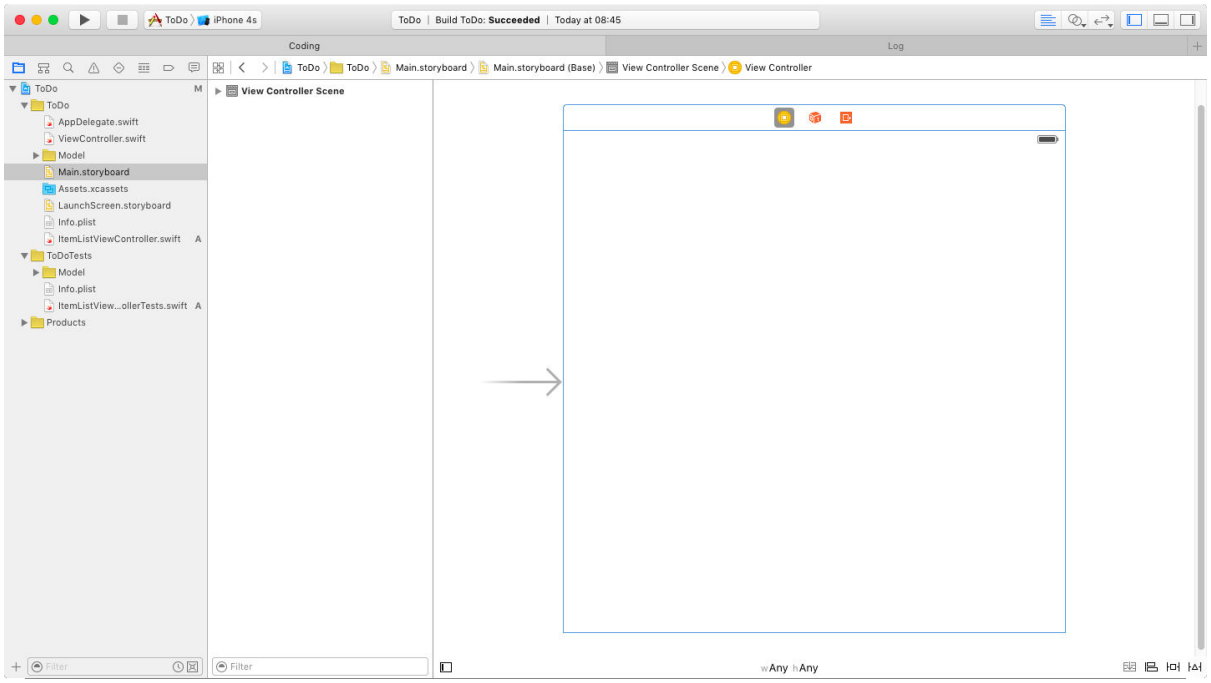
Chapter 3: A Test-Driven Data Model

```
23
24      func testInit_ShouldTakeTitle() {
25          ToDoItem(title: "Test title")   Use of unresolved identifier 'ToDoItem'
26      }
27  }
28
```

```
72
73      func performNotEqualTestWithLocationProperties(firstName: String,
74          secondName: String,
75          firstLongLat: (Double, Double)?,
76          secondLongLat: (Double, Double)?) {
77
78              let firstCoord: CLLocationCoordinate2D?
79              if let firstLongLat = firstLongLat {
80                  firstCoord = CLLocationCoordinate2D(
81                      latitude: firstLongLat.0,
82                      longitude: firstLongLat.1)
83              } else {
84                  firstCoord = nil
85              }
86              let firstLocation = Location(name: firstName,
87                  coordinate: firstCoord)
88
89              let secondCoord: CLLocationCoordinate2D?
90              if let secondLongLat = secondLongLat {
91                  secondCoord = CLLocationCoordinate2D(
92                      latitude: secondLongLat.0,
93                      longitude: secondLongLat.1)
94              } else {
95                  secondCoord = nil
96              }
97              let secondLocation = Location(name: secondName,
98                  coordinate: secondCoord)
99
100             XCTAssertNotEqual(firstLocation, secondLocation)
101     }   XCTAssertNotEqual failed: ("Optional(ToDo.Location(name: "Home", coordinate: Optional(C.CLLocationCoordinate2D(latitu...
102 }
103
```

Chapter 4: A Test-Driven View Controller




ToDo
iPhone 4s
ToDo | Build ToDo: Succeeded | Today at 08:45
Coding
Log
ToDo
Main.storyboard
Main.storyboard (Base)
View Controller Scene
View Controller
AppDelegate.swift
ViewController.swift
Model
Main.storyboard
Assets.xcassets
LaunchScreen.storyboard
Info.plist
ItemListViewController.swift
ToDoTests
Products
wAny hAny

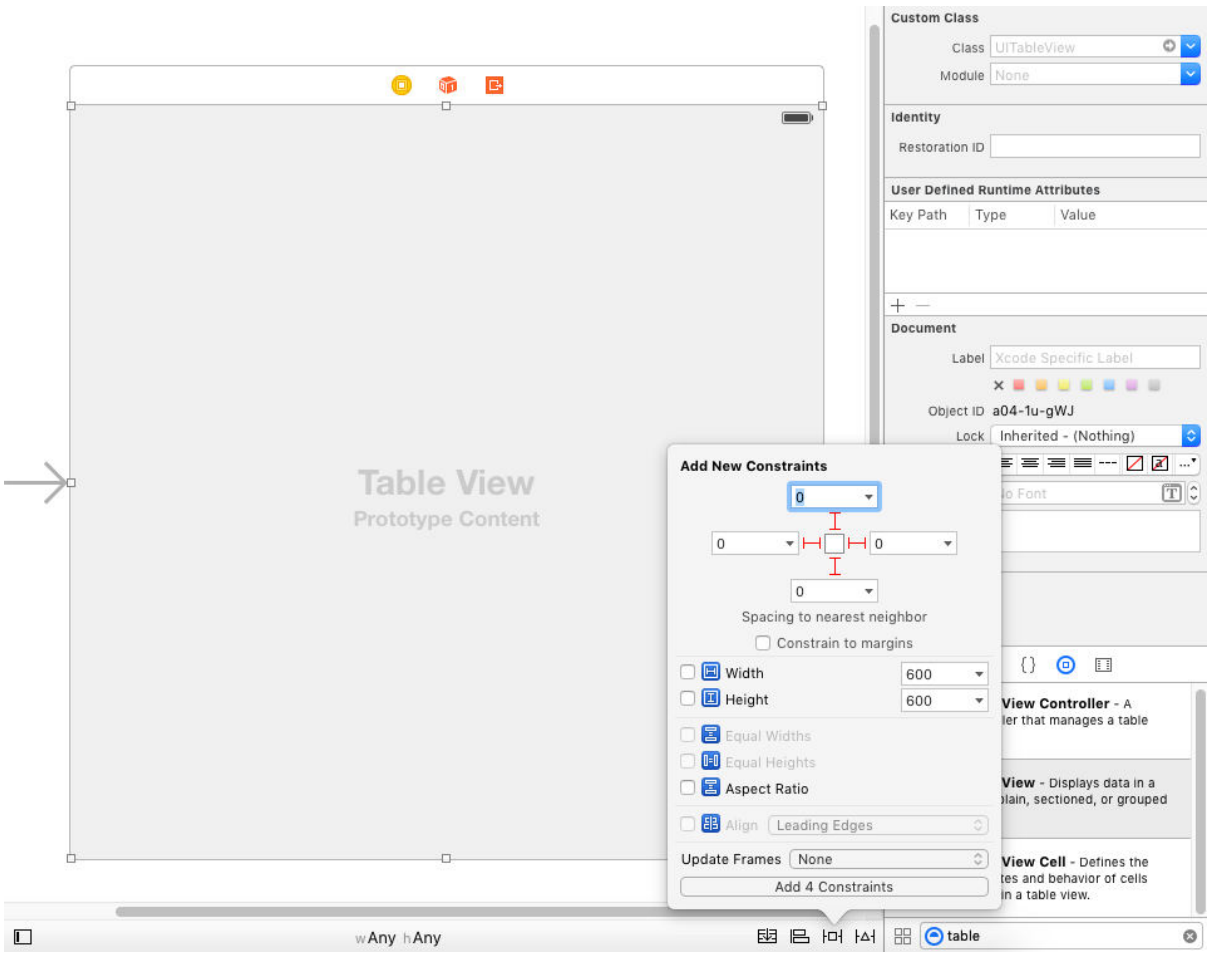
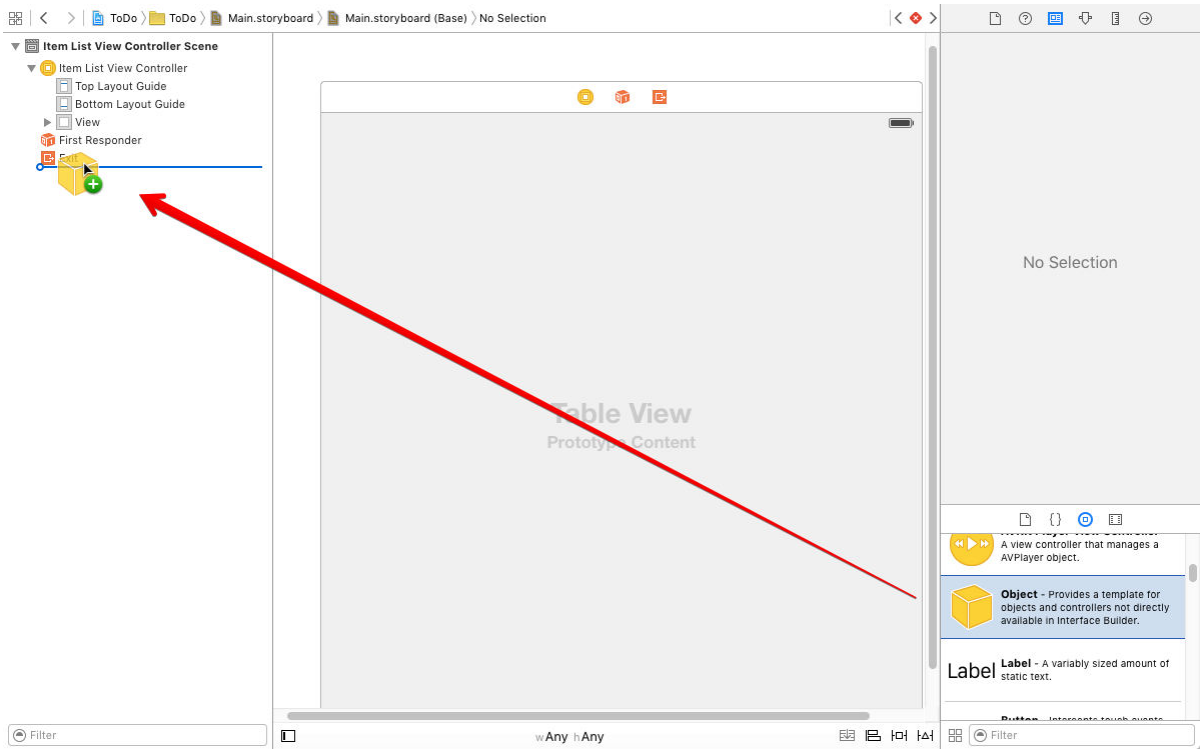
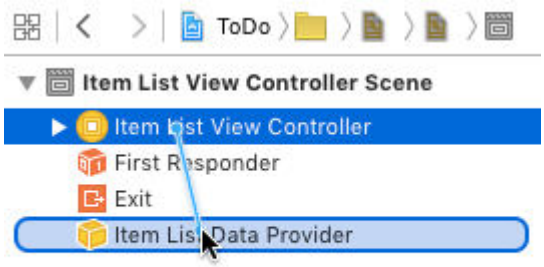
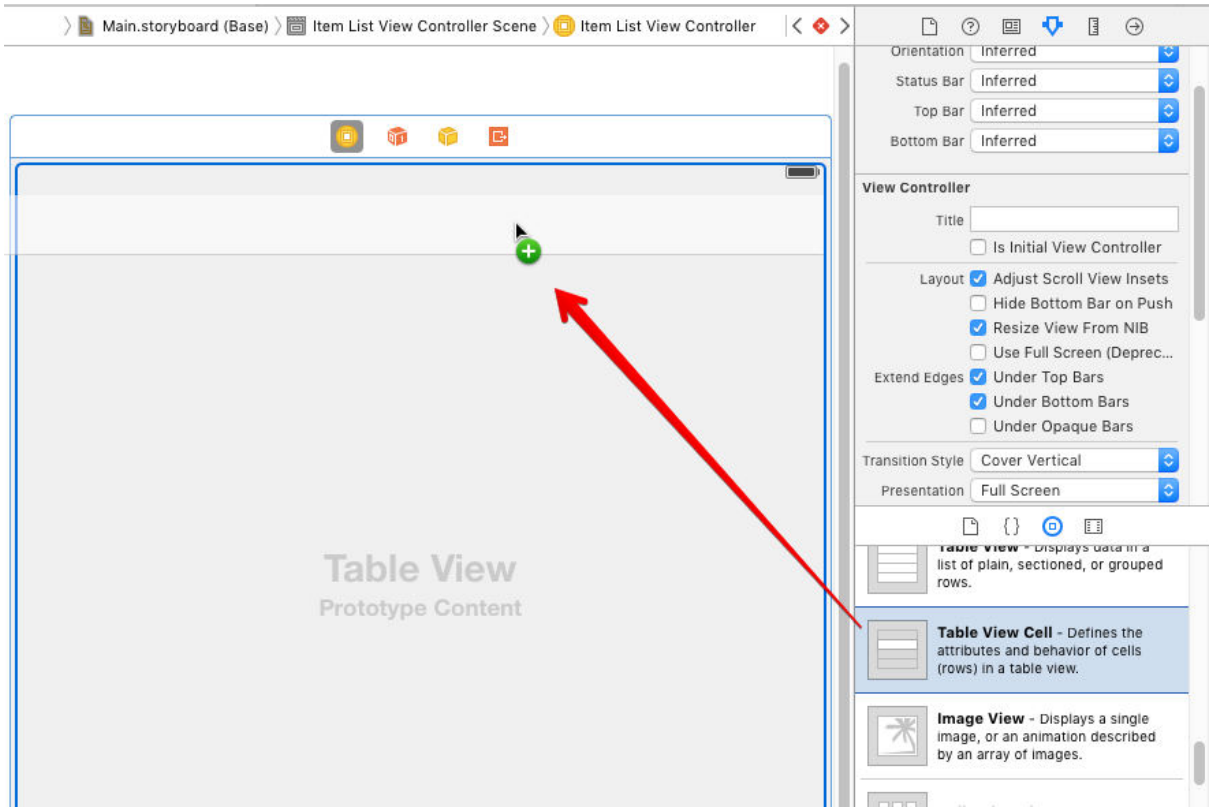
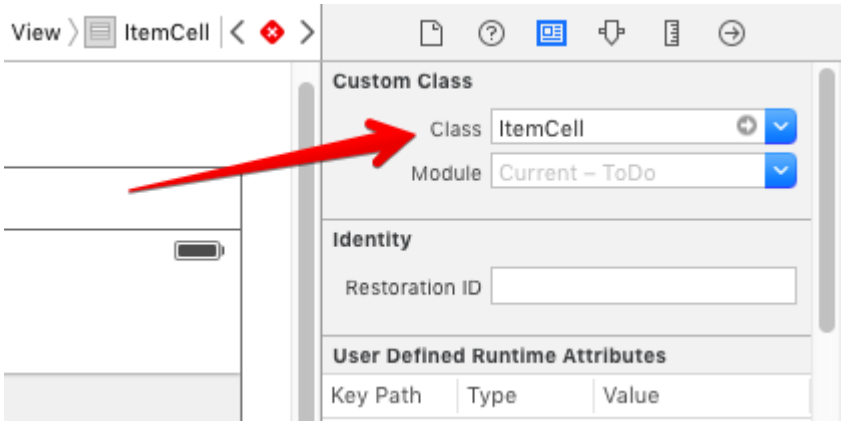


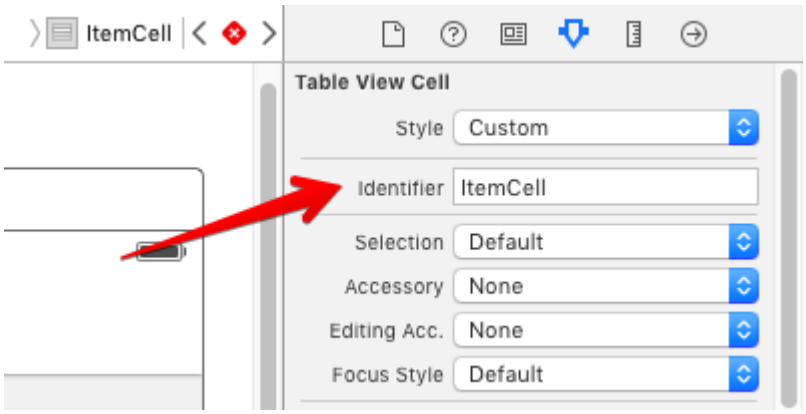
Table View
Prototype Content
Custom Class
Class
UITableView
Module
None
Identity
Restoration ID
User Defined Runtime Attributes
Key Path
Type
Value
Document
Label
Xcode Specific Label
Object ID
a04-1u-gWJ
Lock
Inherited - (Nothing)
Add New Constraints
Spacing to nearest neighbor
Constrain to margins
Width
600
Height
600
Equal Widths
Equal Heights
Aspect Ratio
Align
Leading Edges
Update Frames
None
Add 4 Constraints
wAny hAny
table

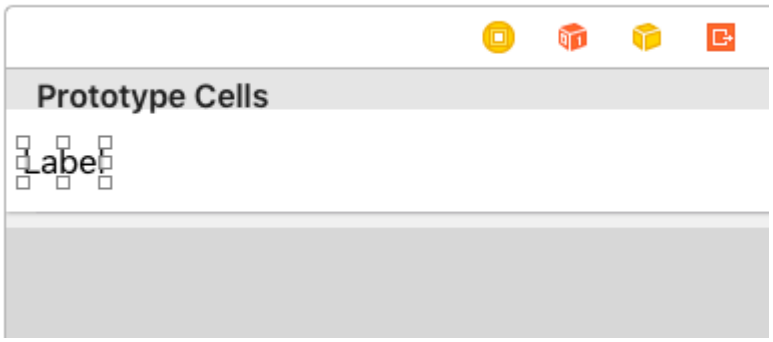

ToDo
ToDo
Main.storyboard
Main.storyboard (Base)
No Selection
Item List View Controller Scene
Item List View Controller
Top Layout Guide
Bottom Layout Guide
View
First Responder
Exit
Table View
Prototype Content
No Selection
A view controller that manages a AVPlayer object.
Object - Provides a template for objects and controllers not directly available in Interface Builder.
Label
Label - A variably sized amount of static text.
wAny hAny
Filter
Filter

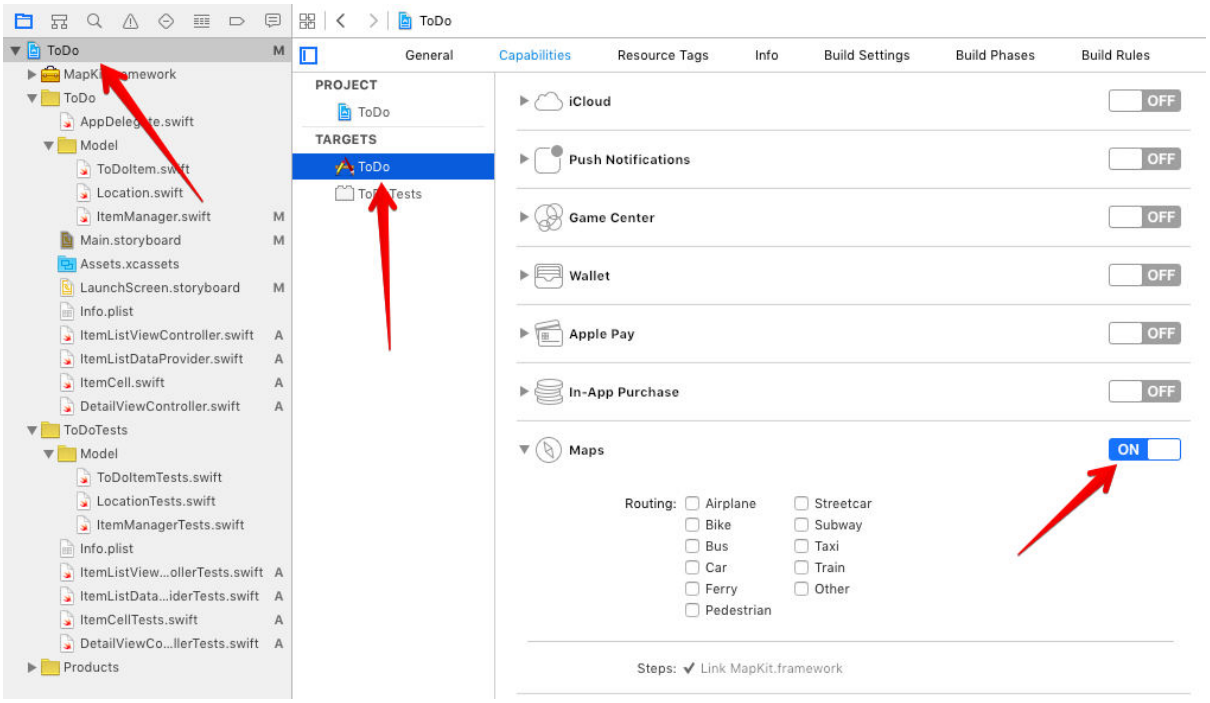

ToDo
Item List View Controller Scene
Item List View Controller
First Responder
Exit
Item List Data Provider


Main.storyboard (Base)
Item List View Controller Scene
Item List View Controller
Orientation Inferred
Status Bar Inferred
Top Bar Inferred
Bottom Bar Inferred
View Controller
Title
Is Initial View Controller
Layout Adjust Scroll View Insets
Hide Bottom Bar on Push
Resize View From NIB
Use Full Screen (Deprec...
Extend Edges Under Top Bars
Under Bottom Bars
Under Opaque Bars
Transition Style Cover Vertical
Presentation Full Screen
Table View
Prototype Content
Table View Cell - Defines the attributes and behavior of cells (rows) in a table view.
Image View - Displays a single image, or an animation described by an array of images.


View
ItemCell
Custom Class
Class ItemCell
Module Current – ToDo
Identity
Restoration ID
User Defined Runtime Attributes
Key Path
Type
Value

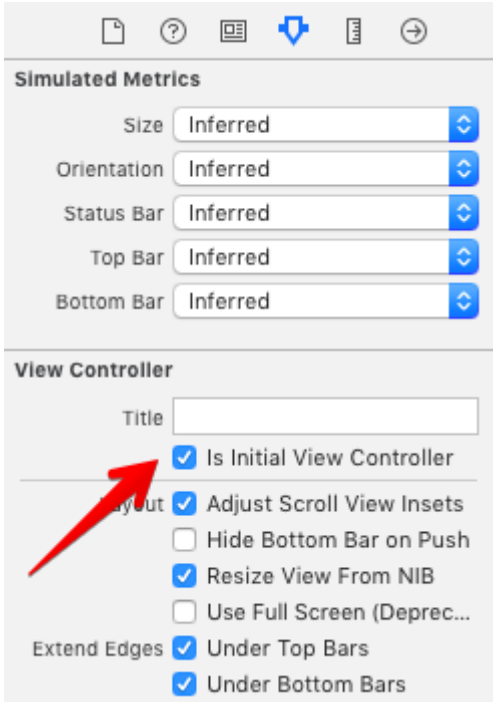

ItemCell
Table View Cell
Style Custom
Identifier ItemCell
Selection Default
Accessory None
Editing Acc. None
Focus Style Default

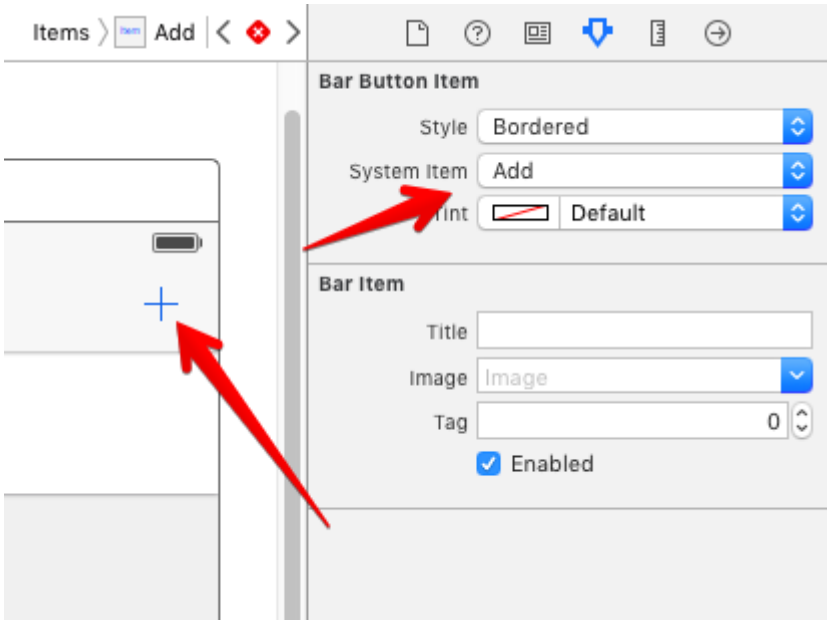

Prototype Cells
Label

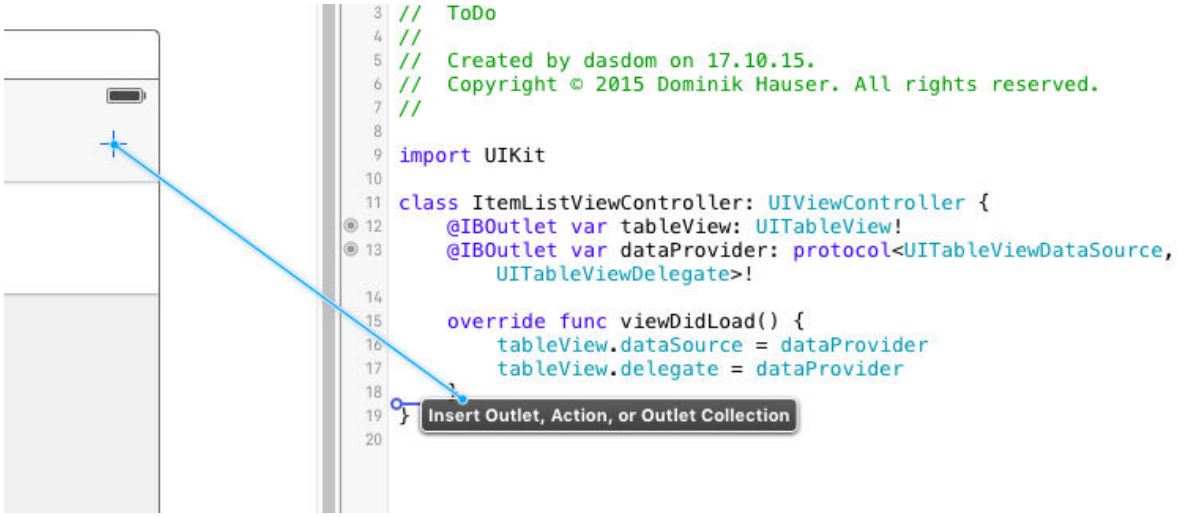

ToDo
General
Capabilities
Resource Tags
Info
Build Settings
Build Phases
Build Rules
PROJECT
ToDo
TARGETS
ToDo
iCloud
OFF
Push Notifications
OFF
Game Center
OFF
Wallet
OFF
Apple Pay
OFF
In-App Purchase
OFF
Maps
ON
Routing:
Airplane
Bike
Bus
Car
Ferry
Pedestrian
Streetcar
Subway
Taxi
Train
Other
Steps:
Link MapKit.framework

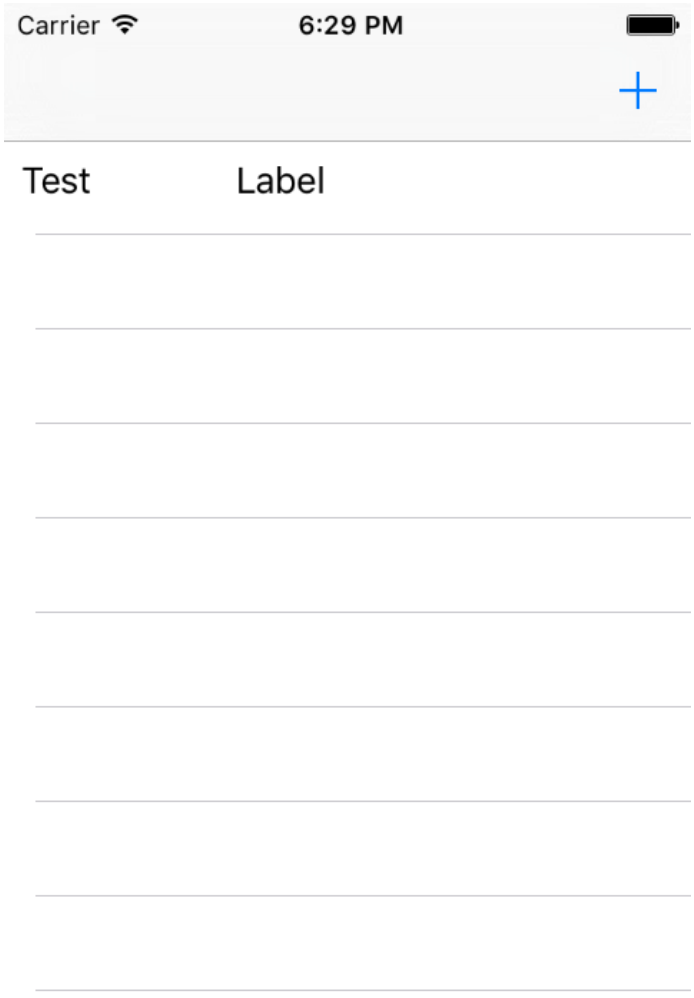
```
153
154             XCTAssertEqualWithAccuracy(latitude, 0.0, accuracy: 0.000001)
155             XCTAssertEqualWithAccuracy(longitude, 0.0, accuracy: 0.000001)
156         }
```

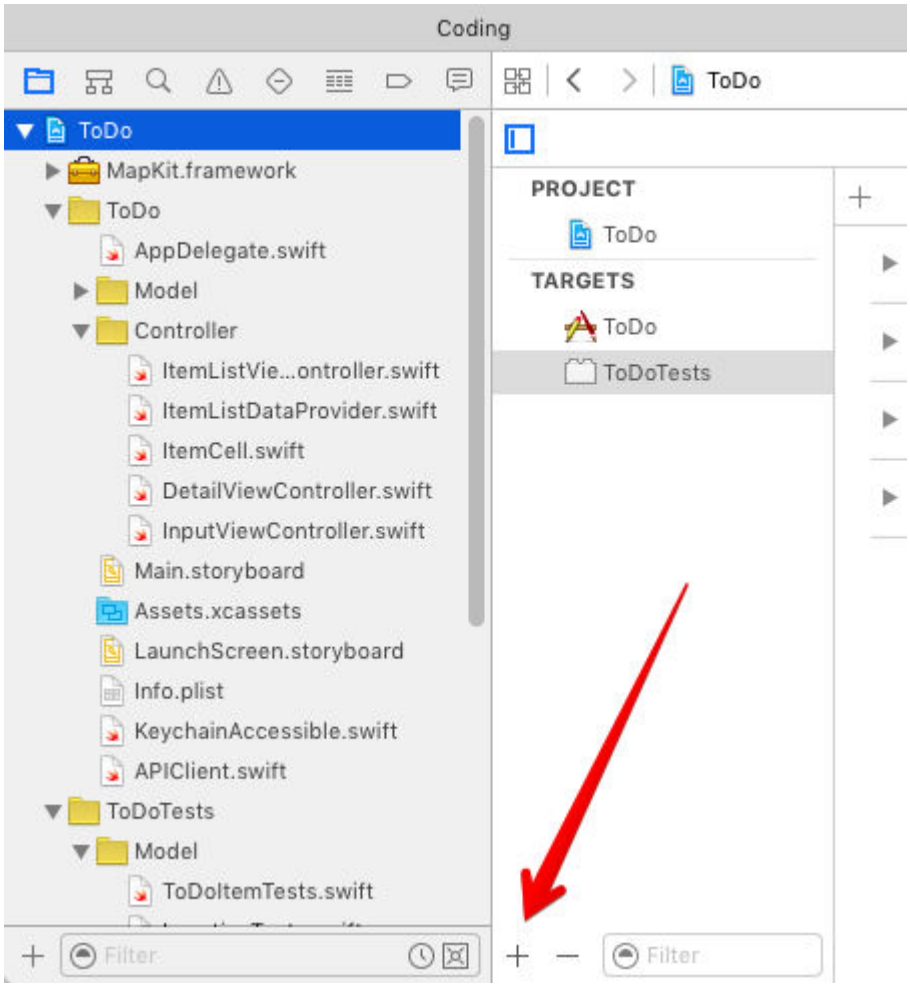
Chapter 6: Putting It All Together

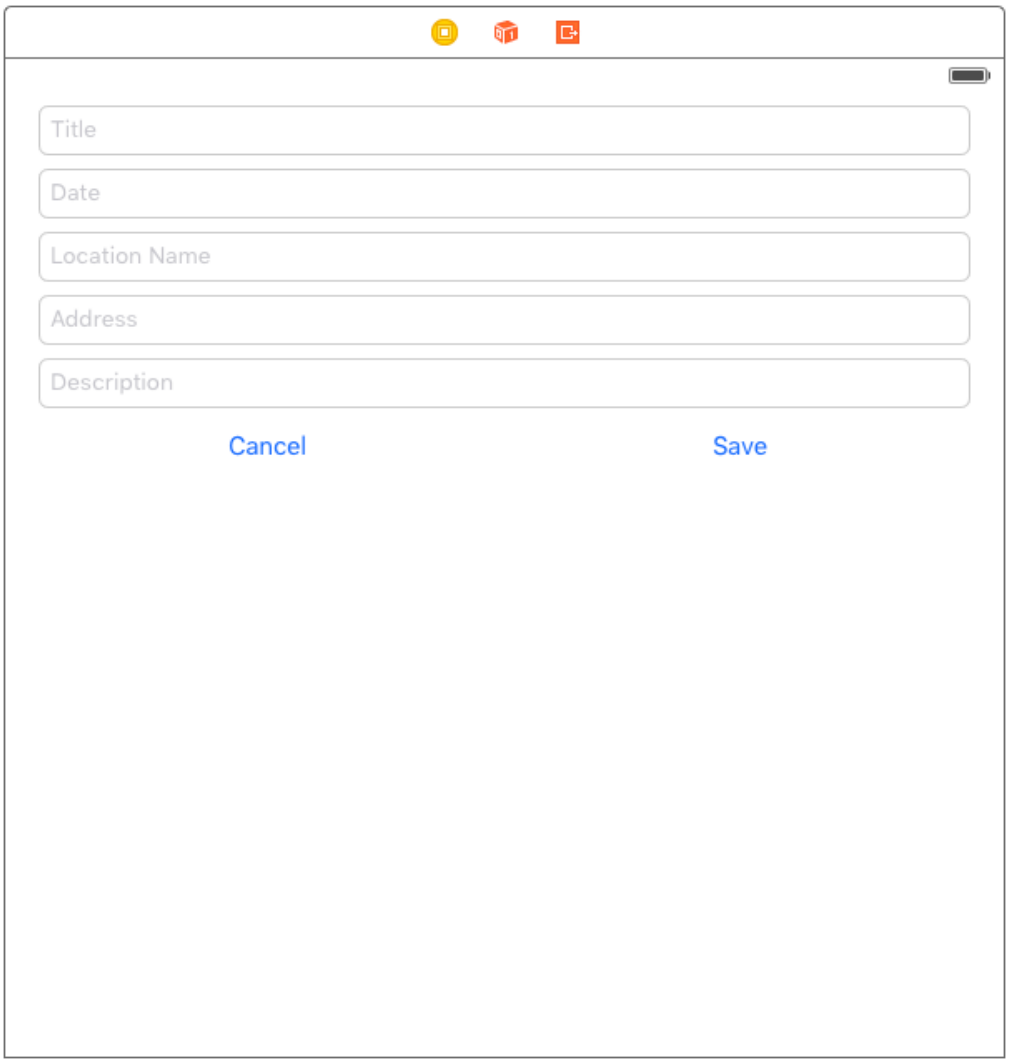


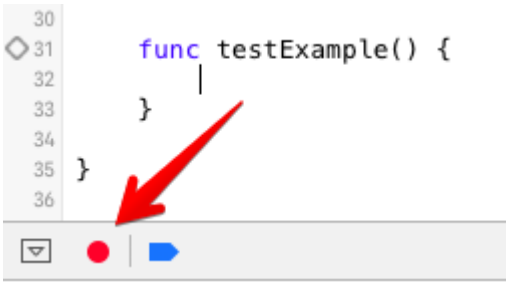



3 // ToDo
4 //
5 // Created by dasdom on 17.10.15.
6 // Copyright © 2015 Dominik Hauser. All rights reserved.
7 //
8
9 import UIKit
10
11 class ItemListViewController: UIViewController {
12   @IBOutlet var tableView: UITableView!
13   @IBOutlet var dataProvider: protocol<UITableViewDataSource,
UITableViewDelegate>!
14
15   override func viewDidLoad() {
16   tableView.dataSource = dataProvider
17   tableView.delegate = dataProvider
18   }
19 }
Insert Outlet, Action, or Outlet Collection
20

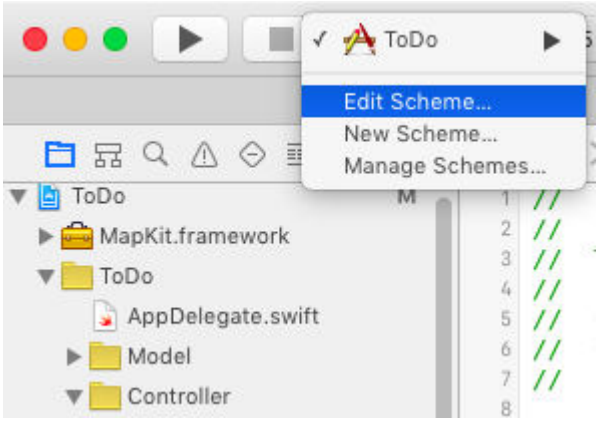

Carrier
6:29 PM
Test
Label

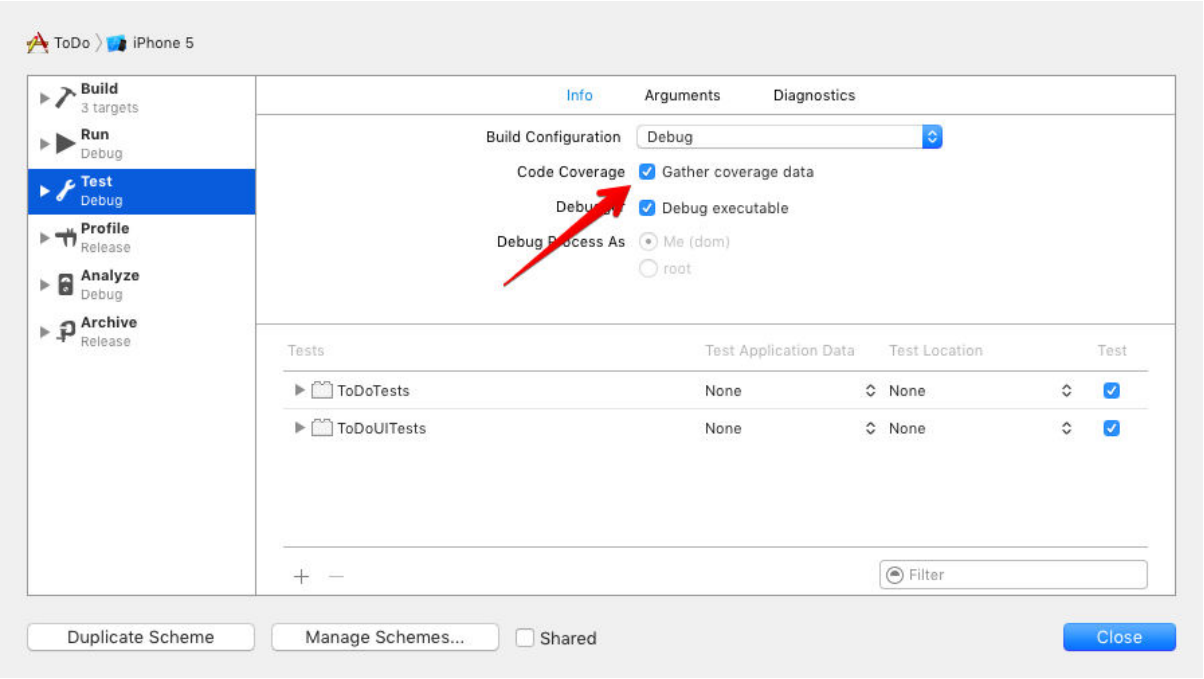

Coding
ToDo
MapKit.framework
ToDo
AppDelegate.swift
Model
Controller
ItemListVie...ontroller.swift
ItemListDataProvider.swift
ItemCell.swift
DetailViewController.swift
InputViewController.swift
Main.storyboard
Assets.xcassets
LaunchScreen.storyboard
Info.plist
KeychainAccessible.swift
APIClient.swift
ToDoTests
Model
ToDoItemTests.swift
Filter
ToDo
PROJECT
ToDo
TARGETS
ToDo
ToDoTests
Filter

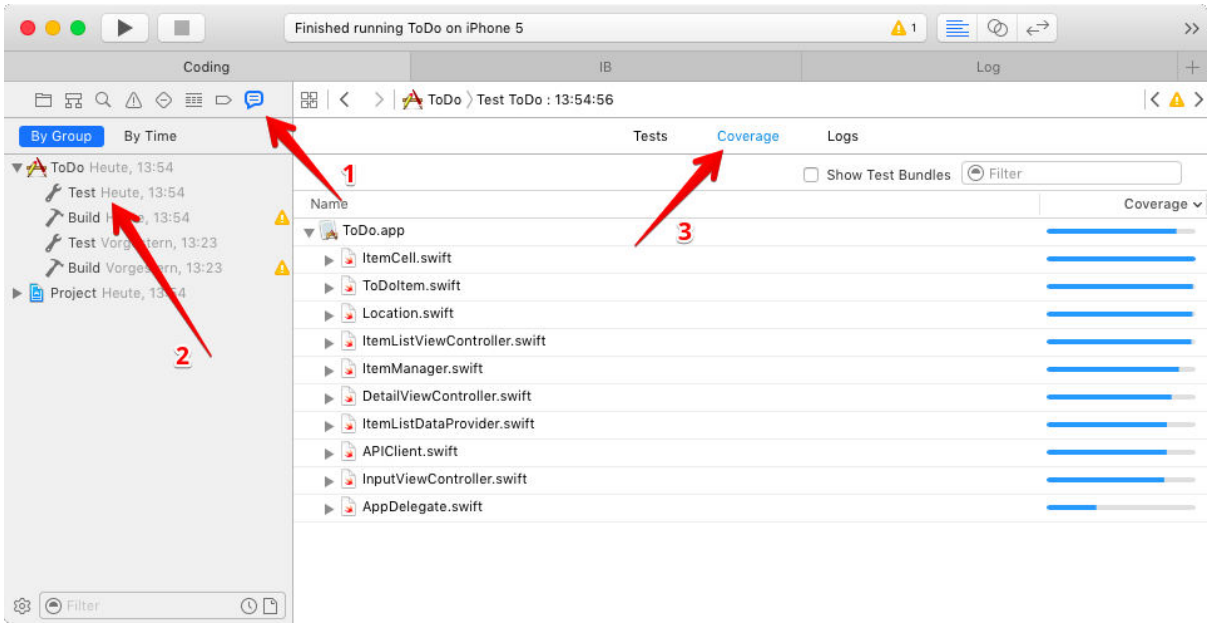

Title
Date
Location Name
Address
Description
Cancel
Save


30
31
32
33
34
35
36
func testExample() {
}
}

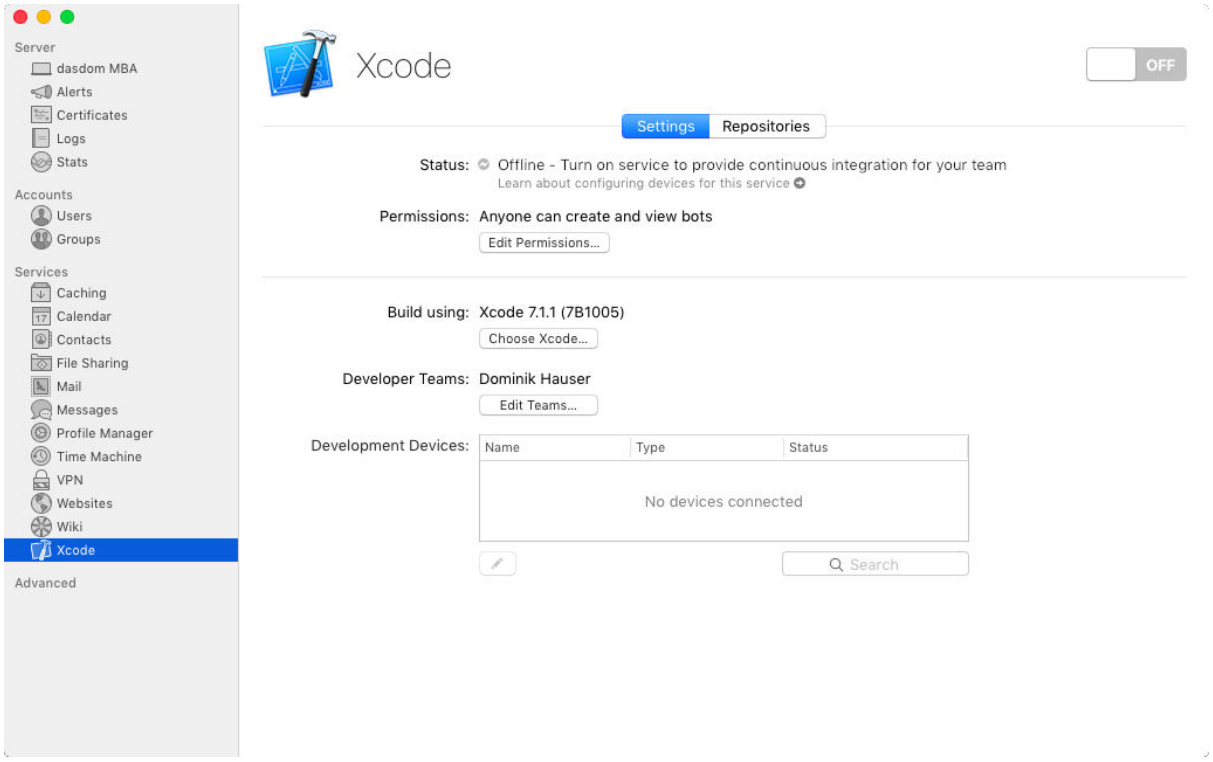
Chapter 7: Code Coverage and Continuous Integration

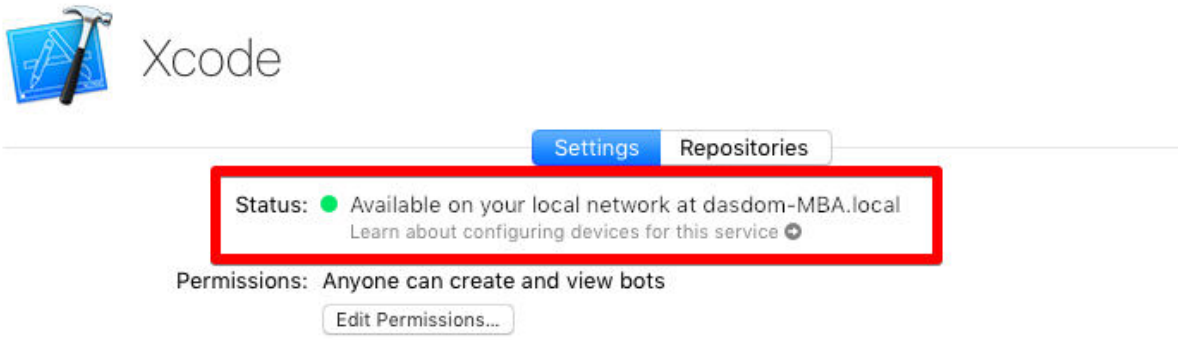


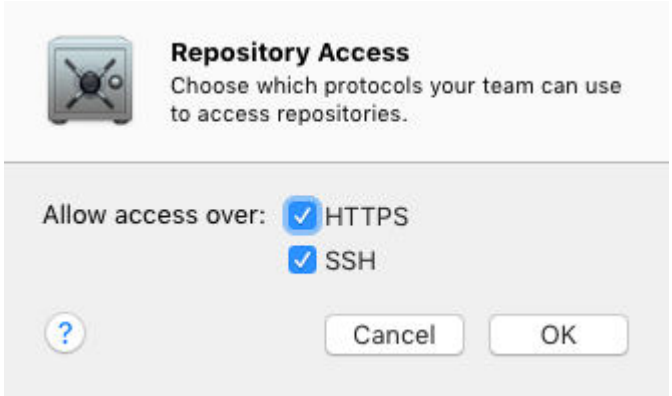


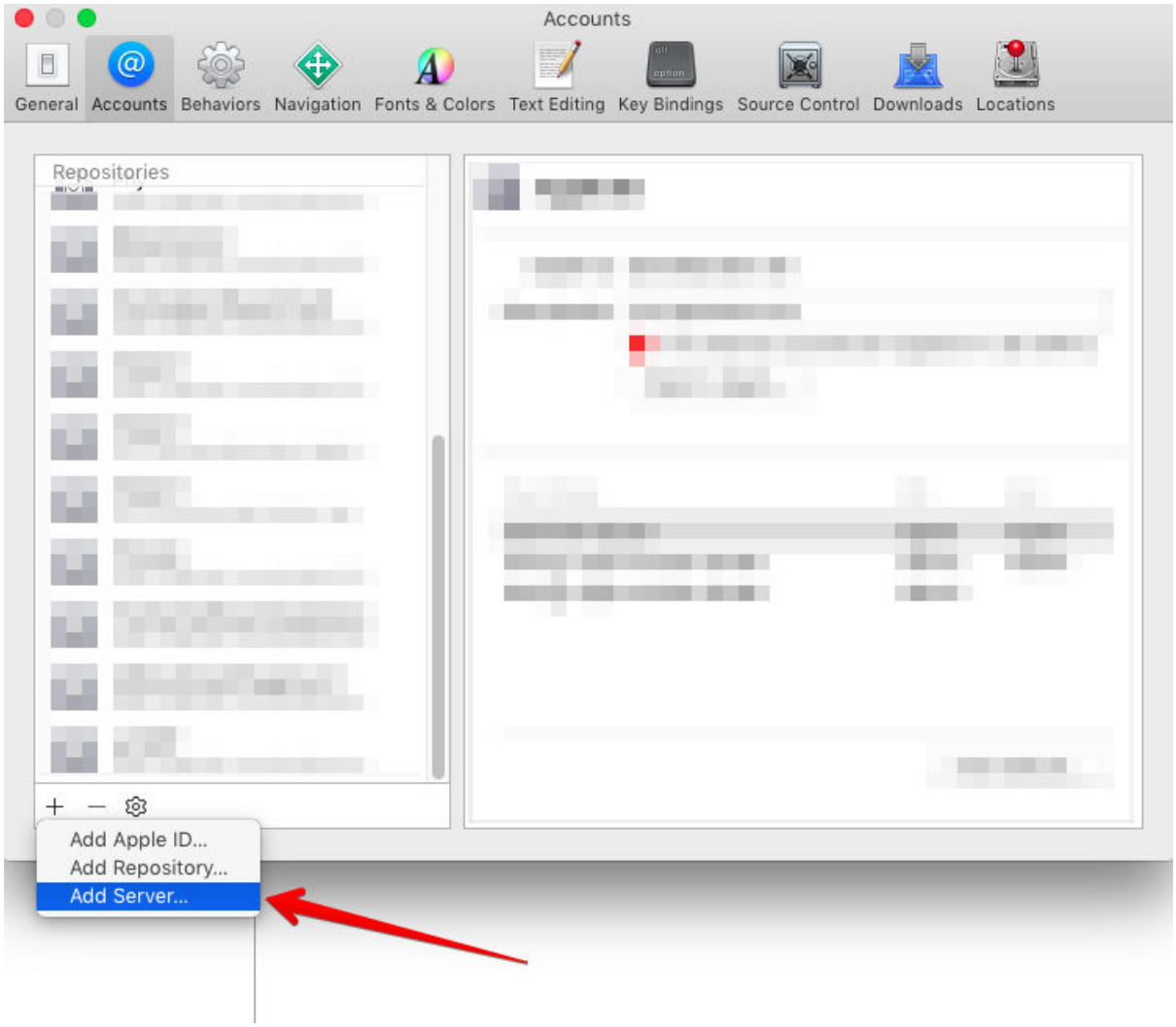


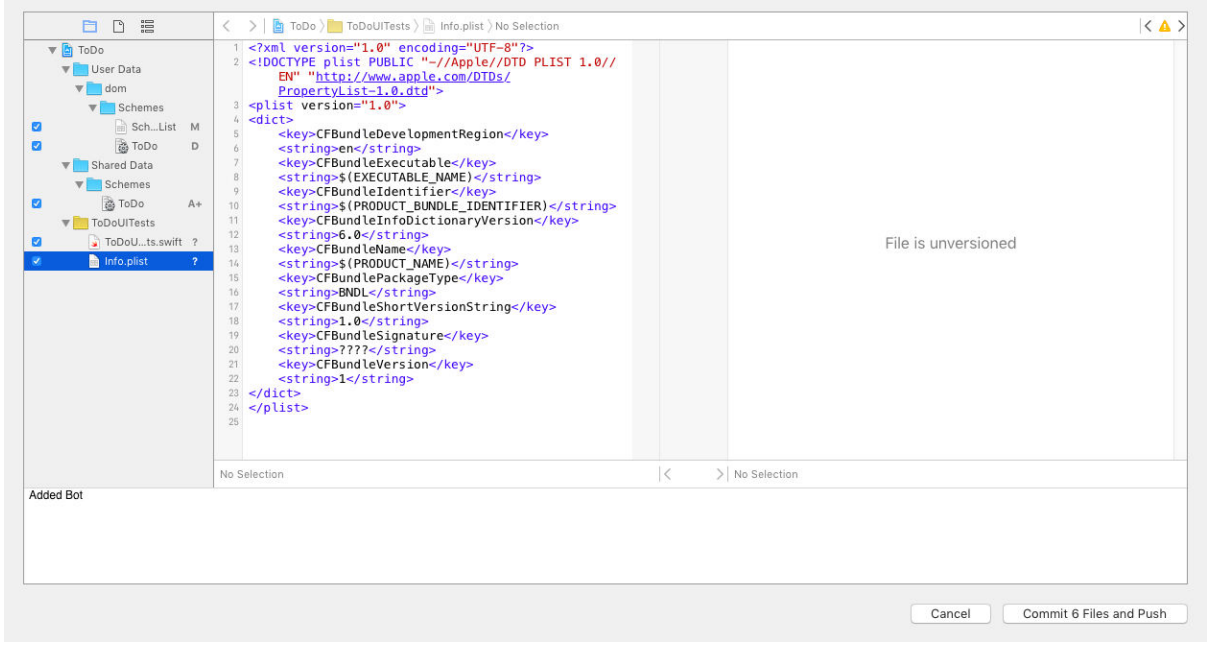

```
20  var itemInfo: (ItemManager, Int)?
21
22  let dateFormatter: NSDateFormatter = {                    37
23      let dateFormatter = NSDateFormatter()
24      dateFormatter.dateFormat = "MM/dd/yyyy"
25      return dateFormatter
26  }()
27
28  override func viewWillAppear(animated: Bool) {            1
29      super.viewWillAppear(animated)
30
31      guard let itemInfo = itemInfo else { return }         0
32                                                            1
33      let item = itemInfo.0.itemAtIndex(itemInfo.1)
34
35      titleLabel.text = item.title
36      locationLabel.text = item.location?.name
37      descriptionLabel.text = item.itemDescription
```

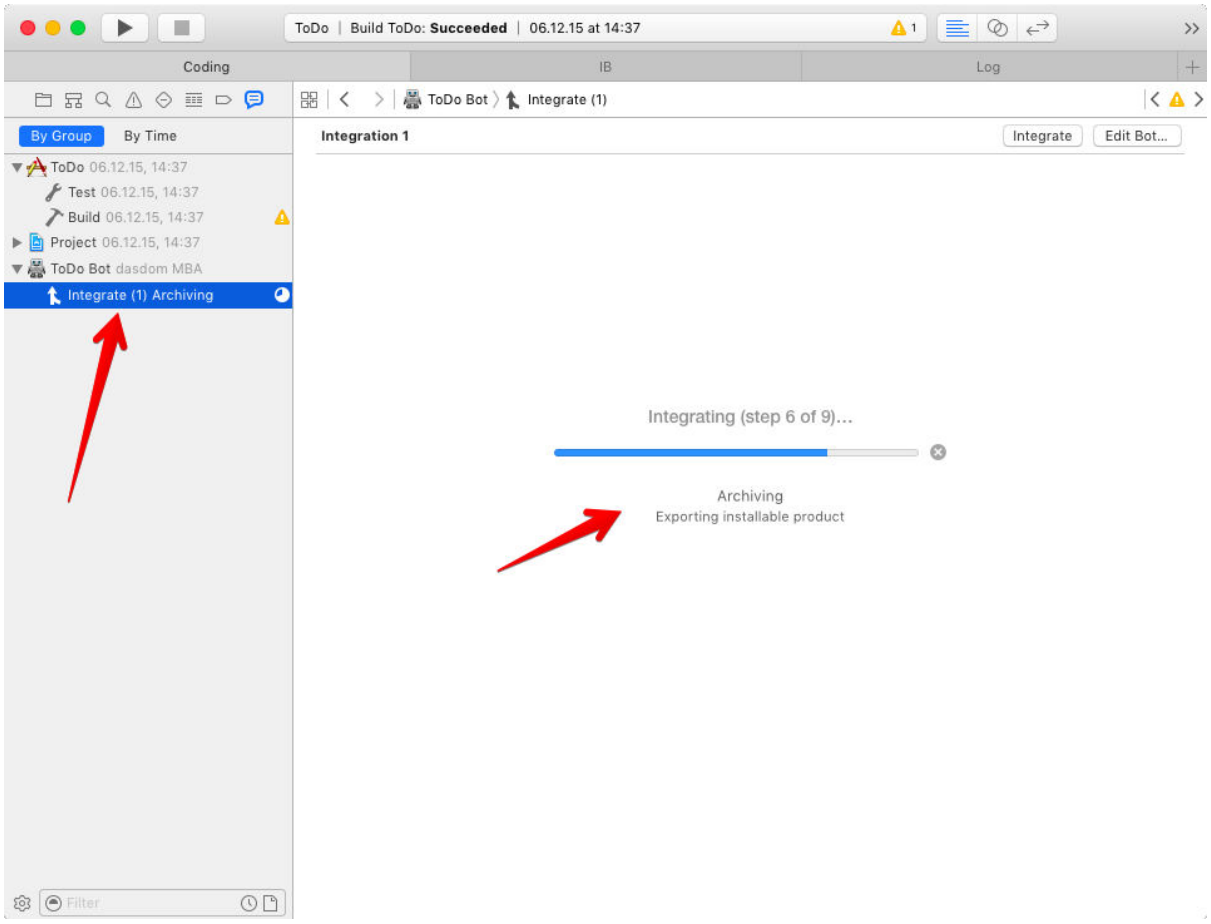

Server
dasdom MBA
Alerts
Certificates
Logs
Stats
Accounts
Users
Groups
Services
Caching
Calendar
Contacts
File Sharing
Mail
Messages
Profile Manager
Time Machine
VPN
Websites
Wiki
Xcode
Advanced
Xcode
OFF
Settings
Repositories
Status: Offline - Turn on service to provide continuous integration for your team
Learn about configuring devices for this service
Permissions: Anyone can create and view bots
Edit Permissions...
Build using: Xcode 7.1.1 (7B1005)
Choose Xcode...
Developer Teams: Dominik Hauser
Edit Teams...
Development Devices:
Name
Type
Status
No devices connected
Search

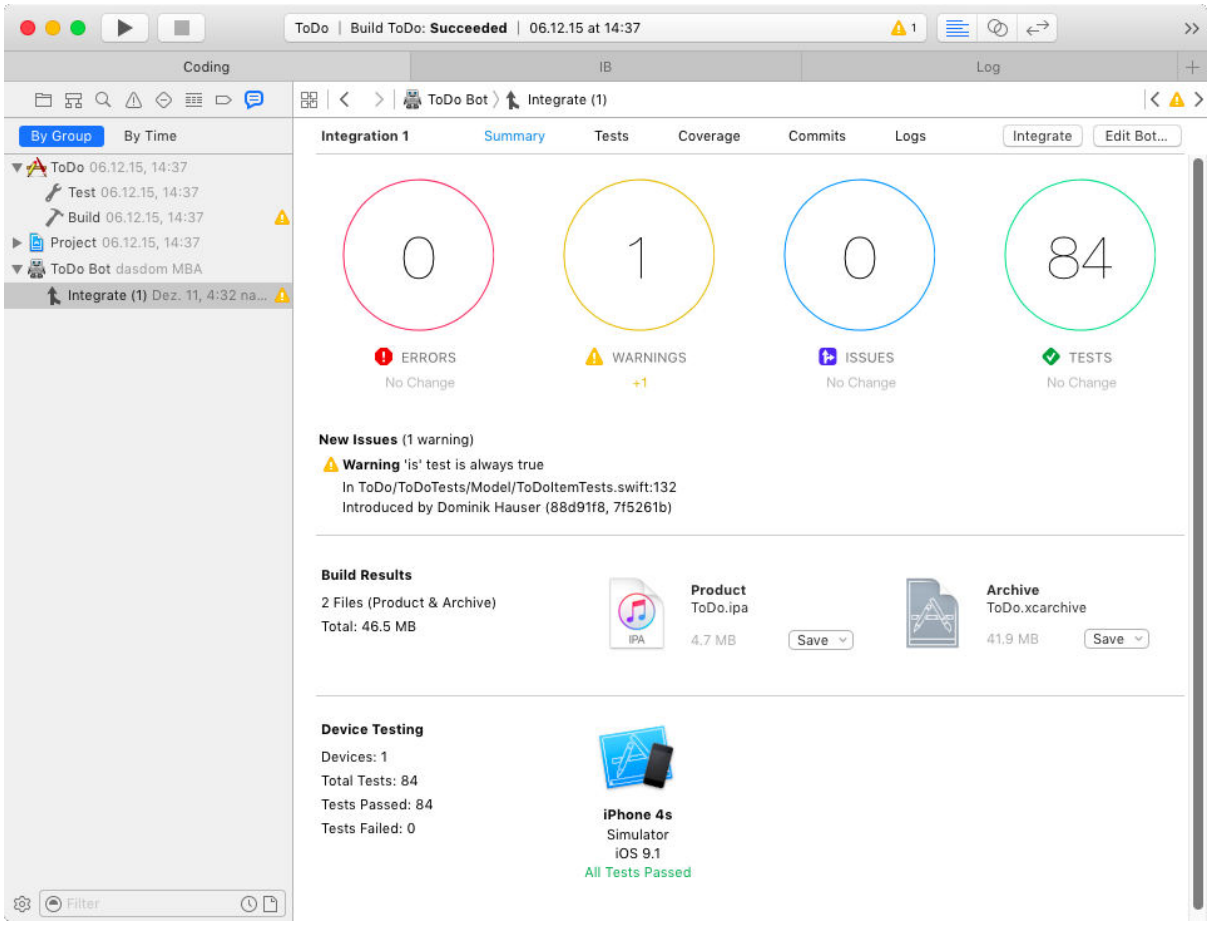

Xcode
Settings
Repositories
Status: Available on your local network at dasdom-MBA.local
Learn about configuring devices for this service
Permissions: Anyone can create and view bots
Edit Permissions...

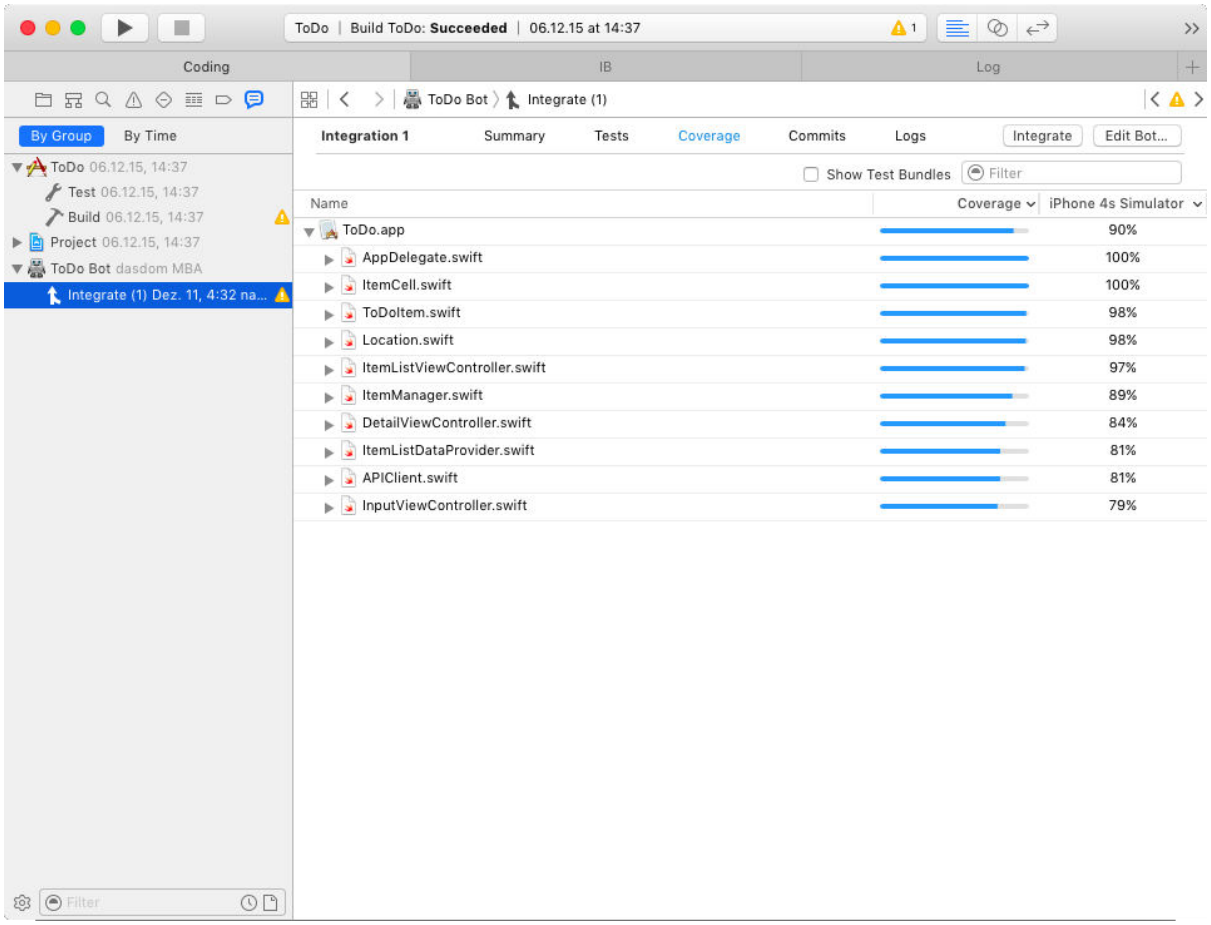

Repository Access
Choose which protocols your team can use to access repositories.
Allow access over:
HTTPS
SSH
Cancel
OK

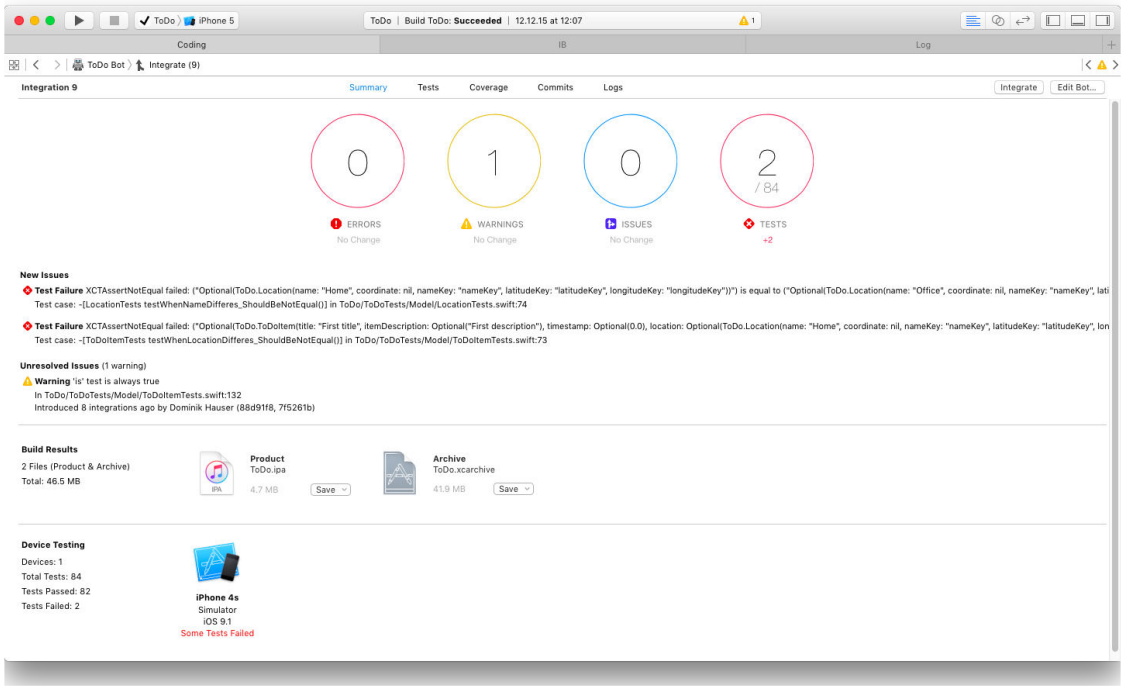

Accounts
General
Accounts
Behaviors
Navigation
Fonts & Colors
Text Editing
Key Bindings
Source Control
Downloads
Locations
Repositories
Add Apple ID...
Add Repository...
Add Server...


ToDo
User Data
dom
Schemes
Sch...List M
ToDo D
Shared Data
Schemes
ToDo A+
ToDoUITests
ToDoU...ts.swift ?
Info.plist ?
ToDo ToDoUITests Info.plist No Selection
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
<key>CFBundleDevelopmentRegion</key>
<string>en</string>
<key>CFBundleExecutable</key>
<string>$(EXECUTABLE_NAME)</string>
<key>CFBundleIdentifier</key>
<string>$(PRODUCT_BUNDLE_IDENTIFIER)</string>
<key>CFBundleInfoDictionaryVersion</key>
<string>6.0</string>
<key>CFBundleName</key>
<string>$(PRODUCT_NAME)</string>
<key>CFBundlePackageType</key>
<string>BNDL</string>
<key>CFBundleShortVersionString</key>
<string>1.0</string>
<key>CFBundleSignature</key>
<string>????</string>
<key>CFBundleVersion</key>
<string>1</string>
</dict>
</plist>
File is unversioned
No Selection
No Selection
Added Bot
Cancel
Commit 6 Files and Push


ToDo | Build ToDo: Succeeded | 06.12.15 at 14:37
Coding
IB
Log
ToDo Bot
Integrate (1)
By Group
By Time
Integration 1
Integrate
Edit Bot...
ToDo 06.12.15, 14:37
Test 06.12.15, 14:37
Build 06.12.15, 14:37
Project 06.12.15, 14:37
ToDo Bot dasdom MBA
Integrate (1) Archiving
Integrating (step 6 of 9)...
Archiving
Exporting installable product
Filter


ToDo | Build ToDo: Succeeded | 06.12.15 at 14:37
Coding
IB
Log
ToDo Bot
Integrate (1)
By Group
By Time
ToDo 06.12.15, 14:37
Test 06.12.15, 14:37
Build 06.12.15, 14:37
Project 06.12.15, 14:37
ToDo Bot dasdom MBA
Integrate (1) Dez. 11, 4:32 na...
Filter
Integration 1
Summary
Tests
Coverage
Commits
Logs
Integrate
Edit Bot...
0
ERRORS
No Change
1
WARNINGS
+1
0
ISSUES
No Change
84
TESTS
No Change
New Issues (1 warning)
Warning 'is' test is always true
In ToDo/ToDoTests/Model/ToDoItemTests.swift:132
Introduced by Dominik Hauser (88d91f8, 7f5261b)
Build Results
2 Files (Product & Archive)
Total: 46.5 MB
IPA
Product
ToDo.ipa
4.7 MB
Save
Archive
ToDo.xcarchive
41.9 MB
Save
Device Testing
Devices: 1
Total Tests: 84
Tests Passed: 84
Tests Failed: 0
iPhone 4s
Simulator
iOS 9.1
All Tests Passed


ToDo | Build ToDo: Succeeded | 06.12.15 at 14:37
Coding
IB
Log
By Group
By Time
ToDo 06.12.15, 14:37
Test 06.12.15, 14:37
Build 06.12.15, 14:37
Project 06.12.15, 14:37
ToDo Bot dasdom MBA
Integrate (1) Dez. 11, 4:32 na...
ToDo Bot
Integrate (1)
Integration 1
Summary
Tests
Coverage
Commits
Logs
Integrate
Edit Bot...
Show Test Bundles
Filter
Name
Coverage
iPhone 4s Simulator
ToDo.app 90%
AppDelegate.swift 100%
ItemCell.swift 100%
ToDoItem.swift 98%
Location.swift 98%
ItemListViewController.swift 97%
ItemManager.swift 89%
DetailViewController.swift 84%
ItemListDataProvider.swift 81%
APIClient.swift 81%
InputViewController.swift 79%


ToDo | Build ToDo: Succeeded | 12.12.15 at 12:07
Integration 9
Summary
Tests
Coverage
Commits
Logs
Integrate
Edit Bot...
0
ERRORS
No Change
1
WARNINGS
No Change
0
ISSUES
No Change
2
/ 84
TESTS
+2
New Issues
Test Failure XCTAssertNotEqual failed: ("Optional(ToDo.Location(name: "Home", coordinate: nil, nameKey: "nameKey", latitudeKey: "latitudeKey", longitudeKey: "longitudeKey"))") is equal to ("Optional(ToDo.Location(name: "Office", coordinate: nil, nameKey: "nameKey", lati
Test case: -[LocationTests testWhenNameDifferes_ShouldBeNotEqual()] in ToDo/ToDoTests/Model/LocationTests.swift:74
Test Failure XCTAssertNotEqual failed: ("Optional(ToDo.ToDoItem(title: "First title", itemDescription: Optional("First description"), timestamp: Optional(0.0), location: Optional(ToDo.Location(name: "Home", coordinate: nil, nameKey: "nameKey", latitudeKey: "latitudeKey", lon
Test case: -[ToDoItemTests testWhenLocationDifferes_ShouldBeNotEqual()] in ToDo/ToDoTests/Model/ToDoItemTests.swift:73
Unresolved Issues (1 warning)
Warning 'is' test is always true
In ToDo/ToDoTests/Model/ToDoItemTests.swift:132
Introduced 8 integrations ago by Dominik Hauser (88d91f8, 7f5261b)
Build Results
2 Files (Product & Archive)
Total: 46.5 MB
Product
ToDo.ipa
4.7 MB
Save
Archive
ToDo.xcarchive
41.9 MB
Save
Device Testing
Devices: 1
Total Tests: 84
Tests Passed: 82
Tests Failed: 2
iPhone 4s
Simulator
iOS 9.1
Some Tests Failed