

Miscellaneous Topics

Mobile Application Development in iOS

School of EECS

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Outline

- Access app info
- Rename app and Xcode project
- Add app icons
- Package management with CocoaPods

Access App Info

Access App Info.plist

The screenshot shows the Xcode interface with the "Info.plist" file open in the main editor. The sidebar on the left lists project files, and the top bar shows the target as "TestApp1" for an "iPhone 11". The main editor displays the contents of "Info.plist" under "TestApp1 > TestApp1 > Info.plist > No Selection". The table has columns for "Key", "Type", and "Value". A context menu is open over the "Value" column for the first item, showing options like Cut, Copy, Paste, Shift Row Right, Shift Row Left, Value Type (with a submenu for "armv7"), Add Row, Raw Keys & Values, Property List Type, and Property List Editor Help.

Key	Type	Value
Localization native development region	String	\$(DEVELOPMENT_LANGUAGE)
Executable file	String	\$(EXECUTABLE_NAME)
Bundle identifier	String	\$(PRODUCT_BUNDLE_IDENTIFIER)
InfoDictionary version	String	6.0
Bundle name	String	\$(PRODUCT_NAME)
Bundle OS Type code	String	\$(PRODUCT_BUNDLE_PACKAGE_TYPE)
Bundle version string (short)	String	1.0
Bundle version	String	1
Application requires iPhone environment	Boolean	YES
Application Scene Manifest	Dictionary	(2 items)
Enable Multiple Windows	Boolean	NO
Scene Configuration	Dictionary	(1 item)
Application supports indirect input events	Boolean	YES
Launch screen interface file base name	String	LaunchScreen
Main storyboard file base name	String	Main
Required device capabilities	Array	(1 item)
Item 0	String	armv7
Supported interface orientations	Array	(3 items)
Item 0	String	Portrait (bottom home button)
Item 1	String	Landscape (left home button)
Item 2	String	Landscape (right home button)
Supported interface orientations	Array	(4 items)
Item 0	String	Portrait (bottom home button)
Item 1	String	Portrait (top home button)
Item 2	String	Landscape (left home button)
Item 3	String	Landscape (right home button)

Key

- Information Property List
 - CFBundleDevelopmentRegion
 - CFBundleExecutable
 - CFBundleIdentifier
 - CFBundleInfoDictionaryVersion
 - CFBundleName
 - CFBundlePackageType
 - CFBundleShortVersionString
 - CFBundleVersion
 - LSRequiresiPhoneOS
- UIApplicationSceneManifest
 - UIApplicationSupportsMultipleScenes
 - UISceneConfigurations
 - UIApplicationSupportsIndirectInputEvents
 - UILaunchStoryboardName
 - UIMainStoryboardFile
- UIRequiredDeviceCapabilities
- UISupportedInterfaceOrientations
- UISupportedInterfaceOrientations-ipad

Access App Info.plist

```
// Get app name
let appName = Bundle.main.object(forInfoDictionaryKey:
    "CFBundleName") as! String

// Get app version
let appVersion = Bundle.main.object(forInfoDictionaryKey:
    "CFBundleShortVersionString") as! String

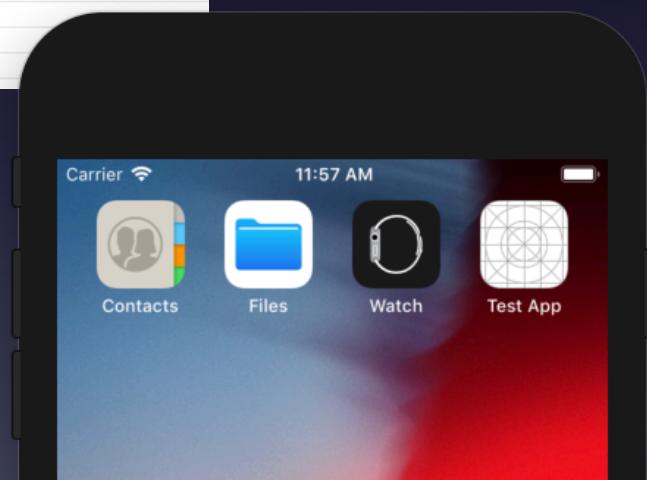
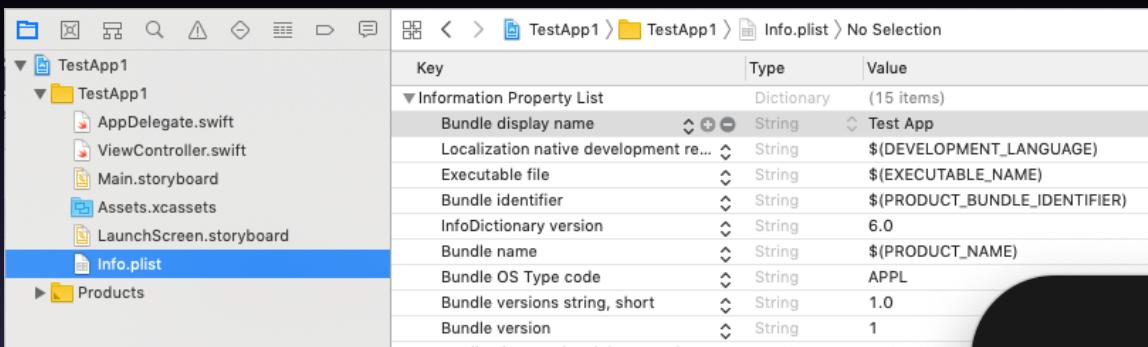
// Get app build
let appBuild = Bundle.main.object(forInfoDictionaryKey:
    "CFBundleVersion") as! String
```

<https://developer.apple.com/library/archive/documentation/General/Reference/InfoPlistKeyReference/Introduction/Introduction.html>

Rename App and Xcode Project

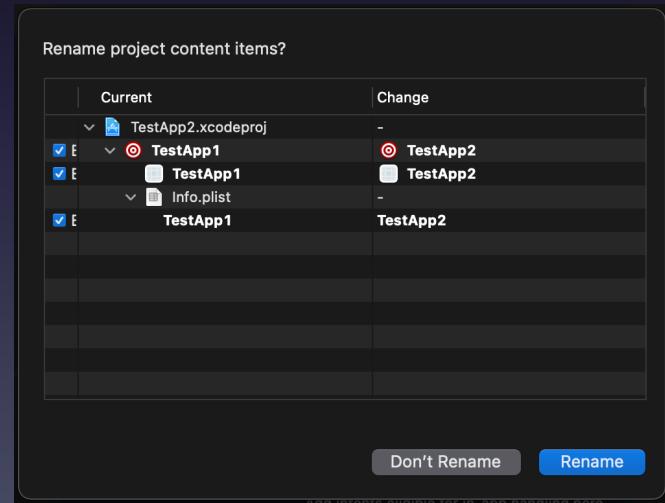
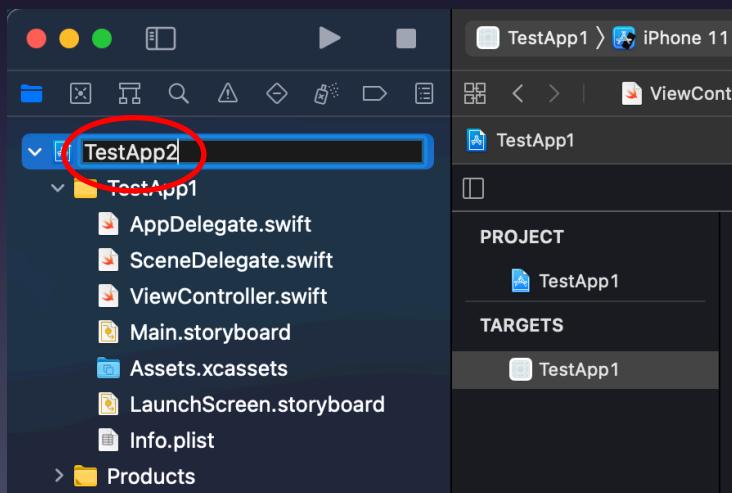
Rename App Display Name

- Add "Bundle display name" key to Info.plist



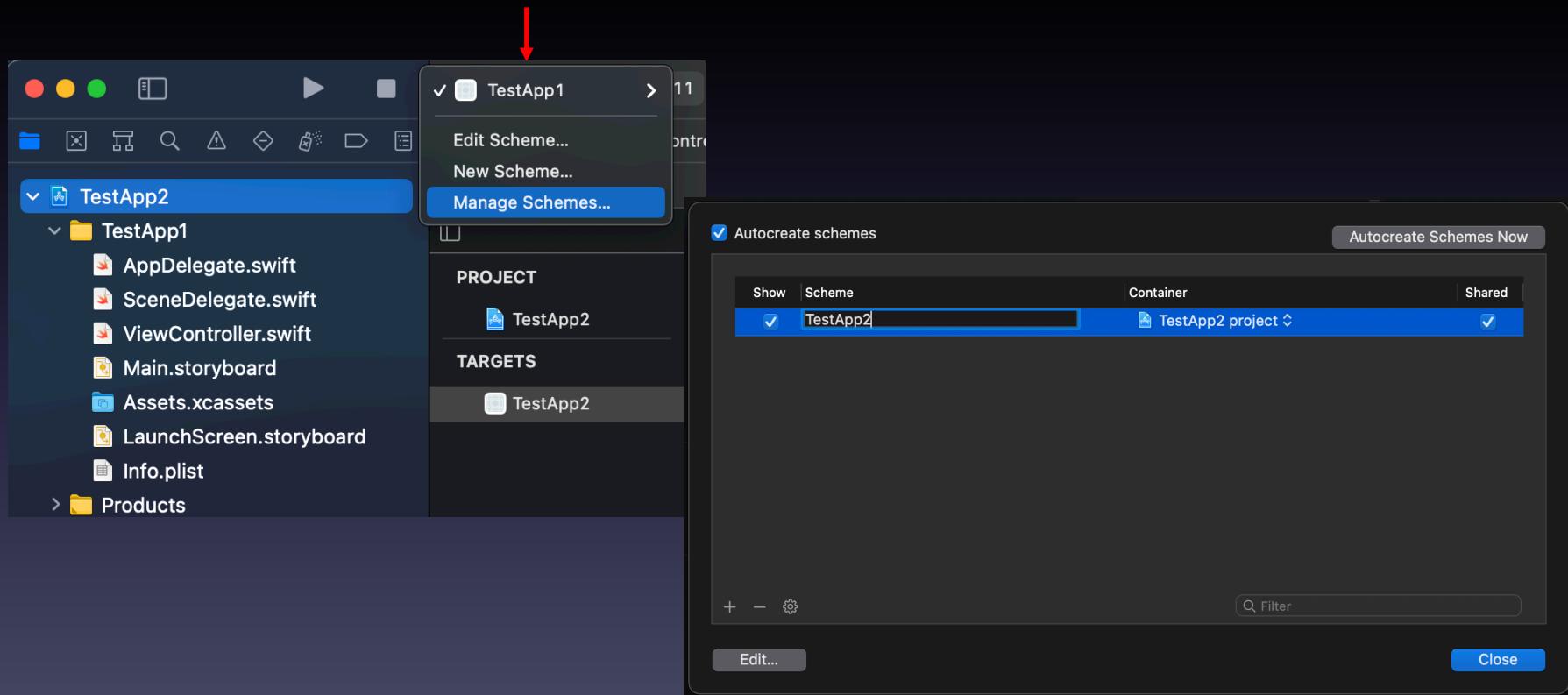
Rename Xcode Project

- Step 1: Change project name in upper left of file hierarchy
 - Rename project content items



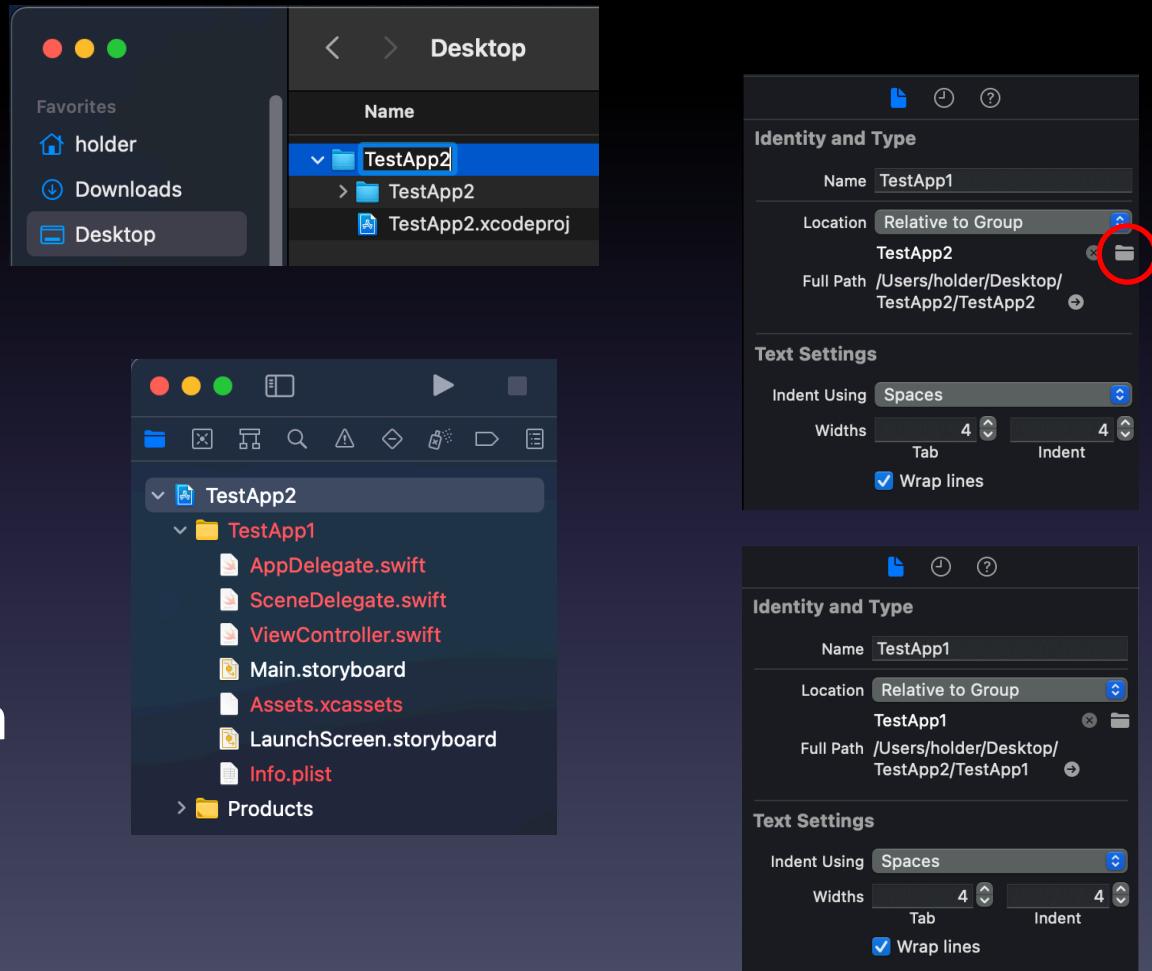
Rename Xcode Project

- Step 2: Rename scheme



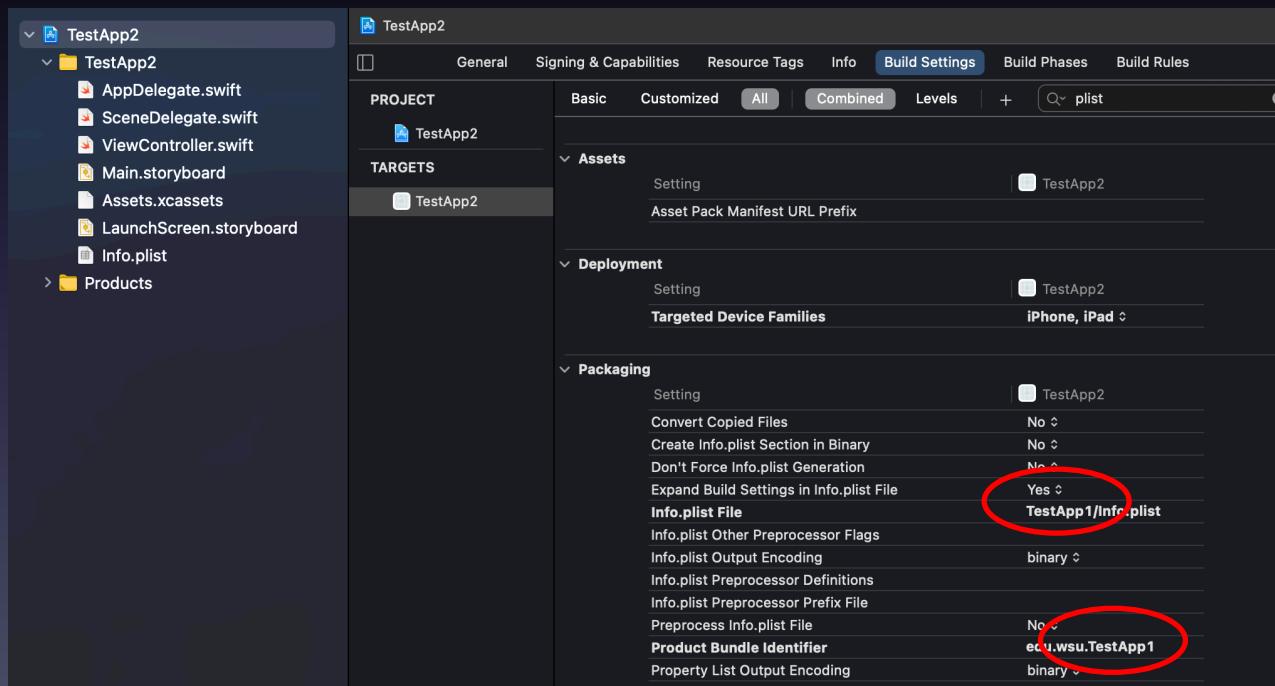
Renaming Xcode Project

- Step 3:
 - Exit Xcode
 - Rename main project folders
 - Restart Xcode
 - Fix file location errors



Renaming Xcode Project

- Step 4: Change "plist" items in Build Settings
 - Info.plist File, Product Bundle Identifier



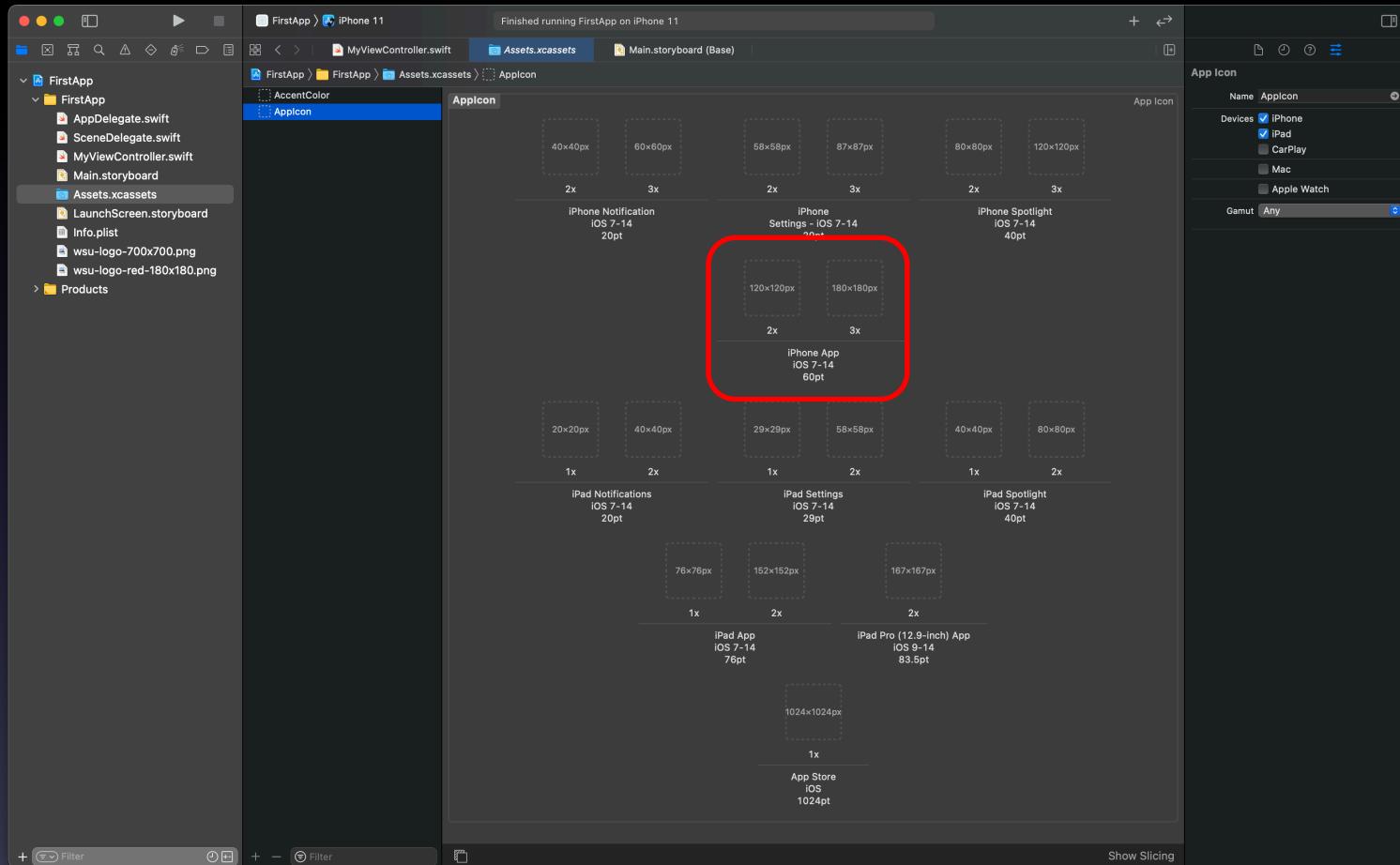
Done!

Add App Icons

Add App Icons



Add App Icons



Add App Icons

- Create main high-resolution icon
- Use app icon service to generate different resolutions
 - E.g., www.makeappicon.com
- Drag and drop into AppIcon assets



Add App Icons

Name	Date Modified	Size	Kind
> android	Today at 12:45 AM	--	Folder
> imessenger	Today at 12:45 AM	--	Folder
ios	Today at 12:45 AM	--	Folder
AppIcon.appiconset	Today at 12:45 AM	--	Folder
Contents.json	Nov 23, 2018 at 9:22 AM	3 KB	JSON Document
Icon-App-20x20@1x.png	Today at 8:41 AM	4 KB	PNG image
Icon-App-20x20@2x.png	Today at 8:41 AM	5 KB	PNG image
Icon-App-20x20@3x.png	Today at 8:41 AM	7 KB	PNG image
Icon-App-29x29@1x.png	Today at 8:41 AM	4 KB	PNG image
Icon-App-29x29@2x.png	Today at 8:41 AM	7 KB	PNG image
Icon-App-29x29@3x.png	Today at 8:41 AM	10 KB	PNG image
Icon-App-40x40@1x.png	Today at 8:41 AM	5 KB	PNG image
Icon-App-40x40@2x.png	Today at 8:41 AM	9 KB	PNG image
Icon-App-40x40@3x.png	Today at 8:41 AM	13 KB	PNG image
Icon-App-60x60@2x.png	Today at 8:41 AM	13 KB	PNG image
Icon-App-60x60@3x.png	Today at 8:41 AM	19 KB	PNG image
Icon-App-76x76@1x.png	Today at 8:41 AM	9 KB	PNG image
Icon-App-76x76@2x.png	Today at 8:41 AM	16 KB	PNG image
Icon-App-83.5x83.5@2x.png	Today at 8:41 AM	18 KB	PNG image
iTunesArtwork@2x.png	Today at 8:41 AM	103 KB	PNG image
iTunesArtwork@1x.png	Today at 8:41 AM	48 KB	PNG image
iTunesArtwork@2x.png	Today at 8:41 AM	103 KB	PNG image
iTunesArtwork@3x.png	Today at 8:41 AM	162 KB	PNG image
README.md	Apr 29, 2016 at 12:18 PM	1 KB	Markdo...cument
watchkit	Today at 12:45 AM	--	Folder
AppIcon.appiconset	Today at 12:45 AM	--	Folder
Contents.json	Sep 22, 2020 at 7:35 AM	3 KB	JSON Document
Icon-24@2x.png	Today at 8:40 AM	6 KB	PNG image
Icon-27.5@2x.png	Today at 8:40 AM	7 KB	PNG image
Icon-29@2x.png	Today at 8:40 AM	7 KB	PNG image
Icon-29@3x.png	Today at 8:40 AM	10 KB	PNG image
Icon-40@2x.png	Today at 8:41 AM	9 KB	PNG image
Icon-44@2x.png	Today at 8:41 AM	10 KB	PNG image
Icon-50@2x.png	Today at 8:41 AM	11 KB	PNG image
Icon-86@2x.png	Today at 8:41 AM	18 KB	PNG image
Icon-98@2x.png	Today at 8:40 AM	21 KB	PNG image
Icon-108@2x.png	Today at 8:40 AM	23 KB	PNG image
iTunesArtwork@2x.png	Today at 8:41 AM	116 KB	PNG image

Add App Icons

The screenshot shows the AppIcon tool interface. On the left, there's a grid of placeholder icons for various iOS and iPad app sizes. A red arrow points from the 60x60px placeholder icon in the top row to a file browser window on the right. The file browser shows a directory structure under 'ios' with several JSON and PNG files, including 'Icon-App-60x60@3x.png' which is highlighted.

Category	Icon Type	Dimensions	Platform	Version	Label
iPhone	Notification	40x40px	2x	iOS 7-14	iPhone Notification
	Notification	60x60px	3x	iOS 7-14	iPhone Notification
iPhone	Settings	58x58px	2x	iOS 7-14	iPhone Settings
	Settings	87x87px	3x	iOS 7-14	iPhone Settings
iPhone	Spotlight	80x80px	2x	iOS 7-14	iPhone Spotlight
	Spotlight	120x120px	3x	iOS 7-14	iPhone Spotlight
iPhone	App	20x20px	1x	iOS 7-14	iPhone App
	App	40x40px	2x	iOS 7-14	iPhone App
iPad	Notifications	29x29px	1x	iOS 7-14	iPad Notifications
	Notifications	58x58px	2x	iOS 7-14	iPad Notifications
iPad	Settings	40x40px	1x	iOS 7-14	iPad Settings
	Settings	80x80px	2x	iOS 7-14	iPad Settings
iPad	Spotlight	76x76px	1x	iOS 7-14	iPad Spotlight
	Spotlight	152x152px	2x	iOS 7-14	iPad Spotlight
iPad	App	167x167px	2x	iOS 7-14	iPad App
	App	1024x1024px	1x	iOS 7-14	iPad App
App Store					

File Browser:

Path	Name	Size	Type
ios	imessenger	Today at 12:45 AM	Folder
ios	AppIcon.appiconset	Today at 12:46 AM	Folder
ios	Contents.json	Today at 12:45 AM	JSON Document
ios	Icon-App-20x20@1x.png	Nov 23, 2018 at 9:22 AM	PNG image
ios	Icon-App-20x20@2x.png	Today at 8:41 AM	PNG image
ios	Icon-App-29x29@1x.png	Today at 8:41 AM	PNG image
ios	Icon-App-29x29@2x.png	Today at 8:41 AM	PNG image
ios	Icon-App-29x29@3x.png	Today at 8:41 AM	PNG image
ios	Icon-App-40x40@1x.png	Today at 8:41 AM	PNG image
ios	Icon-App-40x40@2x.png	Today at 8:41 AM	PNG image
ios	Icon-App-40x40@3x.png	Today at 8:41 AM	PNG image
ios	Icon-App-60x60@2x.png	Today at 8:41 AM	PNG image
ios	Icon-App-60x60@3x.png	Today at 8:41 AM	PNG image
ios	Icon-App-76x76@1x.png	Today at 8:41 AM	PNG image
ios	Icon-App-76x76@2x.png	Today at 8:41 AM	PNG image
ios	Icon-App-83.5x83.5@2x.png	Today at 8:41 AM	PNG image
ios	iTunesArtwork@2x.png	Today at 8:41 AM	PNG image
ios	iTunesArtwork@1x.png	Today at 8:41 AM	PNG image
ios	iTunesArtwork@2x.png	Today at 8:41 AM	PNG image
ios	iTunesArtwork@3x.png	Today at 8:41 AM	PNG image
ios	README.md	Apr 29, 2016 at 12:18 PM	Markdo...ument
watchkit	AppIcon.appiconset	Today at 12:45 AM	Folder
watchkit	Contents.json	Today at 12:45 AM	JSON Document
watchkit	Icon-24@2x.png	Today at 8:40 AM	PNG image
watchkit	Icon-27.5@2x.png	Today at 8:40 AM	PNG image
watchkit	Icon-29@2x.png	Today at 8:40 AM	PNG image
watchkit	Icon-29@3x.png	Today at 8:40 AM	PNG image
watchkit	Icon-40@2x.png	Today at 8:41 AM	PNG image
watchkit	Icon-44@2x.png	Today at 8:41 AM	PNG image

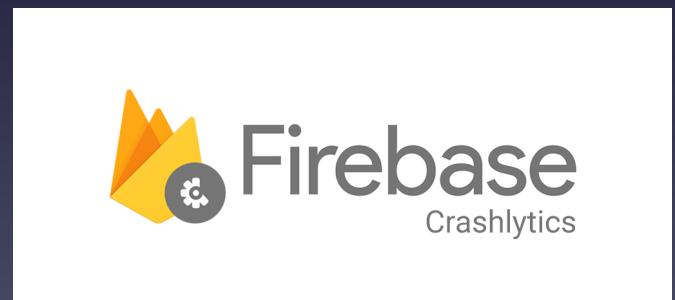
Package Management with CocoaPods

Package Management with CocoaPods

- <https://cocoapods.org>
- MacOS installation (using Ruby)
 - `sudo gem install cocoapods`
- Create Podfile in top-level app directory
 - `pod init`
- Add pods to Podfile
- Install dependencies
 - `pod install`
- Open `.xcworkspace` version of project

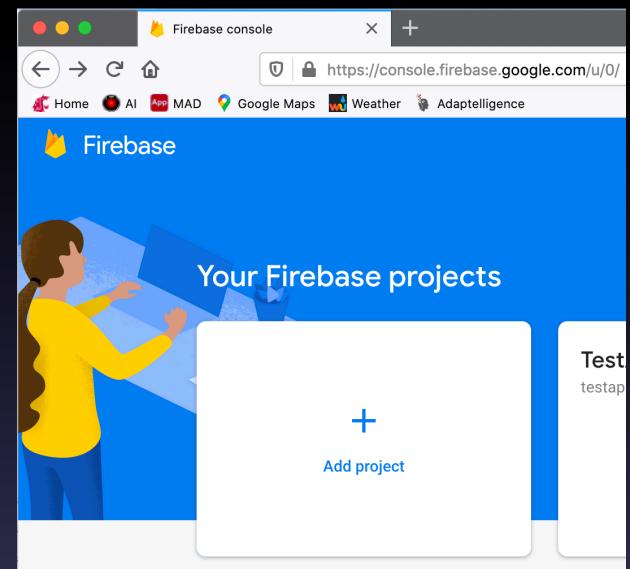
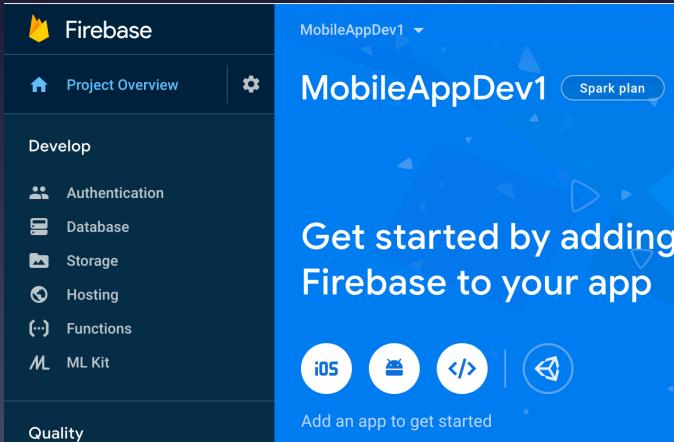
CocoaPods Example: Crashlytics

- How to know when your deployed app crashes?
- <https://firebase.google.com/docs/crashlytics>
- Free for small deployments



Firebase Console

- console.firebaseio.google.com
- Add project
- Add Firebase to your iOS app



Podfile Example: Crashlytics

```
> pod init
```

```
# Podfile

target 'CrashApp' do
  use_frameworks!

  pod 'Fabric'
  pod 'Crashlytics'
  pod 'Firebase/Analytics'

end
```

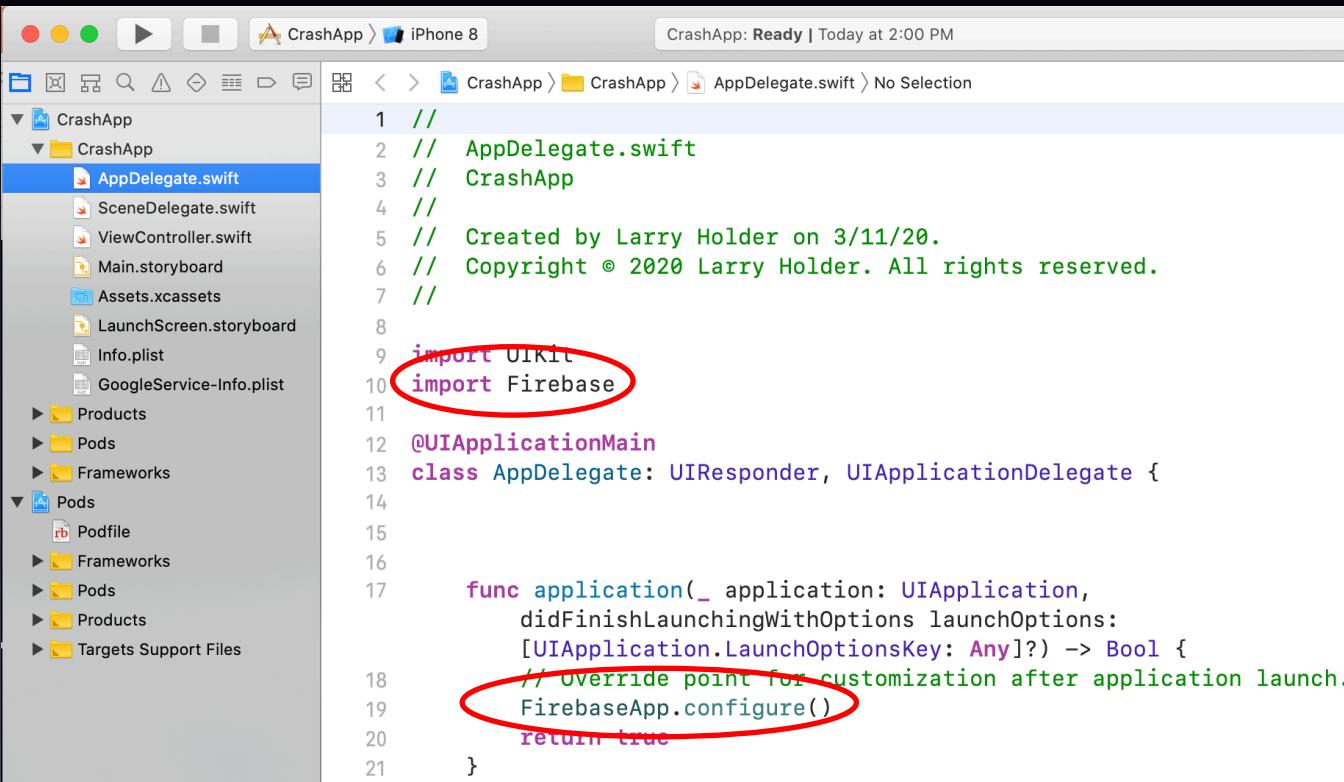
```
> pod install
```

```
...
```

```
[!] Please close any current Xcode sessions and use
'CrashApp.xcworkspace' for this project from now on.
```

CocoaPods

- Import Firebase and initialization in AppDelegate



The screenshot shows the Xcode interface with the project 'CrashApp' open. The left sidebar displays the project structure, including files like AppDelegate.swift, SceneDelegate.swift, ViewController.swift, Main.storyboard, Assets.xcassets, LaunchScreen.storyboard, Info.plist, and GoogleService-Info.plist. The right pane shows the code editor with the AppDelegate.swift file selected. Two specific lines of code are circled with red ovals: 'import Firebase' at line 10 and 'FirebaseApp.configure()' at line 19. The code itself is as follows:

```
// AppDelegate.swift
// CrashApp
//
// Created by Larry Holder on 3/11/20.
// Copyright © 2020 Larry Holder. All rights reserved.

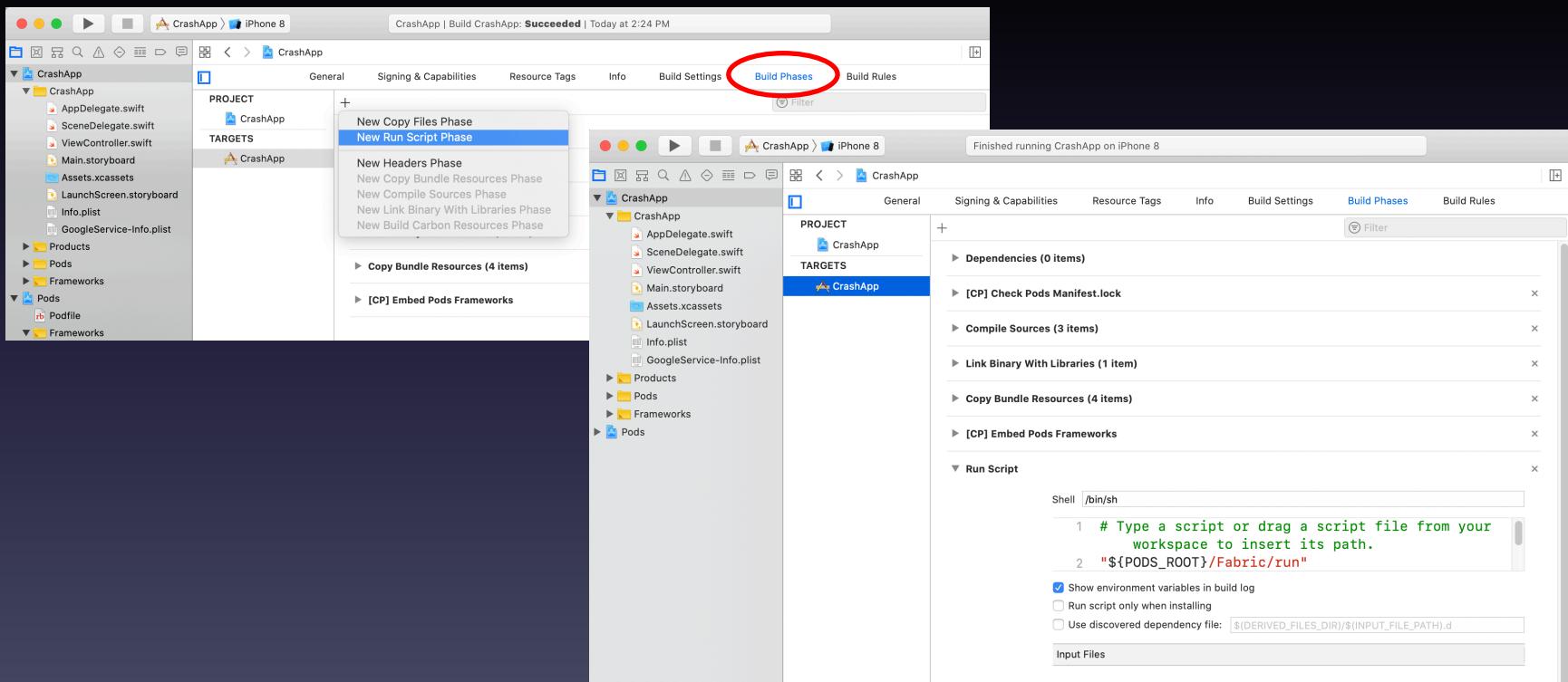
import UIKit
import Firebase

@UIApplicationMain
class AppDelegate: UIResponder, UIApplicationDelegate {

    func application(_ application: UIApplication,
                     didFinishLaunchingWithOptions launchOptions:
                     [UIApplication.LaunchOptionsKey: Any]?) -> Bool {
        // Override point for customization after application launch.
        FirebaseApp.configure()
        return true
    }
}
```

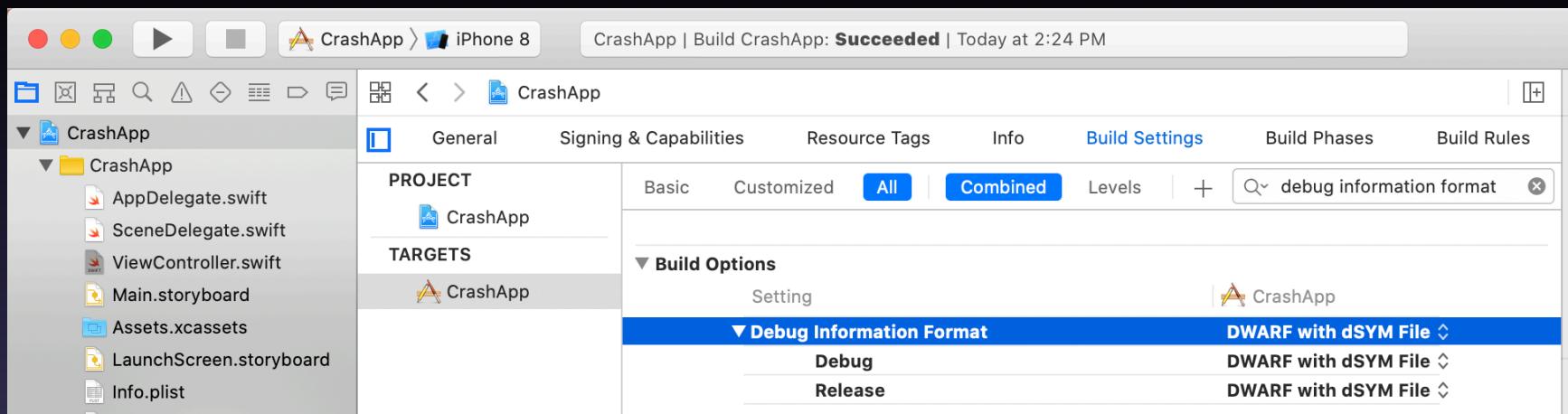
Crashlytics Extra Steps (1)

- Add a Run Script Build Phase



Crashlytics Extra Steps (2)

- Collect symbols



Crashlytics Example

- Add code to crash the app
 - Can collect various information

```
import Crashlytics

@IBAction func crashMeTapped(_ sender: UIButton) {

    // Store some user info
    Crashlytics.sharedInstance().setUserIdentifier("Larry")

    // Crash the app
    Crashlytics.sharedInstance().crash()
}
```

Crashlytics Example

- Crash the app
 - Run app from Xcode to install on simulator/device
 - Run app without Xcode directly on simulator/device
 - Crash the app
 - `Crashlytics.sharedInstance().crash()`
 - Run app again from Xcode (sends crash report)
 - View on Firebase Crashlytics dashboard

Crashlytics Example

The screenshot shows the Firebase Crashlytics dashboard for a project named "MobileAppDev". A specific crash issue for "ViewController.swift line 17" is highlighted. The dashboard provides a summary of the crash, including the number of events, affected users, and a timeline of events. It also displays device, operating system, and device state statistics. Below the summary, a detailed stack trace is shown, revealing the error occurred on the main thread.

Total events by version
for the last 7 days

Version	Events
1.0 (1)	1
2	2

Sessions All versions ▾

Session summary: 1.0 (1) iOS 13.3.0 (19D76) iOS Simulator (iPhone) Mar 13, 2020, 2:54:00 PM

Stack trace

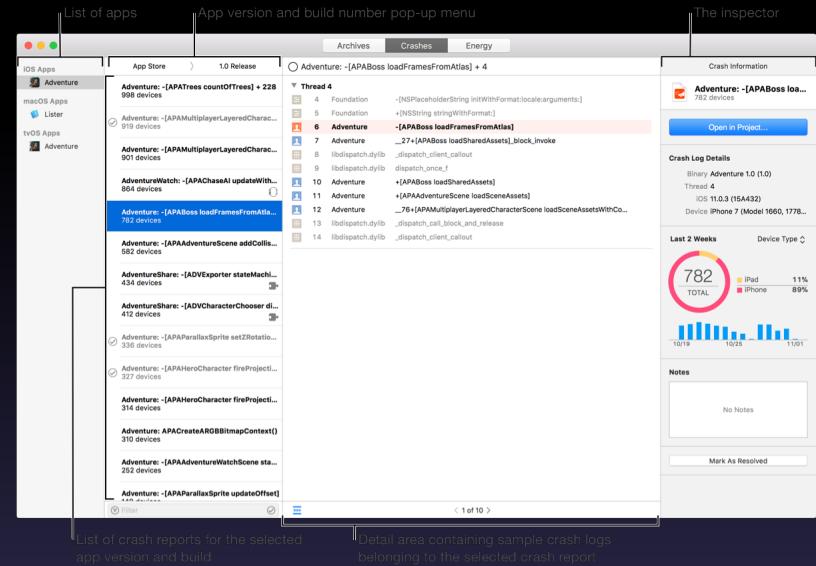
```
Crashed: com.apple.main-thread
EXC_BAD_INSTRUCTION EXC_I386_INVOP 0x0000000000000000

0 CrashApp -[Crashlytics crash] + 4
1 CrashApp ViewController.swift - Line 17
ViewController.crashMeTapped() + 17
2 CrashApp <compiler-generated> - Line 68
@objc ViewController.crashMeTapped() + 68
3 UIKitCore -[UIApplication sendAction:to:from:forEvent:] + 83
18 UIKitCore UIApplicationMain + 1621
19 CrashApp AppDelegate.swift - Line 13
main + 13
20 libdyld.dylib start + 1
```

Show all 13 threads

Other Crash Tools

- Xcode (iOS)
 - Once app on App Store or Test Flight



Other Package Management Tools

- Carthage
 - <https://github.com/Carthage/Carthage>
 - Similar to CocoaPods, but decentralized
- Swift Package Manager
 - <https://swift.org/package-manager/>

Resources

- iOS App Info.plist keys
 - <https://developer.apple.com/library/archive/documentation/General/Reference/InfoPlistKeyReference/Introduction/Introduction.html>
- Rename Xcode project
 - <https://stackoverflow.com/questions/33370175/how-do-i-completely-rename-an-xcode-project-inclusive-of-folders>