

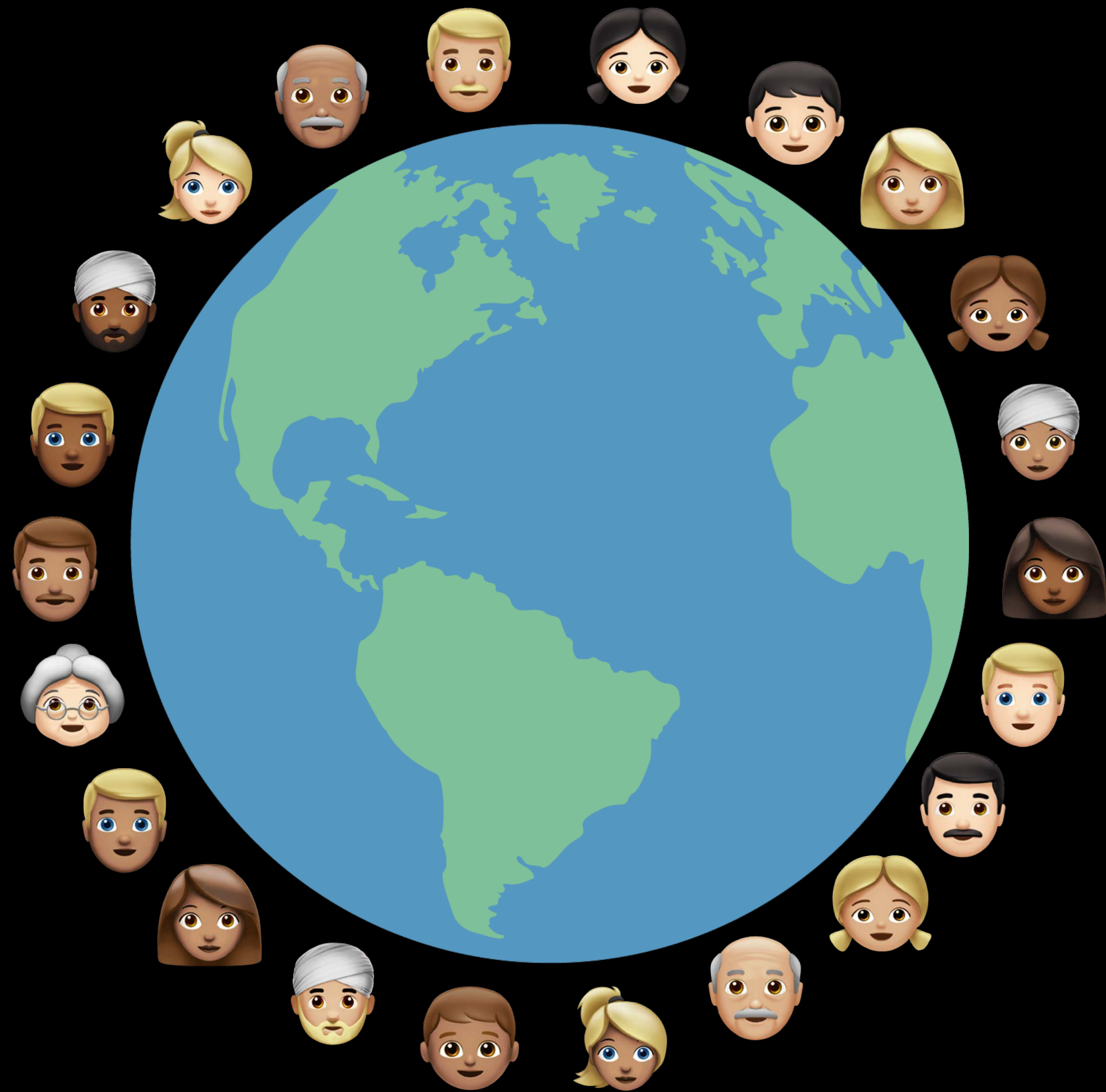
Localizing with Xcode 9

Session 401

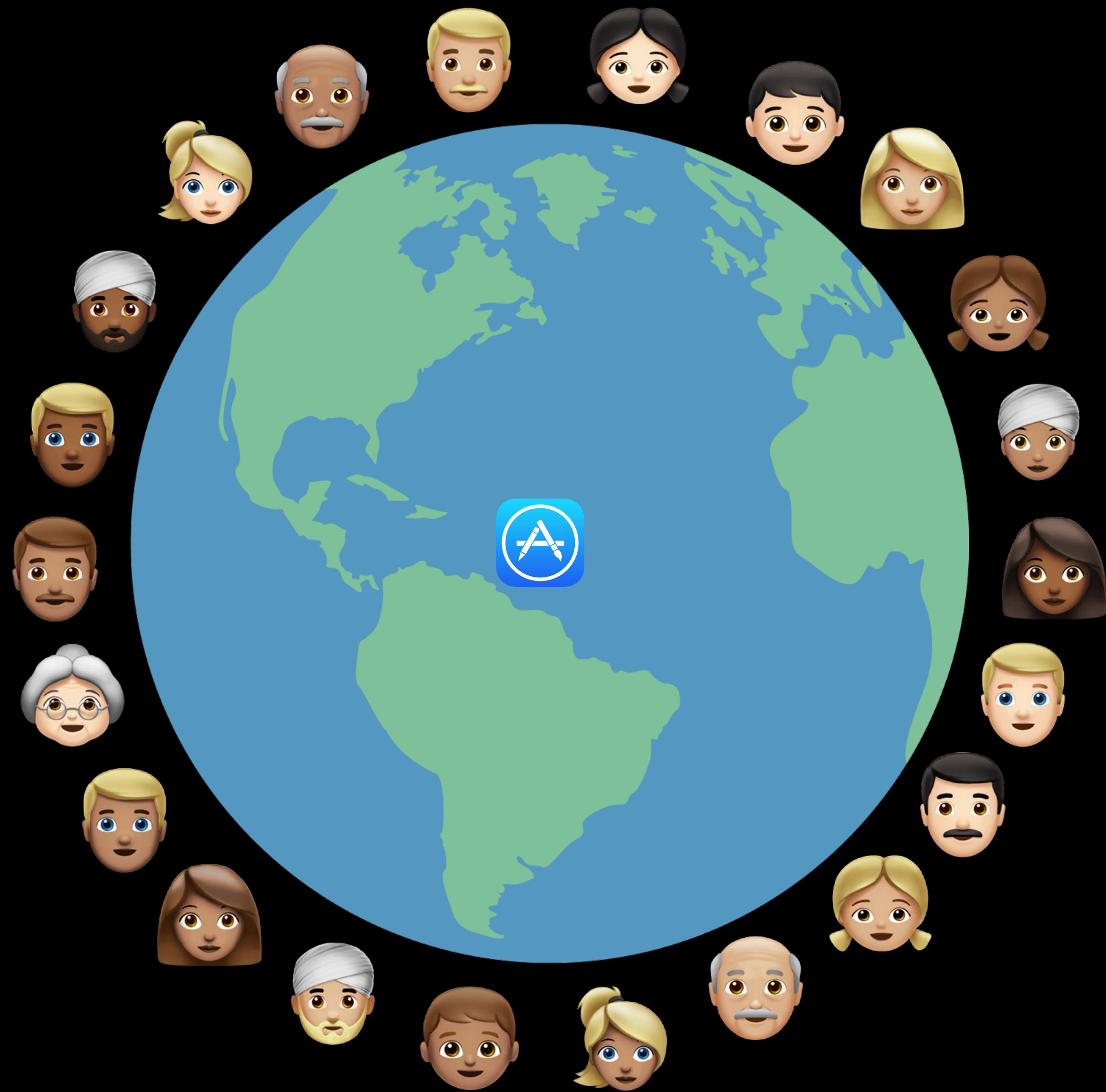
Sara Radi, Software Engineer

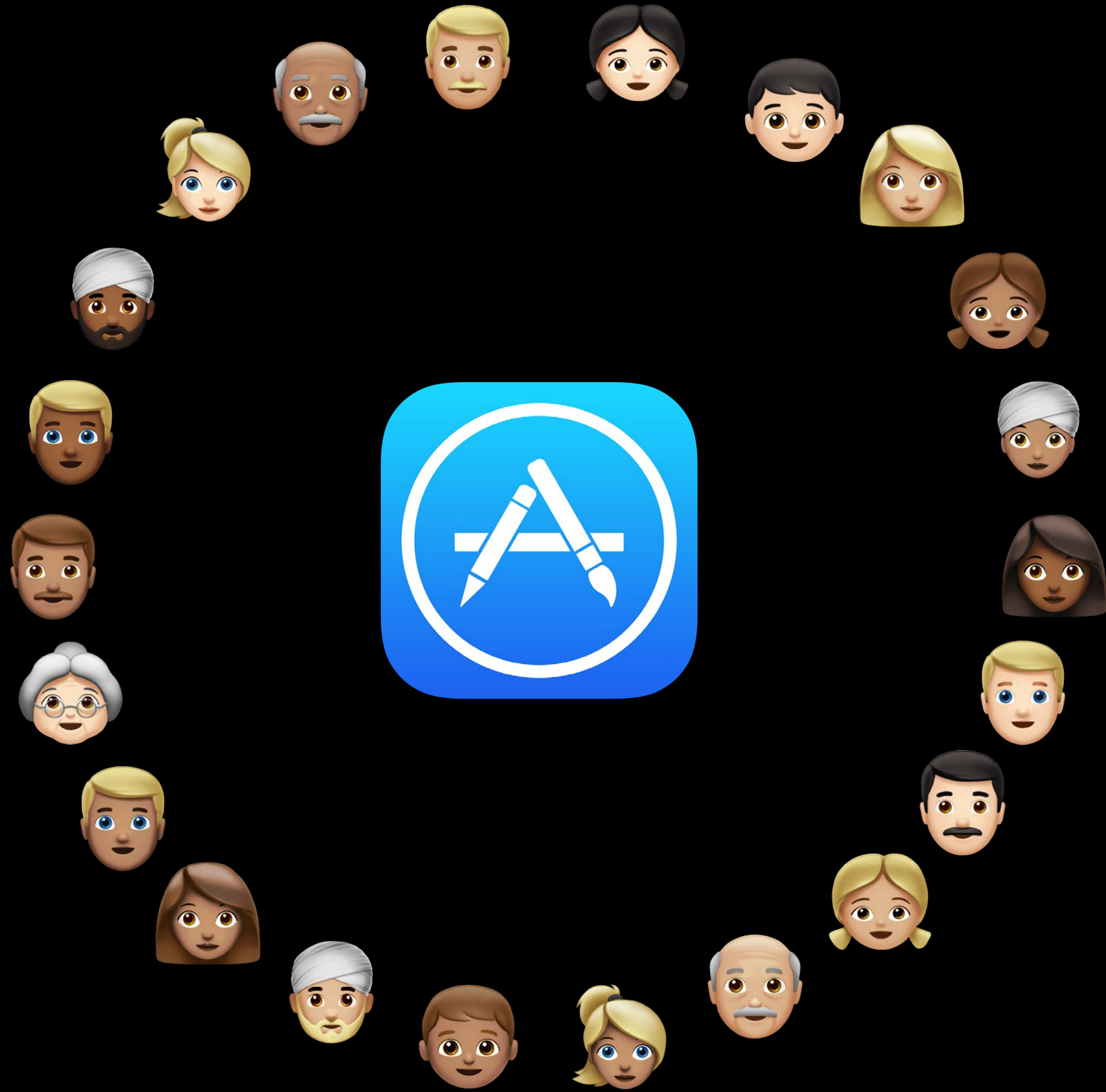
Aya Siblani, Software Engineer

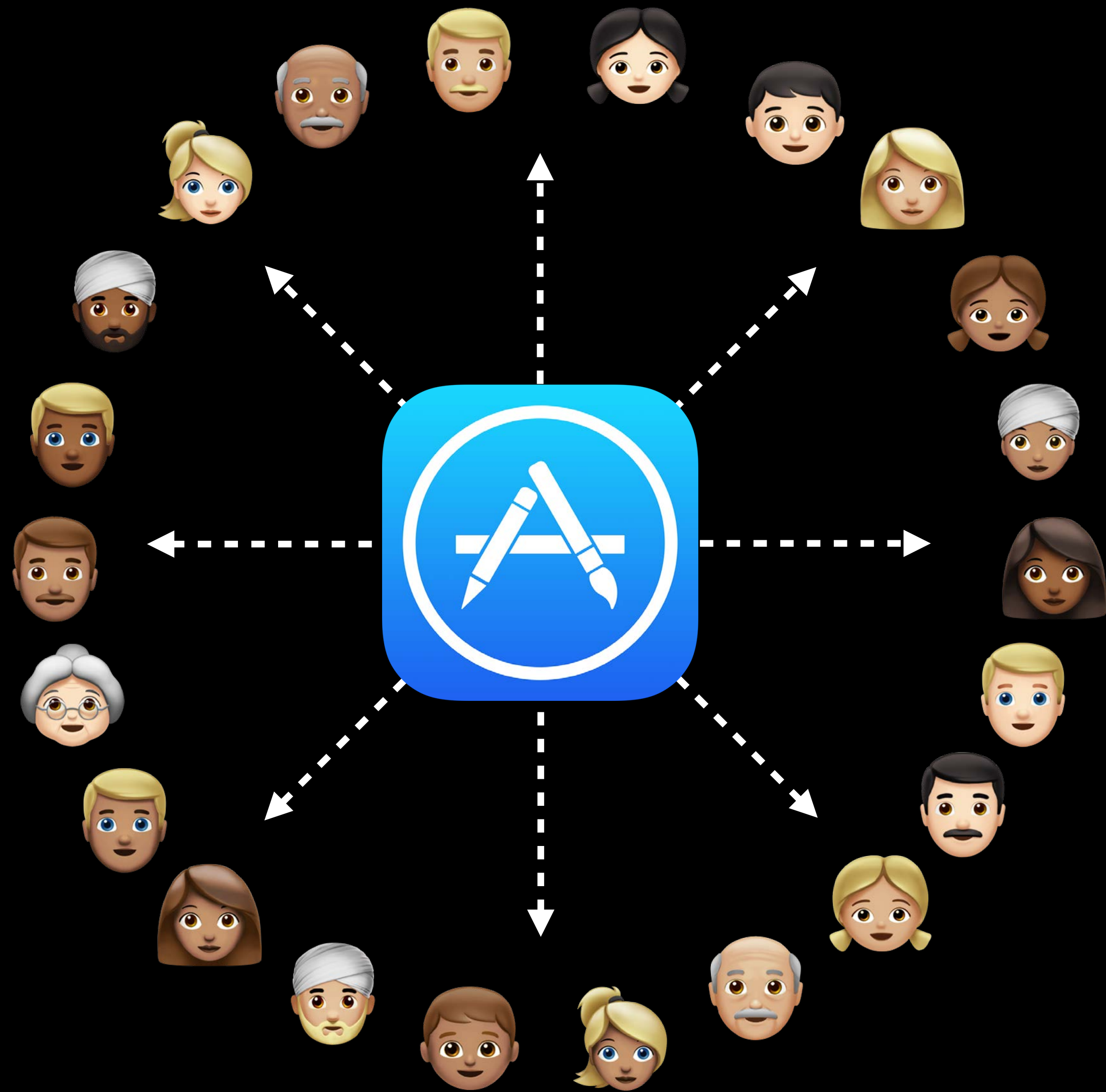
Chris Hanson, Software Engineer











Agenda

Agenda

Internationalization

Agenda

Internationalization

Xcode Localization Workflow

Agenda

Internationalization

Xcode Localization Workflow

Testing

Internationalization

Sara Radi, Software Engineer

Cupertino

Mostly Sunny

82°

Sunday Today 90 56

10AM	11AM	12PM	1PM	2PM
75°	80°	84°	87°	89°

Monday		91 58
Tuesday		86 54
Wednesday		81 54
Thursday		70 52
Friday		69 50
Saturday		74 50

库比提诺

晴间多云

28°

星期日 今天 32 13

上午10时	上午11时	下午12时	下午1时	下午2时
24°	27°	29°	31°	32°

星期一		33 14
星期二		30 12
星期三		27 12
星期四		21 11
星期五		21 10
星期六		23 10

Cupertino

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82°

Sunday Today

90 56

10AM	11AM	12PM	1PM	2PM
75°	80°	84°	87°	89°

Monday		91	58
Tuesday		86	54
Wednesday		81	54
Thursday		70	52
Friday		69	50
Saturday		74	50

Cupertino

Κυρίως ηλιοφάνεια

28°

Κυριακή Σήμερα

32 13

Τώρα	7 μμ	8 μμ	8:15 μμ	9 μμ
28°	28°	24°	Δύση	22°

Δευτέρα		33	14
Τρίτη		30	12
Τετάρτη		27	12
Πέμπτη		21	11
Παρασκευή		21	10
Σάββατο		23	10

Cupertino

Mostly Sunny

82°

Sunday Today 90 56

10AM	11AM	12PM	1PM	2PM
75°	80°	84°	87°	89°

Monday		91	58
Tuesday		86	54
Wednesday		81	54
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Saturday		74	50

Cupertino

แดดออกเป็นส่วนมาก

28°

วันอาทิตย์ วันนี้ 32 14

10	11	12	13	14	15
24°	26°	29°	30°	32°	32°

วันจันทร์		33	14
วันอังคาร		30	13
วันพุธ		27	12
วันพฤหัสบดี		22	12
วันศุกร์		21	11
วันเสาร์		23	11



9:41 AM

100%

Cupertino

Mostly Sunny

82°

Sunday Today

90 56

10AM

11AM

12PM

1PM

2PM



75°

80°

84°

87°

89°

Monday



91 58

Tuesday



86 54

Wednesday



81 54

Thursday



70 52

Friday



69 50

Saturday



74 50



100%

٩:٤١ ص



كوبرتينو

مشمس أغلب الوقت

٢٨°

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الأحد اليوم

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١٠ ص



٣٢°

٣٢°

٣١°

٢٩°

٢٧°

٢٤°

١٤ ٣٣



الاثنين

١٢ ٣٠



الثلاثاء

١٢ ٢٧



الأربعاء

١١ ٢١



الخميس

١٠ ٢١



الجمعة

١٠ ٢٣



السبت



Strings Management

Formatting

User Interface

Strings Management

Strings Management

Prepare your strings for translation

Strings Management

Prepare your strings for translation

Use `NSLocalizedString` to load strings in code

Strings Management

Prepare your strings for translation

Use `NSBundleLocalizedString` to load strings in code

Use `localizedStringWithFormat` to get a localized formatted string

```
// Set a label's text
label.text = "Population"

// Set a label's text to a localized string
label.text = NSLocalizedString("Population", comment: "Label preceding the population value")

// Load localized string from a specific table
label.text = NSLocalizedString("Population", tableName: "Localizable", bundle: .main, value:
nil, comment: "Label preceding the population value")

// Create a formatted string
let format = NSLocalizedString("%d popular languages", comment: "Number of popular languages")
label.text = String.localizedStringWithFormat(format, popularLanguages.count)
```

```
// Set a label's text
```

```
label.text = "Population"
```

```
// Set a label's text to a localized string
```

```
label.text = NSLocalizedString("Population", comment: "Label preceding the population value")
```

```
// Load localized string from a specific table
```

```
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nil, comment: "Label preceding the population value")
```

```
// Create a formatted string
```

```
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```



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```

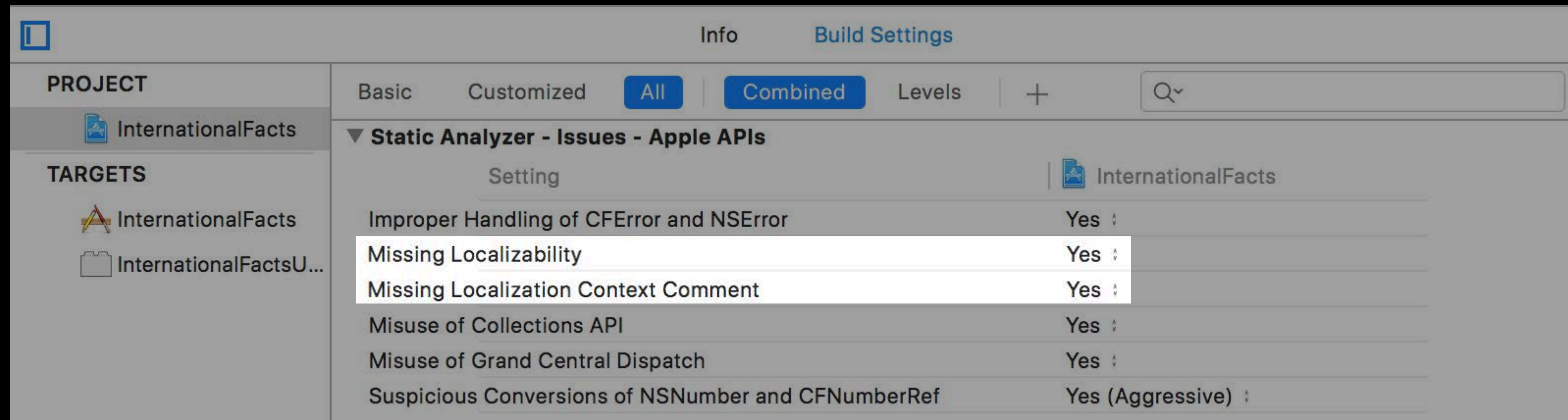
Strings Management

fr.lproj/Localizable.strings

```
/* Title label's text */  
"International Facts" = "Faits Internationaux";  
  
/* Label prompting a user to choose a territory */  
"Territory" = "Territoire";
```

Strings Management

Static analyzer



The screenshot shows the Xcode interface for the Static Analyzer. The left sidebar displays the project 'InternationalFacts' and its targets. The main area is titled 'Static Analyzer - Issues - Apple APIs' and shows a list of settings for the 'InternationalFacts' target. The settings are as follows:

Setting	Value
Improper Handling of CFError and NSError	Yes
Missing Localizability	Yes
Missing Localization Context Comment	Yes
Misuse of Collections API	Yes
Misuse of Grand Central Dispatch	Yes
Suspicious Conversions of NSNumber and CFNumberRef	Yes (Aggressive)

Strings Management

Static analyzer

```
– (UITableViewCell *)tableView: (UITableView *)tableView cellForRowAtIndexPath:  
  (NSIndexPath *)indexPath {  
  UITableViewCell *cell = [tableView dequeueReusableCellWithIdentifier:@"Cell"  
    forIndexPath:indexPath];  
  
  cell.textLabel.text = @"Details";  
  
  return cell;  
}
```



User-facing text should use localized string macro

Strings Management

Formatting

User Interface



100%

6:40

Monday, June 5

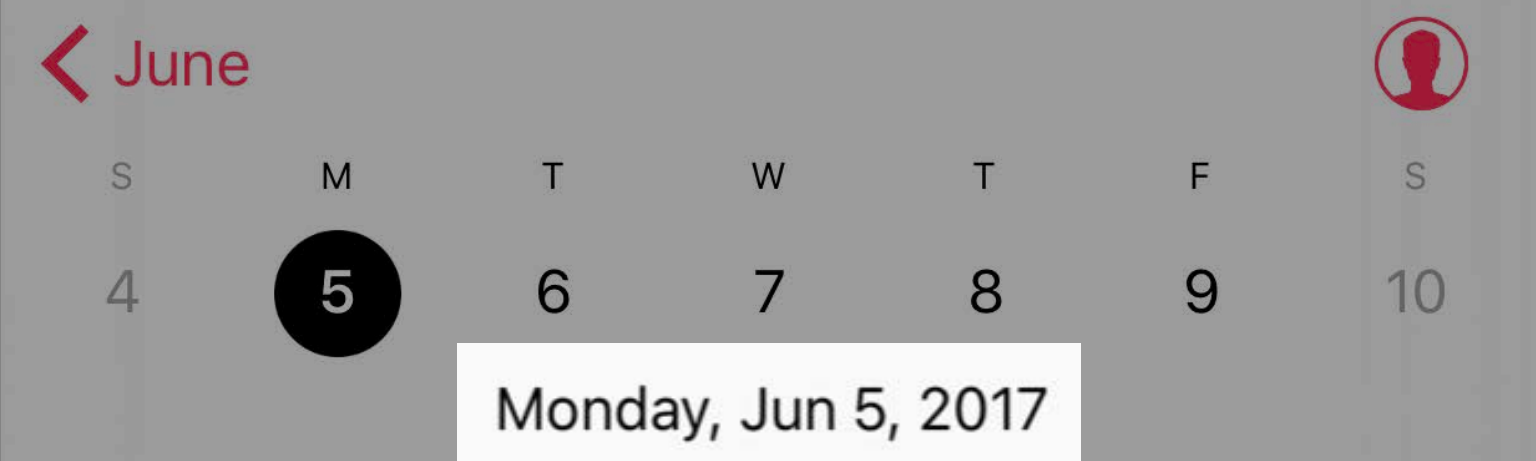


100%

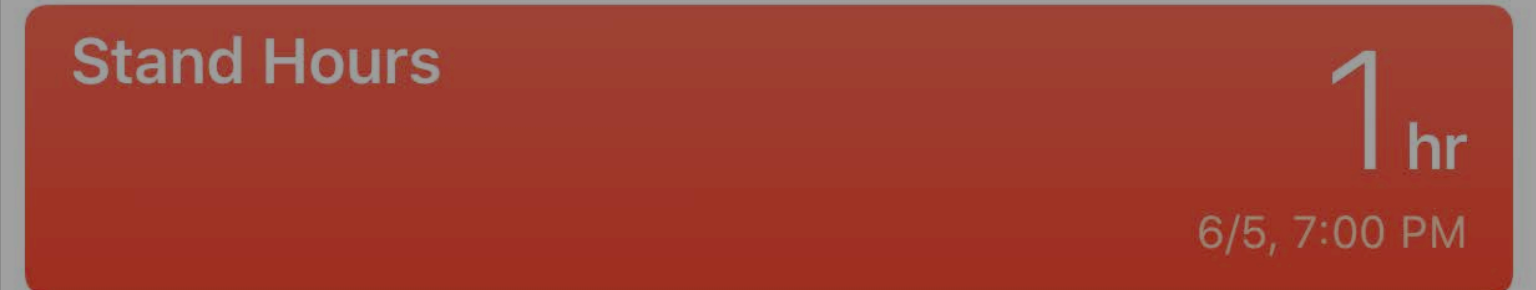
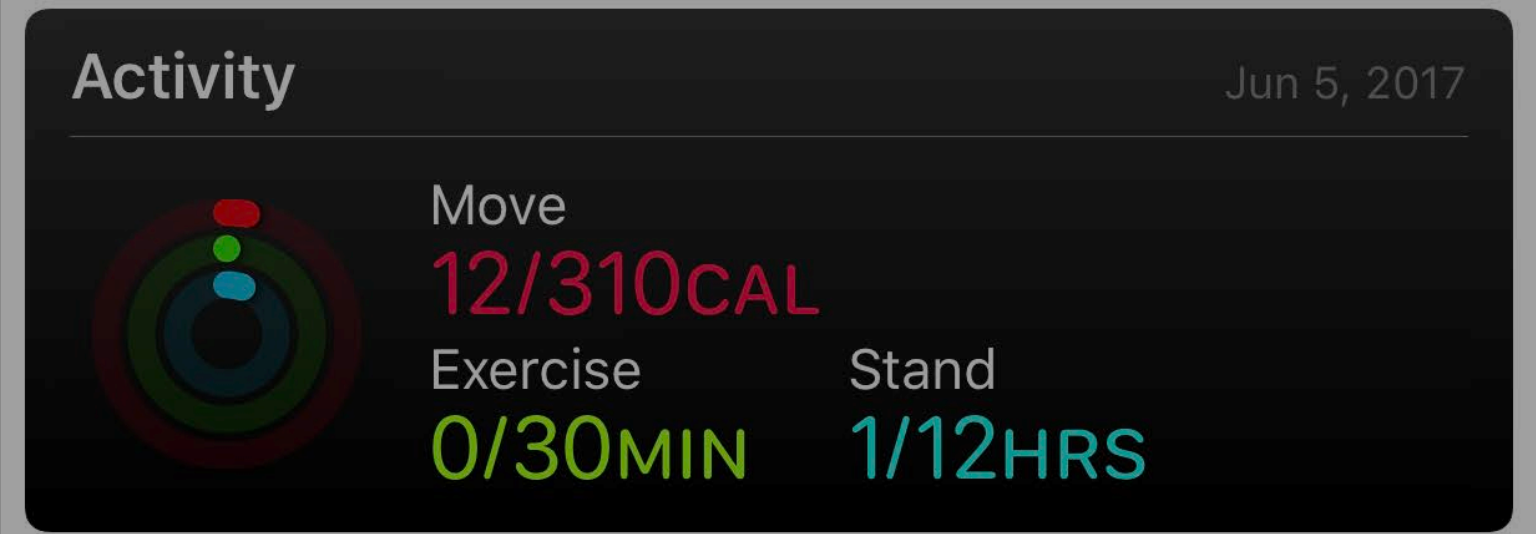
18:40

Lundi 5 juin





Activity



Vitals



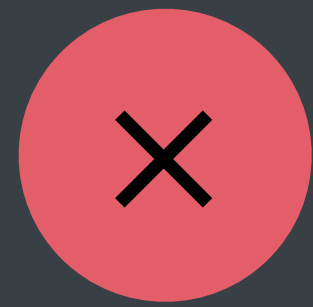
Formatters

Date and time

```
let formatter = DateFormatter()  
formatter.dateFormat = "EEEE, MMMM d, yyyy"  
let str = formatter.string(from: date)
```


Formatters

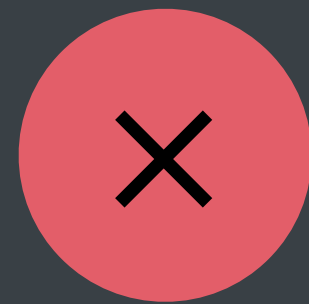
Date and time



```
let formatter = DateFormatter()  
formatter.dateFormat = "EEEE, MMMM d, yyyy"  
let str = formatter.string(from: date)
```

Formatters

Date and time



```
let formatter = DateFormatter()  
formatter.dateFormat = "EEEE, MMMM d, yyyy"  
let str = formatter.string(from: date)
```



```
let formatter = DateFormatter()  
formatter.dateStyle = .full  
let str = formatter.string(from: date)
```

< June



S M T W T F S
4 5 6 7 8 9 10

Monday, Jun 5, 2017

Activity

Activity

Jun 5, 2017



Move

12/310 CAL

Exercise

0/30 MIN

Stand

1/12 HRS

Resting Energy

2,672 kcal

6/6, 12:44 AM

Stand Hours

1 hr

6/5, 7:00 PM

Active Energy

12.8 kcal

6/5, 6:44 PM

Vitals

Heart Rate

63 bpm

6/5, 6:44 PM



Today



Health Data



Sources



Medical ID

< juin



D L M M J V S
4 5 6 7 8 9 10

Lundi 5 juin 2017

Activité

Activité

5 juin 2017



Bouger

12 CAL/310

M'entraîner

0 MN/30

Me lever

1 H/12

Énergie au repos

2 672 kcal

06/06 à 00:44

Heures debout

1 h

05/06 à 19:00

Énergie en activité

12,8 kcal

05/06 à 18:44

Signes vitaux

Rythme cardiaque

63 bpm

05/06 à 18:44



Aujourd'hui



Données Santé



Sources



Fiche médicale

Formatters

DateFormatter

DateComponentsFormatter

DateIntervalFormatter

PersonNameComponentsFormatter

NumberFormatter

ByteCountFormatter

EnergyFormatter

LengthFormatter

MassFormatter

MeasurementFormatter

Measurements and Units

WWDC 2016

Internationalization Best Practices

WWDC 2016

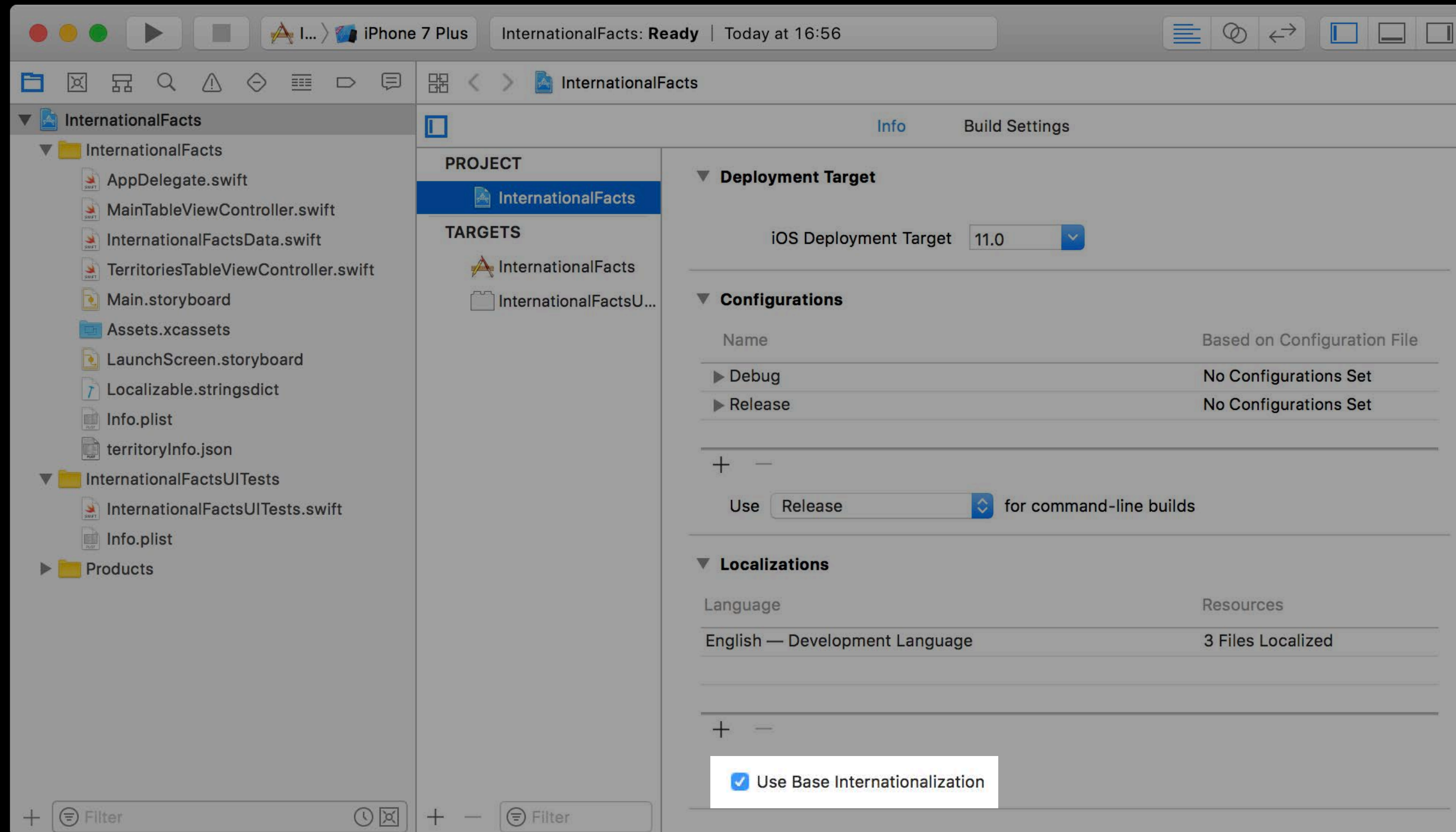
Strings Management

Formatting

User Interface

User Interface

Base internationalization

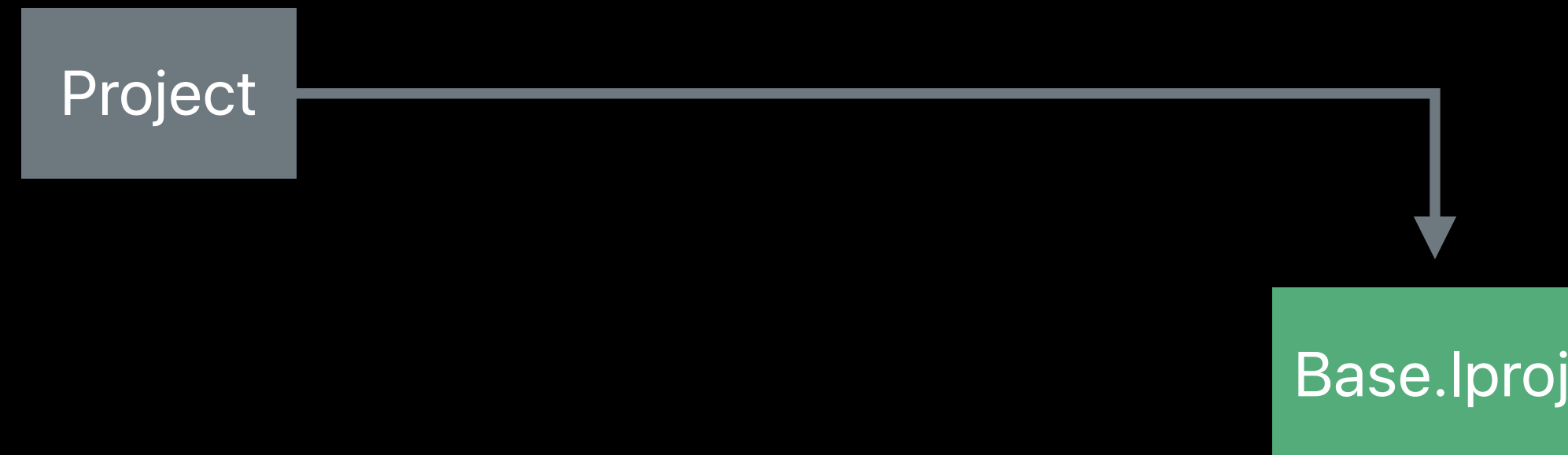


Localized Resources Structure

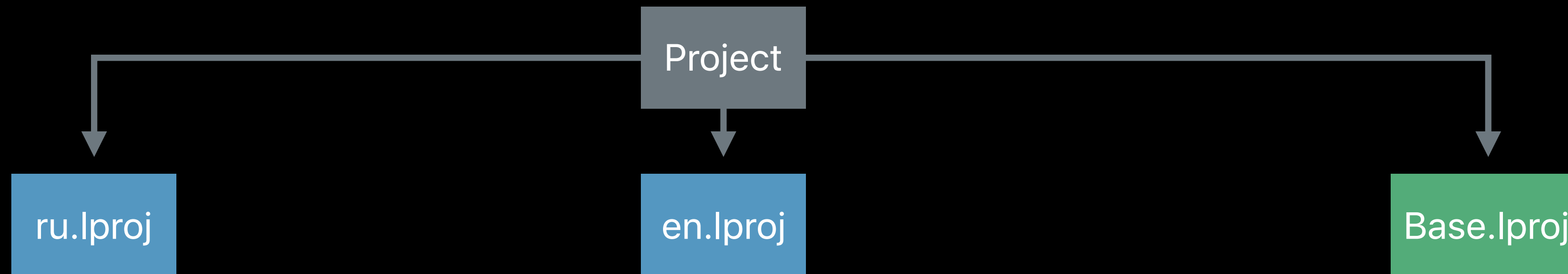
Localized Resources Structure

Project

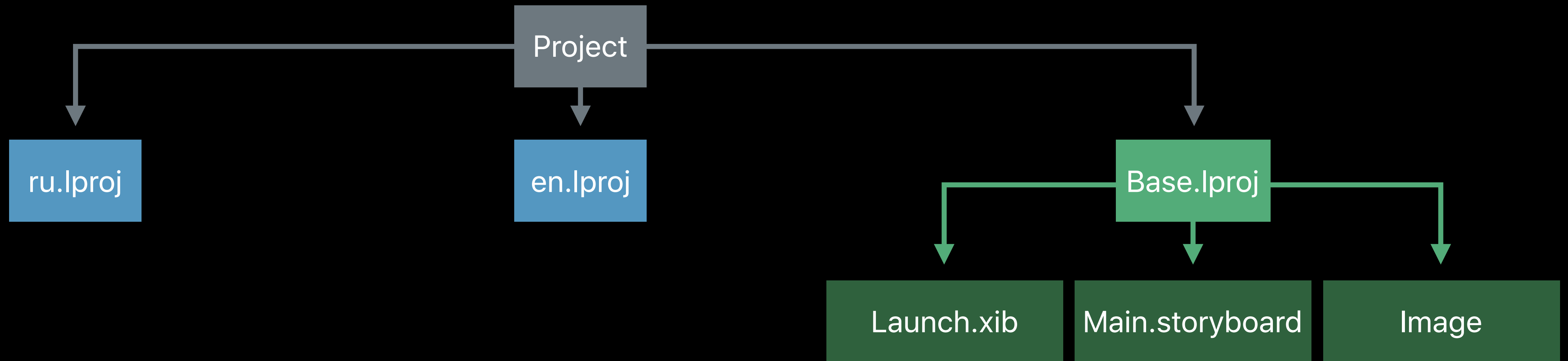
Localized Resources Structure



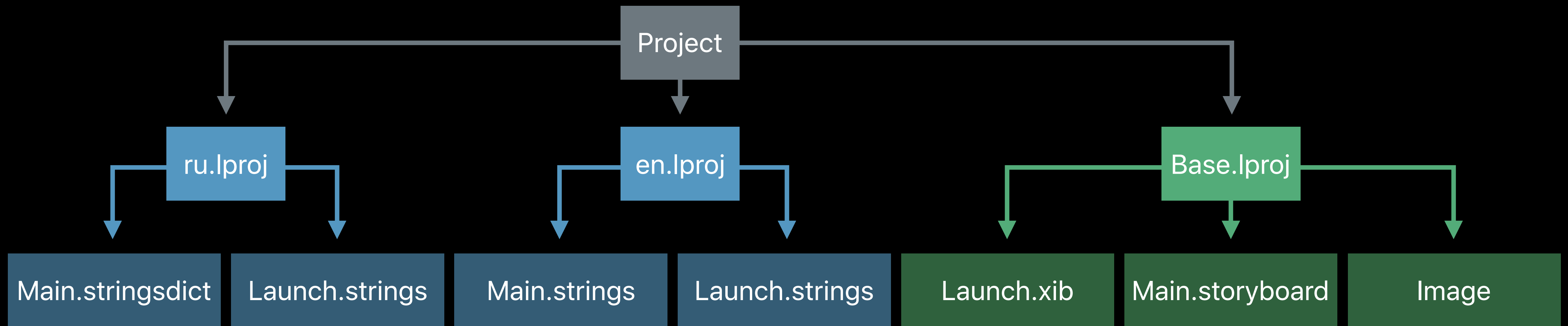
Localized Resources Structure



Localized Resources Structure

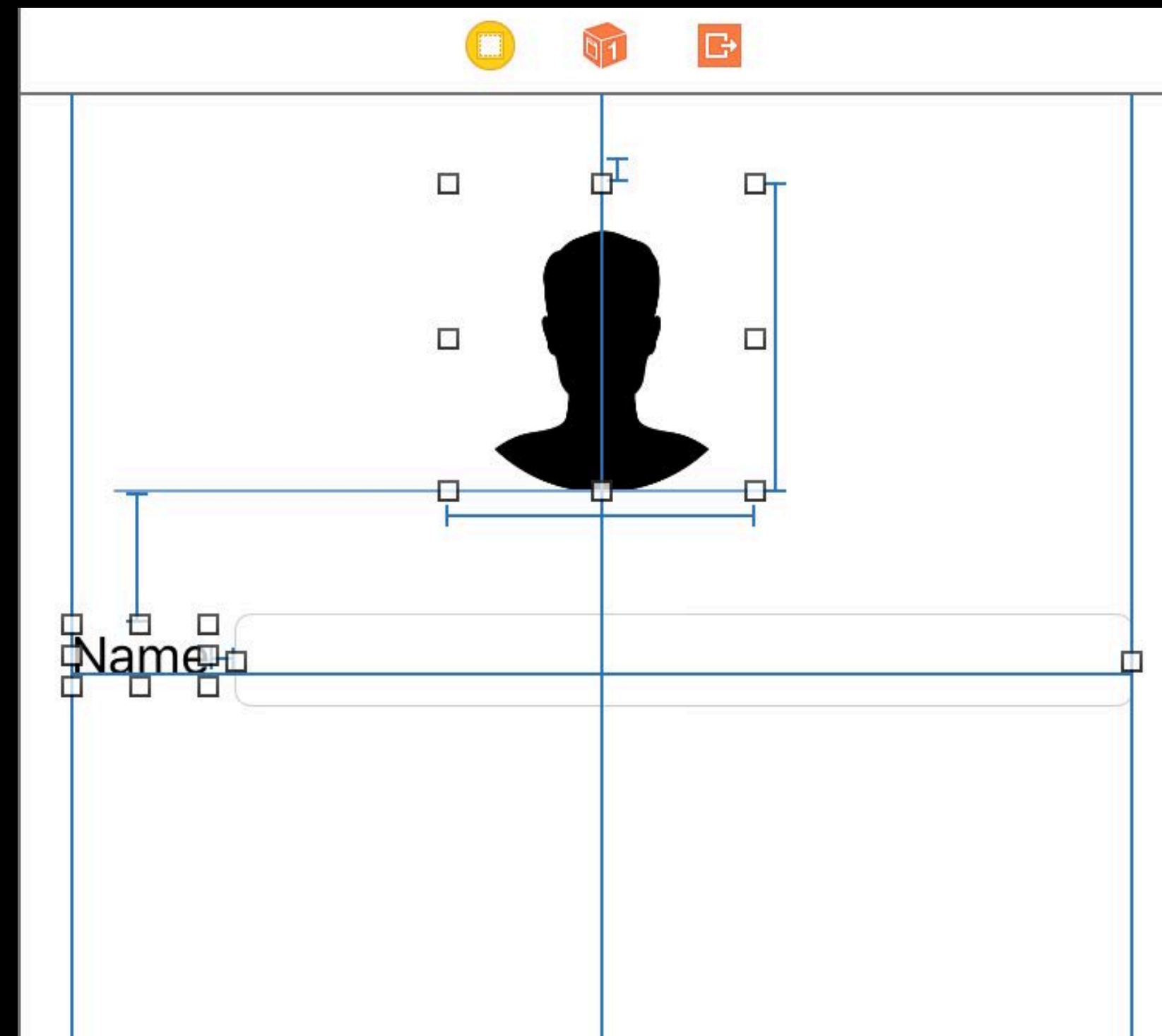


Localized Resources Structure



User Interface

Auto Layout



What's New in Auto Layout

WWDC 2016

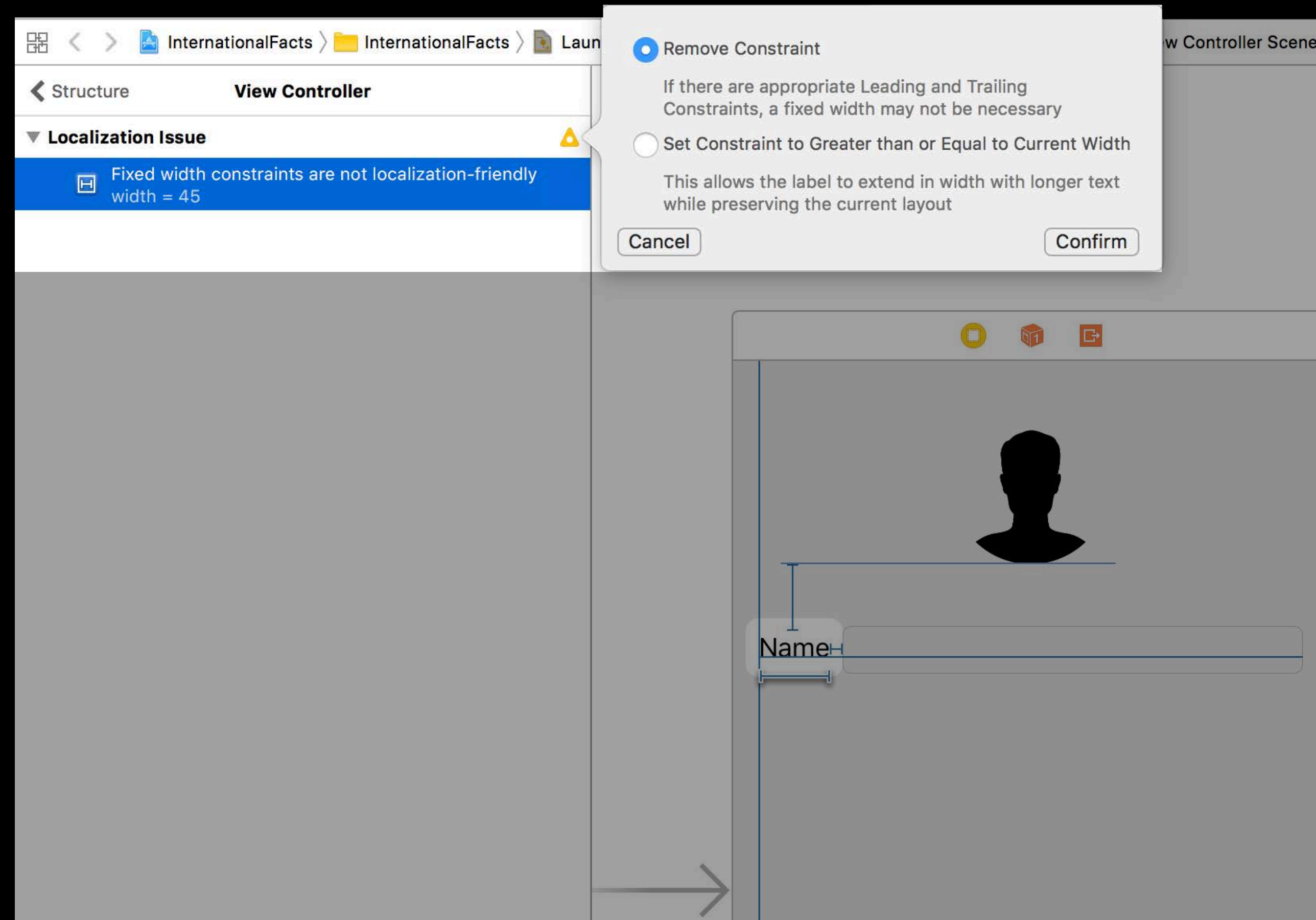
Auto Layout Techniques in Interface Builder

WWDC 2016

User Interface

Localization warnings

NEW



User Interface

Pseudolocalization

NEW

Default

Lorem Ipsum

Double Length

Lorem Ipsum Lorem Ipsum

Accented Latin

Łòrēm ĩpşum

Affixed Strings

[#Lorem Ipsum#]

Right to Left

muspl meroL

Demo

Prepare your app for localization

Aya Siblani, Software Engineer

Summary

Summary

Use standard APIs to handle the complexity of data formatting

Summary

Use standard APIs to handle the complexity of data formatting

Use base internationalization and Auto Layout

Summary

Use standard APIs to handle the complexity of data formatting

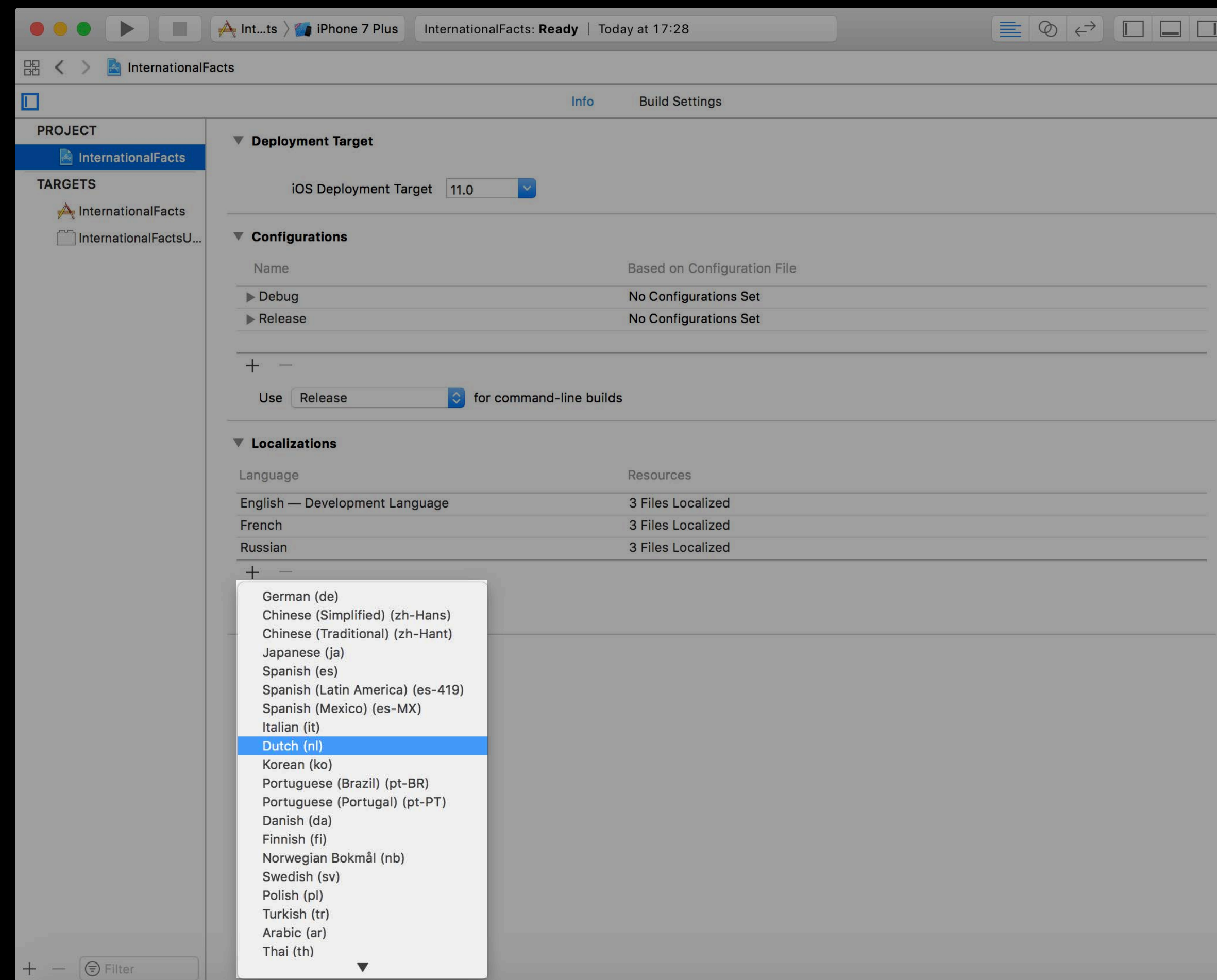
Use base internationalization and Auto Layout

Validate your strings and UI

Localization Workflow

Sara Radi, Software Engineer

Localization



Localization Process

Localization Process

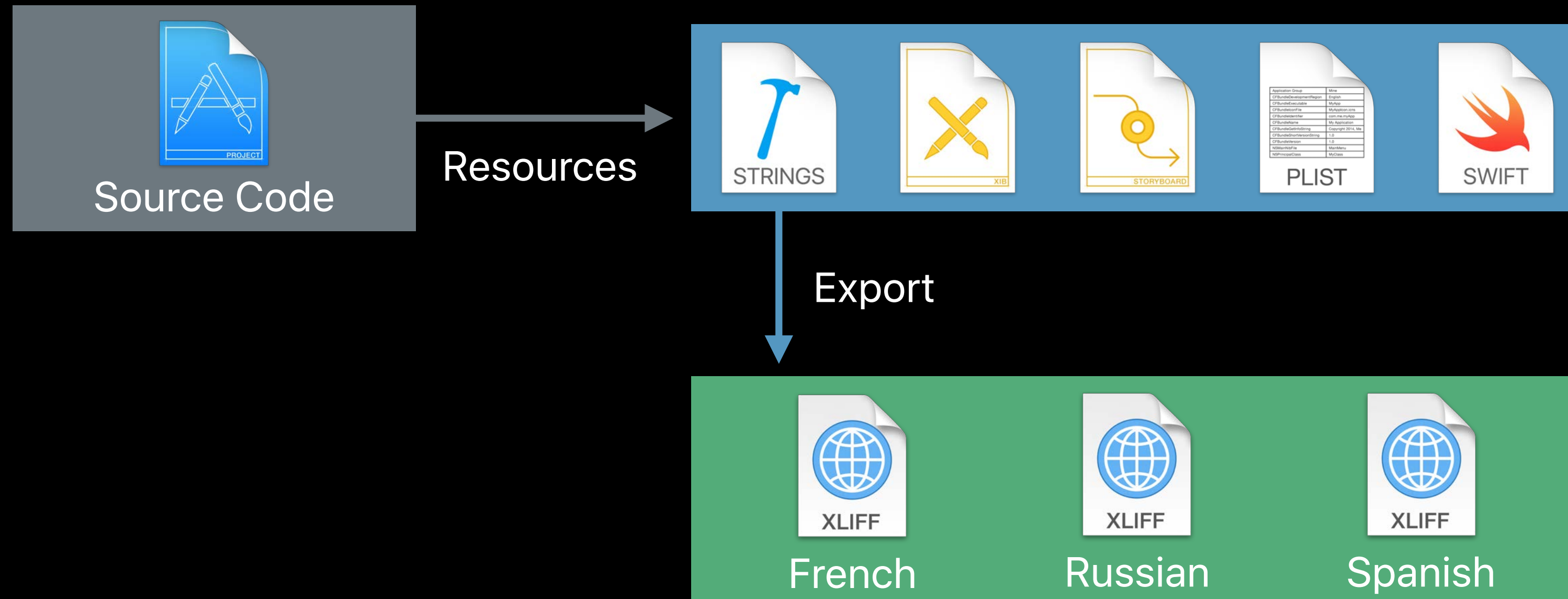


Source Code

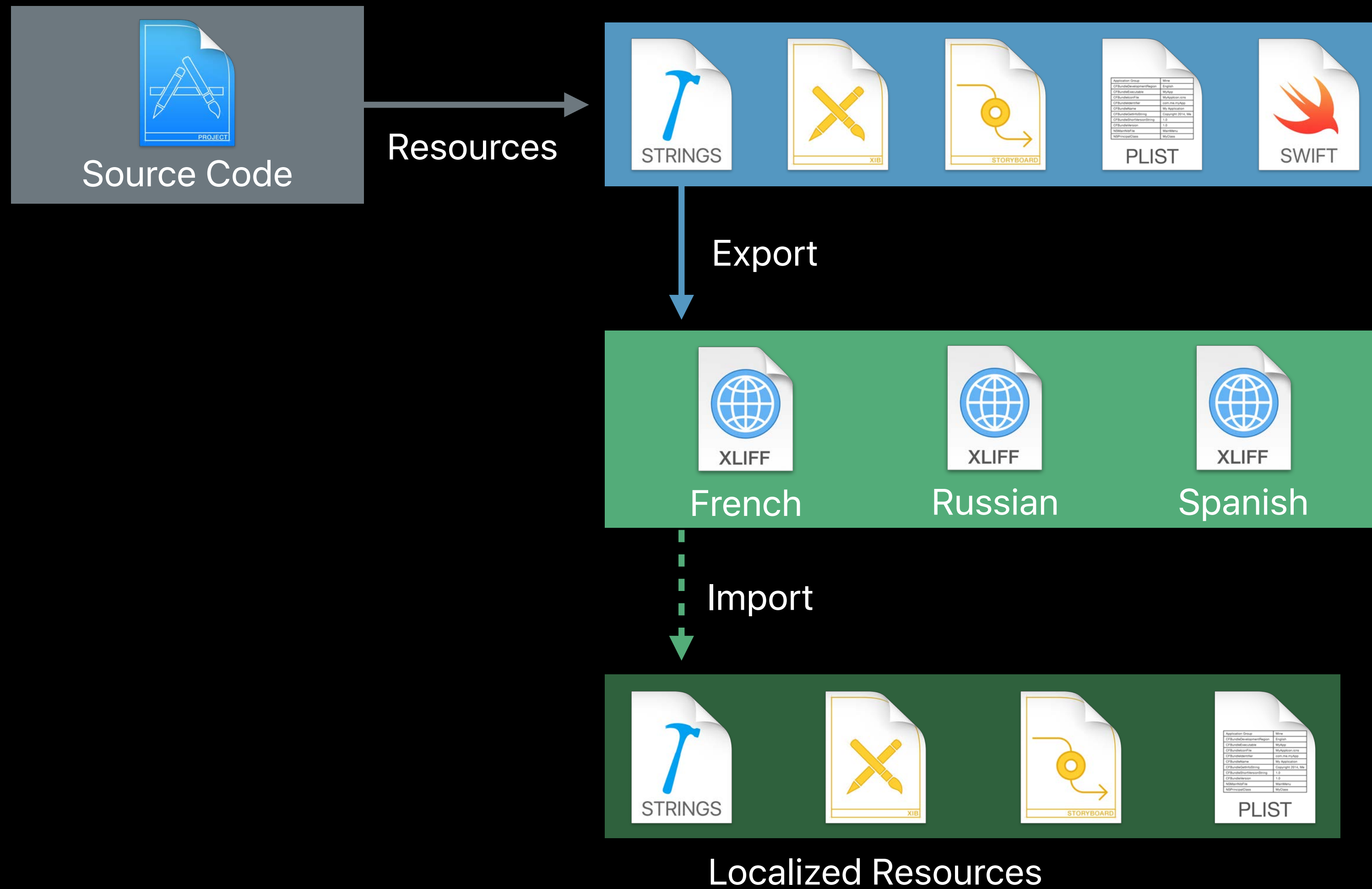
Localization Process



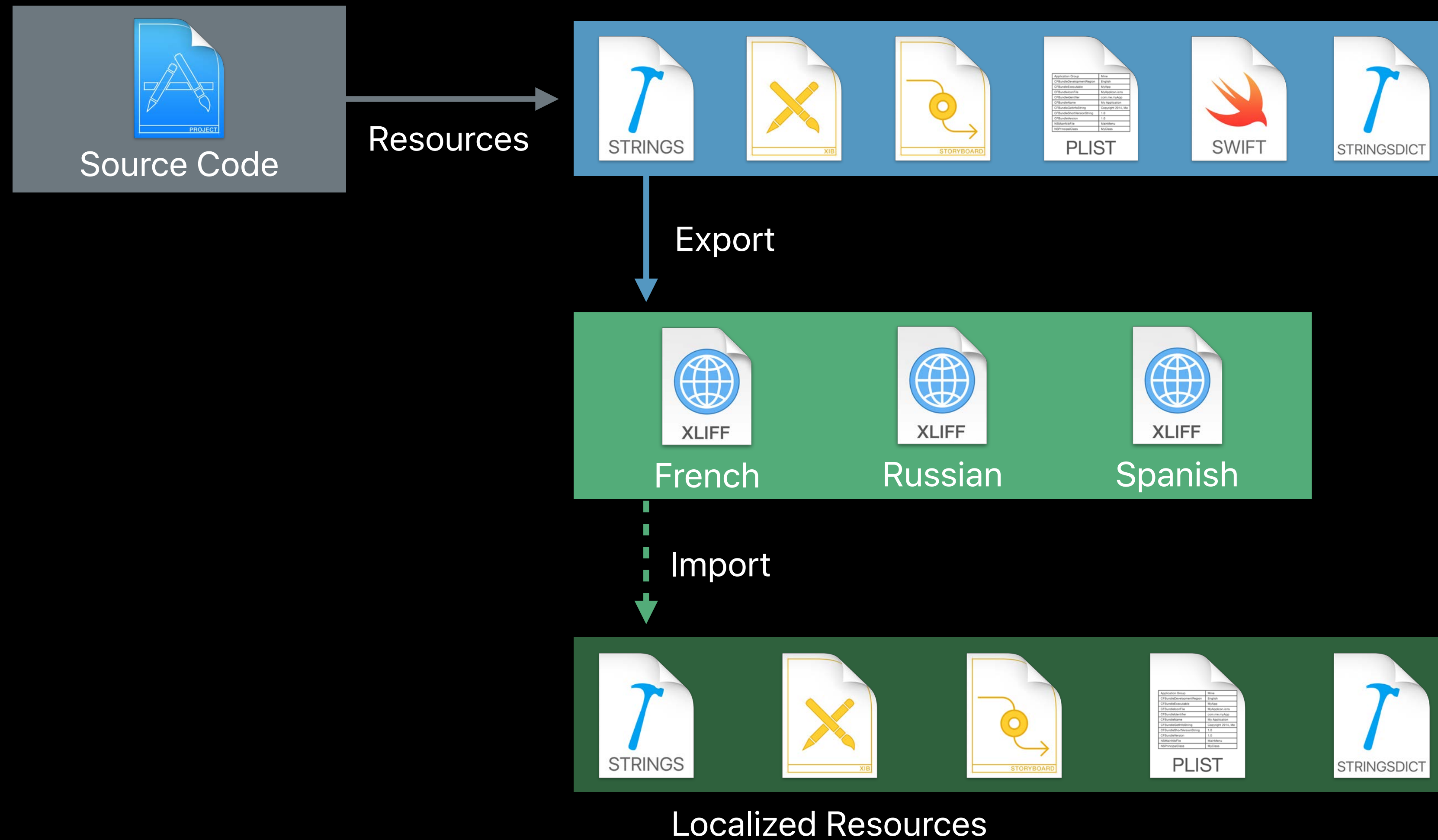
Localization Process



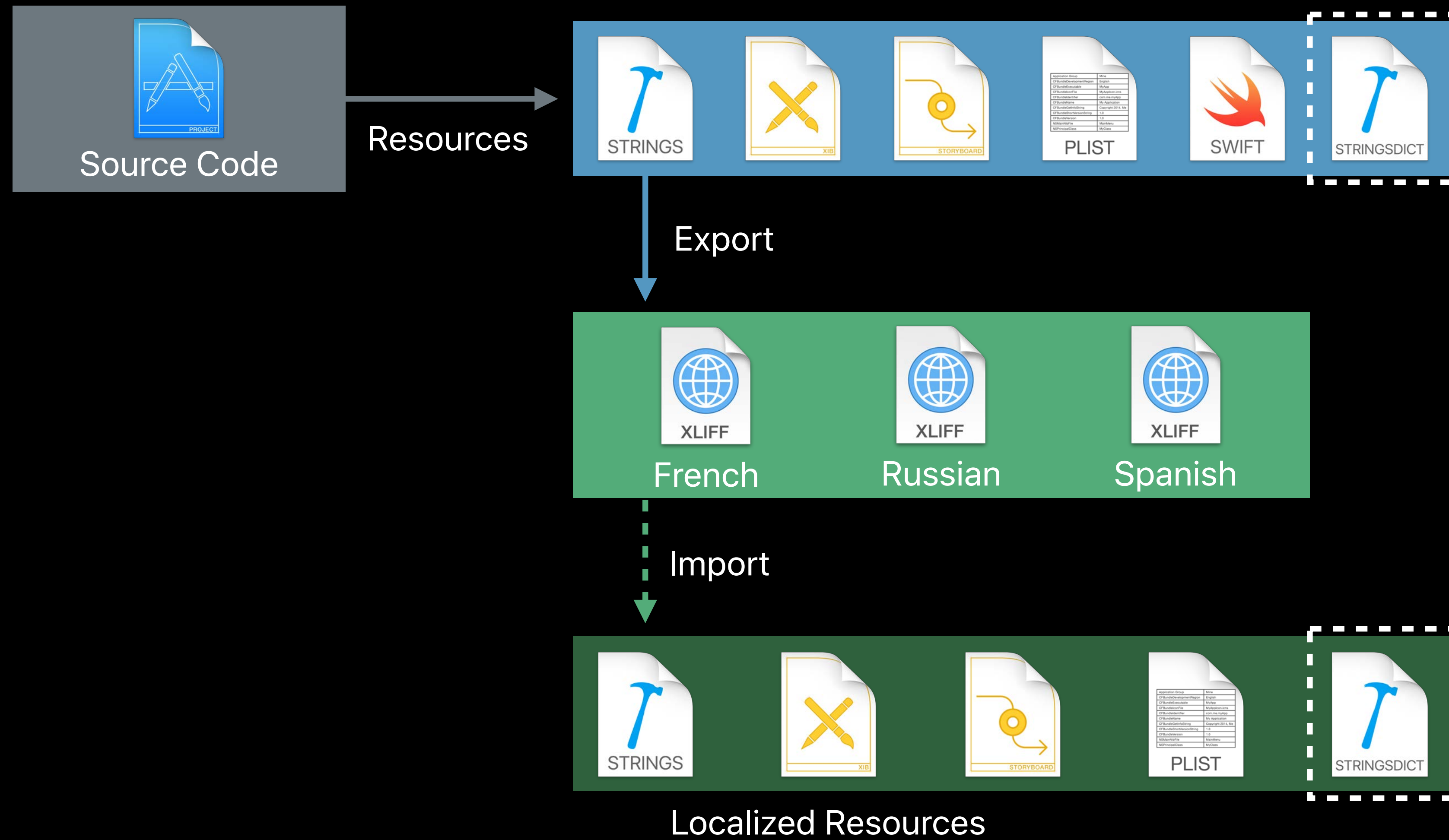
Localization Process



Localization Process

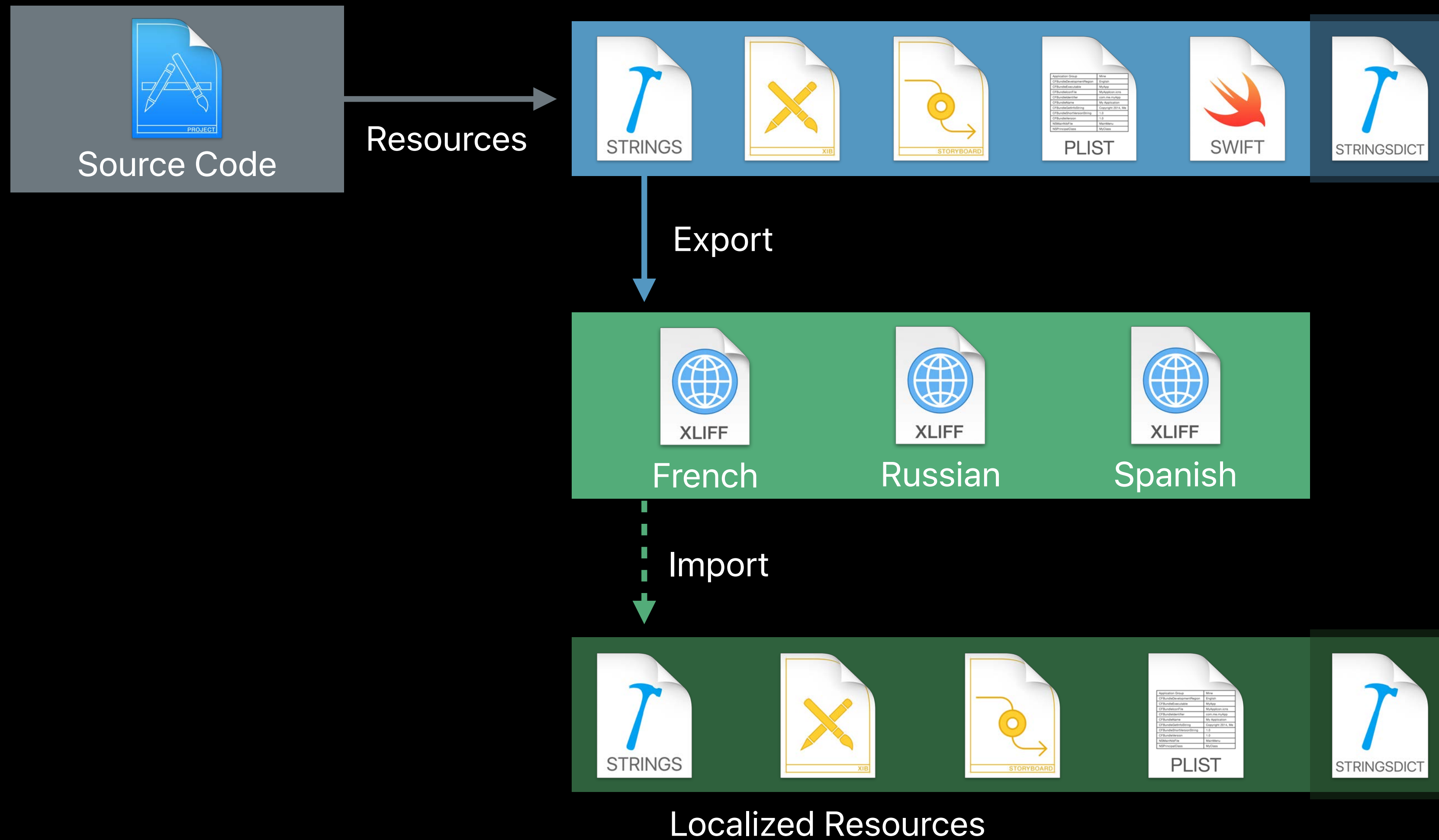


Localization Process



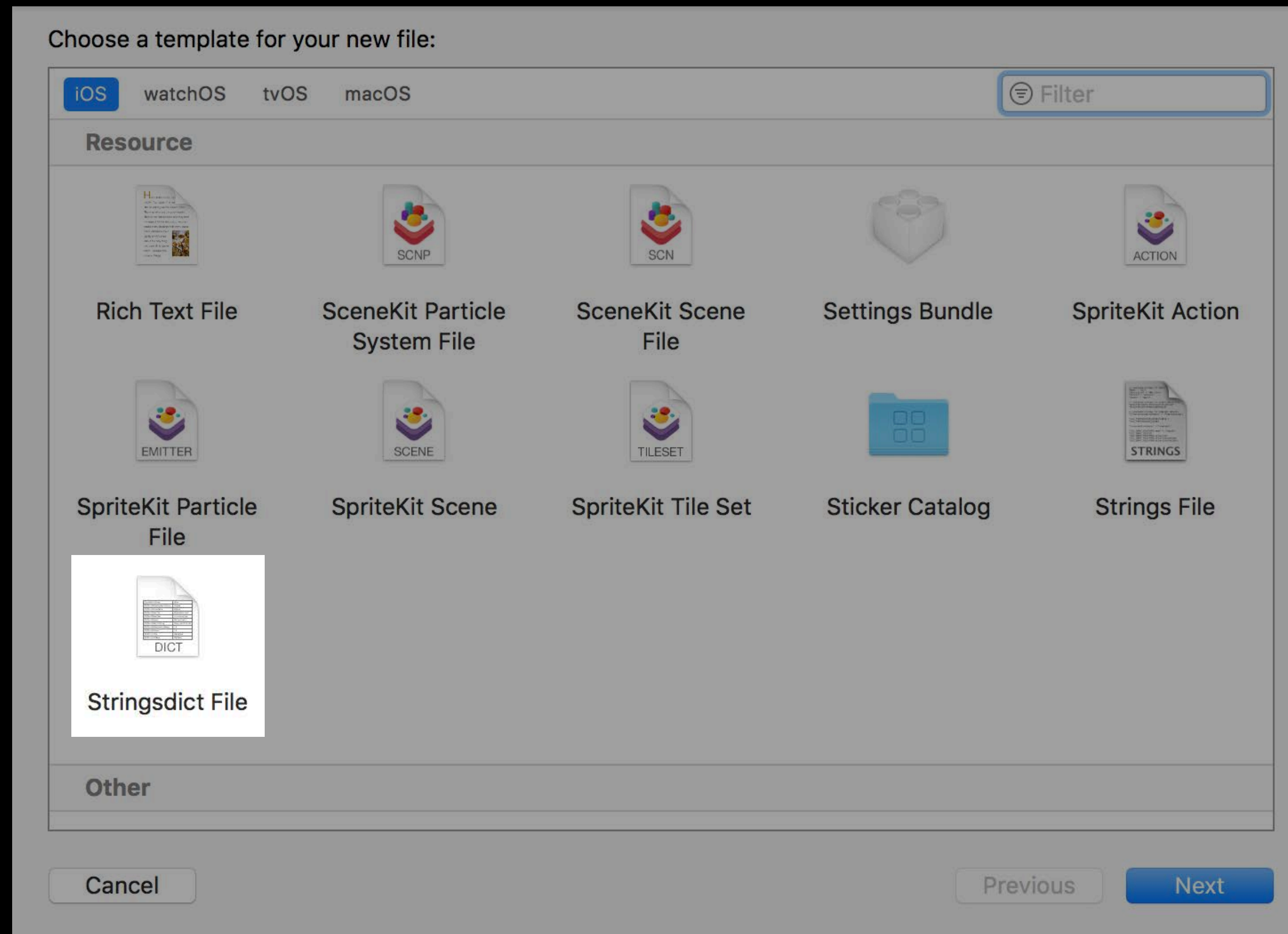
Localization Process

NEW



Stringsdict

NEW



Handling Plurals

Adaptive Strings

Localization Export and Import

Other Resources

Stringsdict

Plurals

```
if popularLanguages.count == 1 {
    label.text = String.localizedStringWithFormat(NSLocalizedString("1 popular language",
comment: "The list contains only one language"))
} else {
    label.text = String.localizedStringWithFormat(NSLocalizedString("%d popular languages",
comment: "The list contains more than one language"), popularLanguages.count)
}
```

Stringsdict

Plurals

```
if popularLanguages.count == 1 {
    label.text = String.localizedStringWithFormat(NSLocalizedString("1 popular language",
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} else {
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}
```

Stringsdict

Plurals


```
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comment: "The list contains only one language"))
} else {
    label.text = String.localizedStringWithFormat(NSLocalizedString("%d popular languages",
comment: "The list contains more than one language"), popularLanguages.count)
}
```

Stringsdict

Plurals

Stringsdict

Plurals

 English

1 popular language

2 popular languages

...

5 popular languages

Stringsdict

Plurals



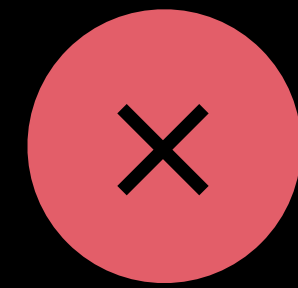
English

1 popular language

2 popular languages

...

5 popular languages



Russian

Распространенных языков: 1

Распространенных языков: 2

...

Распространенных языков: 5

Stringsdict

Plurals



Key	Type	Value
▼ Strings Dictionary	Dictionary	(1 item)
▼ %d popular language(s)	Dictionary	(2 items)
NSStringLocalizedFormatKey	String	%#@languages@
▼ languages	Dictionary	(4 items)
NSStringFormatSpecTypeKey	String	NSStringPluralRuleType
NSStringFormatValueTypeKey	String	d
one	String	%d popular language
other	String	%d popular languages

```
label.text = String.localizedStringWithFormat(NSLocalizedString("%d popular languages",  
comment: "The list contains more than one language"), popularLanguages.count)
```

Stringsdict

Plurals



The screenshot shows the Xcode interface for editing a stringsdict file. The breadcrumb path is: InternationalFacts > InternationalFacts > Localizable.stringsdict > Localizable.stringsdict (English) > No Selection. The table below represents the content of the stringsdict file.

Key	Type	Value
▼ Strings Dictionary	Dictionary	(1 item)
▼ %d popular language(s)	Dictionary	(2 items)
NSStringLocalizedFormatKey	String	%#@languages@
▼ languages	Dictionary	(4 items)
NSStringFormatSpecTypeKey	String	NSStringPluralRuleType
NSStringFormatValueTypeKey	String	d
one	String	%d popular language
other	String	%d popular languages

```
label.text = String.localizedStringWithFormat(NSLocalizedString("%d popular languages",  
comment: "The list contains more than one language"), popularLanguages.count)
```


Stringsdict

Plurals



The screenshot shows the Xcode interface for editing a Strings Dictionary. The breadcrumb path is: InternationalFacts > InternationalFacts > Localizable.stringsdict > Localizable.stringsdict (English) > No Selection. The table below represents the content of the dictionary.

Key	Type	Value
▼ Strings Dictionary	Dictionary	(1 item)
▼ %d popular language(s)	Dictionary	(2 items)
NSStringLocalizedFormatKey	String	%#@languages@
▼ languages	Dictionary	(4 items)
NSStringFormatSpecTypeKey	String	NSStringPluralRuleType
NSStringFormatValueTypeKey	String	d
one	String	%d popular language
other	String	%d popular languages

```
label.text = String.localizedStringWithFormat(NSLocalizedString("%d popular languages",  
comment: "The list contains more than one language"), popularLanguages.count)
```

Stringsdict

Plurals

Stringsdict

Plurals

 Russian

Распространенных языков: 1

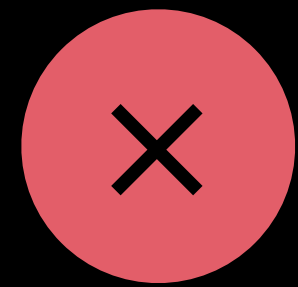
Распространенных языков: 2

...

Распространенных языков: 5

Stringsdict

Plurals



Russian

Распространенных языков: 1

Распространенных языков: 2

...

Распространенных языков: 5



Russian

1 распространенный язык

2 распространенных языка

...

5 распространенных языков

Handling Plurals

Adaptive Strings

Localization Export and Import

Handling Other Resources

International Facts



Territory United States >

DETAILS

Population 323,996,000

Gross Domestic Product (in billions) \$18,560.00

Literacy 99.0%

LANGUAGE POPULATION

Spanish 9.6%

English 96.0%

2 popular languages



9:41 AM



International Facts



Territory

United States >

DETAILS

Population

323,996,000

Gross Domestic Product (in billions)

\$18,560.00

Literacy

99.0%

LANGUAGE POPULATION

Spanish

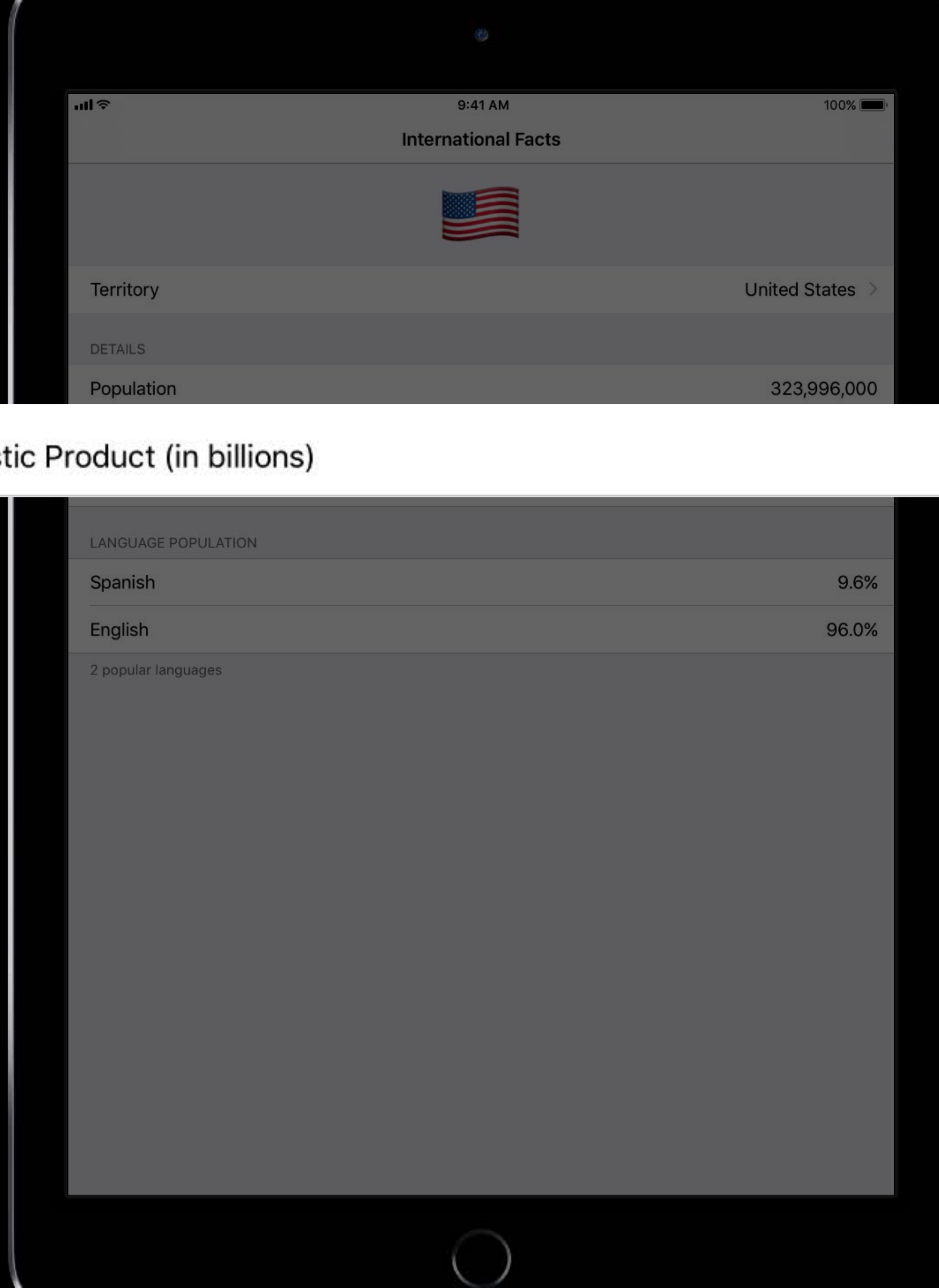
9.6%

English

96.0%

2 popular languages





Gross Domestic Product (in billions) \$18,560.00



9:41 AM

100%

International Facts



Territory

United States >

DETAILS

Population 323,996,000

Gross Domestic Product (in billions) \$18,5...

Literacy 99.0%

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Spanish 9.6%

English 96.0%

2 popular languages



9:41 AM

100%

International Facts



Territory United States >

DETAILS

Population 323,996,000

Gross Domestic Product (in billions) \$18,5...

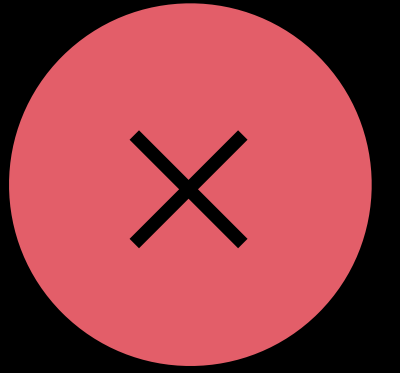
Literacy 99.0%

LANGUAGE POPULATION

Spanish 9.6%

English 96.0%

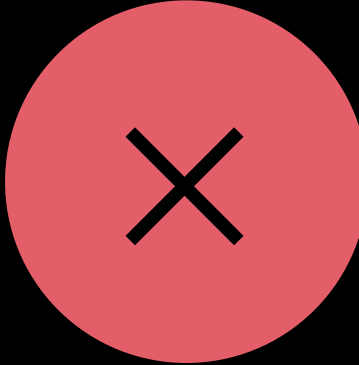
2 popular languages





Gross Domestic Product (in billions) \$18,5...

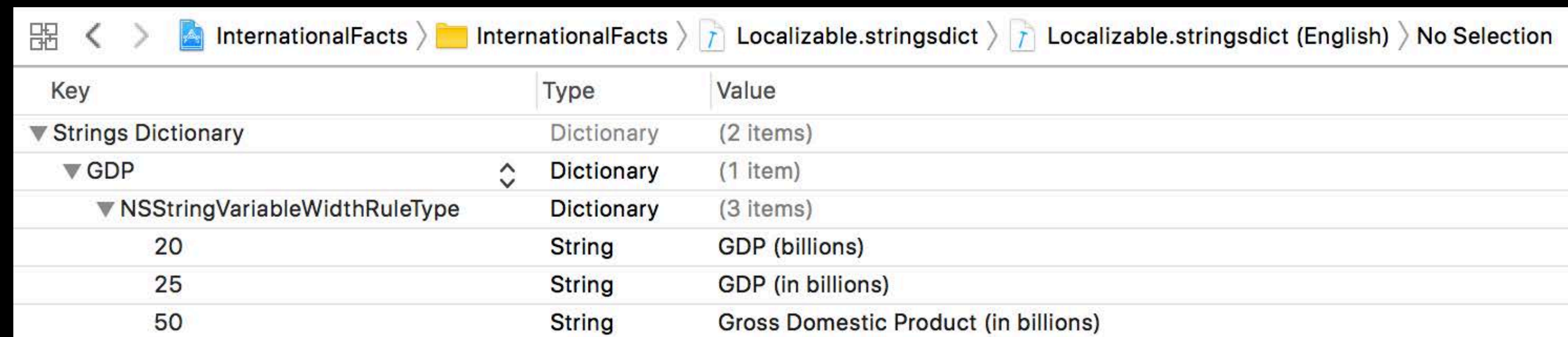
Literacy	99.0%
LANGUAGE POPULATION	
Spanish	9.6%
English	96.0%
2 popular languages	



Stringsdict

Adaptive Strings

NEW



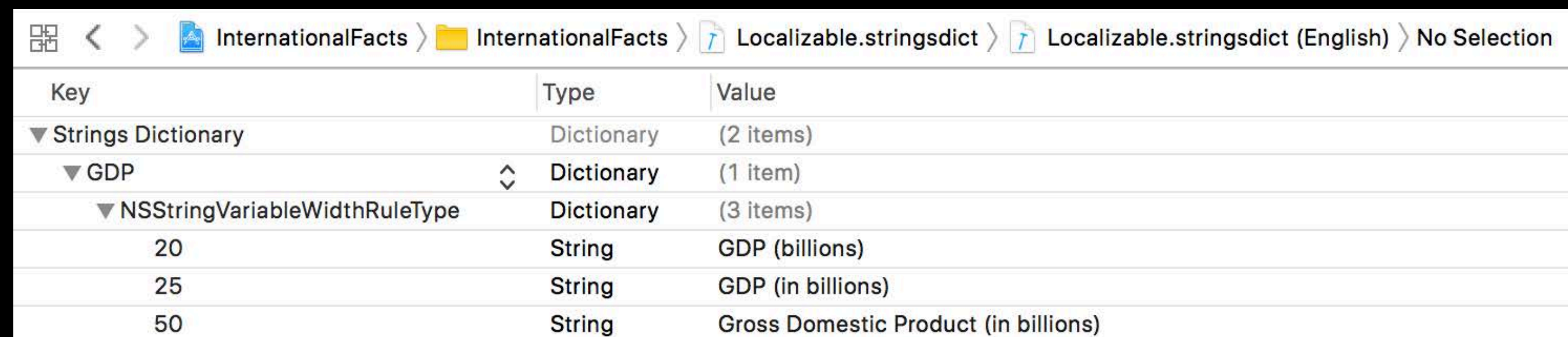
The screenshot shows the Xcode interface for editing a strings dictionary. The breadcrumb path is: InternationalFacts > InternationalFacts > Localizable.stringsdict > Localizable.stringsdict (English) > No Selection. The table below displays the dictionary's structure and content.

Key	Type	Value
▼ Strings Dictionary	Dictionary	(2 items)
▼ GDP	Dictionary	(1 item)
▼ NSStringVariableWidthRuleType	Dictionary	(3 items)
20	String	GDP (billions)
25	String	GDP (in billions)
50	String	Gross Domestic Product (in billions)

Stringsdict

Adaptive Strings

NEW



The screenshot shows the Xcode Strings Dictionary editor. The breadcrumb path is: InternationalFacts > InternationalFacts > Localizable.stringsdict > Localizable.stringsdict (English) > No Selection. The dictionary structure is as follows:

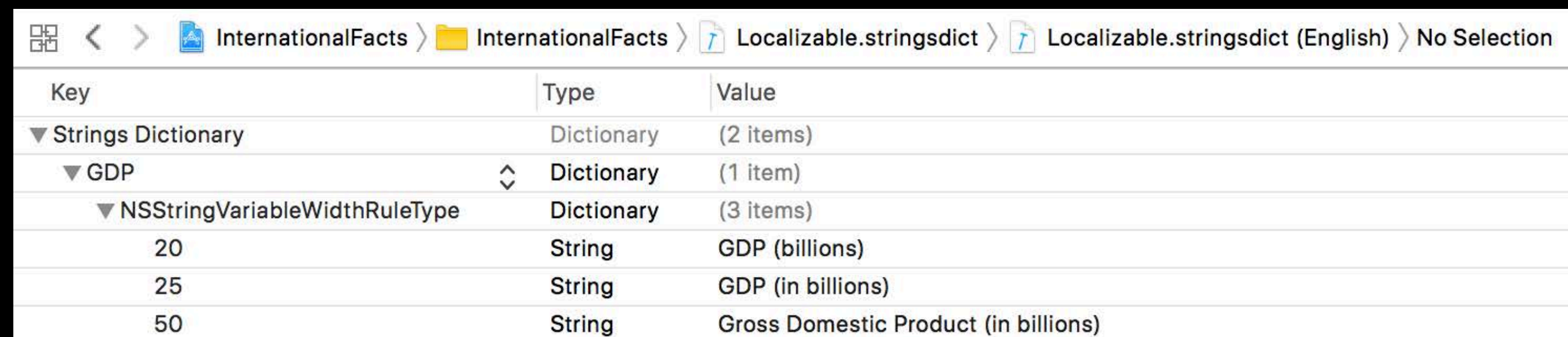
Key	Type	Value
▼ Strings Dictionary	Dictionary	(2 items)
▼ GDP	Dictionary	(1 item)
▼ NSStringVariableWidthRuleType	Dictionary	(3 items)
20	String	GDP (billions)
25	String	GDP (in billions)
50	String	Gross Domestic Product (in billions)

```
label.text = NSLocalizedString("GDP", comment: "A territory's GDP (Gross Domestic Product)")
```

Stringsdict

Adaptive Strings

NEW



The screenshot shows the Xcode interface for editing a strings dictionary. The breadcrumb path is: InternationalFacts > InternationalFacts > Localizable.stringsdict > Localizable.stringsdict (English) > No Selection. The dictionary structure is as follows:

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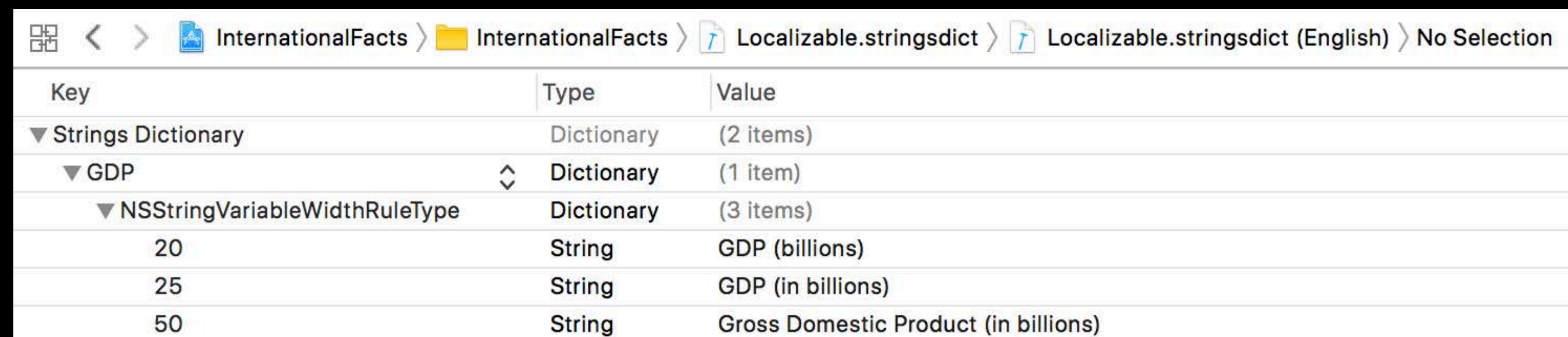
```
label.text = NSLocalizedString("GDP", comment: "A territory's GDP (Gross Domestic Product)")
```

```
let widthFormattedString = string.variantFittingPresentationWidth(20)
```

Stringsdict

Adaptive Strings

NEW



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label.text = NSLocalizedString("GDP", comment: "A territory's GDP (Gross Domestic Product)")
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let widthFormattedString = string.variantFittingPresentationWidth(20)
```

International Facts



Territory United States >

DETAILS

Population 323,996,000

Gross Domestic Product (in billions) \$18,560.00

Literacy 99.0%

LANGUAGE POPULATION

Spanish 9.6%

English 96.0%

2 popular languages



9:41 AM

100%

International Facts



Territory

United States >

DETAILS

Population

323,996,000

Gross Domestic Product (in billions)

\$18,560.00

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99.0%

LANGUAGE POPULATION

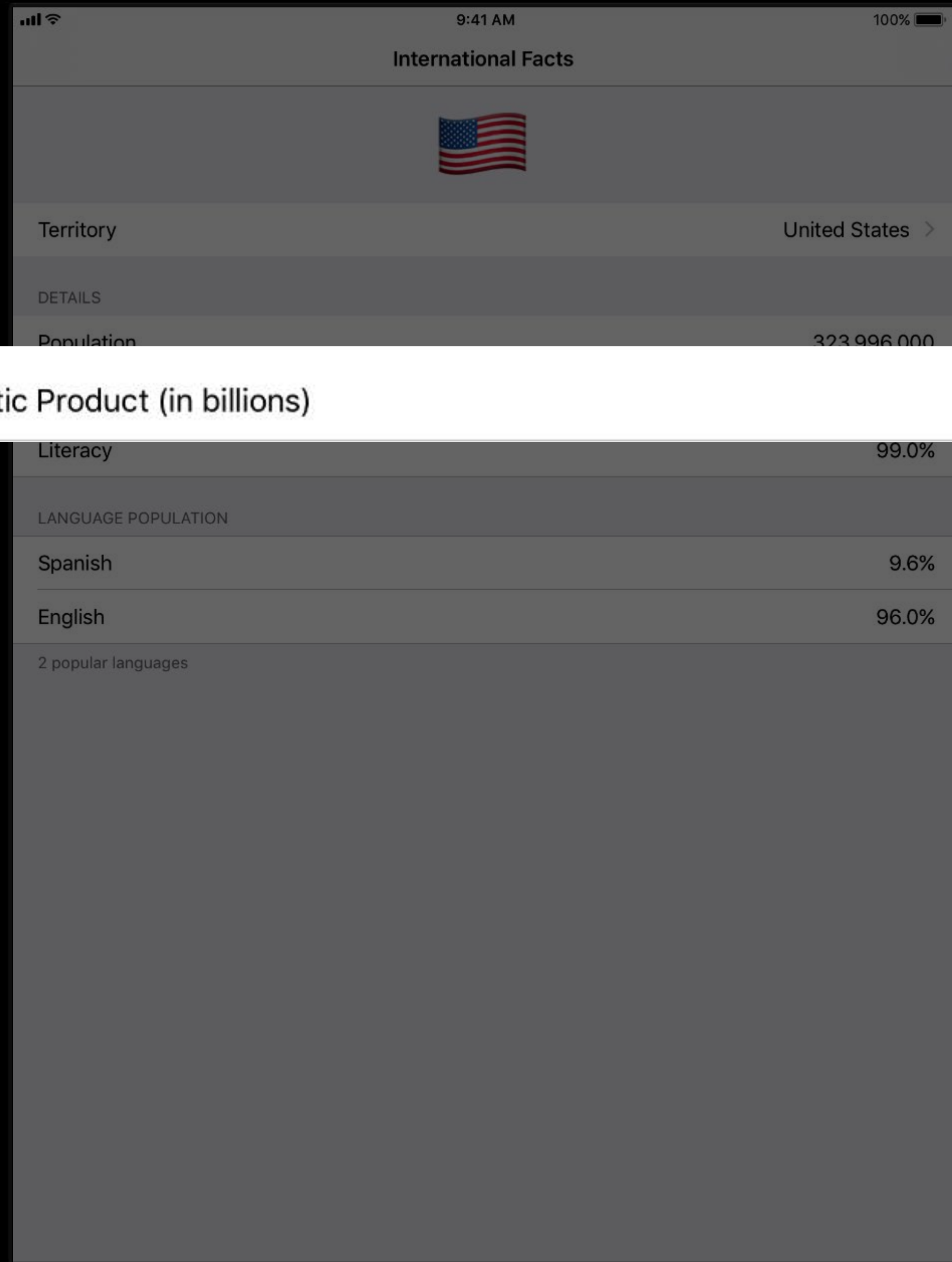
Spanish

9.6%

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Gross Domestic Product (in billions)

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9:41 AM

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International Facts



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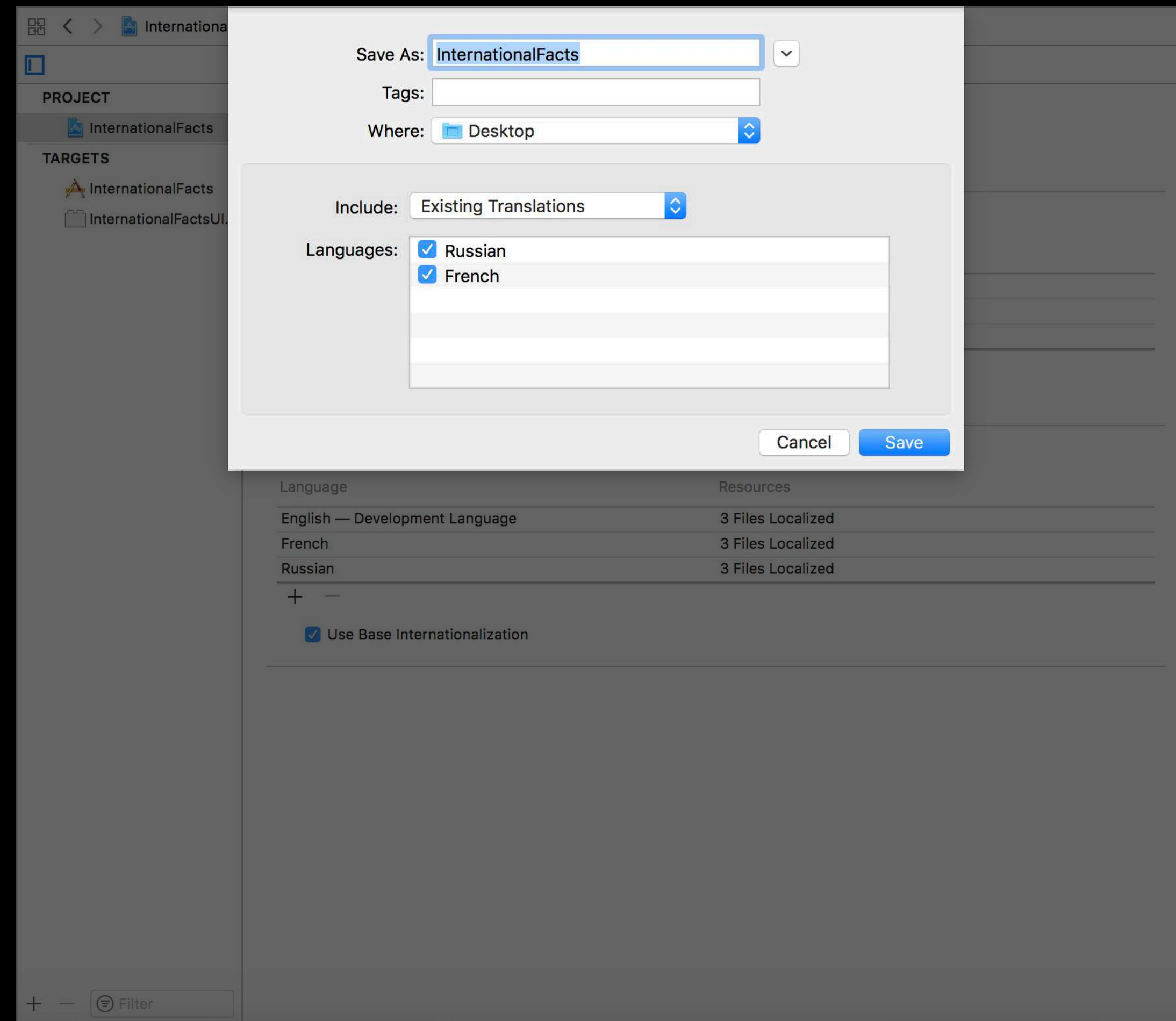
Handling Plurals

Adaptive Strings

Localization Export and Import

Other Resources

Export XLIFF



Import XLIFF

Line	Source Dictionary	Target Dictionary
5	%"#@languages@"	%"#@languages@"
6	/%d language(s) spoken:dict/languages:dict/ one:dict/:string	/%d language(s) spoken:dict/languages:dict/ one:dict/:string
7	/* (No Comment) */	/* (No Comment) */
8	""	""
9	%"d language spoken"	%"d language spoken"
10	%"d language spoken"	%"d langue parlée"
11	/%d language(s) spoken:dict/languages:dict/ other:dict/:string	/%d language(s) spoken:dict/languages:dict/ other:dict/:string
12	/* (No Comment) */	/* (No Comment) */
13	""	""
14	%"d languages spoken"	%"d languages spoken"
15	%"d languages spoken"	%"d langues parlées"
16	/GDP:dict/NSStringVariableWidthRuleType:dict/ 1:dict/:string	/GDP:dict/NSStringVariableWidthRuleType:dict/ 1:dict/:string
17	/* (No Comment) */	/* (No Comment) */
18	"GDP (billions)"	"GDP (billions)"
19	"GDP (billions)"	"PIB (milliards)"
20	"GDP (billions)"	"GDP (billions)"
21	/GDP:dict/NSStringVariableWidthRuleType:dict/ 20:dict/:string	/GDP:dict/NSStringVariableWidthRuleType:dict/ 20:dict/:string
22	/* (No Comment) */	/* (No Comment) */
23	"GDP (in billions)"	"GDP (in billions)"
24	"GDP (in billions)"	"PIB (en milliards)"
25	"GDP (in billions)"	"GDP (in billions)"
26	/GDP:dict/NSStringVariableWidthRuleType:dict/ 50:dict/:string	/GDP:dict/NSStringVariableWidthRuleType:dict/ 50:dict/:string
27	/* (No Comment) */	/* (No Comment) */
28	"Gross Domestic Product (in billions)"	"Gross Domestic Product (in billions)"
29	"Gross Domestic Product (in billions)"	"Produit intérieur brut (en milliards)"
30	"Gross Domestic Product (in billions)"	"Produit intérieur brut (en milliards)"
31		
32		
33		

Cancel Import

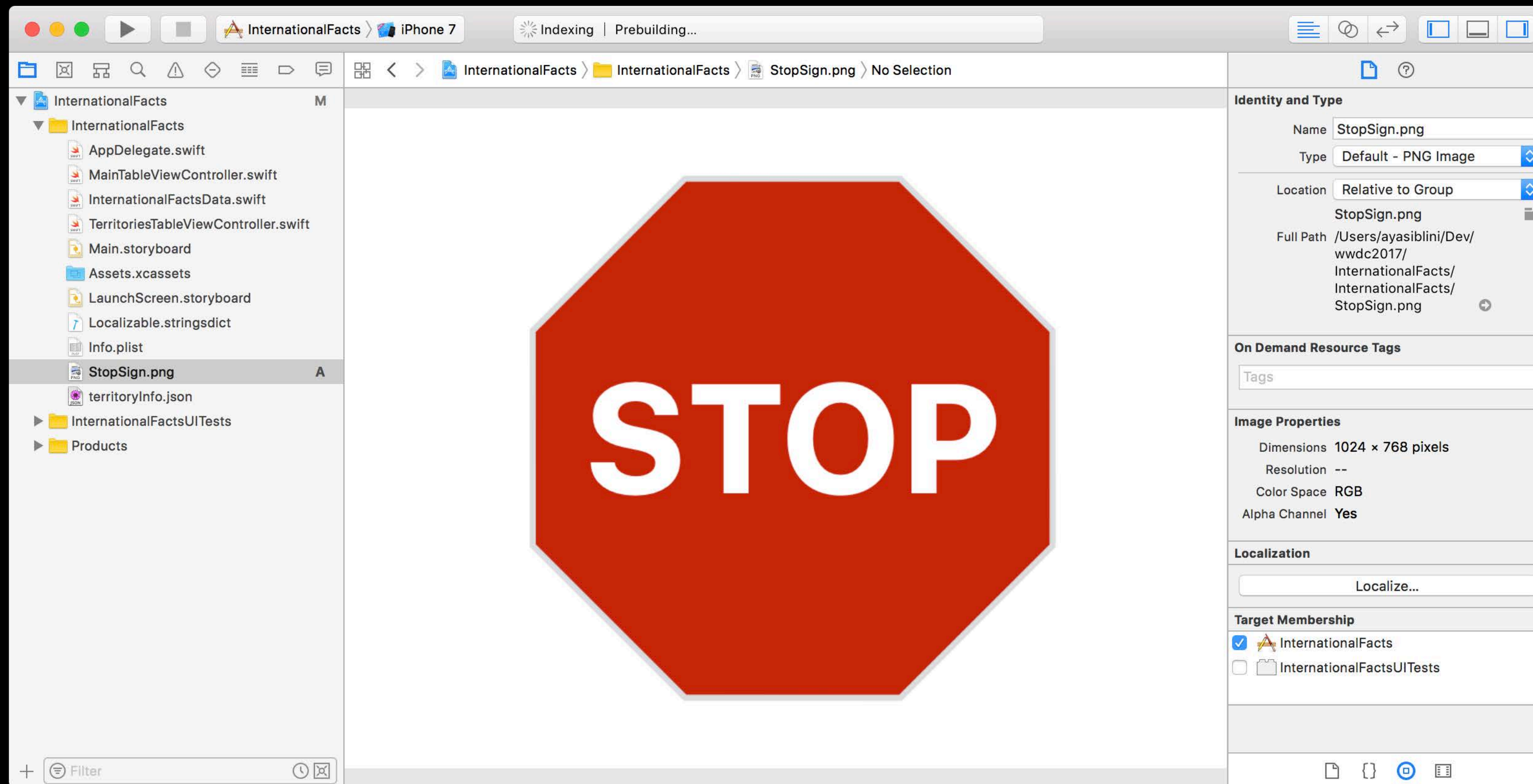
Handling Plurals

Adaptive Strings

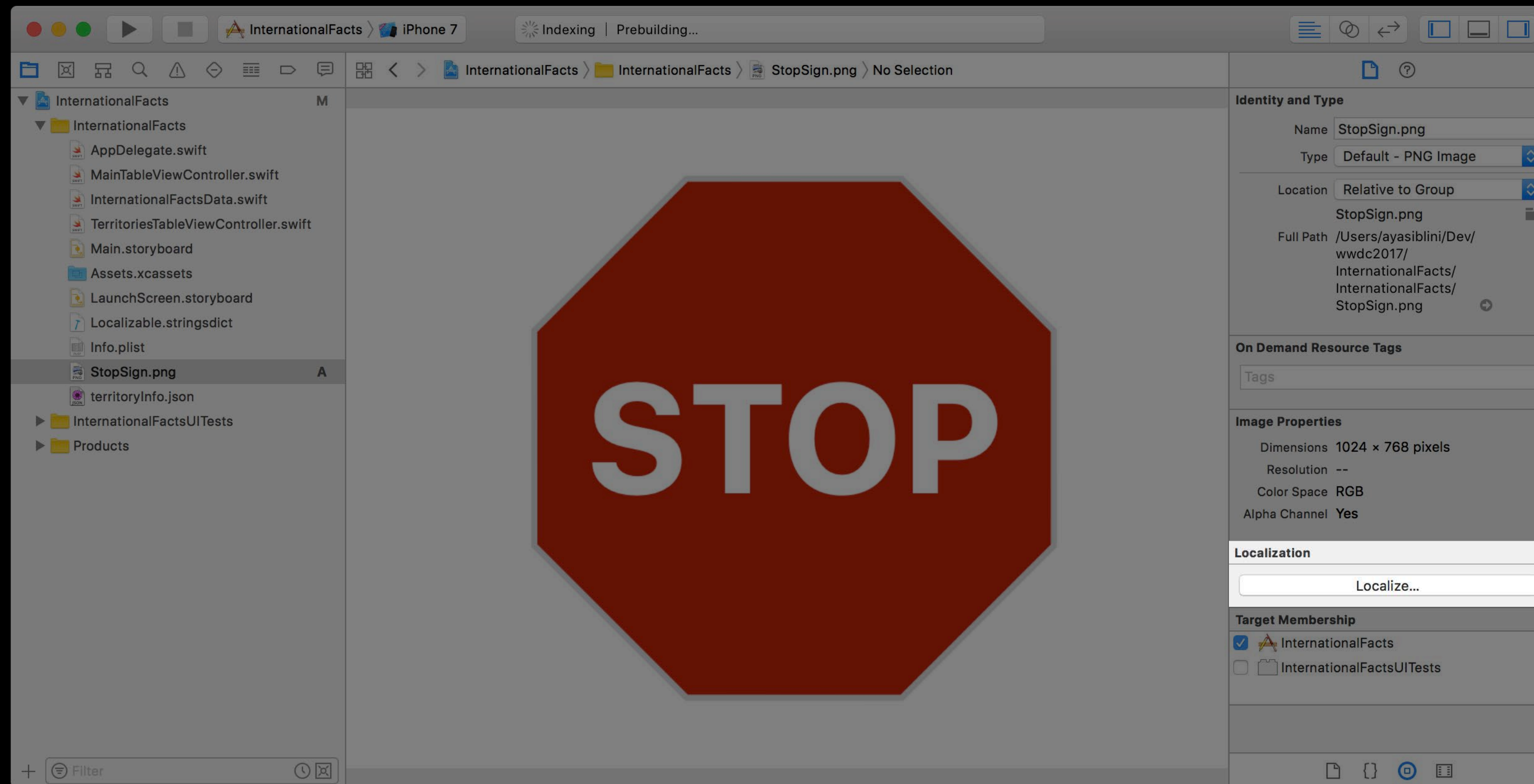
Localization Export and Import

Other Resources

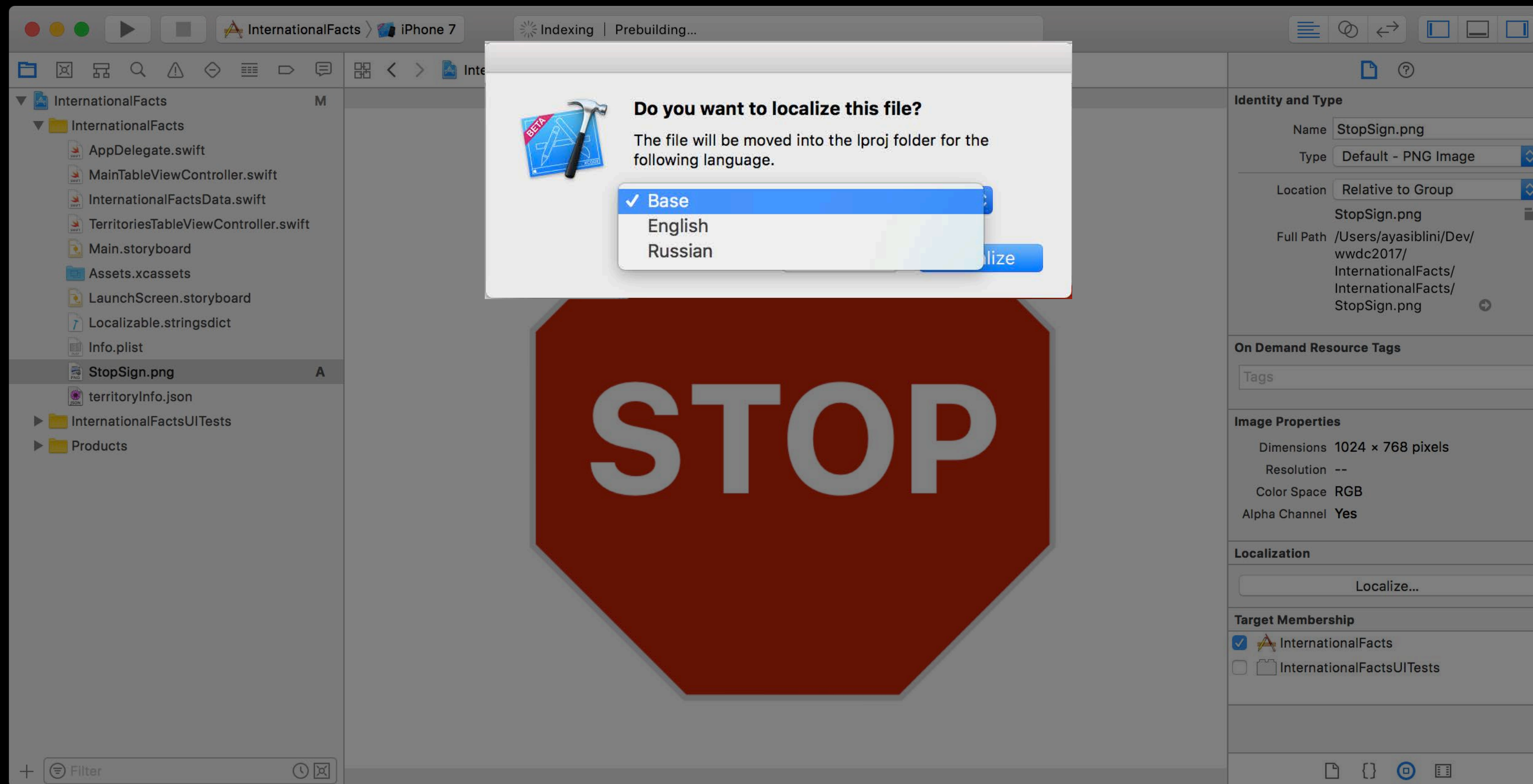
Other Resources



Other Resources



Other Resources



Demo

Localization export and import

Chris Hanson, Software Engineer

Summary

Summary

Use stringsdict for plurals and width variants

Summary

Use stringsdict for plurals and width variants

Export XLIFF for localization

Summary

Use stringsdict for plurals and width variants

Export XLIFF for localization

Import localized XLIFF

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Export XLIFF for localization

Import localized XLIFF

Localize non-string resources in Xcode

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Localize non-string resources in Xcode

Testing

Aya Siblani, Software Engineer

Testing

XCTest

NEW

InternationalFacts > iPhone 7 Plus

Build 2 targets
Run Debug
Test Debug
Profile Release
Analyze Debug
Archive Release

Info Arguments **Options** Diagnostics

Application Language System Language

Application Region System Region

UI Testing Capture screenshots automatically
 Delete when each test succeeds

Attachments Delete when each test succeeds

Duplicate Scheme Manage Schemes... Shared Close

Testing

XCTest

NEW

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Testing

UI testing

Testing

UI testing

```
app.tables.cells.staticTexts["Territory"].tap()
```


Testing

UI testing



```
app.tables.cells.staticTexts["Territory"].tap()
```

Testing

UI testing



```
app.tables.cells.staticTexts["Territory"].tap()
```

Use `accessibilityIdentifier`

```
app.tables.cells["territoryTableCell"].tap()
```

Testing

UI testing



```
app.tables.cells.staticTexts["Territory"].tap()
```

Use `accessibilityIdentifier`



```
app.tables.cells["territoryTableCell"].tap()
```

Testing

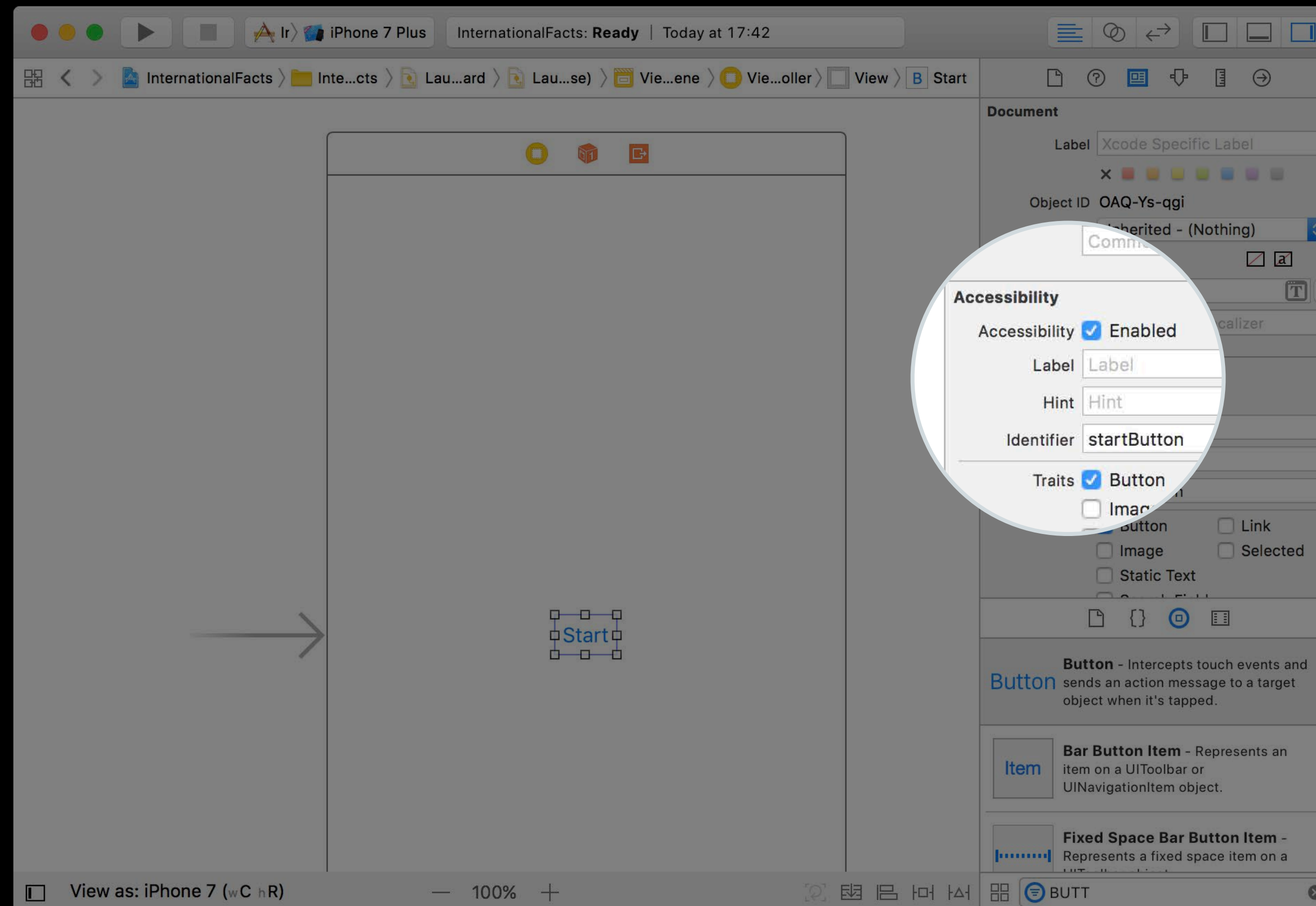
UI testing

Set accessibilityIdentifier

```
button.accessibilityIdentifier = "startButton"
```

Testing

UI testing



Testing

UI testing



NEW

Use accessibility identifiers

Use `XCTAttachment` to collect screenshots

Get full coverage of UI for all localizations

What's New in Testing

Hall 2

Thursday 3:10PM

Engineering for Testability

Hall 3

Friday 1:50PM

Demo Testing

Aya Siblani, Software Engineer

Summary

Summary

Prepare your app for localization

Summary

Prepare your app for localization

Validate your app's readiness

Summary

Prepare your app for localization

Validate your app's readiness

Export localizable content to be translated

Summary

Prepare your app for localization

Validate your app's readiness

Export localizable content to be translated

Import localized content

Summary

Prepare your app for localization

Validate your app's readiness

Export localizable content to be translated

Import localized content

Use `XCTest` to test your localized app

More Information

<https://developer.apple.com/wwdc17/401>

Related Sessions

Advances in TVMLKit	Grand Ballroom B	Tuesday 11:20AM
What's New in Testing	Hall 2	Thursday 3:10PM
Localizing Content for Swift Playgrounds	Grand Ballroom A	Thursday 3:10PM
Auto Layout Techniques in Interface Builder	Hall 3	Friday 9:00AM
The Keys to a Better Text Input Experience	Grand Ballroom B	Friday 11:00AM
Building Apps with Dynamic Type	Executive Ballroom	Friday 1:50PM
Engineering for Testability	Hall 3	Friday 1:50PM
Localization Best Practices on tvOS		WWDC 2017 Video

Labs

Introduction to Interface Builder Lab

Technology Lab E

Tue 12:00PM-3:10PM

Internationalization Lab

Technology Lab I

Tue 1:50PM-4:10PM

Advanced Interface Builder and Auto Layout Lab

Technology Lab K

Wed 3:10PM-6:00PM

Internationalization Lab

Technology Lab I

Fri 9:00AM-1:50PM

Advanced Interface Builder and Auto Layout Lab

Technology Lab K

Fri 12:00PM-1:50PM

