What's New in Internationalization

Session 227

Nat Hillard Frameworks, Internationalization

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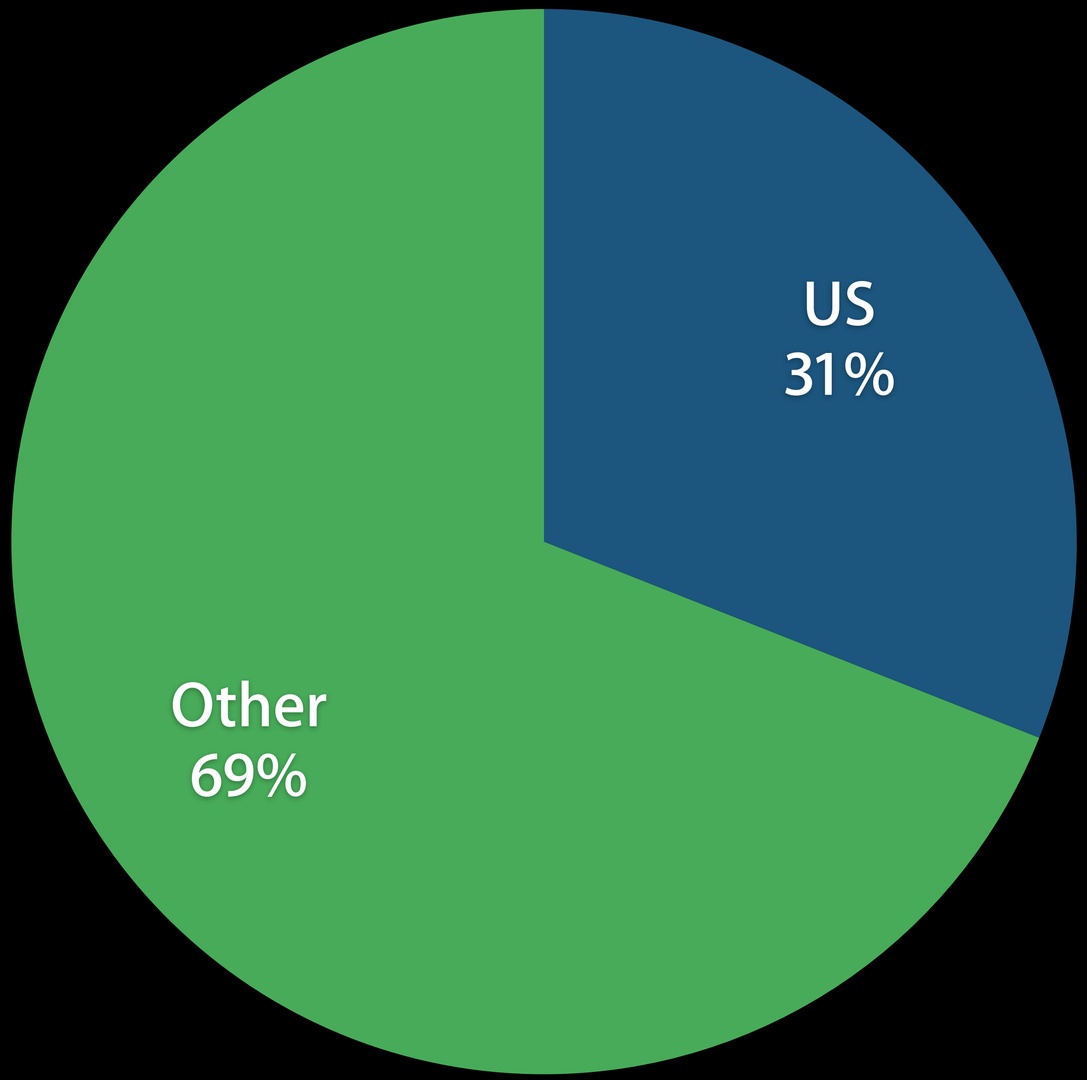
Overview

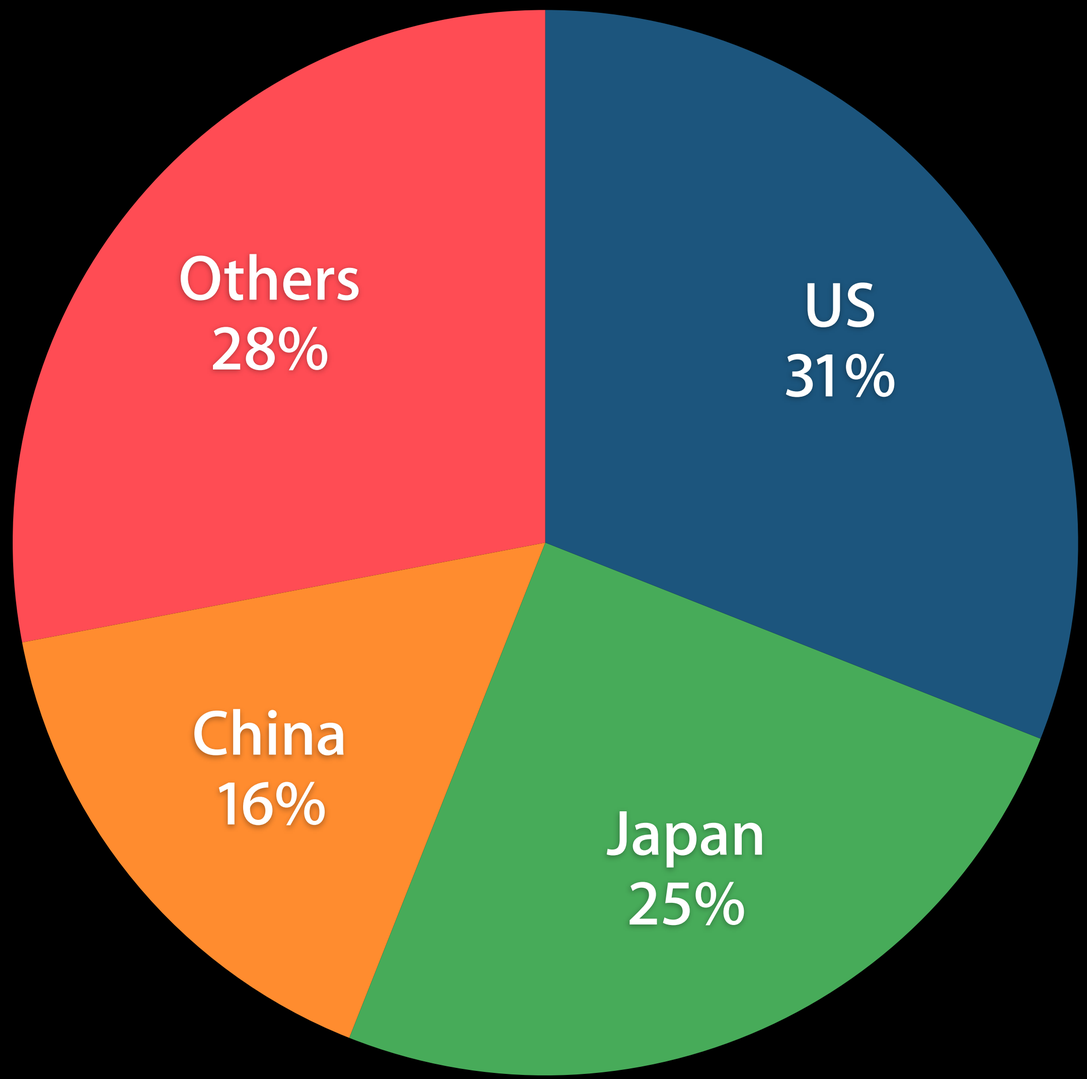
69%

of Apple revenue is international

Worldwide App Store Sales



Worldwide App Store Sales



Outline

Localization

Formatting

Handling Text

Layout

Localization

Formatting

Handling Text

Layout

Localization

Formatting

Handling Text

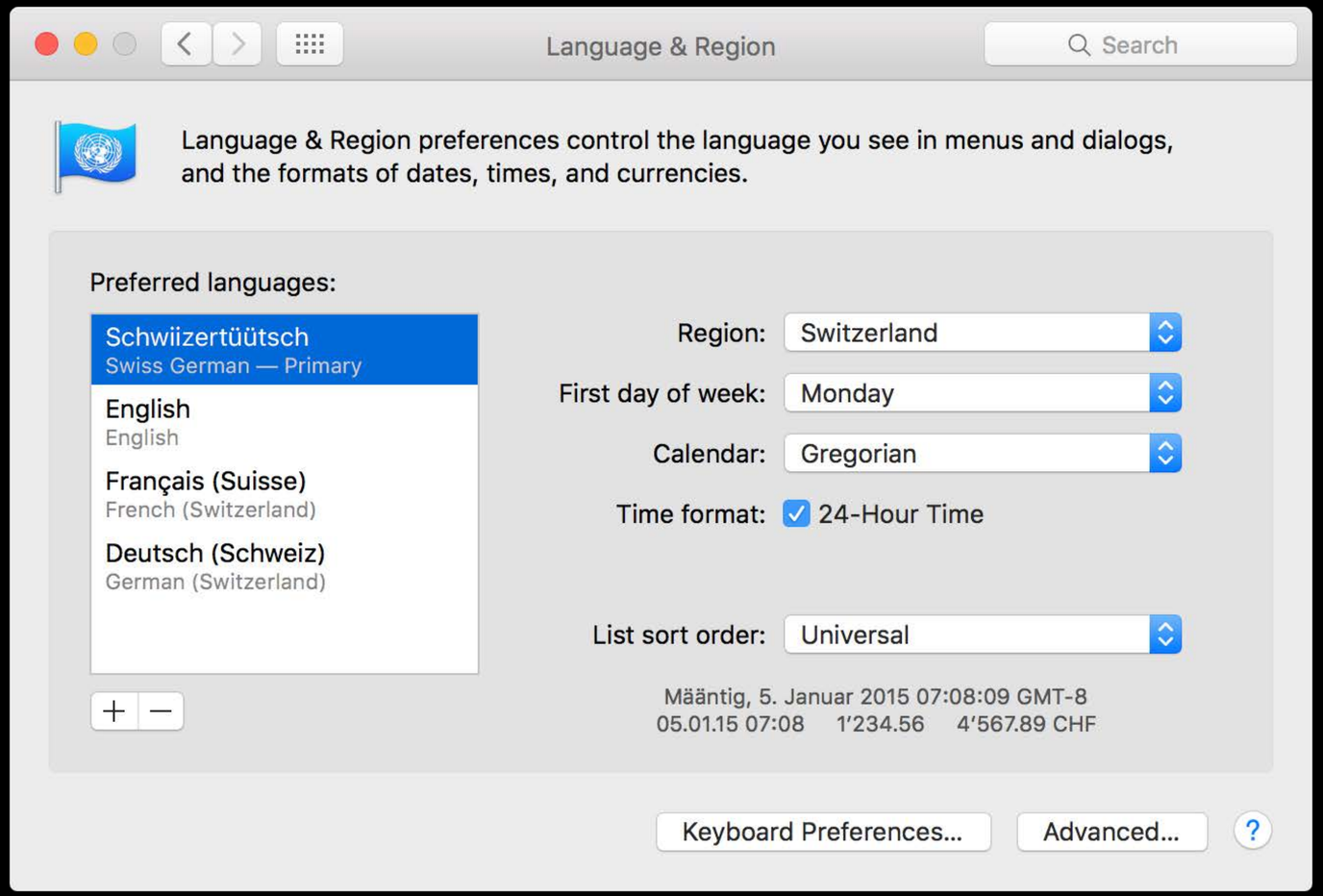
Layout

Localization

Making your app speak your customer's language

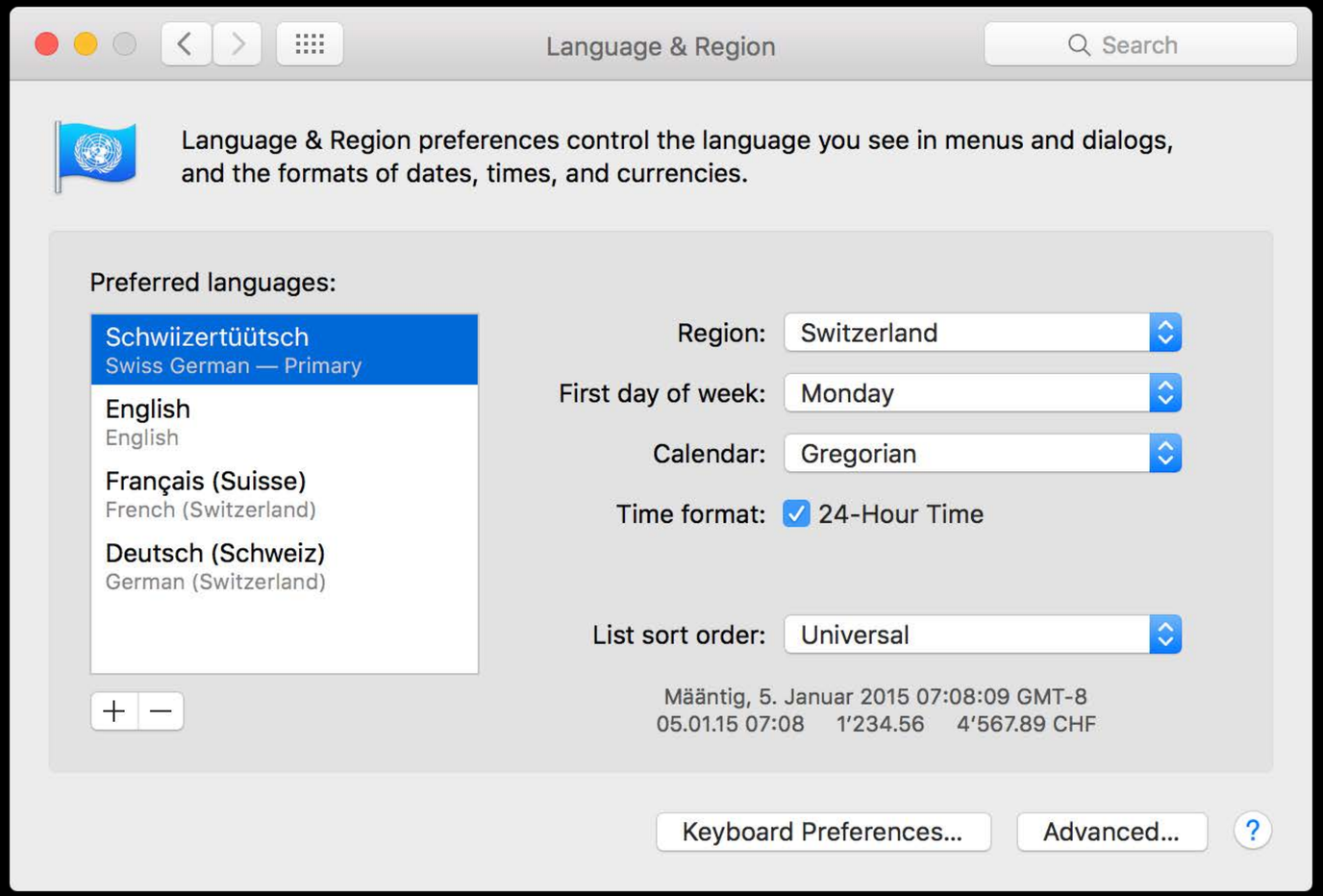
Localization

Language and region settings



Localization

Language and region settings



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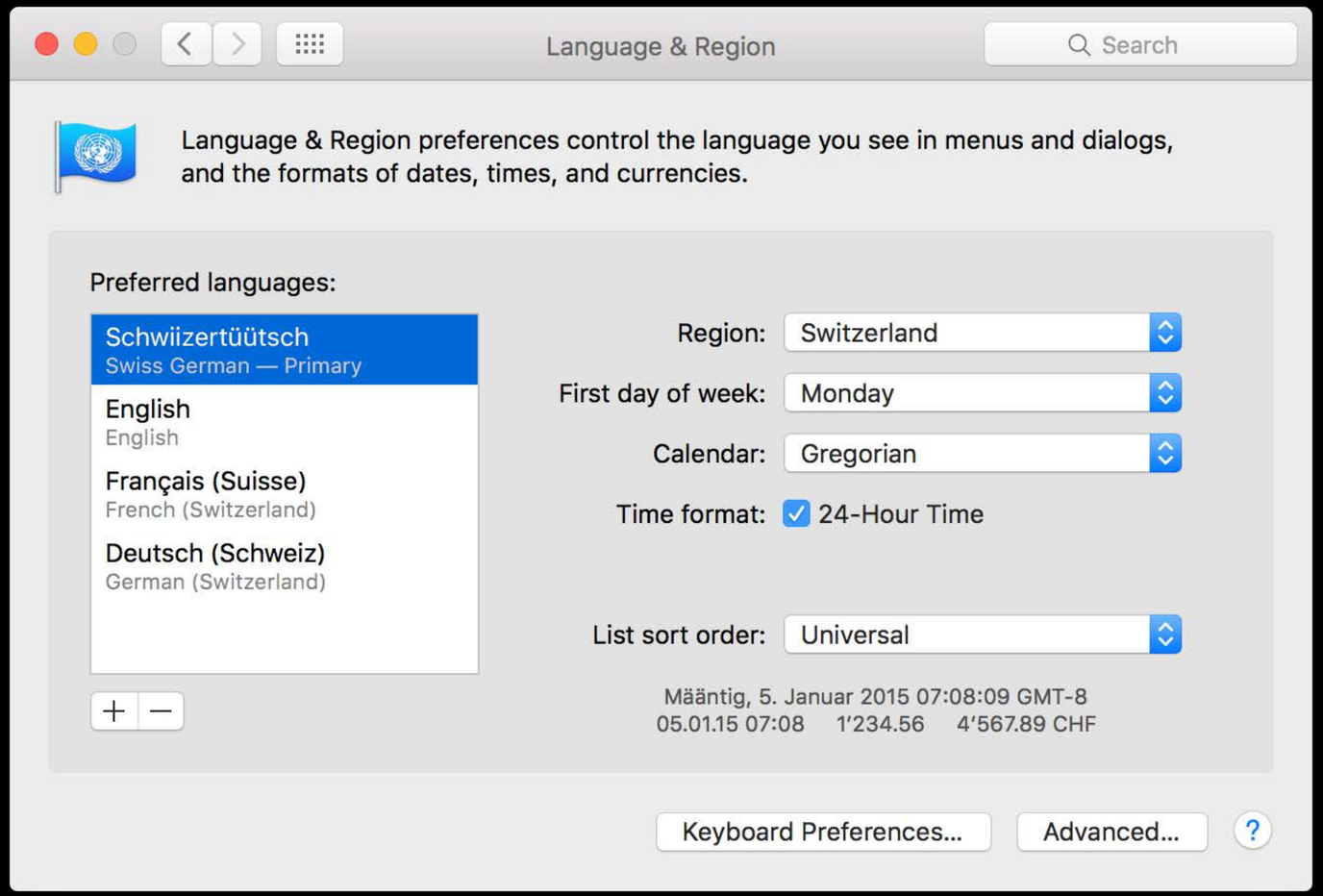

Localization

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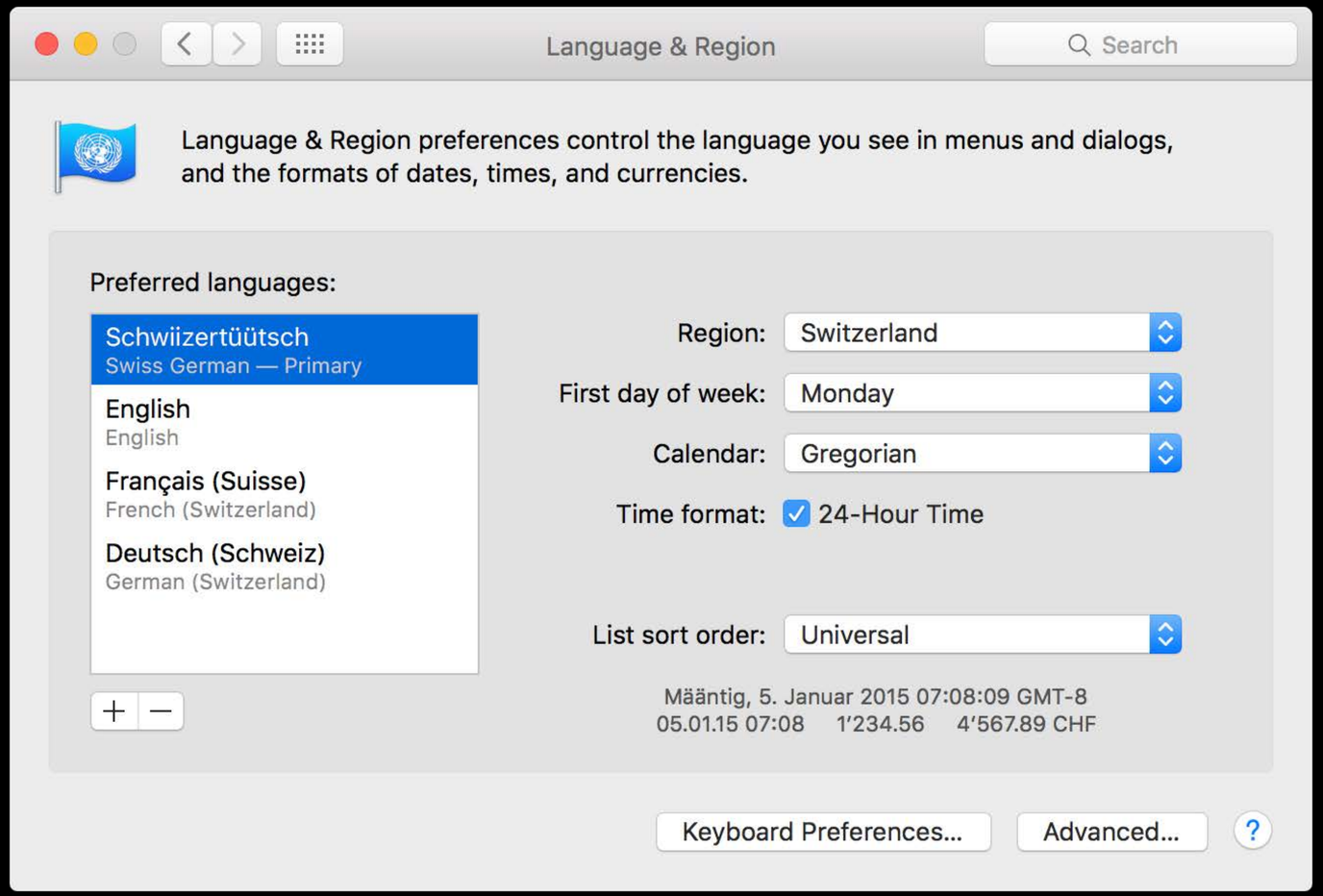


Localization

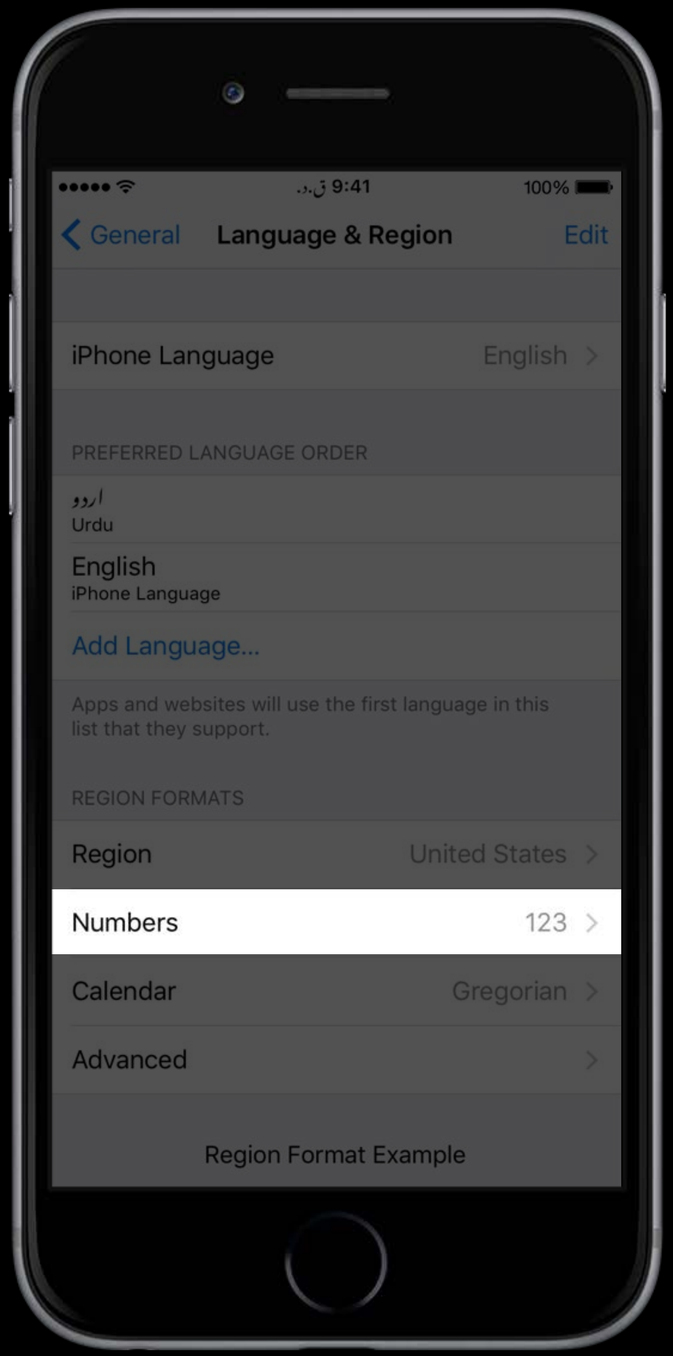
Number Systems

NEW

NEW

9:41
100%
General
Language & Region
Edit
iPhone Language
English
PREFERRED LANGUAGE ORDER
اردو
Urdu
English
iPhone Language
Add Language...
Apps and websites will use the first language in this list that they support.
REGION FORMATS
Region
United States
Numbers
123
Calendar
Gregorian
Advanced
Region Format Example

NEW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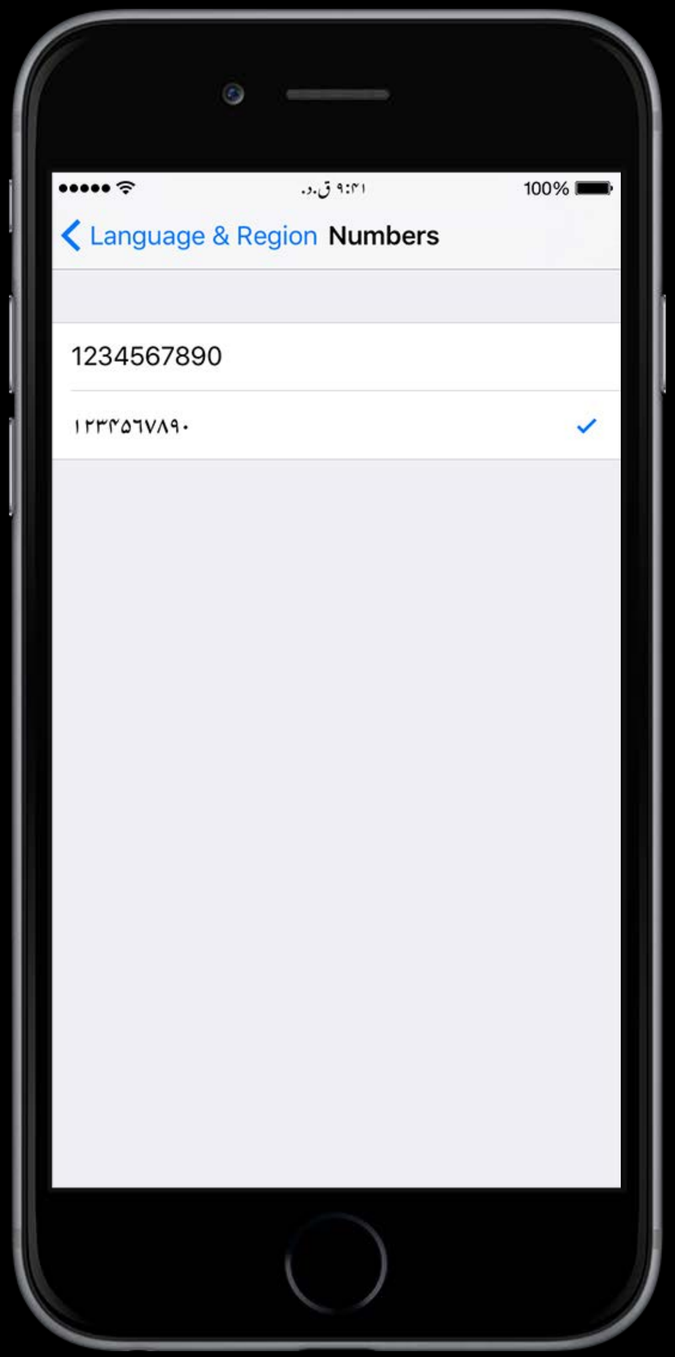


NEW

9:41 ق.ظ.
100%
New York
Sunny
79°
جمعہ
79 64
Now
1ب.ظ.
2ب.ظ.
3ب.ظ.
4ب.ظ.
5ب.ظ.
79° 79° 79° 79° 79° 77°
ہفتہ 82 68
اتوار 81 57
پیر 63 55
منگل 66 54
بدھ 73 61
جمعرات 77 63
جمعہ 82 64
The Weather Channel

۹:۴۱ ق.ظ.
100%
New York
Sunny
۷۹°
جمعہ
۷۹ ۶۴
Now
۱ب.ظ.
۲ب.ظ.
۳ب.ظ.
۴ب.ظ.
۵ب.ظ.
۷۹° ۷۹° ۷۹° ۷۹° ۷۹° ۷۷°
ہفتہ ۸۲ ۶۸
اتوار ۸۱ ۵۷
پیر ۶۳ ۵۵
منگل ۶۶ ۵۴
بدھ ۷۳ ۶۱
جمعرات ۷۷ ۶۳
جمعہ ۸۲ ۶۴
The Weather Channel

Localization

Keyboards

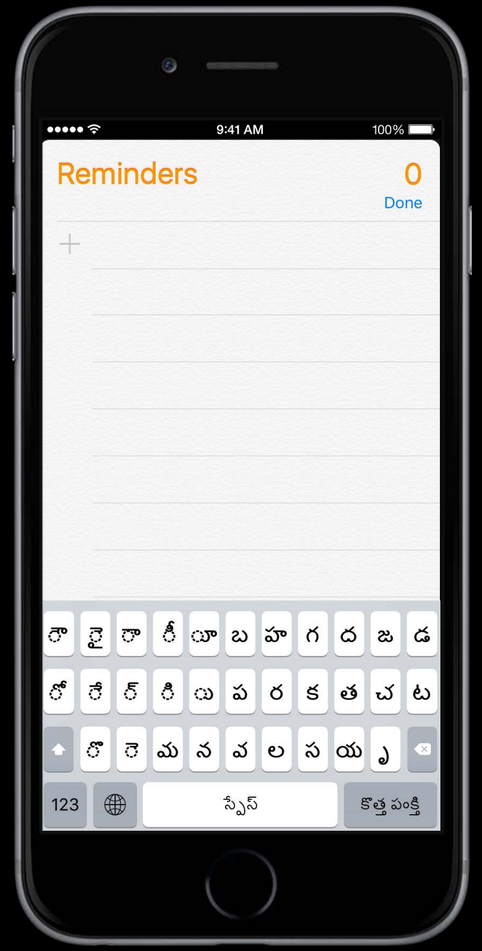
NEW

Indic Keyboards

- Hindi (Latin), a.k.a. “Hinglish”
- Hindi (Transliteration)
- Punjabi
- Telugu
- Gujarati

Predictive Typing for

- Korean
- Mexican Spanish
- Russian
- Turkish



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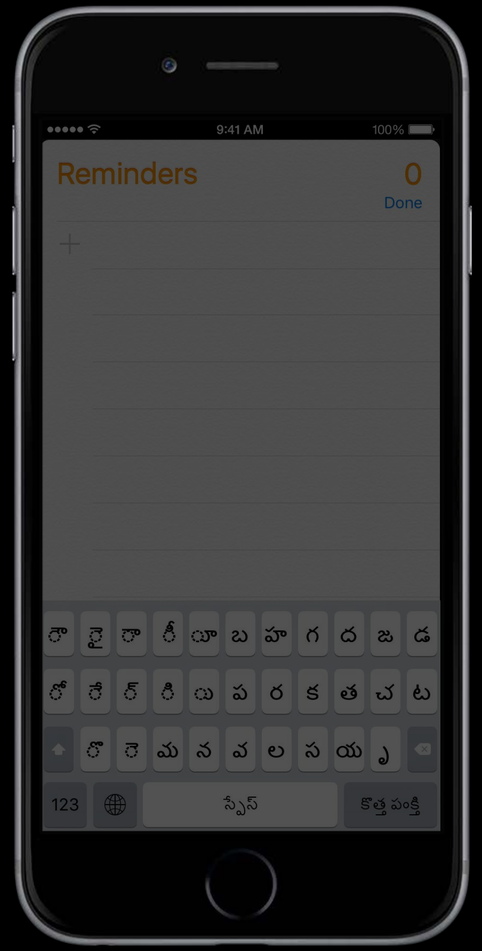

Localization

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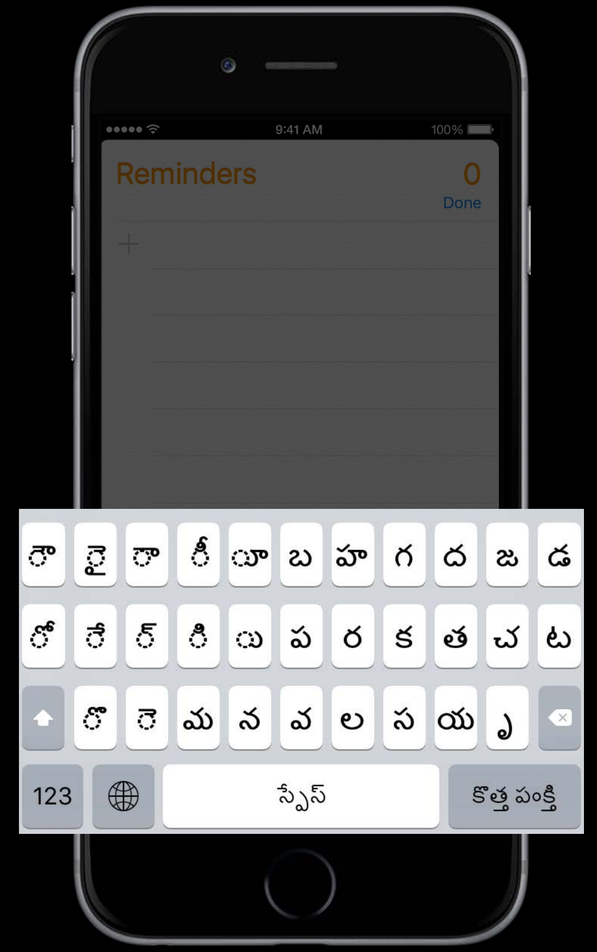


Localization

String Translation

Localization

String Translation

de.lproj/Localizable.strings:

```
/* Wristwatch */
"watch" = "Uhr";
```

Localization

String Translation

de.lproj/Localizable.strings:

```
/* Wristwatch */
"watch" = "Uhr";
```

Stored in lproj subdirectories of your bundle:

```
./Contents/Resources/
                    en.lproj/
                            Localizable.strings
                    de.lproj/
                            Localizable.strings
```

Localization

String Translation

Localization

String Translation

To get simple localized string:

```
func NSLocalizedString(     key : String
                       tableName: String?  = "Localizable",
                          bundle: NSBundle = NSBundle.mainBundle(),
                           value: String   = "",
                         comment: String) -> String
```

Localization

String Translation

To get simple localized string:

```
func NSLocalizedString(     key : String
                       tableName: String?  = "Localizable",
                          bundle: NSBundle = NSBundle.mainBundle(),
                           value: String   = "",
                         comment: String) -> String
```

To get localized formatted string:

```
String.localizedStringWithFormat(format: NSString, args: CVarArgType…)
```

Localization

String Translation

To get simple localized string:

```
func NSLocalizedString(     key : String
                       tableName: String?  = "Localizable",
                          bundle: NSBundle = NSBundle.mainBundle(),
                           value: String   = "",
                         comment: String) -> String
```

To get localized formatted string:

```
String.localizedStringWithFormat(format: NSString, args: CVarArgType…)
```

Together:

```
String.localizedStringWithFormat(NSLocalizedString("%@ %d", comment:…), …)
```

Localization

String Translation

Localization

String Translation

```
var str = String.localizedStringWithFormat(
          NSLocalizedString("Location: %@", comment: "User’s Location"),
          location)
```

Localization

String Translation

```
var str = String.localizedStringWithFormat(
          NSLocalizedString("Location: %@", comment: "User's Location"),
          location)

en.lproj/Localizable.strings:
    "Location: %@" = "Location: %@";
ja.lproj/Localizable.strings:
    "Location: %@" = "場所: %@";
```

Localization

String Translation

```
var str = String.localizedStringWithFormat(
          NSLocalizedString("Location: %@", comment: "User’s Location"),
          location)

en.lproj/Localizable.strings:
   "Location: %@" = "Location: %@";
ja.lproj/Localizable.strings:
   "Location: %@" = "場所: %@";
```

English

Location: San Francisco

Localization

String Translation

```
var str = String.localizedStringWithFormat(
          NSLocalizedString("Location: %@", comment: "User’s Location"),
          location)

en.lproj/Localizable.strings:
    "Location: %@" = "Location: %@";
ja.lproj/Localizable.strings:
    "Location: %@" = "場所: %@";
```

English	Japanese
Location: San Francisco	場所: サンフランシスコ

Localization

Reordering

Localization

Reordering

```
let str = String.localizedStringWithFormat(
                  NSLocalizedString("copy %@’s %@",
                                    comment: "copying item from user"),
                  "hairForce1", "photos")
```

Localization

Reordering

```
let str = String.localizedStringWithFormat(
                  NSLocalizedString("copy %@’s %@",
                                    comment: "copying item from user"),
                  "hairForce1", "photos")
```

```
en.lproj
    "Copy %@’s %@" = "Copying %@’s %@";
de.lproj
    "Copy %@’s %@" = "%@ von %@ kopieren";
```

Localization

Reordering

```
let str = String.localizedStringWithFormat(
                  NSLocalizedString("copy %@’s %@",
                                    comment: "copying item from user"),
                  "hairForce1", "photos")
```

```
en.lproj
   "Copy %@’s %@" = "Copying %@’s %@";
de.lproj
   "Copy %@’s %@" = "%@ von %@ kopieren";
```

English

Copying hairForce1’s photos

Localization

Reordering

```
let str = String.localizedStringWithFormat(
                  NSLocalizedString("copy %@’s %@",
                                    comment: "copying item from user"),
                  "hairForce1", "photos")
```

```
en.lproj
    "Copy %@’s %@" = "Copying %@’s %@";
de.lproj
    "Copy %@’s %@" = "%@ von %@ kopieren";
```

English	German
Copying hairForce1’s photos	**hairForce1** von **photos** kopieren (Copy HairForce1 from photos)

Localization

Reordering

```
let str = String.localizedStringWithFormat(
                  NSLocalizedString("copy %@’s %@",
                                    comment: "copying item from user"),
                  "hairForce1", "photos")
```

```
en.lproj
    "Copy %@’s %@" = "Copying %@’s %@";
de.lproj
    "Copy %@’s %@" = "%$2@ von %$1@ kopieren";
```

English	German
Copying hairForce1’s photos	photos von hairForce1 kopieren

Localization

Don’t access the directories yourself

Localization

Don’t access the directories yourself

```
let lang = NSLocale.preferredLanguages().firstObject!
let lprojPath = lang.stringByAppendingPathExtension("lproj")
let filePath = NSBundle.mainBundle().pathForResource("stopSign",
                ofType: "png", inDirectory: lprojPath)
```

Localization

Don’t access the directories yourself

```
let lang = NSLocale.preferredLanguages().firstObject!
let lprojPath = lang.stringByAppendingPathExtension("lproj")
let filePath = NSBundle.mainBundle().pathForResource("stopSign",
                ofType: "png", inDirectory: lprojPath)
```

Bundle only has es.lproj

Localization

Don’t access the directories yourself

```
let lang = NSLocale.preferredLanguages().firstObject!
let lprojPath = lang.stringByAppendingPathExtension("lproj")
let filePath = NSBundle.mainBundle().pathForResource("stopSign",
                ofType: "png", inDirectory: lprojPath)
```

Bundle only has es.lproj

es-MX (Mexican Spanish)

Nothing Here!

Localization

Don’t access the directories yourself

```
NSBundle.mainBundle().imageForResource("stopSign")
NSBundle.mainBundle().pathForSoundResource("greeting")
NSBundle.mainBundle().URLForResource("help", withExtension: "pdf")
```

Bundle only has es.lproj

es-MX (Mexican Spanish)

Localization

Pluralization

```
if numDays == 1 {
    daysString = String.localizedStringWithFormat(
                        NSLocalizedString("%d day remaining",
                                          comment: "Single day remaining"
                        numDays)
} else {
    daysString = String.localizedStringWithFormat(
                        NSLocalizedString("%d days remaining",
                                          comment: "number of days remaining"),
                        numDays)
}
```

Localization

Pluralization

```
if numDays == 1 {
    daysString = String.localizedStringWithFormat(
                        NSLocalizedString("%d day remaining",
                                          comment: "Single day remaining"
                        numDays)
} else {
    daysString = String.localizedStringWithFormat(
                        NSLocalizedString("%d days remaining",
                                          comment: "number of days remaining"),
                        numDays)
}
```

English

1 day remaining

5 days remaining

Localization

Pluralization

```
if numDays == 1 {
    daysString = String.localizedStringWithFormat(
                        NSLocalizedString("%d day remaining",
                                          comment: "Single day remaining"
                        numDays)
} else {
    daysString = String.localizedStringWithFormat(
                        NSLocalizedString("%d days remaining",
                                          comment: "number of days remaining"),
                        numDays)
}
```

English	Russian
1 day remaining	остается 1 день
5 days remaining	остается 5 дня

Localization

stringsdict

Localization

stringsdict

```
<key>%d day(s) remaining</key>
    <dict>
        <key>NSStringLocalizedFormatKey</key>
        <string>%#@days@</string>
        <key>days</key>
        <dict>
        <key>NSStringFormatSpecTypeKey</key>
        <string>NSStringPluralRuleType</string>
        <key>NSStringFormatValueTypeKey</key>
        <string>d</string>
        <key>one</key>
        <string>%d day remaining</string>
        <key>other</key>
        <string>%d days remaining</string>
    </dict>
</dict>
```

Localization

stringsdict

```
<key>%d day(s) remaining</key>
    <dict>
        <key>NSStringLocalizedFormatKey</key>
        <string>%#@days@</string>
        <key>days</key>
        <dict>
        <key>NSStringFormatSpecTypeKey</key>
        <string>NSStringPluralRuleType</string>
        <key>NSStringFormatValueTypeKey</key>
        <string>d</string>
        <key>one</key>
        <string>%d day remaining</string>
        <key>other</key>
        <string>%d days remaining</string>
    </dict>
</dict>
```

```
 <key>%d day(s) remaining</key>
<dict>
     <key>NSStringLocalizedFormatKey</key>
     <string>%#@days@</string>
     <key>days</key>
     <dict>
         <key>NSStringFormatSpecTypeKey</key>
         <string>NSStringPluralRuleType</string>
         <key>NSStringFormatValueTypeKey</key>
         <string>d</string>
         <key>one</key>
         <string>остается %d день</string>
         <key>few</key>
         <string>остается %d дня</string>
        <key>many</key>
         <string>остается %d дней</string>
        <key>other</key>
         <string>остается %d дня</string>
    </dict>
</dict>
```

Localization

stringsdict

```
<key>%d day(s) remaining</key>
    <dict>
        <key>NSStringLocalizedFormatKey</key>
        <string>%#@days@</string>
        <key>days</key>
        <dict>
            <key>NSStringFormatSpecTypeKey</key>
            <string>NSStringPluralRuleType</string>
            <key>NSStringFormatValueTypeKey</key>
            <string>d</string>
            <key>one</key>
            <string>%d day remaining</string>
            <key>other</key>
            <string>%d days remaining</string>
        </dict>
    </dict>
```

```
 <key>%d day(s) remaining</key>
<dict>
     <key>NSStringLocalizedFormatKey</key>
     <string>%#@days@</string>
     <key>days</key>
     <dict>
         <key>NSStringFormatSpecTypeKey</key>
         <string>NSStringPluralRuleType</string>
         <key>NSStringFormatValueTypeKey</key>
         <string>d</string>
         <key>one</key>
         <string>остается %d день</string>
         <key>few</key>
         <string>остается %d дня</string>
        <key>many</key>
         <string>остается %d дней</string>
        <key>other</key>
         <string>остается %d дня</string>
     </dict>
</dict>
```

Localization

Pluralization

Localization

Pluralization

```
for x in [1,2,5] {
    let formatted = String.localizedStringWithFormat(
        NSLocalizedString("%d day(s) remaining",
                          comment: "number of days remaining until watch release"), x)
}
```

Localization

Pluralization

```
for x in [1,2,5] {
    let formatted = String.localizedStringWithFormat(
        NSLocalizedString("%d day(s) remaining",
                          comment: "number of days remaining until watch release"), x)
}
```

English
1 day remaining
2 days remaining
5 days remaining

Localization

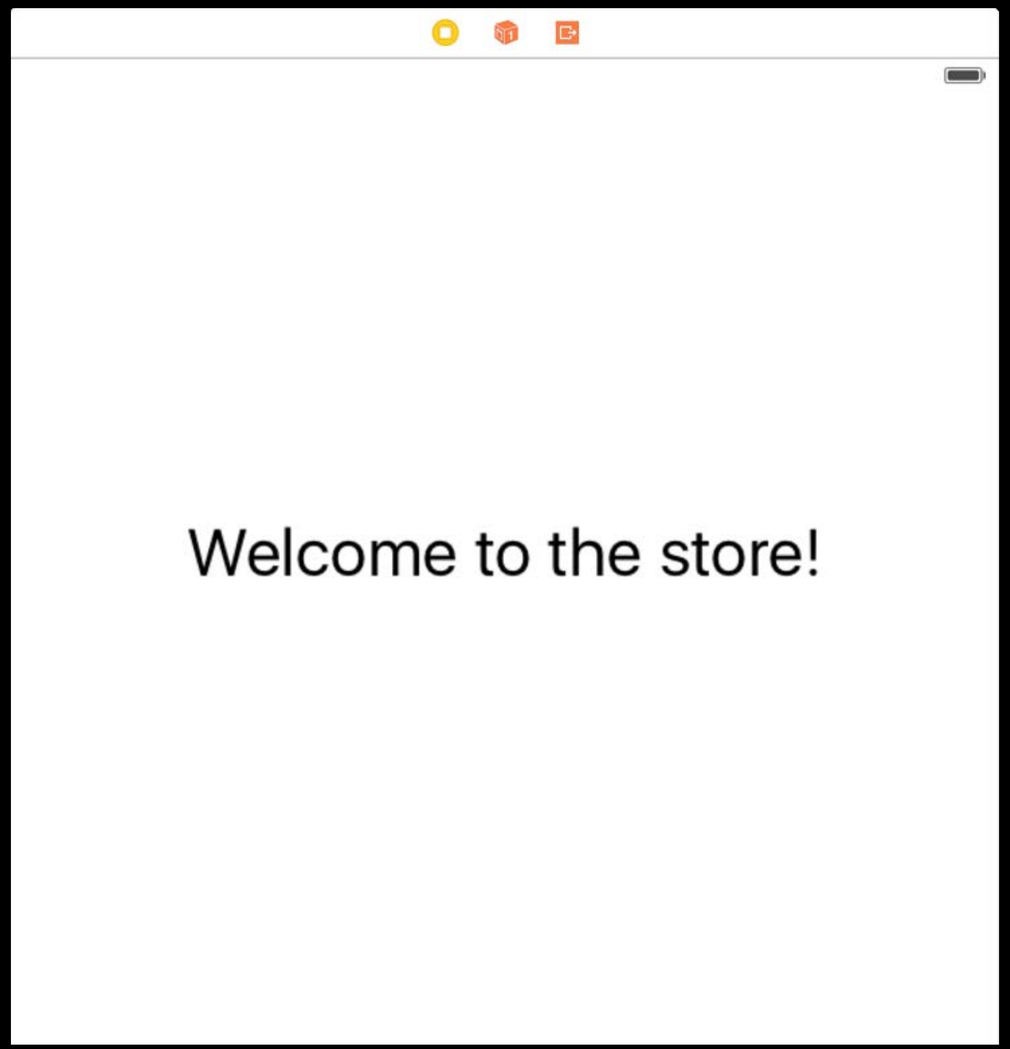
Pluralization

```
for x in [1,2,5] {
    let formatted = String.localizedStringWithFormat(
        NSLocalizedString("%d day(s) remaining",
                          comment: "number of days remaining until watch release"), x)
}
```

English	Russian
1 day remaining	остается 1 день
2 days remaining	остается 2 дня
5 days remaining	остается 5 дней

Localization

VariableWidth



Localization

VariableWidth

iPad
9:41 AM
100%
Welcome to the store!

9:41 AM
100%
Welcome to the store

9:41 AM
100%
elcome to the sto

Localization

VariableWidth

NEW

```
<key>Welcome</key>
   <dict>
       <key>NSStringVariableWidthRuleType</key>
       <dict>
           <key>20</key>
           <string>Hi</string>
           <key>25</key>
           <string>Welcome</string>
           <key>50</key>
           <string>Welcome to the store!</string>
      </dict>
  </dict>
```

Localization

VariableWidth

NEW

Localization

VariableWidth

NEW

```
self.label = NSLocalizedString("Welcome", comment: "Welcomes the user")
```

Localization

VariableWidth

NEW

```
self.label = NSLocalizedString("Welcome", comment: "Welcomes the user")
```

Localization

VariableWidth

NEW

```
self.label = NSLocalizedString("Welcome", comment: "Welcomes the user")
```

Localization

VariableWidth

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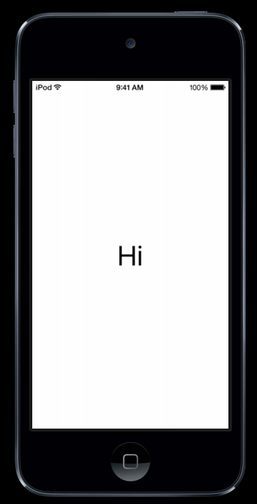
```
self.label = NSLocalizedString("Welcome", comment: "Welcomes the user")
```



Localization

VariableWidth

Localization

VariableWidth

```
let formatted = NSLocalizedString("Welcome", comment: "Welcomes the user")

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

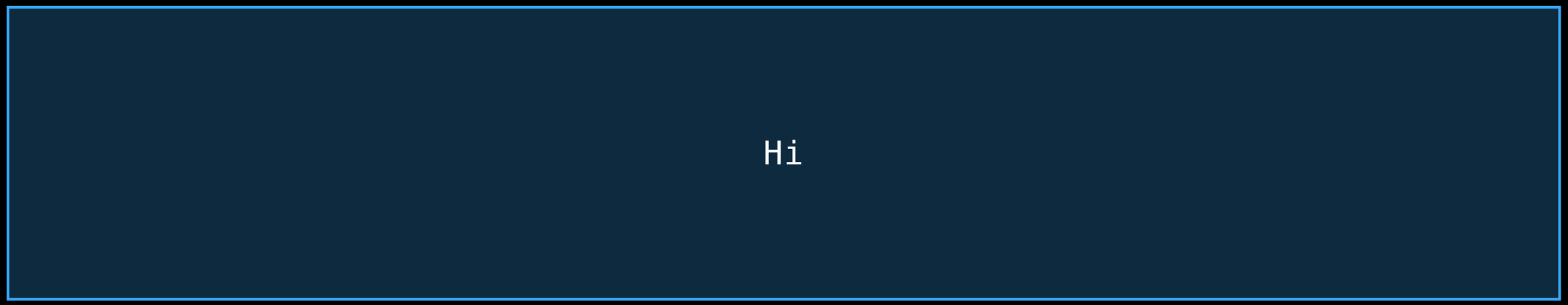
Localization

VariableWidth

NEW

```
let formatted = NSLocalizedString("Welcome", comment: "Welcomes the user")

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



Localization

VariableWidth

NEW

```
let formatted = NSLocalizedString("Welcome", comment: "Welcomes the user")

let widthFormattedString = formatted.variantFittingPresentationWidth(25)
```

Welcome

Localization

VariableWidth

NEW

```
let formatted = NSLocalizedString("Welcome", comment: "Welcomes the user");

let widthFormattedString = formatted.variantFittingPresentationWidth(50)
```

Welcome to the store!

Localization

Formatting

Handling Text

Layout

Localization

Formatting

Handling Text

Layout

Formatting

Numbers, Dates, Times, and Names

Formatting

Numbers

Formatting

Numbers

```
let pi = String(format: "%.3f", M_PI)
```

Formatting

Numbers

```
let pi = String(format: "%.3f", M_PI)
```

English

3.142

Formatting

Numbers

```
let pi = String(format: "%.3f", M_PI)
```

English

3.142

German

3.142

Formatting

Numbers

```
let pi = String(format: "%.3f", M_PI)
```

English	German
3.142	3.142
	"Three Thousand One Hundred Forty Two"

Formatting

Numbers

```
let pi = String.localizedStringWithFormat("%.3f", M_PI)
```

English	German
3.142	3,142

Formatting

Numbers

```
let pi = String.localizedStringWithFormat("%.3f", M_PI)
```

English	German
3.142	3,142

Formatting

Numbers

NEW

```
formatter.stringFromNumber(x)!
```

Input	Style	Output
-42	.CurrencyStyle	-$42.00
-42	.CurrencyISOCodeStyle	-USD42.00
-42	.CurrencyPluralStyle	-42.00 US dollars
-42	.CurrencyAccountingStyle	($42.00)
42	.OrdinalStyle	42nd

Formatting

Dates

Formatting

Dates

```
let date = String(format: "%d/%d/%d, %d:%d%d", 6, 12, 2015, 9, 0, 0)
```

Formatting

Dates

```
let date = String(format: "%d/%d/%d, %d:%d%d", 6, 12, 2015, 9, 0, 0)
```

English (US)

6/12/2015, 9:00

Formatting

Dates

```
let date = String(format: "%d/%d/%d, %d:%d%d", 6, 12, 2015, 9, 0, 0)
```

English (US)	Italian (Italy)
6/12/2015, 9:00	6/12/2015, 9:00

Formatting

Dates

```
let df = NSDateFormatter()
df.dateFormat = "MM/dd/yyyy, h:mm a"
print(df.stringFromDate(NSDate()))
```

English (US)	Italian (Italy)
06/12/2015, 9:00 AM	06/12/2015, 9:00 AM

Formatting

Dates

```
let df = NSDateFormatter()
df.dateStyle = .ShortStyle
df.timeStyle = .ShortStyle
print(df.stringFromDate(NSDate()))
```

English (US)	Italian (Italy)
06/12/2015, 9:00 AM	12/06/2015, 09:00

Formatting

Dates

```
let df = NSDateFormatter()
df.dateStyle = .ShortStyle
df.timeStyle = .ShortStyle
print(df.stringFromDate(NSDate()))
```

English (US)	Italian (Italy)
06/12/2015, 9:00 AM	12/06/2015, 09:00

Formatting

Dates

```
let df = NSDateFormatter()
df.setLocalizedDateFormatFromTemplate("yyyyMMddjjmmss")
print(df.stringFromDate(NSDate()))
```

English (US)	Italian (Italy)
06/12/2015, 9:00:00 AM	12/06/2015, 09:00:00

Formatting

Dates

```
let df = NSDateFormatter()
df.setLocalizedDateFormatFromTemplate("yyyyMMddjjmmss")
print(df.stringFromDate(NSDate()))
```

English (US)	Italian (Italy)
06/12/2015, 9:00:00 AM	12/06/2015, 09:00:00

Formatting

Units

Formatting

Units

```
let weight = String.localizedStringWithFormat(
                            NSLocalizedString("%d pounds",
                                    comment: "Weight"),
                            6)
```

Formatting

Units

```
let weight = String.localizedStringWithFormat(
                            NSLocalizedString("%d pounds",
                                    comment: "Weight"),
                            6)
```

```
it.lproj/Localizable.strings
   "%d pounds" = "%d chilogrammi"
```

Formatting

Units

```
let weight = String.localizedStringWithFormat(
                        NSLocalizedString("%d pounds",
                                 comment: "Weight"),
                        6)
```

```
it.lproj/Localizable.strings
   "%d pounds" = "%d chilogrammi"
```

English (US)

6 pounds

Formatting

Units

```
let weight = String.localizedStringWithFormat(
                        NSLocalizedString("%d pounds",
                                 comment: "Weight"),
                        6)
```

```
it.lproj/Localizable.strings
   "%d pounds" = "%d chilogrammi"
```

English (US)	Italian (Italy)
6 pounds	6 chilogrammi

Formatting

Units

```
let weight = 20.0 // Store weight in metric units
let massFormatter = NSMassFormatter()
massFormatter.unitStyle = .Long
let formatted = massFormatter.stringFromKilograms(weight)
```

English (US)	Italian (Italy)
44.092 pounds	20 chilogrammi

Formatting

Units

```
let weight = 20.0 // Store weight in metric units
let massFormatter = NSMassFormatter()
massFormatter.unitStyle = .Long
let formatted = massFormatter.stringFromKilograms(weight)
```

English (US)	Italian (Italy)
44.092 pounds	20 chilogrammi

Formatting

Names

Formatting

Names

Grace

Formatting

Names

Grace Murray

Formatting

Names

Grace Murray Hopper

Formatting

Names

Grace Murray Hopper

王

Formatting

Names

Grace Murray Hopper

王冬

Formatting

Names

Grace Murray Hopper

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Formatting

Names

Grace Murray Hopper

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Formatting

Names

NEW

Formatting

Names

NEW

NSPersonNameComponents

Formatting

Names

NEW

NSPersonNameComponents

NSPersonNameComponentsFormatter

Formatting

Names

NEW

Formatting

Names

NEW

English:

```
let components = NSPersonNameComponents()
components.givenName = "Grace"
components.middleName = "Murray"
components.familyName = "Hopper"
```

Formatting

Names

NEW

English:

```
let components = NSPersonNameComponents()
components.givenName = "Grace"
components.middleName = "Murray"
components.familyName = "Hopper"
```

Russian:

```
let components = NSPersonNameComponents()
components.givenName = "Фёдор"          // Fyodor
components.middleName = "Михайлович"    // Mikhailovich
components.familyName = "Достоевский"   // Dostoyevsky
```

Formatting

Names

Formatting

Names

```
let formatter = NSPersonNameComponentsFormatter()
formatter.style = .Short
formatter.stringFromPersonNameComponents(components)
```

Formatting

Names

	English Name	Russian Name
.Default	Grace Hopper	Фёдор Достоевский
.Long	Grace Murray Hopper	Фёдор Михайлович Достоевский
.Medium	Grace Hopper	Фёдор Достоевский
.Short	Grace	Ф Достоевский
.Abbreviated	GMH	Ф Достоевский

Localization

Formatting

Handling Text

Layout

Localization

Formatting

Handling Text

Layout

Handling Text

Characters, Case Changes, Searching, and Transforms

Handling Text

What is a character?

How many characters is 💏 ?

Handling Text

What is a character?

How many characters is 💏 ?

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

U+200D (ZERO WIDTH JOINER) +

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U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

U+200D (ZERO WIDTH JOINER) +

U+1F48B (KISS MARK) 💋 +

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

U+200D (ZERO WIDTH JOINER) +

U+1F48B (KISS MARK) 💋 +

U+200D (ZERO WIDTH JOINER) +

Handling Text

What is a character?

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U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

U+200D (ZERO WIDTH JOINER) +

U+1F48B (KISS MARK) 💋 +

U+200D (ZERO WIDTH JOINER) +

U+1F468 (MAN) 👨

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

U+200D (ZERO WIDTH JOINER) +

U+1F48B (KISS MARK) 💋 +

U+200D (ZERO WIDTH JOINER) +

U+1F468 (MAN) 👨

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

U+200D (ZERO WIDTH JOINER) +

U+1F48B (KISS MARK)💋 +

U+200D (ZERO WIDTH JOINER) +

U+1F468 (MAN) 👨

8

Handling Text

What is a character?

How many characters is 💏 ?

U+1F468 (MAN) 👨 +

U+200D (ZERO WIDTH JOINER) +

U+2764 (HEAVY BLACK HEART) ❤ +

U+FE0F (VARIATION SELECTOR-16) +

U+200D (ZERO WIDTH JOINER) +

U+1F48B (KISS MARK)💋 +

U+200D (ZERO WIDTH JOINER) +

U+1F468 (MAN) 👨

8?

Handling Text

Enumeration: Incorrect

Handling Text

Enumeration: Incorrect

```
NSString *str = @"test 💏";
for(int i = 0; i < str.length; i++) {
    NSLog(@"%C",[str characterAtIndex:i]);
}
```

Handling Text

Enumeration: Incorrect

```
NSString *str = @"test 💏";
for(int i = 0; i < str.length; i++) {
    NSLog(@"%C",[str characterAtIndex:i]);
}
```

```
t e s t ? ? ? ? ❤ ? ? ?
```

Handling Text

Enumeration: Swift

```
let str = "test 💏"
str.enumerateSubstringsInRange(str.startIndex ..< str.endIndex,
                options: .ByComposedCharacterSequences) {
                (substring, substringRange, enclosingRange, stop) -> () in
                    print("\(substring)")
    }
```

```
test 💏
```

Handling Text

Enumeration: Swift

```
let str = "test 💏"
str.enumerateSubstringsInRange(str.startIndex ..< str.endIndex,
                options: .ByComposedCharacterSequences) {
                (substring, substringRange, enclosingRange, stop) -> () in
                    print("\(substring)")
}
```

```
test 💏
```

Handling Text

Case changes

Handling Text

Case changes

```
let str = "istanbul"
print(str.capitalizedString)
```

Handling Text

Case changes

```
let str = "istanbul"
print(str.capitalizedString)
```

```
Istanbul
```

Handling Text

Case changes

```
let str = "istanbul"
print(str.localizedCapitalizedString)
```

```
İstanbul
```

Handling Text

Case changes

```
let str = "istanbul"
print(str.localizedCapitalizedString)
```

```
İstanbul
```

Handling Text

Case changes

NEW

Handling Text

Case changes

NEW

```
let str = "istanbul"
print(str.localizedUppercaseString)
print(str.localizedLowercaseString)
print(str.localizedCapitalizedString)
```

Handling Text

Case changes

NEW

```
let str = "istanbul"
print(str.localizedUppercaseString)
print(str.localizedLowercaseString)
print(str.localizedCapitalizedString)
```

İSTANBUL
istanbul
İstanbul

Handling Text

Searching

Handling Text

Searching

```
let str = "Über"
print(str.rangeOfString("uber"))
```

Handling Text

Searching

```
let str = "Über"
print(str.rangeOfString("uber"))
```

nil

Handling Text

Searching

NEW

```
let str = "Über"
print(str.localizedStandardRangeOfString("uber"))
print(str.localizedStandardContainsString("uber"))
```

0..<4

true

Handling Text

Searching

```
let str = "Über"
print(str.localizedStandardRangeOfString("uber"))
print(str.localizedStandardContainsString("uber"))
```

0..<4

true

Handling Text

String APIs: Transforms

Transforms:

- Uppercase/lowercase
- Unicode normalization
- Script to Script conversion / transliteration

Formerly only CF-level

Handling Text

String APIs: Transliteration

NEW

Handling Text

String APIs: Transliteration

NEW

```
let transliterated =
"👍".stringByApplyingTransform(NSStringTransformToXMLHex, reverse: false)
print(transliterated)
```

Handling Text

String APIs: Transliteration

NEW

```
let transliterated =
"👍".stringByApplyingTransform(NSStringTransformToXMLHex, reverse: false)
print(transliterated)
```

👍

Localization

Formatting

Handling Text

Layout

Localization

Formatting

Handling Text

Layout

Layout

Displaying International UI

Layout

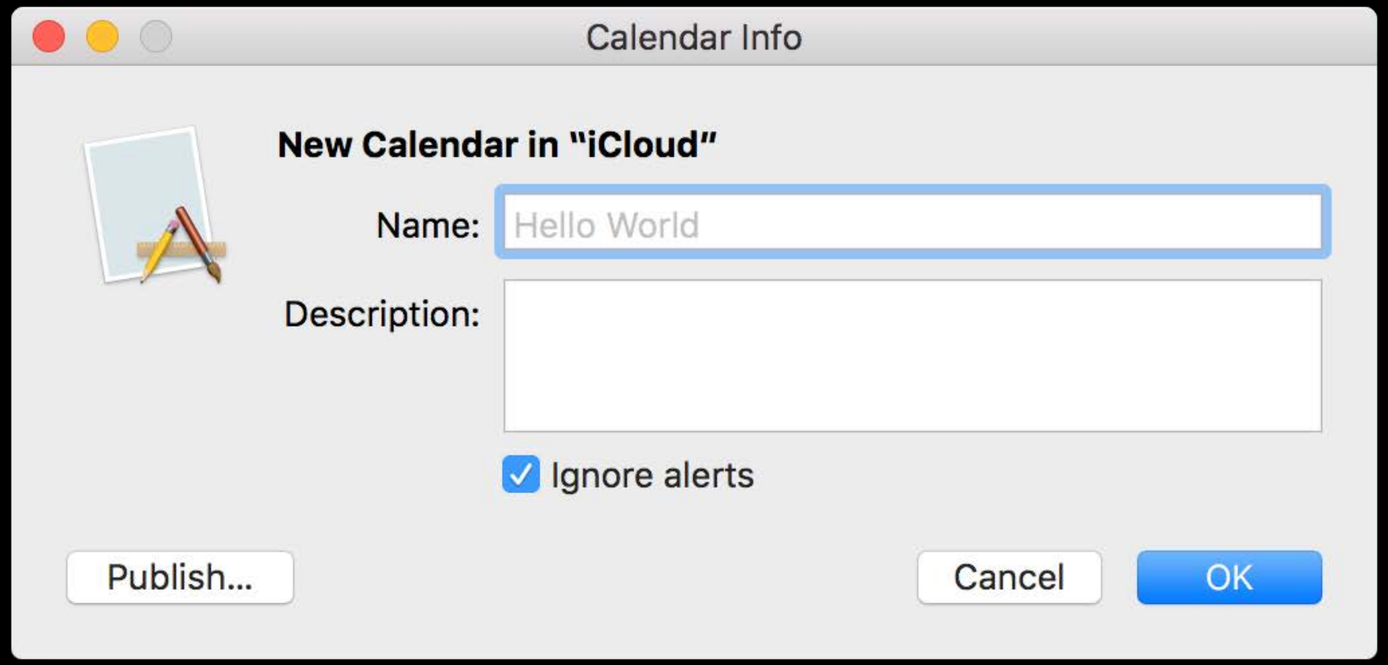
Auto Layout

Layout

Auto Layout

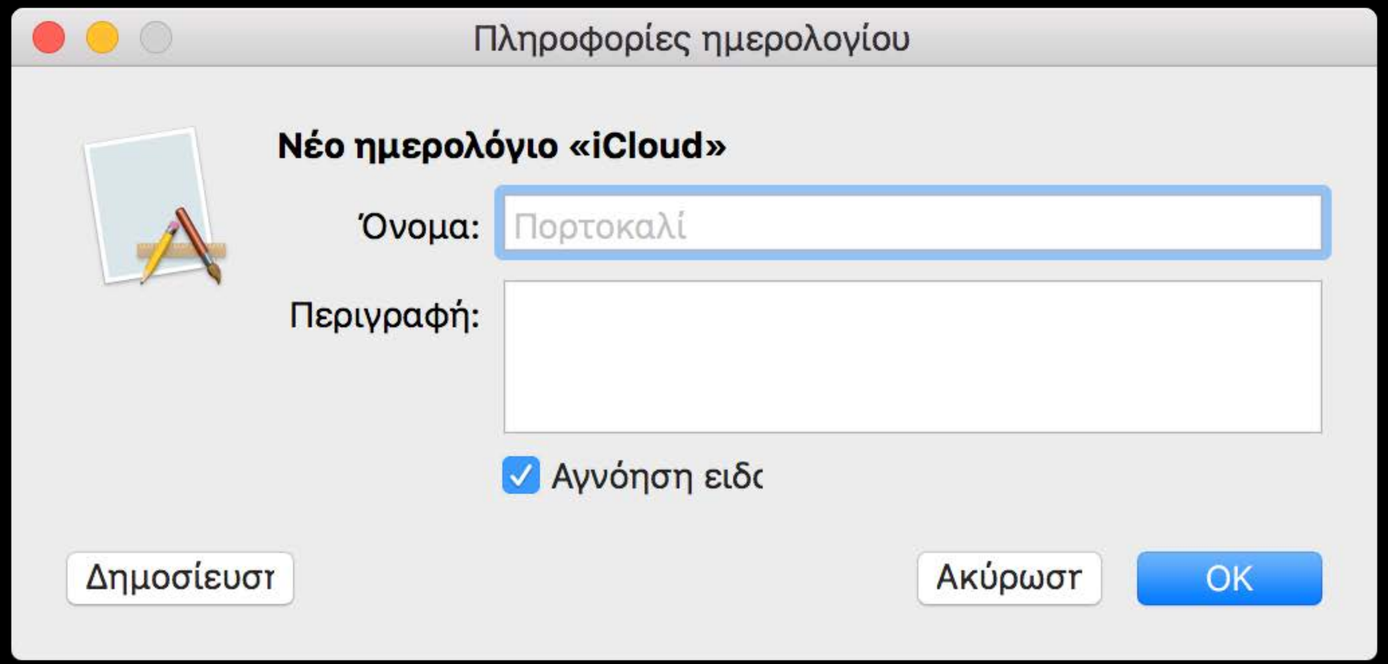
Layout

Auto Layout



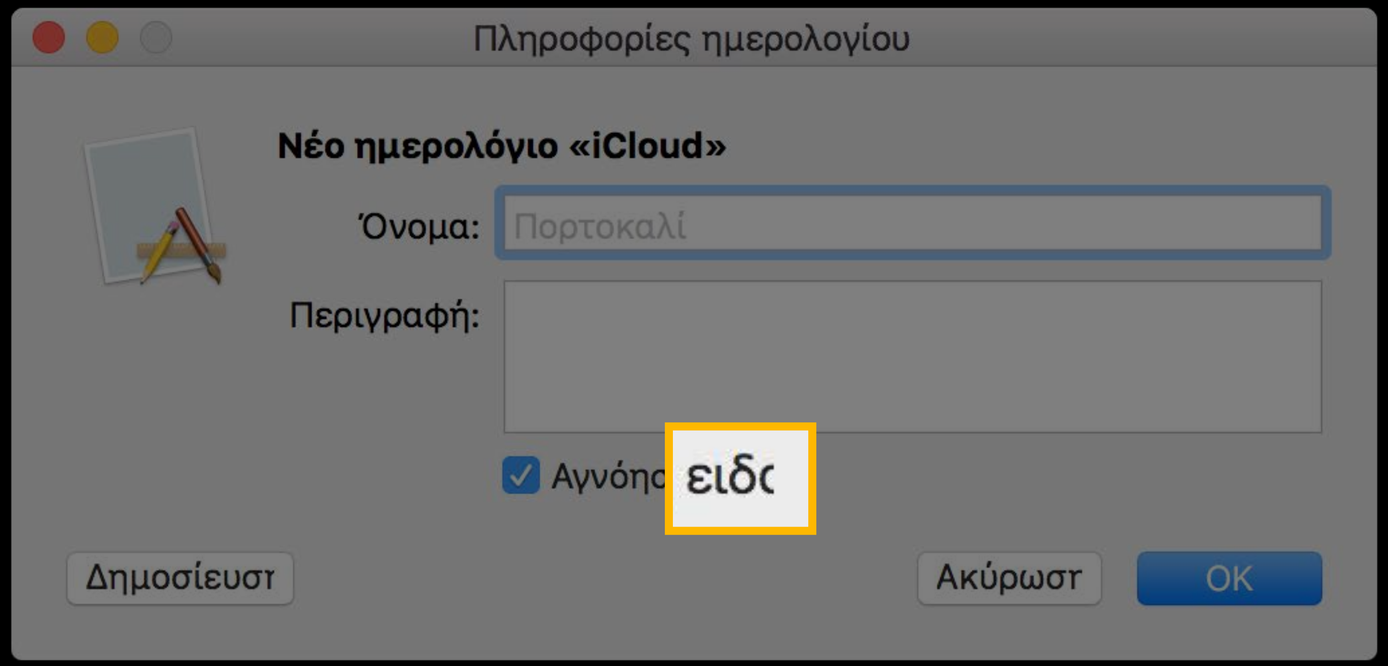
Layout

Auto Layout



Layout

Auto Layout



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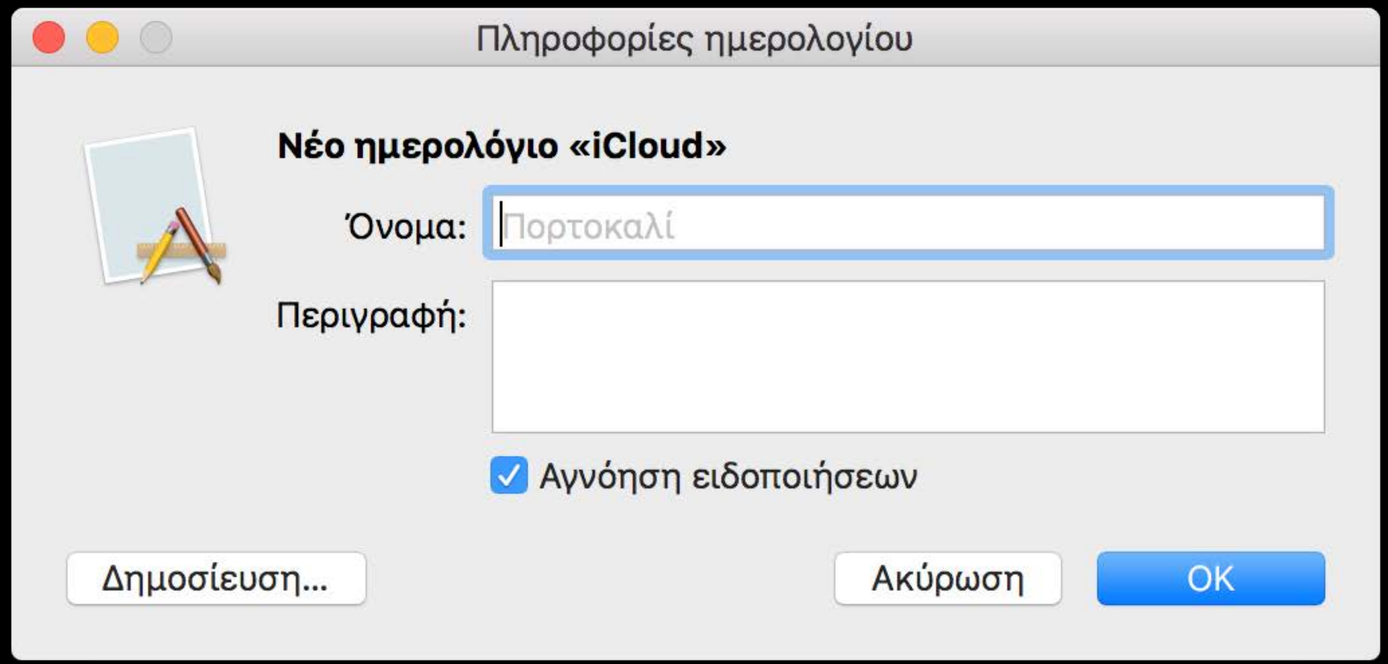
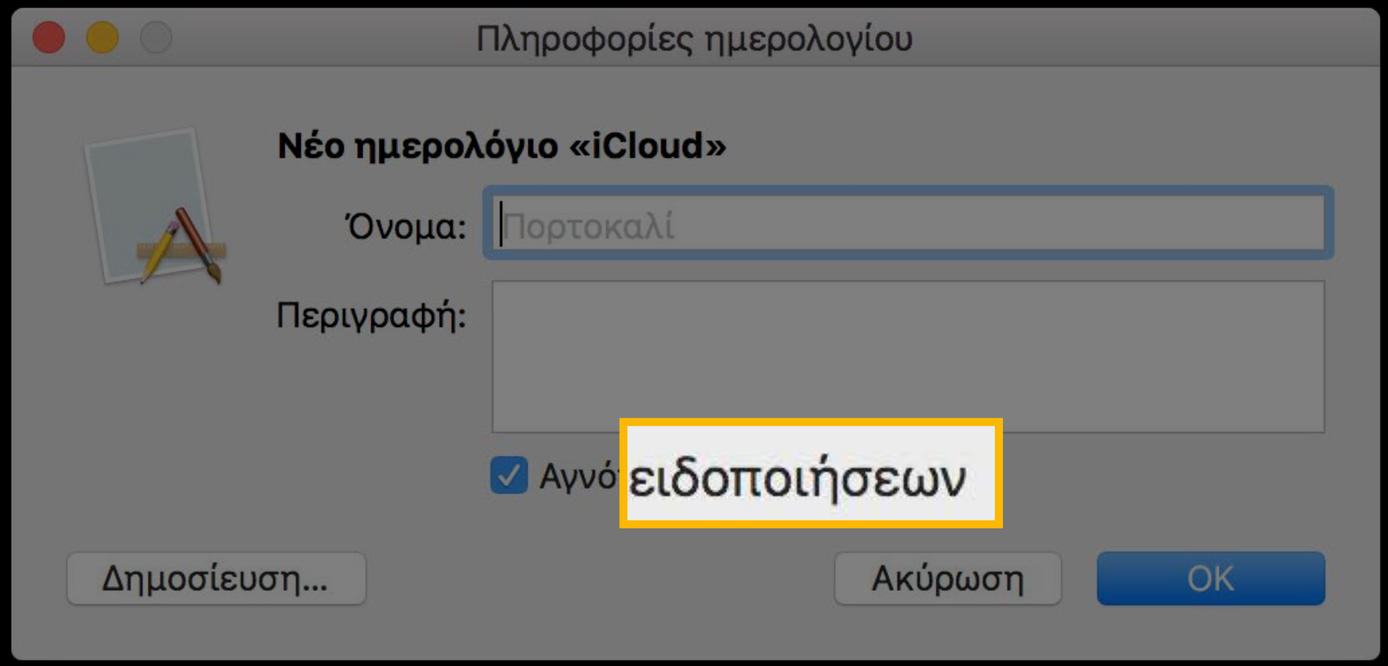
Layout

Auto Layout



Layout

Auto Layout



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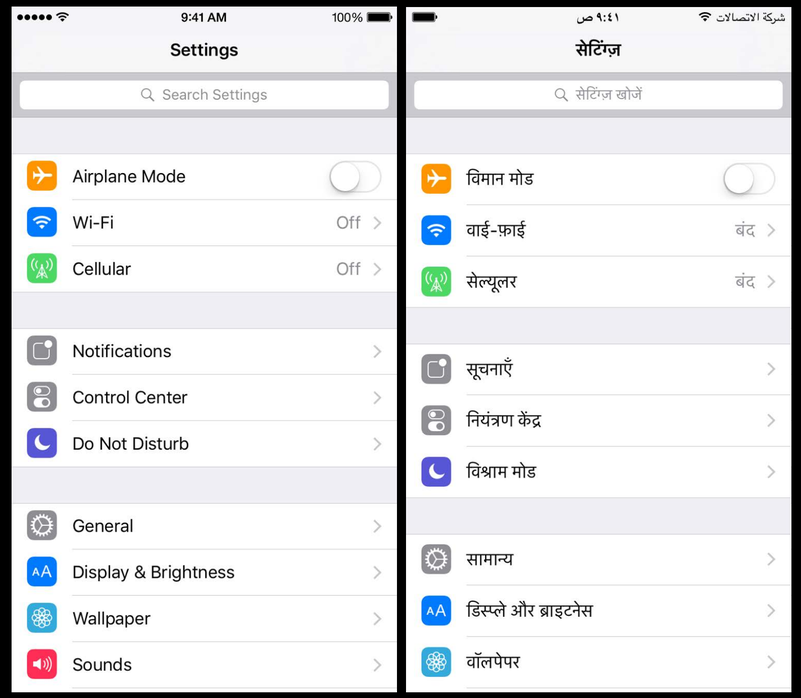
Layout

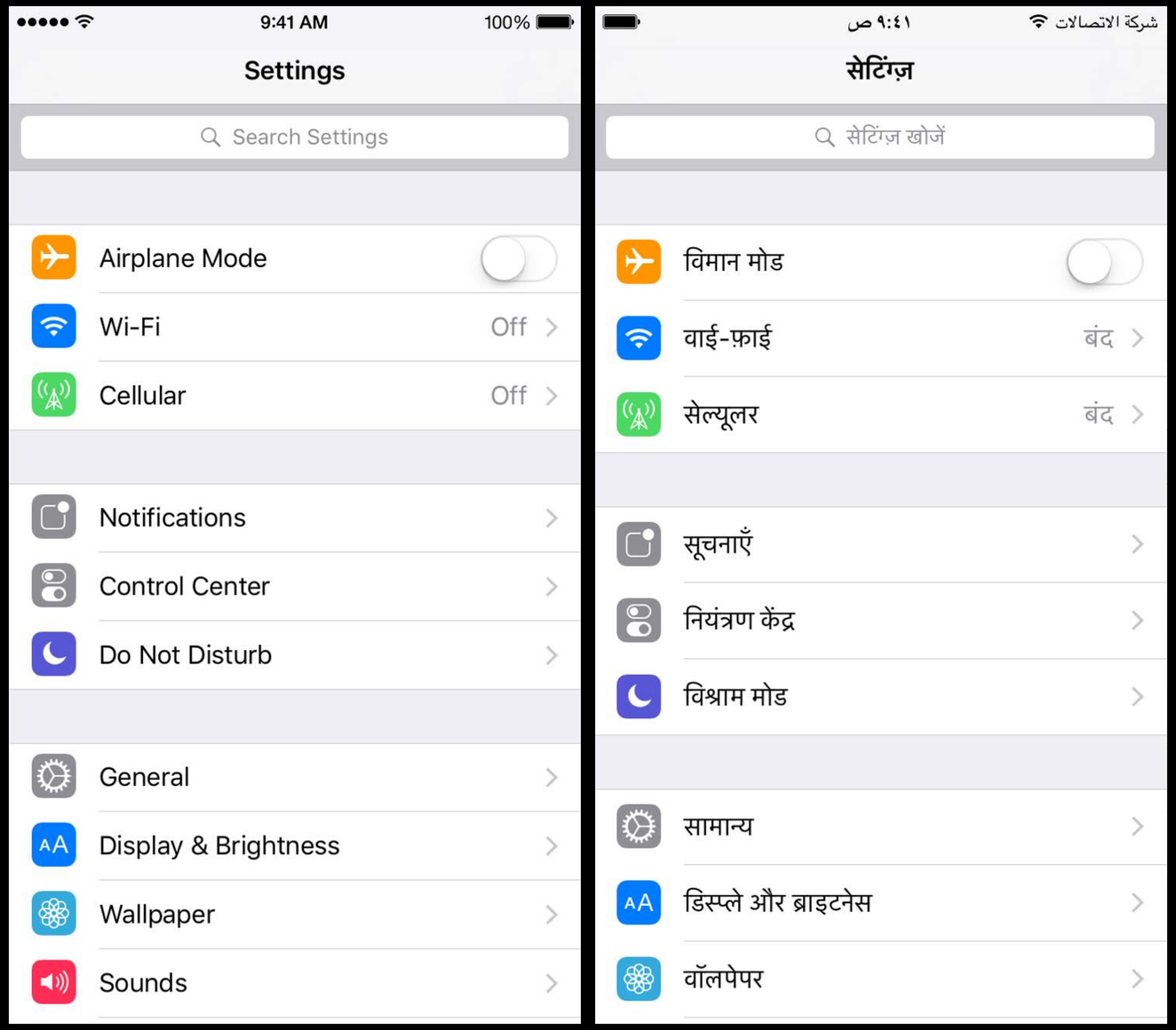
Auto Layout

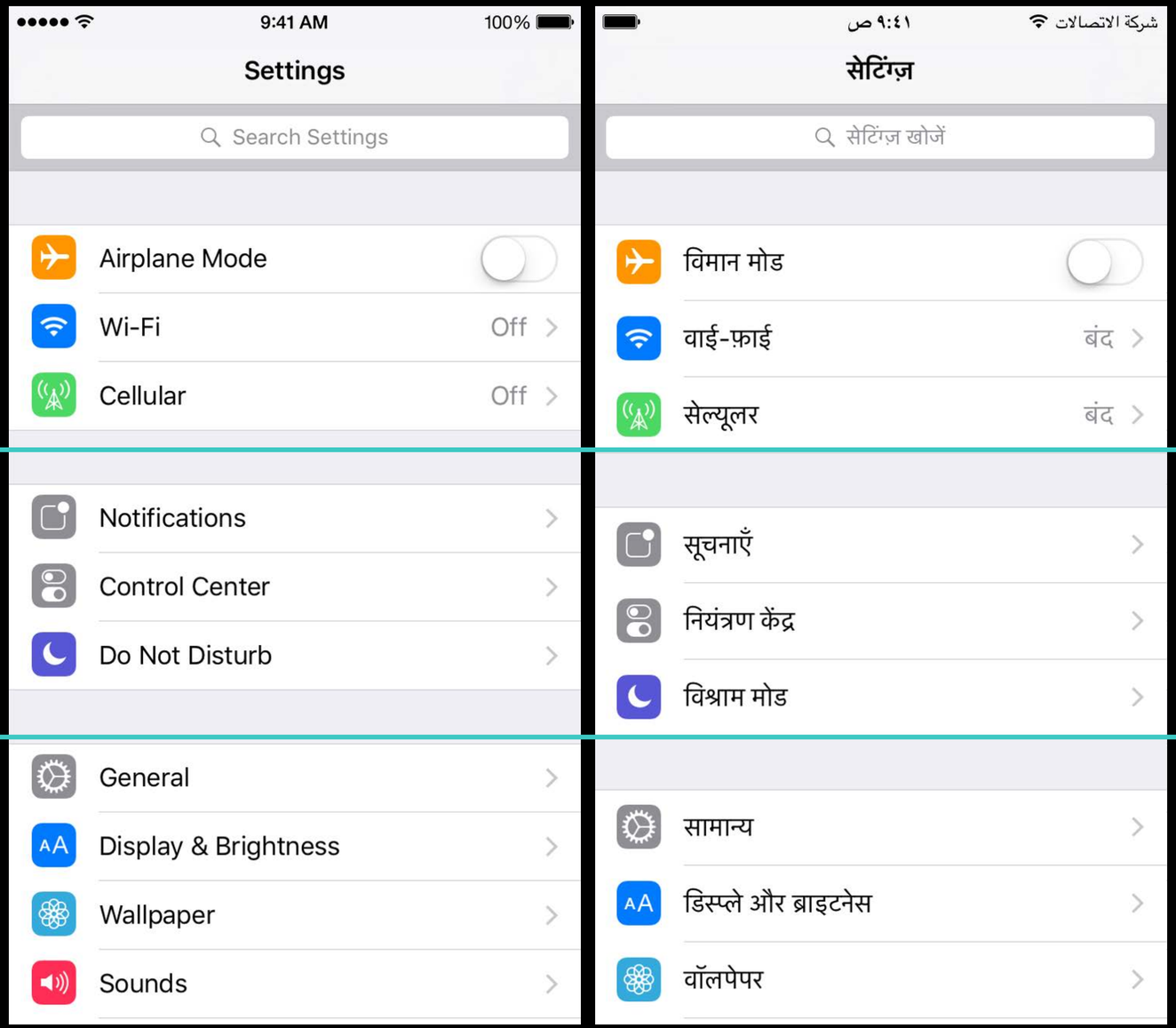
Mysteries of Auto Layout, Part 1	Presidio	Thursday 11:00 AM
Mysteries of Auto Layout, Part 2	Presidio	Thursday 1:30 PM

Layout

Dynamic Type




9:41 AM
100%
Settings
Search Settings
Airplane Mode
Wi-Fi
Off
Cellular
Off
Notifications
Control Center
Do Not Disturb
General
Display & Brightness
Wallpaper
Sounds
٩:٤١ ص
شركة الاتصالات
सेटिंग्ज़
सेटिंग्ज़ खोजें
विमान मोड
वाई-फ़ाई
बंद
सेल्यूलर
बंद
सूचनाएँ
नियंत्रण केंद्र
विश्राम मोड
सामान्य
डिस्प्ले और ब्राइटनेस
वॉलपेपर


9:41 AM
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Settings
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Wi-Fi
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Control Center
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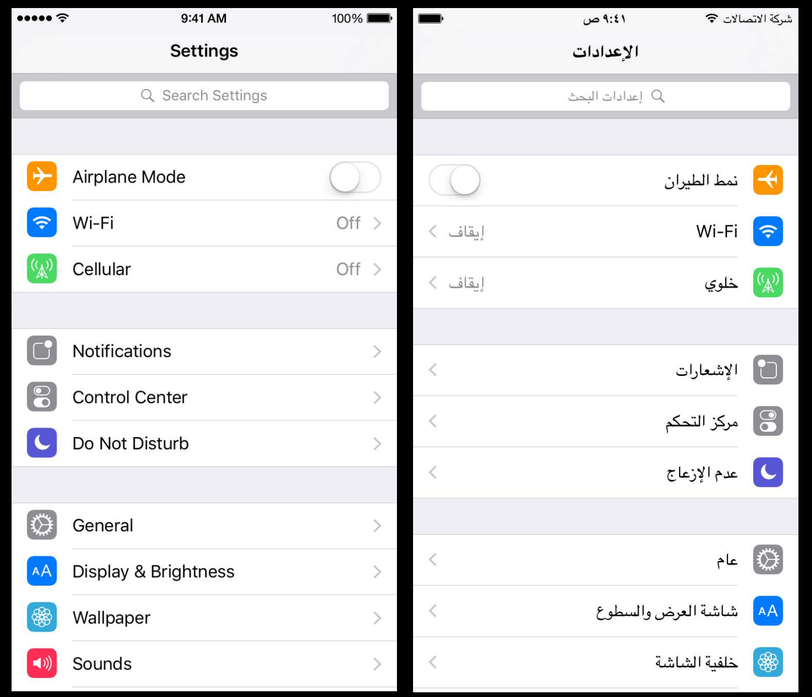
Display & Brightness
Wallpaper
Sounds
٩:٤١ ص
شركة الاتصالات
सेटिंग्ज़
सेटिंग्ज़ खोजें
विमान मोड
वाई-फ़ाई
बंद
सेल्यूलर
बंद
सूचनाएँ
नियंत्रण केंद्र
विश्राम मोड
सामान्य
डिस्प्ले और ब्राइटनेस
वॉलपेपर

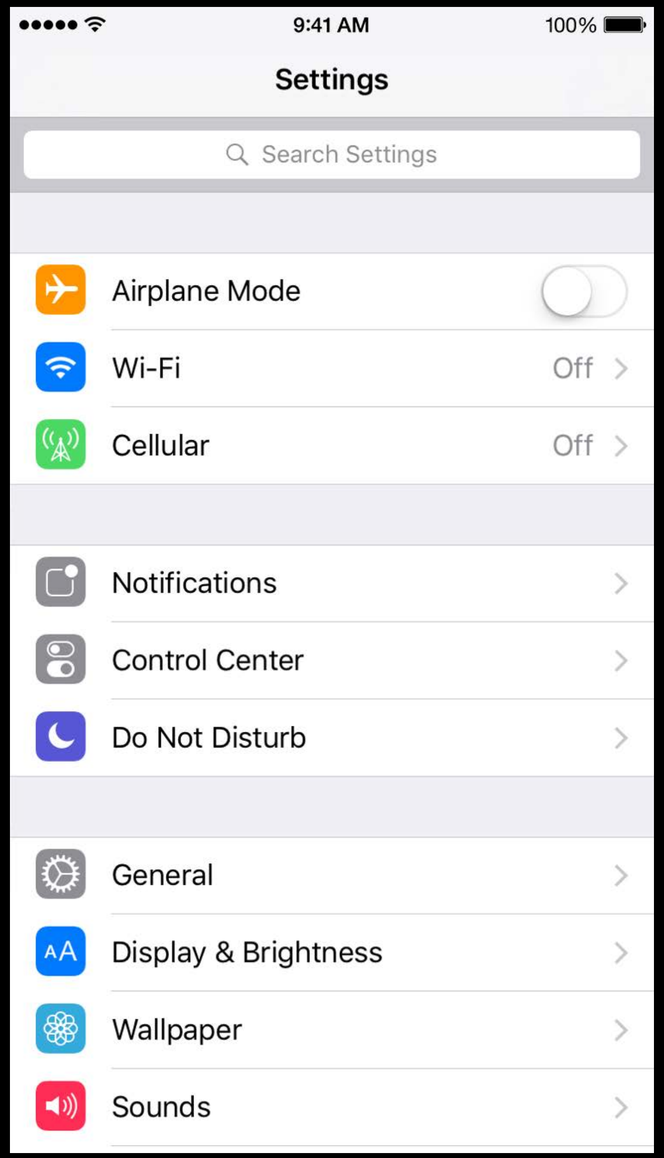
Layout

Right-to-Left

NEW



NEW

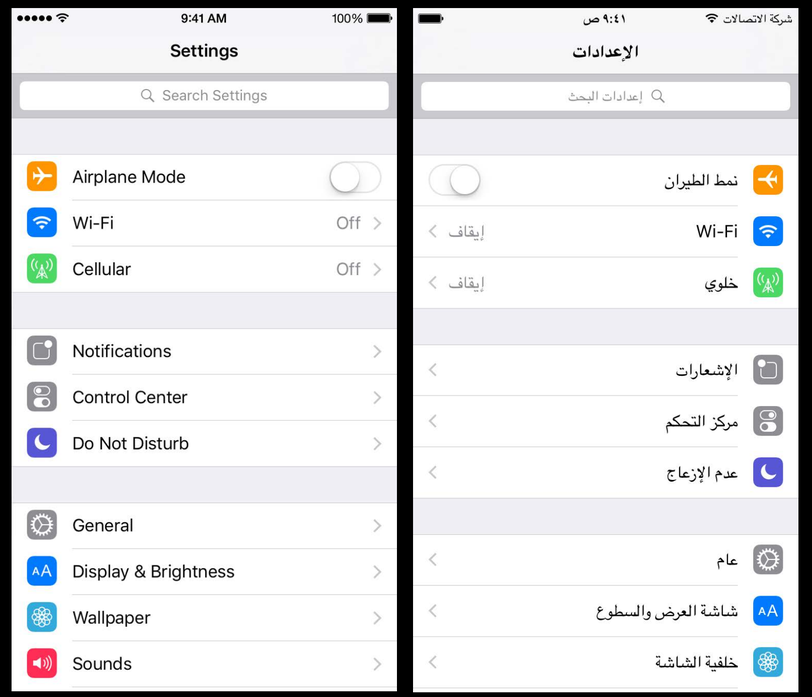

9:41 AM
100%
Settings
Search Settings
Airplane Mode
Wi-Fi
Off
Cellular
Off
Notifications
Control Center
Do Not Disturb
General
Display & Brightness
Wallpaper
Sounds

شركة الاتصالات
٩:٤١ ص
الإعدادات
إعدادات البحث
نمط الطيران
Wi-Fi
إيقاف
خلوي
إيقاف
الإشعارات
مركز التحكم
عدم الإزعاج
عام
شاشة العرض والسطوع
خلفية الشاشة

Layout

Right-to-Left

NEW



New UIKit Support for International User Interfaces — Nob Hill — Thursday 2:30 PM

Summary

Pay attention to

- Localization
- Formatting
- Handling Text
- Layout

Use “localized” variants and standard views

Internationalization opens the world to your application

More Information

Documentation

Internationalization and Localization Guide
http://developer.apple.com/library

Technical Support

Apple Developer Forums
http://developer.apple.com/forums

General Inquiries

Paul Marcos, App Frameworks Evangelist
pmarcos@apple.com

Related Sessions and Lab

What's New in Cocoa	Presidio	Tuesday 1:30 PM
New UIKit Support for International User Interfaces	Nob Hill	Thursday 2:30 PM
Mysteries of Auto Layout, Part 1	Presidio	Thursday 11:00 AM
Mysteries of Auto Layout, Part 2	Presidio	Thursday 1:30 PM
Internationalization Lab	Frameworks Lab A	Friday 11:00 AM

WWDC15