Introducing the New System Fonts

Session 804

Antonio Cavedoni Type Designer
Agenda

San Francisco Fonts
Agenda

San Francisco Fonts
Design Principles
Agenda

San Francisco Fonts
Design Principles
New Features, Changes, and Code
Agenda

San Francisco Fonts
Design Principles
New Features, Changes, and Code
Potential API Pitfalls
Glad you guys could make it to the park on Saturday.

It was great to see you. It's been too long.

I know. We had so much fun. Here we are playing cards.

I don't think I won a single hand.

Probably because we could see your cards reflected in your sunglasses.
Kitchen remodel ideas

Modern kitchen design in a small space. Should have an island. Plenty of storage. Need to research colors, materials, and appliances (stainless steel).

Things to do

- Create a budget
- Price appliances
- Consult with a contractor

1953LF Delta Single Handle Bar/Prep Faucet
m.deltafaucet.com
San Francisco
San Francisco

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
123456789&0
Family Tree

San Francisco
SF Compact
SF and SF Compact

San Francisco

SF

SF Compact
SF and SF Compact

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz
SF and SF Compact

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

oes

oes
SF and SF Compact

abcdefghijklmnopqrstuvwxyz  oes  oes

abcdefghijklmnopqrstuvwxyz  oes  oes
SF and SF Compact

abcdefghijklmnopqrstuvwxyz
SF and SF Compact

abcdefghijklmnopqrstuvwxyz

abcdefghijklmnopqrstuvwxyz

oes

oes
SF and SF Compact

abcdefghijklmnopqrstuvwxyz

oes

abcdefghijklmnopqrstuvwxyz

oes
Texture
To be the first to enter the cosmos, to engage, single-handed, in an unprecedented duel with nature—could one dream of anything more? We choose to go to the moon in this decade and do the other things, not because they are easy,
To be the first to enter the cosmos, to engage, single-handed, in an unprecedented duel with nature—could one dream of anything more? We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win. Here men from the planet Earth first set foot upon the Moon. July 1969 AD. We came in peace for all mankind. Here men from the planet Earth first set foot upon the Moon.
To be the first to enter the cosmos, to engage, single-handed, in an unprecedented duel with nature—could one dream of anything more? We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win. Here men from the planet Earth first set foot upon the Moon. July 1969 AD. We came in peace for all mankind. Here men from the planet Earth first set foot upon the Moon. July 1969 AD. We came in peace for all mankind. Never in all their history have men been able truly to conceive of the world as one: a single sphere, a globe, having the qualities of a globe, a round earth in which all the directions eventually meet, in which there is no center because every point, or none, is center— an equal earth which all men occupy as equals. The airman’s earth, if free men make it, will be truly round: a globe in practice, not in theory.
Proportions

5H1px
Baseline
x-Height

5H1px
Cap-Height

5H1px
Descender

5H1px
Ascender

5HIpx
Proportions

5H1px
Compatible Overall Vertical Metrics

5H1px
Cap-Height Lower Than Ascenders

5H1px
Large x-Height

5H1px
Numbers Align with Uppercase

5Hlpx
Latin

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
które wstrząsnęły sumieniem ludzkości, i że ogłoszono uroczystie jako najwznioślejszy cel ludzkości dążenie do zbudowania takiego świata, w którym ludzie korzystać będą z wolności słowa i przekonań oraz z wolności od strachu i nędzy, zważywshy, że konieczne jest zawarowanie praw człowieka przepisami prawa, aby nie musiał – doprowadzony do ostateczności – uciekać się do buntu przeciw tyranii i uciskowi, zważywshy, że
æðsta markmið almennings um heim allan sé að skapa veröld, þar sem menn fái notið málfrelsís, trúfrelsís og óttaleysís um einkalíf afkomu.

Mannréttindi á að vernda með lögum. Að öðrum kosti hljóta menn að grípa til þess örðrifaráðs að rísa upp gegn kúgun og ofbeldi. Það er mikilsvert að efla vinsamleg samskipti þjóða í milli. Í stofnaskrá sinni hafa Sameinuðu þjóðdirnar lýst yfir trú sinni á grundvallaratriði mannréttinda, á göfgi og gildi.
Hungarian

fellázító barbár cselekményekhez vezetett, és hogy az ember legfőbb vágya egy olyan világ eljövetele, amelyben az elnyomástól, valamint a nyomortól megszabadult emberi lények szava és meggyőződése szabad lesz, tekintettel annak fontosságára, hogy az emberi jogokat a jog uralma védelmezze, nehogy az ember végső szükségében a zsarnokság és az elnyomás elleni lázadásra kényszerüljön, tekintettel arra, hogy igen lényeges a
cả các nước và tất cả các dân tộc đánh giá việc thực hiện mục tiêu mà mọi cá nhân và mọi tổ chức trong xã hội, trên cơ sở luôn ghi nhận Ban tuyên ngôn này, sẽ phân đầu thực đẩy sự tôn trọng các quyền và tự do cơ bản của con người thông qua truyền bá và giáo dục, cũng như sẽ phân đầu đảm bảo cho mọi người dân, ở chính các nước thành viên của Liên Hợp Quốc và ở các lãnh thổ thuộc quyền quản lý của mình, công nhận và thực hiện những quyền
Всеобщую декларацию прав человека в качестве задачи, к выполнению которой должны стремиться все народы и все государства с тем, чтобы каждый человек и каждый орган общества, постоянно имея в виду настоящую Декларацию, стремились путем просвещения и образования содействовать уважению этих прав и свобод и обеспечению, путем национальных и международных прогрессивных мероприятий
ΑΒΓΔΕΖΗΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩαβγδεζηθικλμνξοπρστυφχψω
οποίο πρέπει να κατατείνουν όλοι οι λαοί και όλα τα έθνη, έτσι ώστε κάθε άτομο και κάθε όργανο της κοινωνίας, με τη διακήρυξη αυτή διαρκώς στη σκέψη, να καταβάλλει, με τη διδασκαλία και την παιδεία, κάθε προσπάθεια για να αναπτυχθεί ο σεβασμός των ανθρώπινων δικαιωμάτων και των ελευθεριών αυτών, και να εξασφαλιστεί προοδευτικά, με εσωτερικά και διεθνή μέσα, η παγκόσμια και αποτελεσματική εφαρμογή τους.
San Francisco
San Francisco

New typeface called San Francisco
San Francisco

New typeface called San Francisco

iOS and OS X make use of a new font family called SF
New typeface called San Francisco

iOS and OS X make use of a new font family called SF

Watch family renamed to SF Compact
New typeface called San Francisco

iOS and OS X make use of a new font family called SF

Watch family renamed to SF Compact

Families have similar proportions
San Francisco

New typeface called San Francisco
iOS and OS X make use of a new font family called SF
Watch family renamed to SF Compact
Families have similar proportions
SF and SF Compact are related but different designs
Introducing San Francisco.
The system font for iOS, OS X, and watchOS.

SF

Download Fonts and Resources
Get your apps ready with the latest beta versions of the Apple San Francisco font for iOS 9, OS X El Capitan, and watchOS 2. To download, sign in with your Apple ID associated with your Apple Developer Program membership.

Dynamic Type and Tracking Charts

For iOS 9 and OS X El Capitan
San Francisco Font

For watchOS
San Francisco Compact Font
Download Info

Apple Fonts and Text Page
developer.apple.com/fonts
Principles
Visual perception is largely about illusion
Equalizing Height
Equalizing Height
Equalizing Height
Equalizing Height
Equalizing Height
Equalizing Height

Overshoot
Equalizing Height

Overshoot
To make two shapes look similar, they often have to be made dissimilar.
To make two shapes look similar, they often have to be made dissimilar.
To make two shapes look similar, they often have to be made dissimilar.
To make two shapes look similar, they often have to be made dissimilar
Bonus
Bonus: Octothorpe
Bonus: Octothorpe
Bonus: Octothorpe
Bonus: Octothorpe
Bonus: Octothorpe
Bonus: Octothorpe
Bonus: Octothorpe
Bonus: Octothorpe
Visual perception is largely about illusion
Same Font, Different Sizes

120pt

hamburgefonstiv
Same Font, Different Sizes

120pt

15pt

hamburgefonstiv
Same Font, Different Sizes

hamburgefonstiv

hamburgefonstiv
Same Font, Different Sizes

hamburgefonstiv

hamburgefonstiv
Display Versus Text

hamburgefonstiv

hamburgefonstiv
Display Versus Text

hamburgefonstiv

hamburgefonstiv
Negative Space

hamburger

hamburger

hamburger
Negative Space
Negative Space
Negative Space
Negative Space
Confusable Shapes

sae
Confusuable Shapes
Confusuable Shapes

sae
Confusable Shapes

sae
Confusable Shapes

sae
Confusuable Shapes

sae
Display Versus Text

hamburg
Display Versus Text
Display Versus Text

\[ \text{ham} \]burt\[ \text{ge} \]
Display Versus Text
Display Versus Text
Display Versus Text
Display Versus Text
Display Versus Text
Display Versus Text
Display Versus Text
Display Versus Text
Display Versus Text
Display Versus Text

40pt  
30pt  

Display  
20pt  

Text  
19pt  
18pt  
17pt  
16pt  

hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
Optical Sizes
Optical Sizes

Two optical, size-specific families—Text and Display
Optical Sizes

Two optical, size-specific families—Text and Display
The system automatically switches at 20pt
Optical Sizes

Two optical, size-specific families—Text and Display
The system automatically switches at 20pt
No adoption necessary
Optical Sizes

Two optical, size-specific families—Text and Display
The system automatically switches at 20pt
No adoption necessary
App designers need to be aware of the difference
Tracking
Tracking

hamburgefonstiv
Tracking

hamburgefonstiv
Tracking Versus Kerning

HHHOOOHHHH
Tracking
Negative

HHHOOOHHHH
Tracking
Negative

HHHOOOOHHH
Tracking
Negative

HHHOOOHHH
Kerning

HHHOOOHHHH
Kerning

HHHOOOOGHHH
Kerning

HHHOOOHHH

HHHHHLTHHH
Kerning

HHHOOOHHH

HHHHHLTHHH
Kerning
Negative

HHHOOOHHH

HHHHHLTHHH
Tracking Versus Kerning

HHHOOOHHH

HHHHLTHHH
Tracking Versus Kerning
Tracking Is Size-Specific

Graph showing the relationship between point size and tracking value. The graph indicates a decreasing trend as point size increases.
Tracking Is Size-Specific

<table>
<thead>
<tr>
<th>Font Type</th>
<th>Size</th>
<th>Tracking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>20pt</td>
<td>19T</td>
</tr>
<tr>
<td>Text</td>
<td>19pt</td>
<td>-25T</td>
</tr>
<tr>
<td></td>
<td>18pt</td>
<td>-24T</td>
</tr>
<tr>
<td></td>
<td>17pt</td>
<td>-24T</td>
</tr>
<tr>
<td></td>
<td>16pt</td>
<td>-20T</td>
</tr>
</tbody>
</table>

hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
hamburgefonstiv
Tracking Summary
Tracking Summary

Tracking is automatically enabled for System Font
Tracking Summary

Tracking is automatically enabled for System Font

For designers, we provide the tracking tables that System Font supports
Weights
Font Weight

n
Font Weight
Font Weight
Text Weights

Light
Regular
Medium
Semibold
Bold
Heavy
Text Weights

Light
Regular
Medium
Semibold
Bold
Heavy

Light Italic
Regular Italic
Medium Italic
Semibold Italic
Bold Italic
Heavy Italic
Display Weights

Ultralight
Thin
Light
Regular
Medium
Semibold
Bold
Heavy
Black
Display Weights

Ultralight
Thin
Light
Regular
Medium
Semibold
Bold
Heavy
Black
To be the first to enter the cosmos, to engage, single-handed, in an unprecedented duel with nature—could one dream of anything more? We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win.

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The display weights are as follows:

- **Display Weights**
- To be the first to enter the cosmos, to engage, single-handed, in an unprecedented duel with nature—could one dream of anything more? We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win.

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New Weights Adoption

New System Font weight APIs in AppKit and UIKit
New Weights Adoption

New System Font weight APIs in AppKit and UIKit

NSFont.systemFont(ofSize: SIZE, weight: WEIGHT)
UIFont.systemFont(ofSize: SIZE, weight: WEIGHT)
New Weights Adoption

New System Font weight APIs in AppKit and UIKit

```
NSFont.systemFont(ofSize: SIZE, weight: WEIGHT)
UIFont.systemFont(ofSize: SIZE, weight: WEIGHT)
```

<table>
<thead>
<tr>
<th>New Weights in AppKit</th>
<th>New Weights in UIKit</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSFontWeightUltralight</td>
<td>UIFontWeightUltralight</td>
</tr>
<tr>
<td>NSFontWeightThin</td>
<td>UIFontWeightThin</td>
</tr>
<tr>
<td>NSFontWeightLight</td>
<td>UIFontWeightLight</td>
</tr>
<tr>
<td>NSFontWeightRegular</td>
<td>UIFontWeightRegular</td>
</tr>
<tr>
<td>NSFontWeightMedium</td>
<td>UIFontWeightMedium</td>
</tr>
<tr>
<td>NSFontWeightSemibold</td>
<td>UIFontWeightSemibold</td>
</tr>
<tr>
<td>NSFontWeightHeavy</td>
<td>UIFontWeightHeavy</td>
</tr>
<tr>
<td>NSFontWeightBlack</td>
<td>UIFontWeightBlack</td>
</tr>
</tbody>
</table>
How to Use Weights
How to Use Weights

Differentiation and hierarchy
How to Use Weights

Differentiation and hierarchy

Similitude
How to Use Weights

Differentiation and hierarchy
Similitude
Voice
Weight-Use in Differentiation and Hierarchy
Weight-Use in Differentiation and Hierarchy

Today’s weather is great.
Today’s weather is great.
Weather forecasts
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday

Weight-Use in Differentiation and Hierarchy
Weather forecasts
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Weight Used for Similitude
Weight Used for Similitude

2

ABC
Weight Used for Similitude
Weight Used for Similitude

Light

2

Light

ABC

Light

2

Regular

ABC
Weight Used for Similitude

Larger size = Lighter weight
Smaller size = Heavier weight
Weight Used for Voice
<table>
<thead>
<tr>
<th>Day</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>39°C</td>
</tr>
<tr>
<td>Tuesday</td>
<td>37°C</td>
</tr>
<tr>
<td>Wednesday</td>
<td>39°C</td>
</tr>
<tr>
<td>Thursday</td>
<td>38°C</td>
</tr>
<tr>
<td>Friday</td>
<td>37°C</td>
</tr>
<tr>
<td>Saturday</td>
<td>38°C</td>
</tr>
<tr>
<td>Sunday</td>
<td>40°C</td>
</tr>
</tbody>
</table>
Weight Used for Voice

<table>
<thead>
<tr>
<th>Bee Weather</th>
<th>Dove Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monday</strong></td>
<td><strong>Monday</strong></td>
</tr>
<tr>
<td>39°C</td>
<td>20°C</td>
</tr>
<tr>
<td><strong>Tuesday</strong></td>
<td><strong>Tuesday</strong></td>
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<tr>
<td>37°C</td>
<td>23°C</td>
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<tr>
<td><strong>Wednesday</strong></td>
<td><strong>Wednesday</strong></td>
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<tr>
<td>38°C</td>
<td>20°C</td>
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<tr>
<td><strong>Thursday</strong></td>
<td><strong>Thursday</strong></td>
</tr>
<tr>
<td>37°C</td>
<td>22°C</td>
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<tr>
<td><strong>Friday</strong></td>
<td><strong>Friday</strong></td>
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<tr>
<td>38°C</td>
<td>23°C</td>
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<tr>
<td><strong>Saturday</strong></td>
<td><strong>Saturday</strong></td>
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<tr>
<td>38°C</td>
<td>22°C</td>
</tr>
<tr>
<td><strong>Sunday</strong></td>
<td><strong>Sunday</strong></td>
</tr>
<tr>
<td>39°C</td>
<td>20°C</td>
</tr>
<tr>
<td>Zebra Weather</td>
<td>Dove Weather</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>Monday</strong></td>
<td><strong>Monday</strong></td>
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<tr>
<td>39°C</td>
<td>20°C</td>
</tr>
<tr>
<td><strong>Tuesday</strong></td>
<td><strong>Tuesday</strong></td>
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<tr>
<td>38°C</td>
<td>23°C</td>
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<tr>
<td><strong>Wednesday</strong></td>
<td><strong>Wednesday</strong></td>
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<tr>
<td>37°C</td>
<td>20°C</td>
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<tr>
<td><strong>Thursday</strong></td>
<td><strong>Thursday</strong></td>
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<td>38°C</td>
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<tr>
<td><strong>Saturday</strong></td>
<td><strong>Saturday</strong></td>
</tr>
<tr>
<td>37°C</td>
<td>22°C</td>
</tr>
<tr>
<td><strong>Sunday</strong></td>
<td><strong>Sunday</strong></td>
</tr>
<tr>
<td>40°C</td>
<td>20°C</td>
</tr>
</tbody>
</table>
How to Use Weights
How to Use Weights

Legibility first
How to Use Weights

Legibility first

• Establish hierarchy with consistency and clarity
How to Use Weights

Legibility first

• Establish hierarchy with consistency and clarity
• On iOS, use Text Style APIs and adopt Dynamic Type
Settings > General > Accessibility > Bold Text
Settings > General > Accessibility > Bold Text
Settings > General > Accessibility > Bold Text
How to Use Weights
How to Use Weights

Relying on weights that are too bold will hit upper weight limit
How to Use Weights

Relying on weights that are too bold will hit upper weight limit
On the other hand, too-light text is unreadable for many users
Weights Summary
Weights Summary

New font weights are available in OS X 10.11 and iOS 9
Weights Summary

New font weights are available in OS X 10.11 and iOS 9
New APIs are available to make use of them
Weights Summary

New font weights are available in OS X 10.11 and iOS 9
New APIs are available to make use of them
Same guidelines about hierarchy, legibility, and taste apply to usage
Typographic Features
Features Make Fonts Active
Features Make Fonts Active

Features are behaviors embedded inside a font
Features Make Fonts Active

Features are behaviors embedded inside a font
Make complex scripts and languages possible
Features Make Fonts Active

Features are behaviors embedded inside a font
Make complex scripts and languages possible
Allow access to extended glyphs
Feature Example: Fractions

1/2
Feature Example: Fractions

\[
\frac{1}{2} \quad \frac{1}{2}
\]
Feature Example: Fractions

$\frac{1}{2} \quad \frac{1}{2}$
Feature Example: Fractions

\( \frac{2}{9} \)
Feature Example: Fractions

\[
\frac{2}{9} \quad 2
\]
Feature Example: Fractions
Feature Example: Fractions

\[
\frac{2}{9}
\]
Feature Example: Fractions

\( \frac{2}{9} \quad \frac{2}{9} \)
Feature Example: Fractions

\[ \frac{2}{9} \quad \frac{2}{9} \]
Feature Example: Fractions

\( \frac{2}{9} \)
Feature Example: Fractions

\[ \frac{2}{9} \rightarrow \frac{2}{9} \]
Feature Example: Fractions

$\frac{65}{324}$ → $\frac{65}{324}$
Feature Example: Fractions

\[
\frac{65}{324}
\]
Feature Example: Fractions

\[
\frac{65}{324} \quad \rightarrow \quad \frac{65}{324}
\]
Feature Example: Fractions

\[
\frac{65}{324}
\]
Feature Example: Fractions

\[
\frac{65}{324} \rightarrow \frac{65}{324}
\]
Feature Example: Fractions

65/324 → 65/324
Feature Example: Fractions

\[
\frac{65}{324} \rightarrow \frac{65}{324}
\]
Enabling Features: Typography Panel

- Number Spacing
  - Monospaced Numbers
  - No Change

- Vertical Position
  - Normal Vertical Position
  - Superiors/Superscripts
  - Inferiors/Subscripts

- Contextual Fractional Forms
  - On

- Text Spacing
- Case-Sensitive Layout
  - Capital Forms

- Alternative Stylistic Sets

- Contextual Alternates
Enabling Features: Code

```swift
let pointSize : CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(ofSize: pointSize, weight: UIFont.Weight.light).fontDescriptor()
let fractionFontDesc = systemFontDesc.fontDescriptorByAddingAttributes(
    [UIFontDescriptorFeatureSettingsAttribute: [
        [UIFontFeatureTypeIdentifierKey: kFractionsType, UIFontFeatureSelectorIdentifierKey: kDiagonalFractionsSelector,],
    ]
)

label.font = UIFont(descriptor: fractionFontDesc, size: pointSize)
```
let pointSize : CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(ofSize: pointSize, weight: UIFontWeightLight).fontDescriptor()

let fractionFontDesc = systemFontDesc.fontDescriptorByAddingAttributes([UIFontDescriptorFeatureSettingsAttribute: [
UIFontFeatureTypeIdentifierKey: kFractionsType,
UIFontFeatureSelectorIdentifierKey: kDiagonalFractionsSelector,
]]

label.font = UIFont(descriptor: fractionFontDesc, size: pointSize)
let pointSize : CGFloat = 60.0
let systemFontDesc = UIFont.systemFontOfSize(pointSize,
    weight: UIFontWeightLight).fontDescriptor()
let fractionFontDesc = systemFontDesc.fontDescriptorByAddingAttributes(
    [
        UIFontDescriptorFeatureSettingsAttribute: [
            [
                UIFontFeatureTypeIdentifierKey: kFractionsType,
                UIFontFeatureSelectorIdentifierKey: kDiagonalFractionsSelector,
            ],
        ]
    ]
)
label.font = UIFont(descriptor: fractionFontDesc, size:pointSize)
let pointSize : CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(ofSize: pointSize,
     weight: UIFontWeightLight).fontDescriptor()
let fractionFontDesc = systemFontDesc.fontDescriptorByAddingAttributes(
    [UIFontDescriptorFeatureSettingsAttribute: [
        [UIFontFeatureTypeIdentifierKey: kFractionsType,
        UIFontFeatureSelectorIdentifierKey: kDiagonalFractionsSelector,]
    ]
)

label.font = UIFont(descriptor: fractionFontDesc, size:pointSize)
let pointSize: CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(ofSize: pointSize, weight: UIFontWeightLight).fontDescriptor()
let fractionFontDesc = systemFontDesc.fontDescriptorByAddingAttributes([UIFontDescriptorFeatureSettingsAttribute: [
    [UIFontFeatureTypeIdentifierKey: kFractionsType,
    UIFontFeatureSelectorIdentifierKey: kDiagonalFractionsSelector,
    ]
    ])
label.font = UIFont(descriptor: fractionFontDesc, size: pointSize)
let pointSize : CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(ofSize: pointSize,
    weight: UIFontWeightLight).fontDescriptor()
let fractionFontDesc = systemFontDesc.fontDescriptorByAddingAttributes(
    [UIFontDescriptorFeatureSettingsAttribute: [
        [UIFontFeatureTypeIdentifierKey: kFractionsType,
            UIFontFeatureSelectorIdentifierKey: kDiagonalFractionsSelector,
        ]
    ]
)
label.font = UIFont(descriptor: fractionFontDesc, size:pointSize)

Enabling Features: Code
Feature Example: Superiors/Superscripts

\[ e = mc^2 \]
Feature Example: Superiors/Superscripts

e=mc^2

e=mc_2
Feature Example: Superials/Superscripts

e=mc^2  e=mc^2
Feature Example: Inferiors/Subscripts

C₃H₈
Feature Example: Inferiors/Subscripts

C$_3$H$_8$  \( \text{C}_3\text{H}_8 \)
Feature Example: Inferiors/Subscripts

\[ \text{C}_3\text{H}_8 \]  \hspace{2cm} \[ \text{C}_3\text{H}_8 \]
Feature Example: Uppercase Forms

A+3
Feature Example: Uppercase Forms

A + 3   A + 3
Feature Example: Uppercase Forms

A + 3  A + 3
Special Features
Special Feature: Vertically Centered Colon

9:41
Special Feature: Vertically Centered Colon

9:41 9:41
Special Feature: Vertically Centered Colon

9:41 9:41
Special Feature: Vertically Centered Colon

9:41

Friday, June 12
Special Feature: Vertically Centered Colon

9:41

Friday, June 12
Special Feature: Vertically Centered Colon
Special Feature: Vertically Centered Colon

9:41  9:41
Special Feature: Alternate Six and Nine
Special Feature: Alternate Six and Nine

6 9 6 9 6 9
Special Feature: Alternate Six and Nine
Special Feature: Alternate Six and Nine
Special Feature: Alternate Six and Nine
Special Feature: Alternate Six and Nine

Optional feature
Special Feature: Alternate Six and Nine

Optional feature
Available with code
Special Feature: Alternate Six and Nine

Optional feature
Available with code

UIFontFeatureTypeIdentifierKey: kStylisticAlternativesType
Special Feature: Alternate Six and Nine

Optional feature

Available with code

UIFontFeatureTypeIdentifierKey: kStylisticAlternativesType
UIFontFeatureSelectorIdentifierKey: kStylisticAltOneOnSelector
Bonus: Features and Optical Sizes
Bonus: Features and Optical Sizes

$2^{65}/324$ Display
Bonus: Features and Optical Sizes

\[ \frac{2^{65}}{324} \quad \frac{2^{65}}{324} \]

Display

Text
Features Summary

Features are behavior-embedded inside a font
Features Summary

Features are behavior-embedded inside a font
Some features are automatically turned on for System Font
Features Summary

Features are behavior-embedded inside a font
Some features are automatically turned on for System Font
Others require opt-in
Numbers
Number Spacing

0123456789
Number Spacing

0123456789
Monospaced (Tabular) Numbers

0123456789
Monospaced (Tabular) Numbers

235,667+
30,521+
1,273,313+
9,831+
127,053+
9,967,345+
<p>| 235,667+ |
| 30,521+ |
| 1,273,313+ |
| 9,831+ |
| 127,053+ |
| 9,967,345+ |</p>
<table>
<thead>
<tr>
<th>Number</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,967,345+</td>
<td>2010/05/12 06:27</td>
</tr>
<tr>
<td>127,053+</td>
<td>2011/03/12 12:38</td>
</tr>
<tr>
<td>9,831+</td>
<td>2011/01/01 08:54</td>
</tr>
<tr>
<td>1,273,313+</td>
<td>2012/10/30 04:04</td>
</tr>
<tr>
<td>30,521+</td>
<td>2013/06/22 22:35</td>
</tr>
<tr>
<td>235,667+</td>
<td>2014/12/03 00:33</td>
</tr>
</tbody>
</table>

Monospaced (Tabular) Numbers
### Monospaced (Tabular) Numbers

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Dates/Time</th>
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</thead>
<tbody>
<tr>
<td>235,667+</td>
<td>2015/06/12 12:34</td>
</tr>
<tr>
<td>30,521+</td>
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<tr>
<td>1,273,313+</td>
<td>2013/06/22 22:35</td>
</tr>
<tr>
<td>9,831+</td>
<td>2012/10/30 04:04</td>
</tr>
<tr>
<td>127,053+</td>
<td>2011/01/01 08:54</td>
</tr>
<tr>
<td>9,967,345+</td>
<td>2011/03/12 12:38</td>
</tr>
<tr>
<td></td>
<td>2010/05/12 06:27</td>
</tr>
</tbody>
</table>
Monospaced (Tabular) Numbers

0123456789
Proportional Numbers

0123456789
Monospaced for Animation

0.00MB of 10MB (13KB/sec)

0.00MB of 10MB (13KB/sec)
Monospaced for Animation

0.00MB of 10MB (13KB/sec)

0.00MB of 10MB (13KB/sec)
Monospaced for Animation

0.00MB of 10MB (13KB/sec)

0.00MB of 10MB (13KB/sec)
Proportionals for Static Labels

Friday,
June 12th
Proportionals for Static Labels

Friday,
June 12th

+1 (123) 300-4000
Proportionals for Static Labels

Friday,
June 12th

+1 (123) 300-4000

Inbox (3172 messages, 2 unread)
Proportionals for Static Labels

Friday,
June 12th

+1 (123) 300-4000

Inbox (3172 messages, 2 unread)

seanjohnson21@icloud.com
Proportionals for Static Labels

Friday,
June 12\textsuperscript{th}

+1 (123) 300-4000

Inbox (3172 messages, 2 unread)

seanjohnson21@icloud.com

Proportionals for Static Labels

Friday,
June 12\textsuperscript{th}

+1 (123) 300-4000

Inbox (3172 messages, 2 unread)

seanjohnson21@icloud.com

Proportionals for Static Labels

Calendaring Software Interface for June 2015

- 8 AM: Pilates
- 8 AM: Breakfast with kids
- 7:15 AM: Practice demo
- 7:45 AM: Tennis with Kathy and Jason
- 10 AM: Prepare Training Plan
- 10:45 AM: Sales Offsite
- 1:30 PM: Sales Update
- 3:45 PM: Conference Call with Hiroshi
- 4:30 PM: Marketing Cam...
Proportionals for Static Labels
Proportionals for Static Labels
Proportionals for Static Labels
Proportionals for Static Labels
Proportionals for Static Labels
Proportionals for Static Labels
Proportionals for Static Labels
Proportional numbers by default, opt into monospaced
Numbers Summary
Numbers Summary

Numbers are now proportional by default
Numbers Summary

Numbers are now proportional by default

Applications not linked against OS X 10.11 and iOS 9.0 get monospaced numbers
Numbers Summary

Numbers are now proportional by default

Applications not linked against OS X 10.11 and iOS 9.0 get monospaced numbers

New shortcut API in AppKit
Numbers Summary

Numbers are now proportional by default
Applications not linked against OS X 10.11 and iOS 9.0 get monospaced numbers
New shortcut API in AppKit

**NSFont.monospacedDigitsSystemFontOfSize(**mySize weight:**)
Font API Pitfalls
Don’t Access Fonts with Private Names

let myFont = UIFont.fontWithName(".ApplePrivateFont" size:mySize)
Don’t Reference Font File Names

.../System/Library/Fonts/Apple Color Emoji.ttf
/System/Library/Fonts/AppleSDGothicNeo-Bold.otf
/System/Library/Fonts/Avenir.ttc
/System/Library/Fonts/HiraKakuInterface-W2.otf
/System/Library/Fonts/Monaco.dfont
/System/Library/Fonts/Palatino.ttc
/System/Library/Fonts/ZapfDingbats.ttf
...

Don’t Access System Font by Name

```swift
let myFont = UIFont.systemFont(ofSize: mySize)

...later in the code...

let myOtherFont = UIFont.fontWithFamilyName(myFont.familyName, size: mySize)
```
Do Reuse Font Descriptors

let systemFont = UIFont.systemFont(ofSize: mySize)

...later in the code...

let myOtherFont = UIFont.fontWithDescriptor(systemFont.fontDescriptor(), size: mySize)
Don’t Draw System Font at a Different-Than-Nominal Point Size

15pt

hamburgefonstiv
Don’t Draw System Font at a Different-Than-Nominal Point Size

15pt  

hamburgefonstiv

15pt scaled up  

hamburgefonst
Don’t Draw System Font at a Different-Than-Nominal Point Size

hamburgefonstiv

hamburgefonstiv

hamburgefonstiv
Font API Pitfalls
Font API Pitfalls

Treat fonts as opaque objects
Font API Pitfalls

Treat fonts as opaque objects

Fonts with optical sizes break old assumptions
Font API Pitfalls

- Treat fonts as opaque objects
- Fonts with optical sizes break old assumptions
- Relying on System APIs ensures correct behavior and rendering stability
Summary
Summary

Motivation
San Francisco
Optical Sizes
Tracking
Weight
Features
Numbers
Font API Pitfalls
More Information

Documentation
Apple Fonts and Text Page
developer.apple.com/fonts

Designing Great Apps
developer.apple.com/design

Technical Support
Apple Developer Forums
developer.apple.com/forums

Developer Technical Support
developer.apple.com/support/technical

General Inquiries
Curt Rothert, App Frameworks Evangelist
rothert@apple.com

Mike Stern, User Experience Evangelist
stern@apple.com
# Related Session and Lab

<table>
<thead>
<tr>
<th>Session/ Lab</th>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Watch Design Tips and Tricks</td>
<td>Presidio</td>
<td>Friday 3:30PM</td>
</tr>
<tr>
<td>Text and Fonts Lab</td>
<td>Frameworks Lab D</td>
<td>Friday 3:30PM</td>
</tr>
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</table>