

# Introducing the New System Fonts

Session 804

Antonio Cavedoni Type Designer

# Agenda

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San Francisco Fonts

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Design Principles

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Design Principles

New Features, Changes, and Code

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San Francisco Fonts

Design Principles

New Features, Changes, and Code

Potential API Pitfalls



10:09

Sunset 7:10PM

9HRS 1MIN

Cupertino, CA



14:59



7:00



00:46













Kitchen remodel ideas  
9:41 AM Modern kitchen de...



Carson's birthday party  
9:40 AM Call party supply...



Reference letter for Lee  
9:02 AM Worked on the same team...

Contractor meeting  
8:37 AM Gary says the inspector will...

Tropical vacation ideas  
Sunday Na Pali Properties Ka...



Miami conference notes  
Sunday Sales in emerging markets up

Landscaping  
Saturday Look into flagstone for back...

NYC dining greatest hits  
Thursday Get reservations...



Team-building activities  
Thursday Paintball tournament

Story idea  
Wednesday Circus clowns rob bank.

Landscaping ideas



# 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).

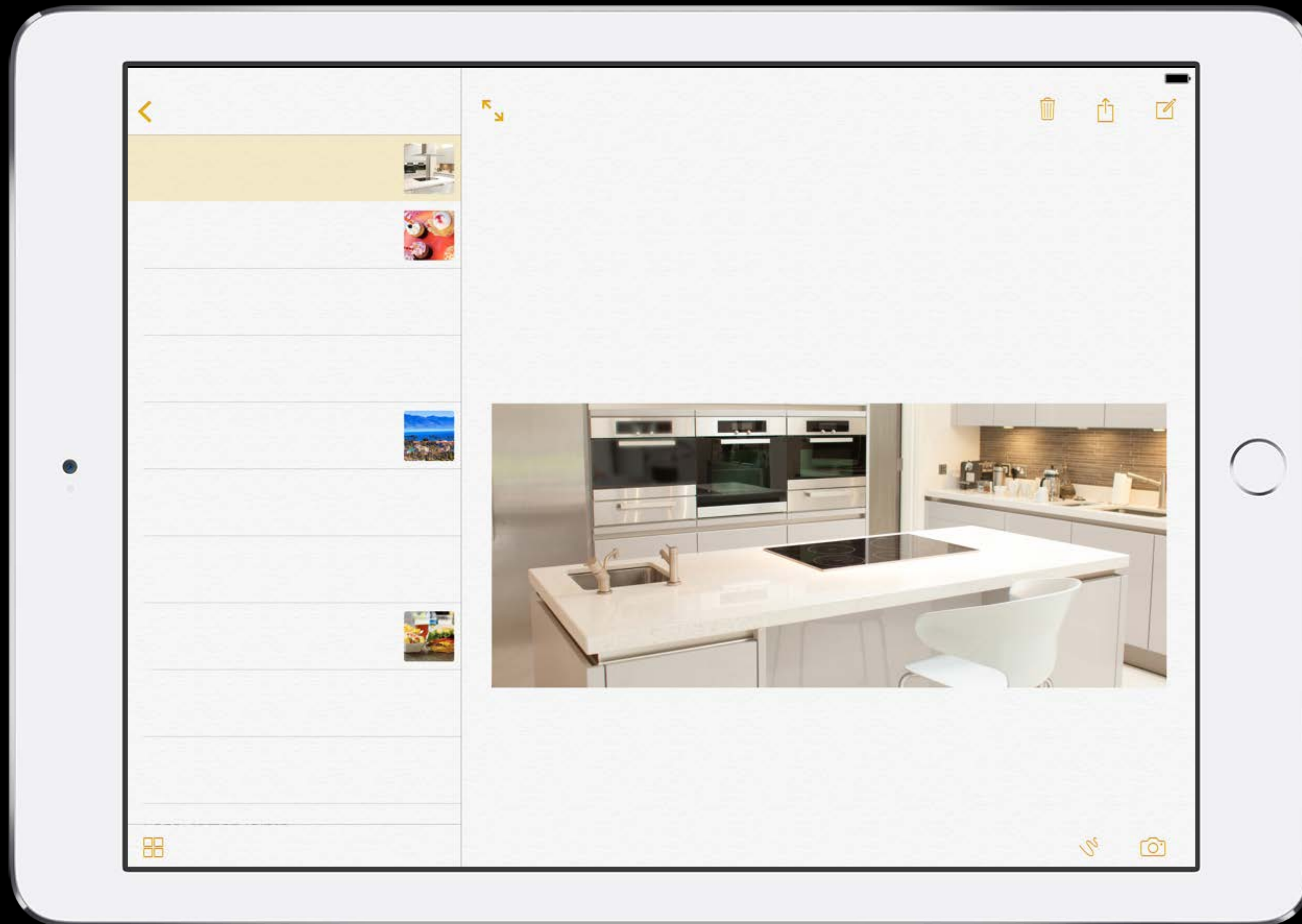
## Things to do

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

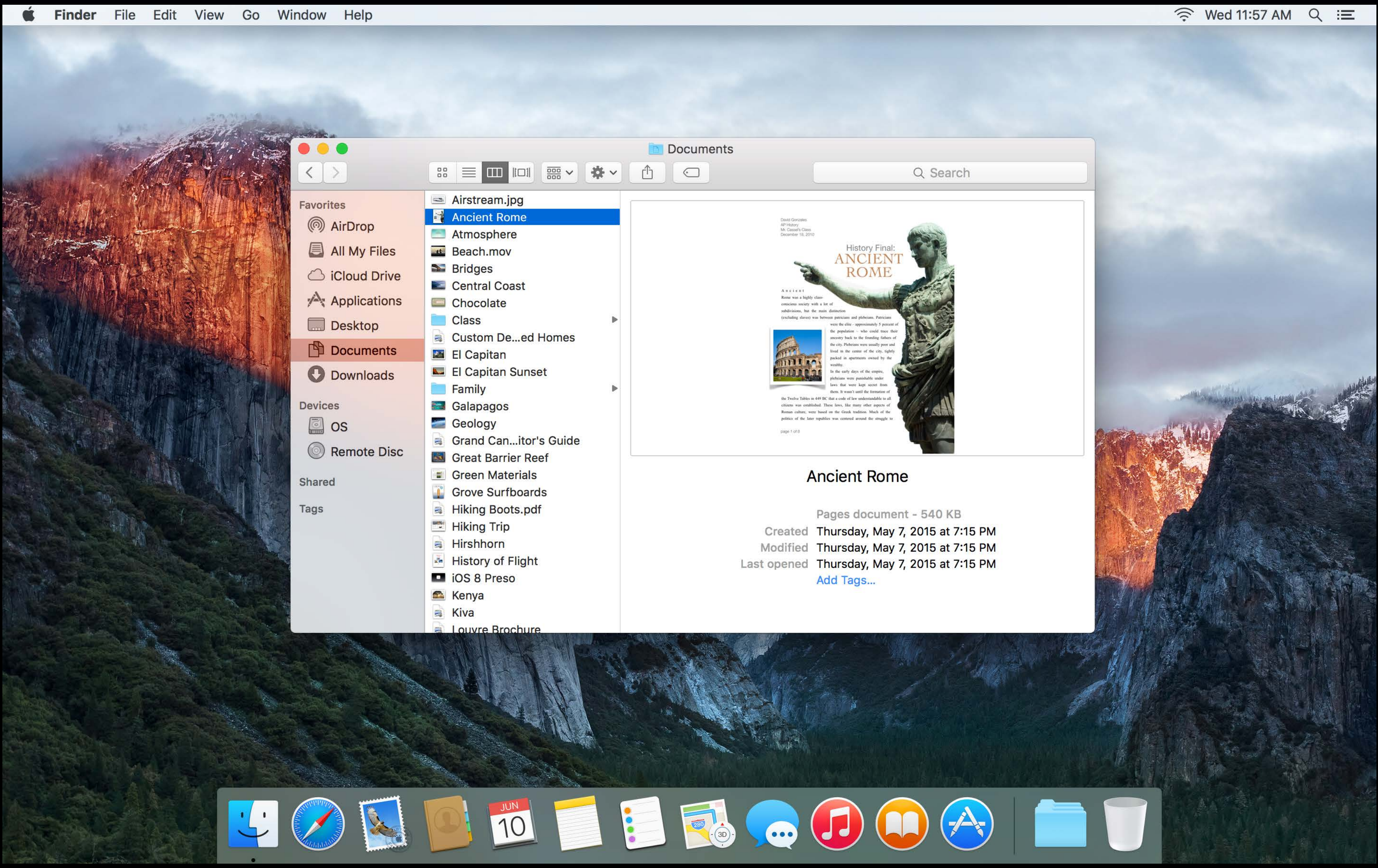


1953LF Delta Single Handle Bar/Prep  
Faucet  
m.deltafaucet.com





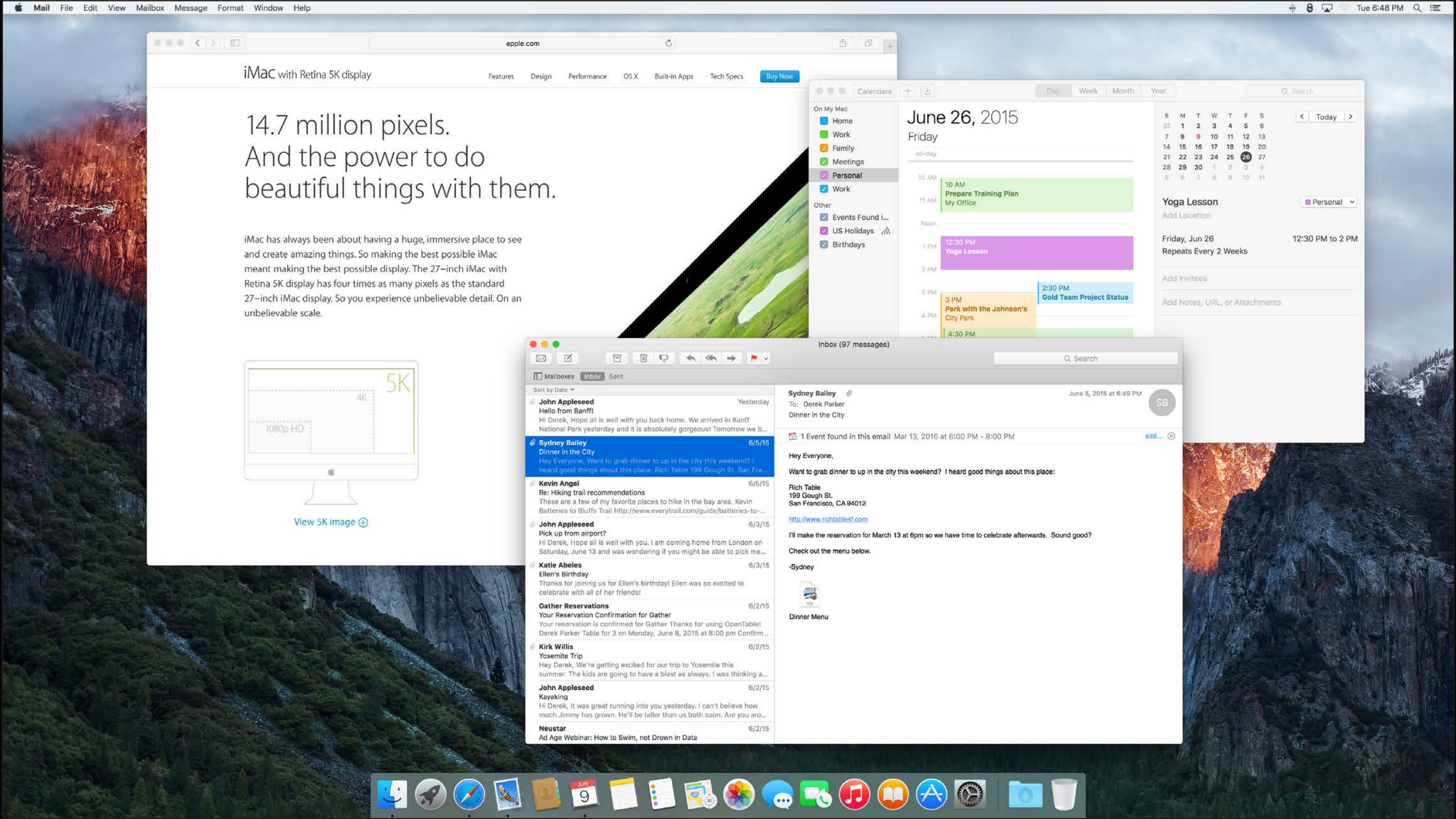














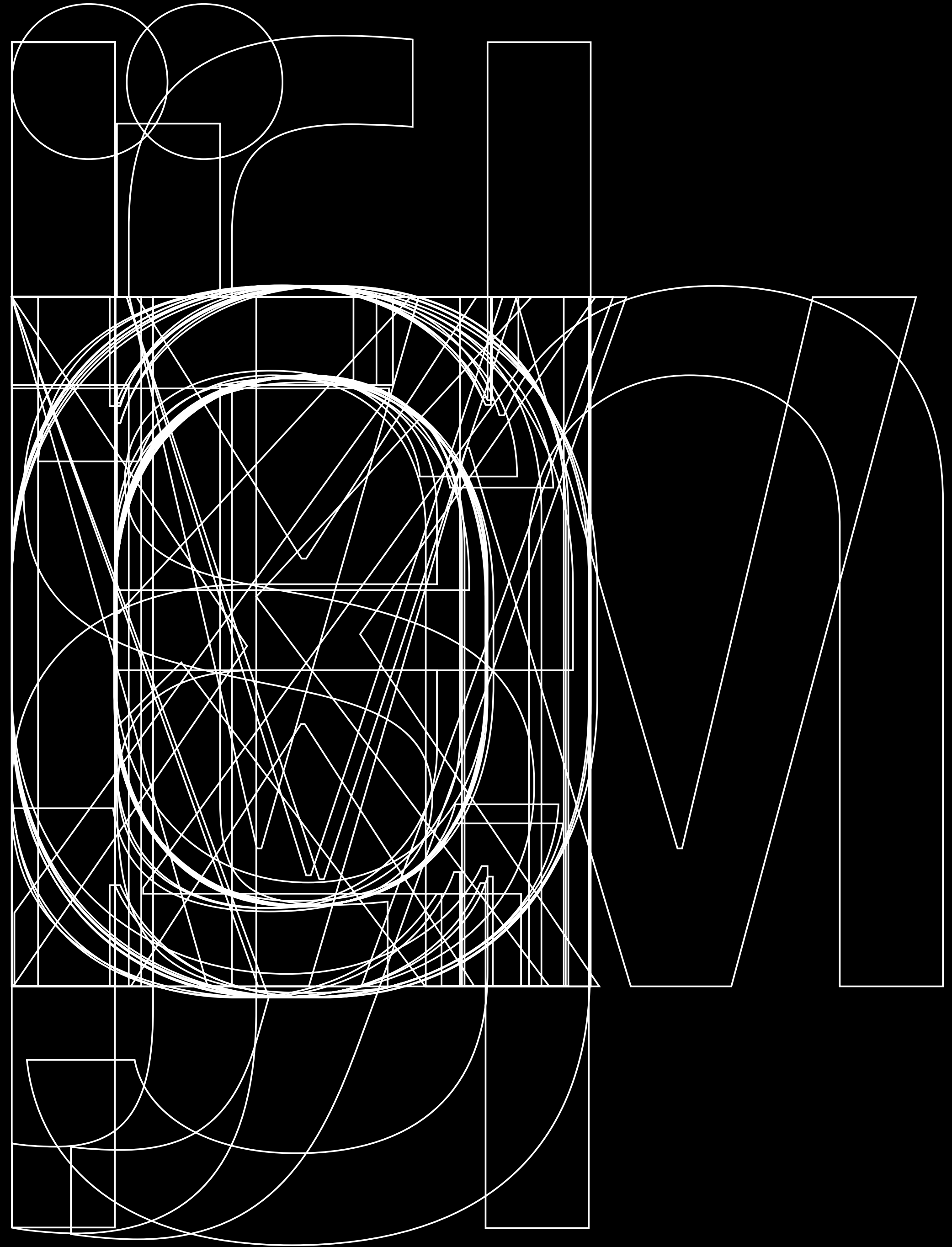




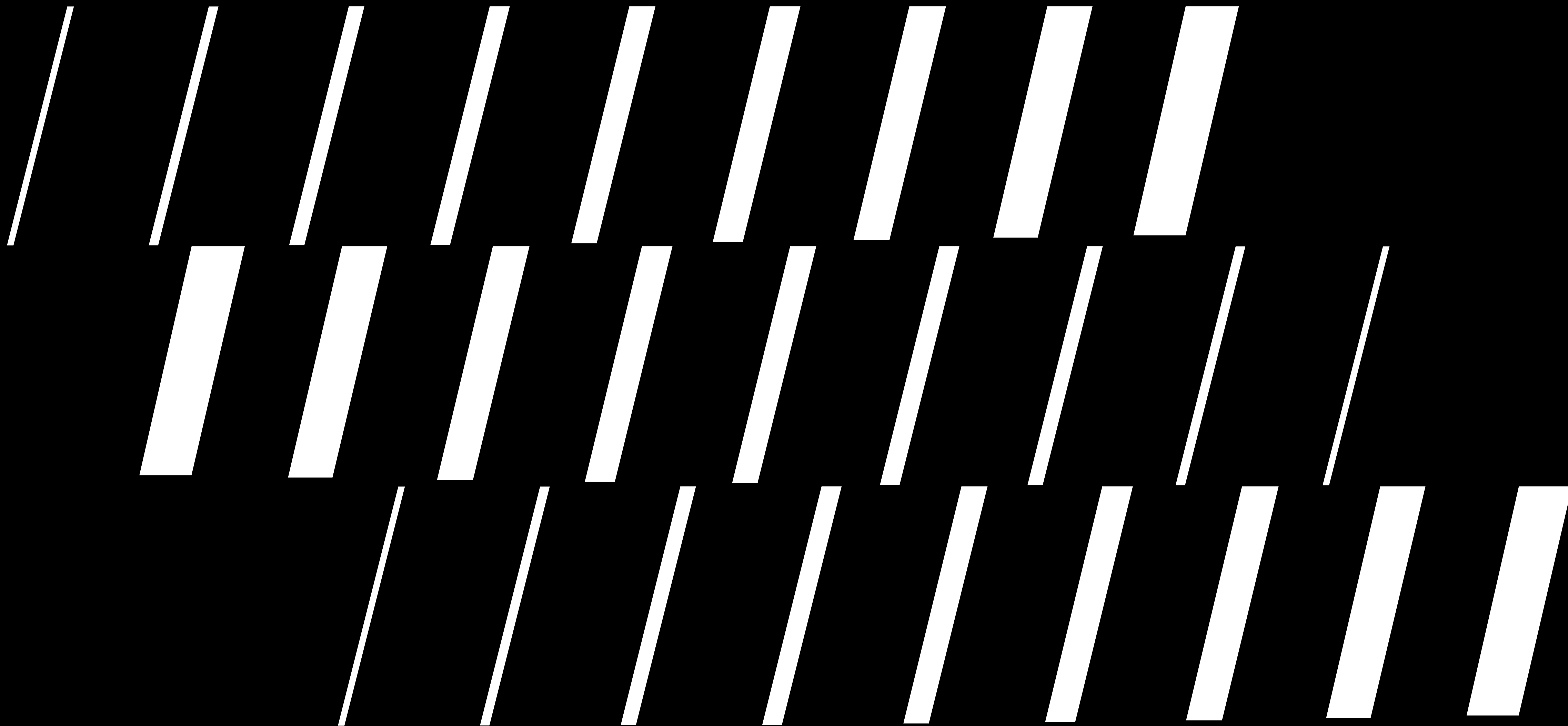




San Francisco



a a a a a a a a



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**1 2 3 4 5 6 7 8 9**

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San Francisco

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# Family Tree

San Francisco



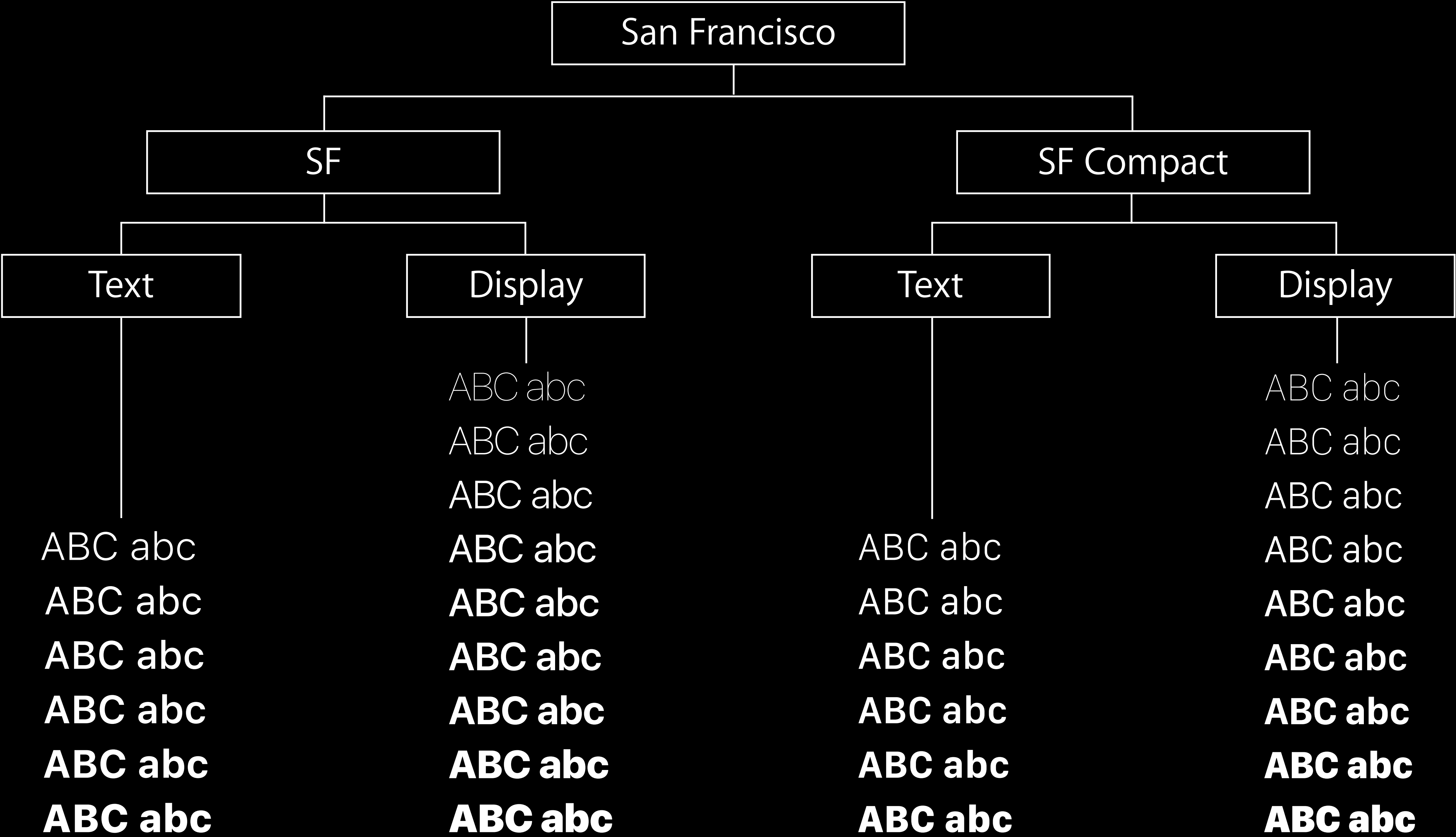
# Family Tree



# Family Tree



# Family Tree



SF

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# SF Compact

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# SF and SF Compact



# SF and SF Compact

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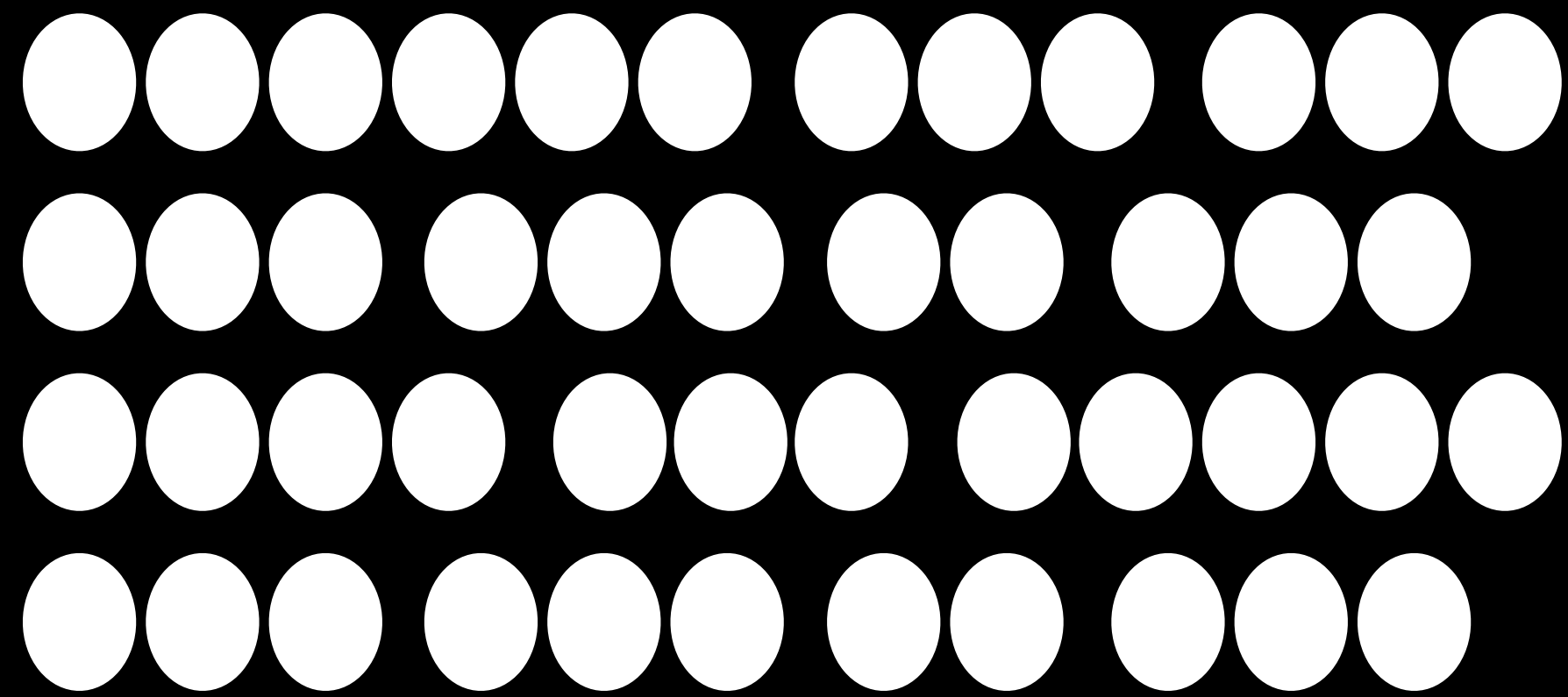
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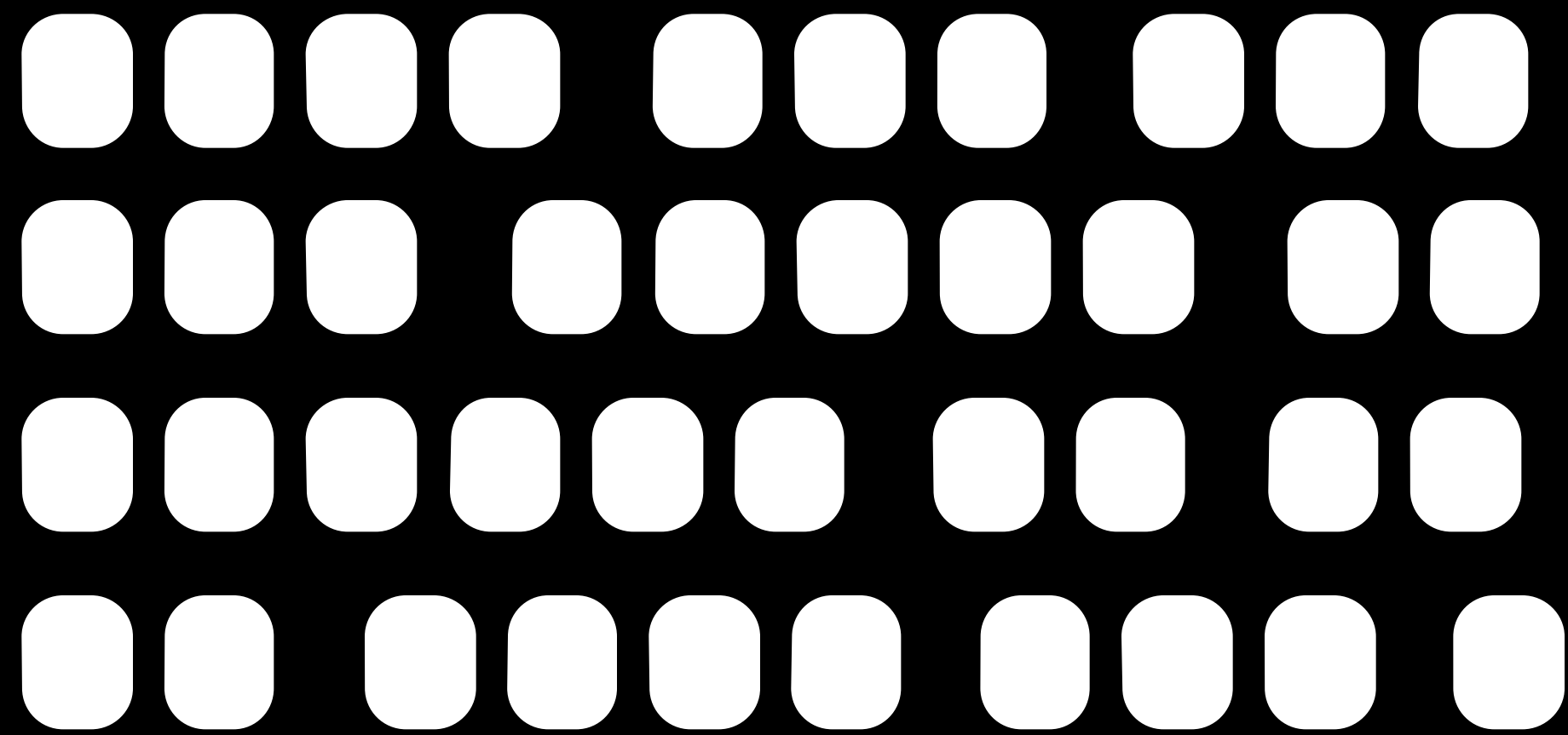
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Texture



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# 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,

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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.

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oes

oes



Proportions

5Hpx

Baseline

5H1pX

x-Height

5HhpX

Cap-Height

5HIpX

Descender

5HIpX

Ascender

5HlpX

Proportions

5Hpx

# Compatible Overall Vertical Metrics

5Hpx



Cap-Height Lower Than Ascenders

5HIpX

Large x-Height

5H1pX

Numbers Align with Uppercase

5HIpX

Latin

A B C D E F G H I J K L M N

O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n

o p q r s t u v w x y z

# Polish

które wstrząsnęły sumieniem ludzkości, i że ogłoszono uroczyście 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, zważywszy, że konieczne jest zawarowanie praw człowieka przepisami prawa, aby nie musiał – doprowadzony do ostateczności – uciekać się do buntu przeciw tyranii i uciskowi, zważywszy, że

# Icelandic

æðsta markmið almennings um heim allan sé að skapa veröld, þar sem menn fá notið málfrelsis, trúfrelsis og óttaleysis um einkalíf afkomu.

Mannréttindi á að vernda með lögum. Að öðrum kosti hljóta menn að grípa til þess örþrifaráðs að rísa upp gegn kúgun og ofbeldi. Það er mikilsvert að efla vinsamleg samskipti þjóða í milli. Í stofnskrá sinni hafa Sameinuðu þjóðirnar 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

# Vietnamese

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 nhớ Bản tuyên ngôn này, sẽ phấn đấu thúc đẩy sự tôn trọng các quyền và tự do cơ bản của con người thông qua truyền bá và giáo dục, cũng như sẽ phấn đấu 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



Cyrillic

А Б В Г Д Е Ж З И Й К Л М Н О

П Р С Т У Ф Х Ц Ч Ш Щ Ъ Ю Я

а б в г д е ж з и й к л м н о

п р с т у ф х ц ч ш щ ъ ю я

# Russian

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

# Greek

Α Β Γ Δ Ε Ζ Η Θ Ι Κ Λ Μ Ν

Ξ Ο Π Ρ Σ Τ Υ Φ Χ Ψ Ω

α β γ δ ε ζ η θ ι κ λ μ ν

ξ ο π ρ σ ς τ υ φ χ ψ ω

# Greek

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

# San Francisco

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

Watch family renamed to SF Compact



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Families have similar proportions

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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

Apple Inc.

DeveloperTechnologiesResourcesProgramsSupportMember Center

# 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](https://developer.apple.com/fonts)



# Download Info

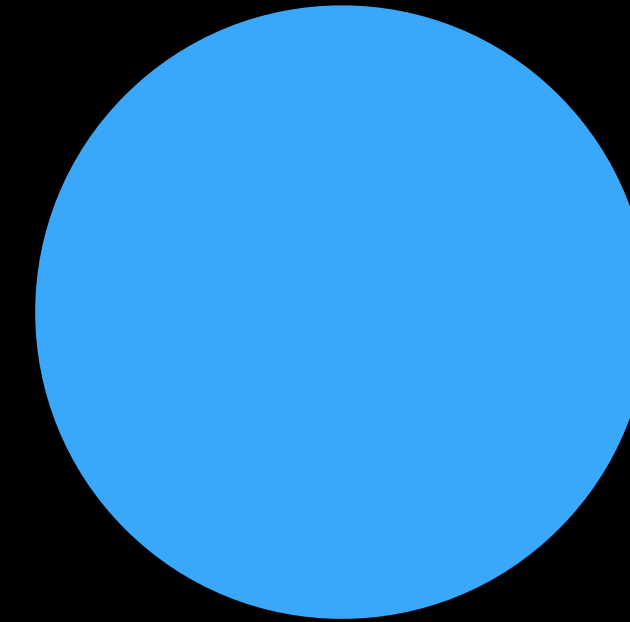
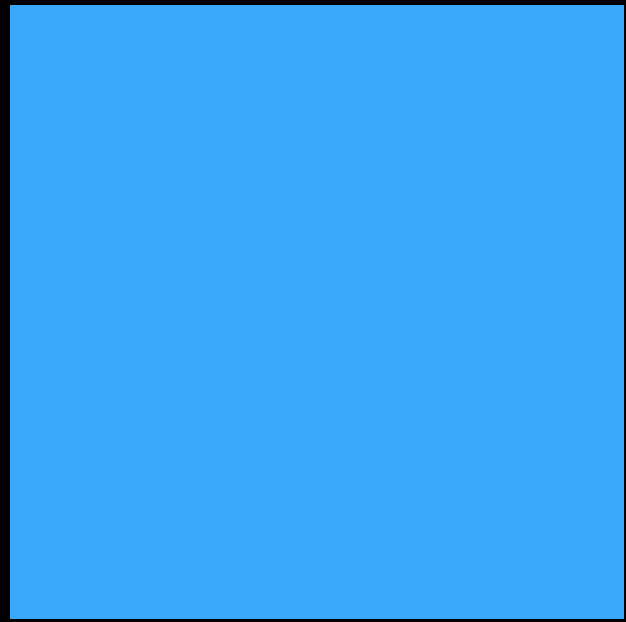
BETA

Apple Fonts and Text Page  
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Principles

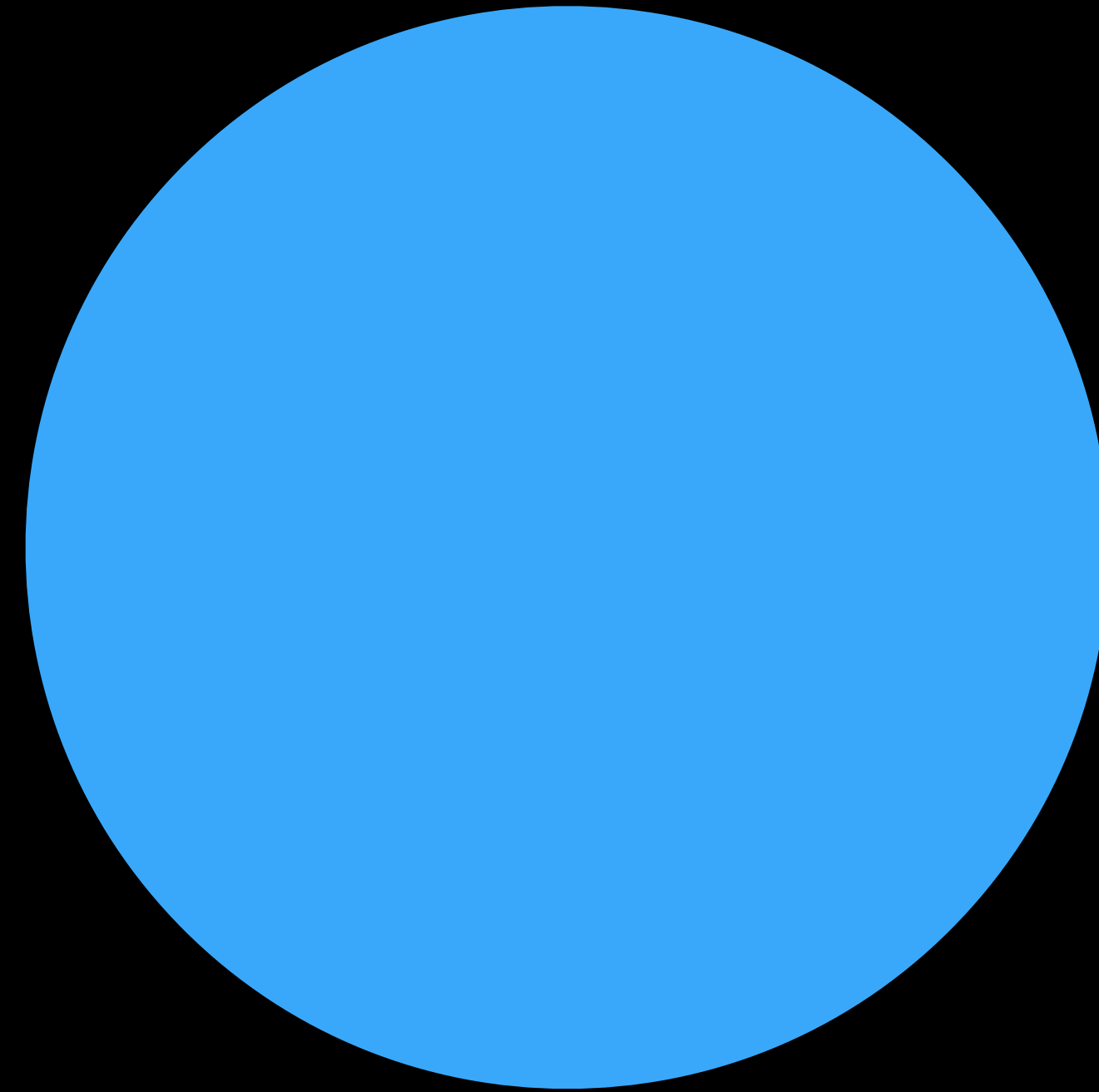
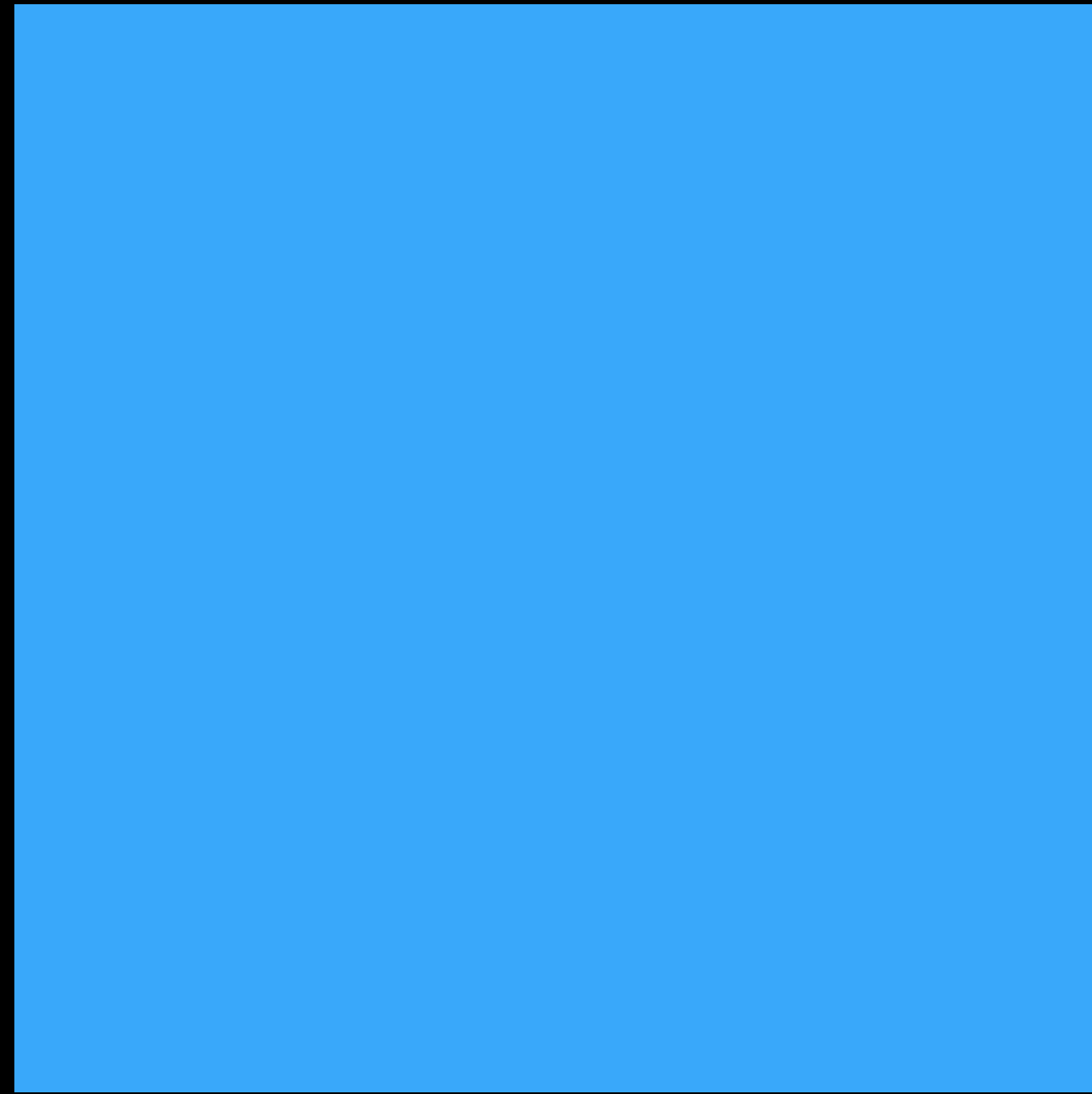
Visual perception is  
largely about illusion

# Equalizing Height

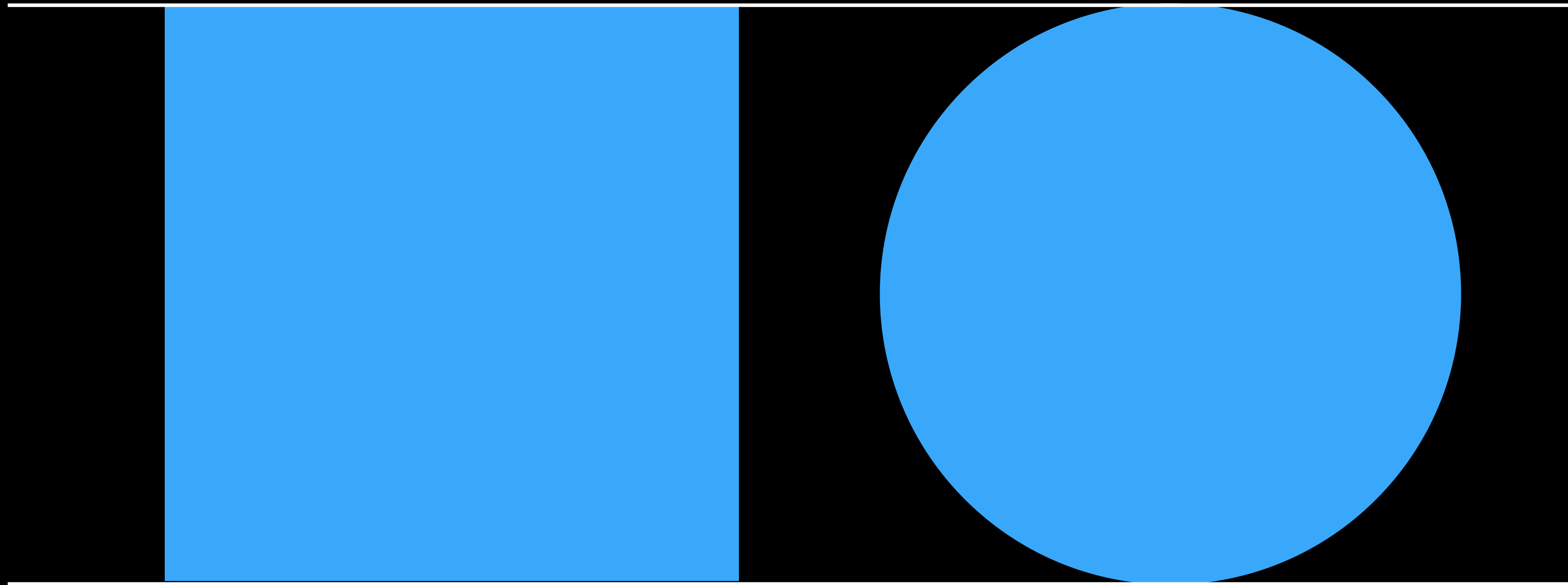




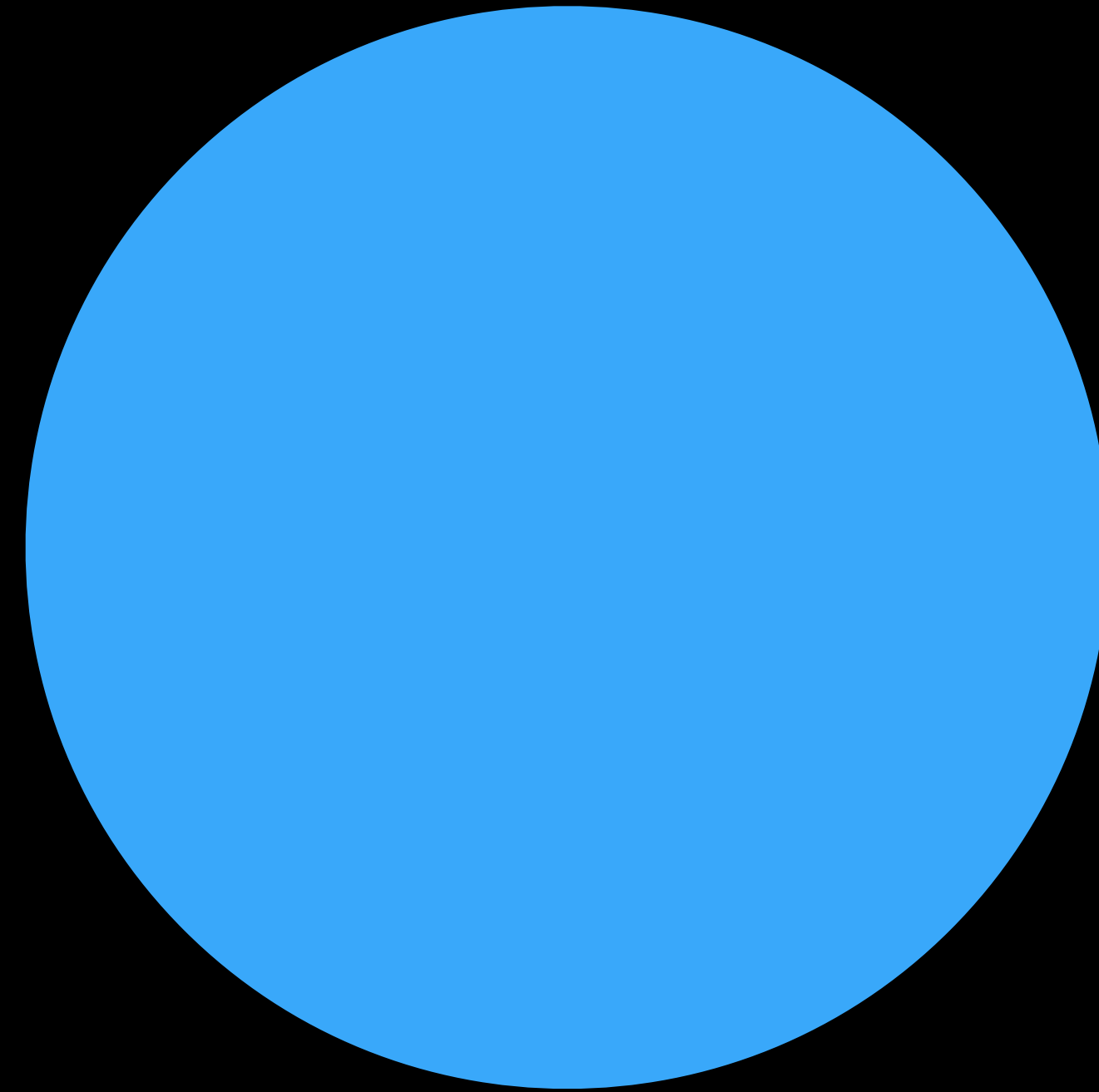
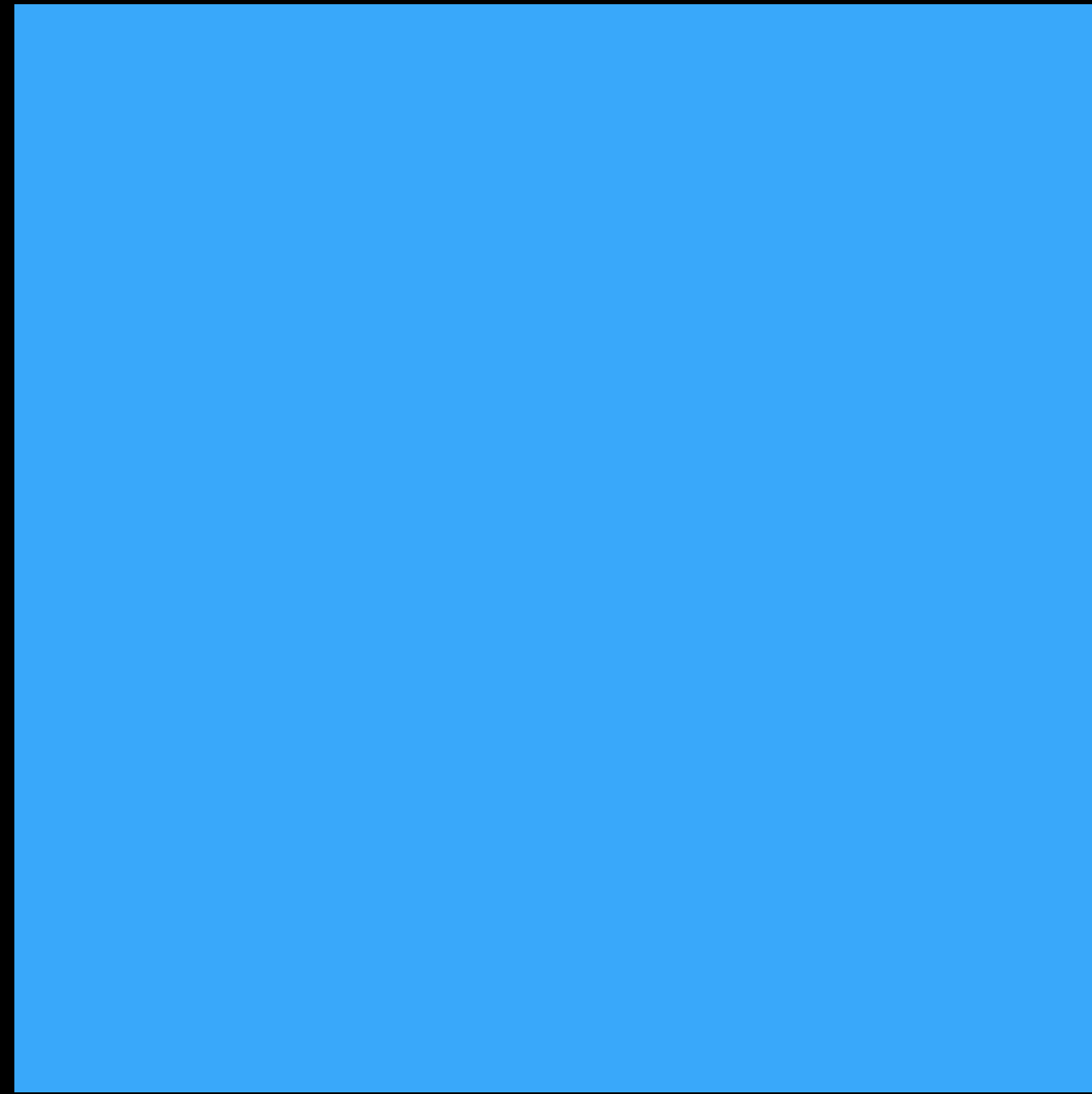
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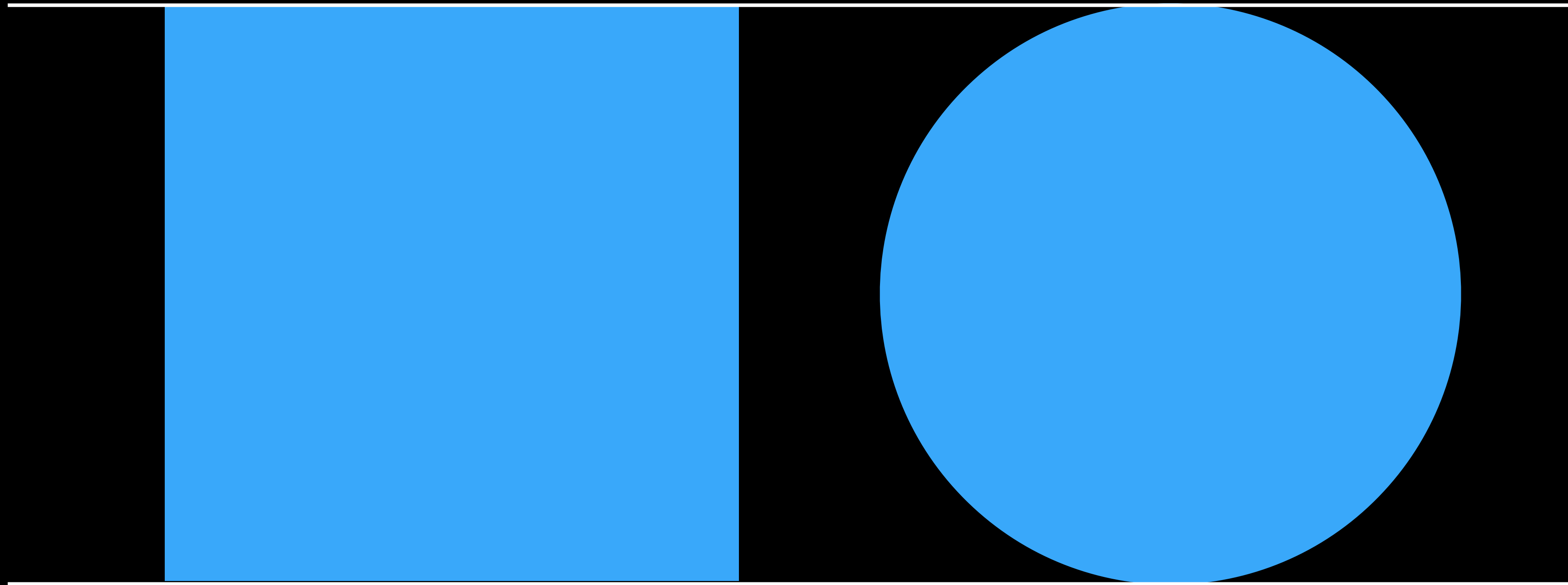
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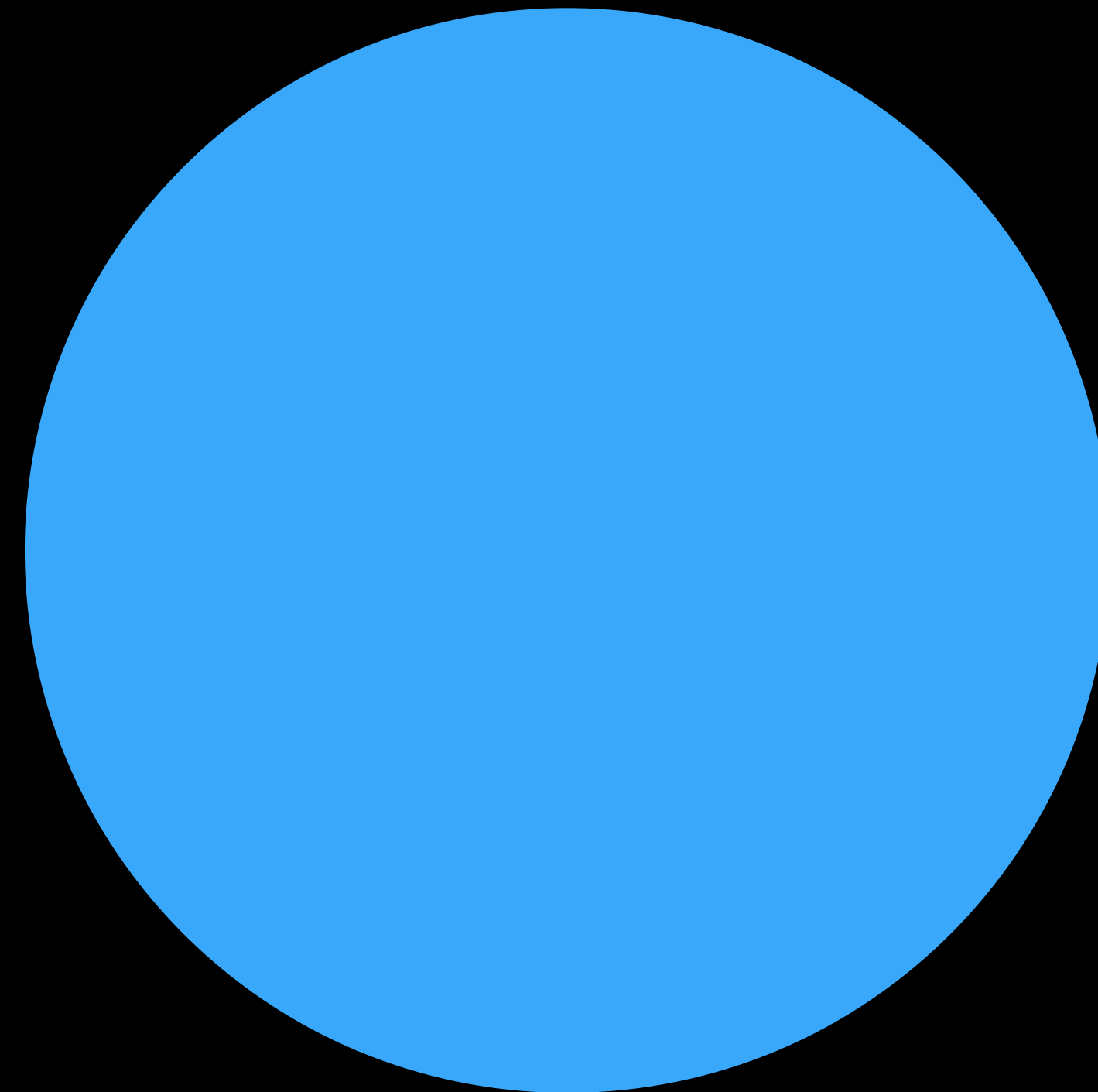
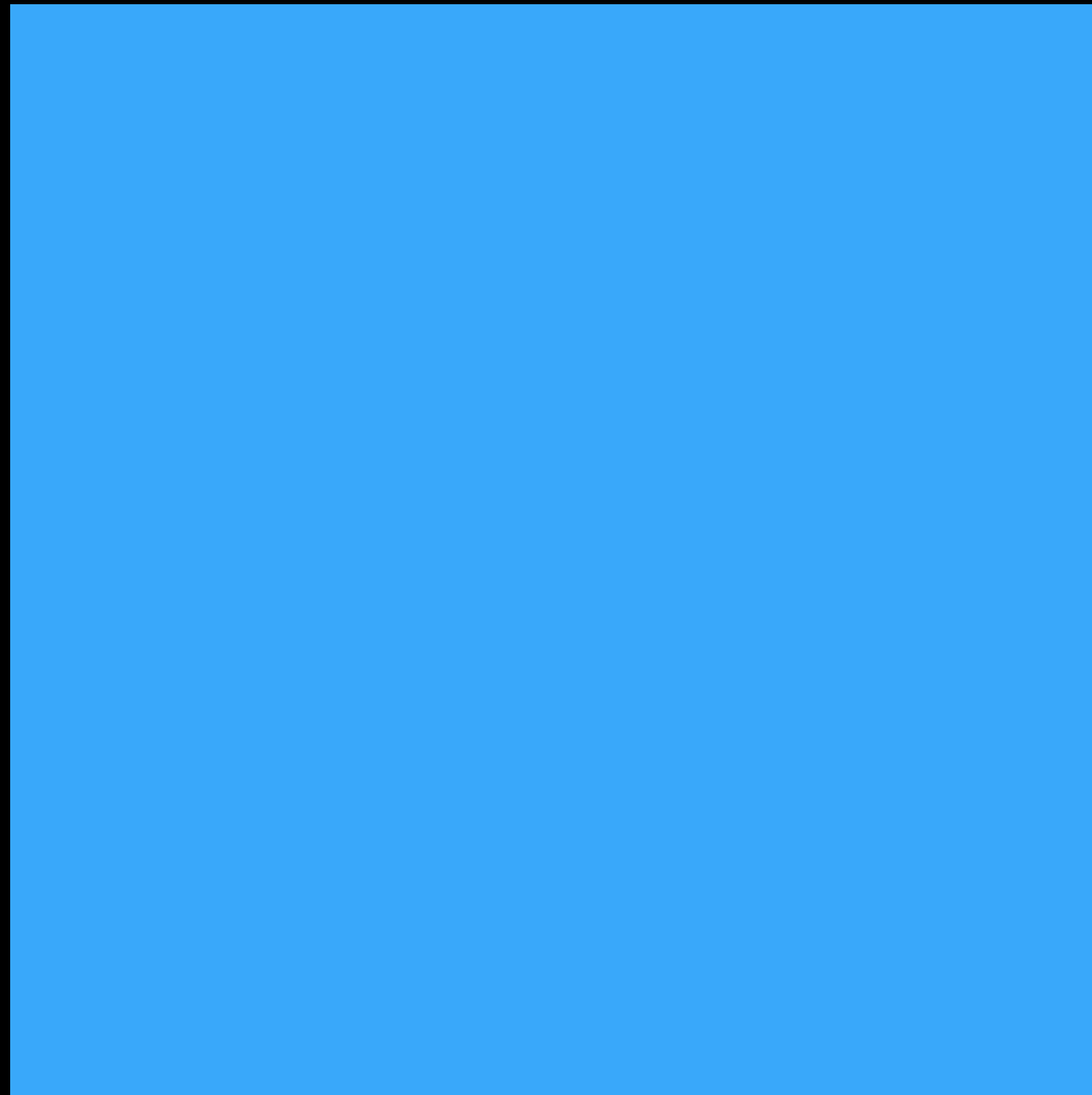
# Equalizing Height

Overshoot

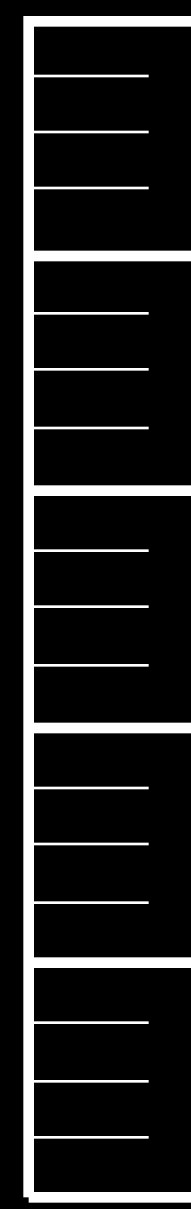


# Equalizing Height

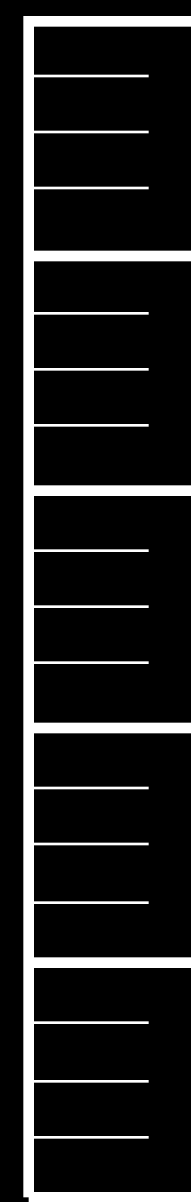
Overshoot



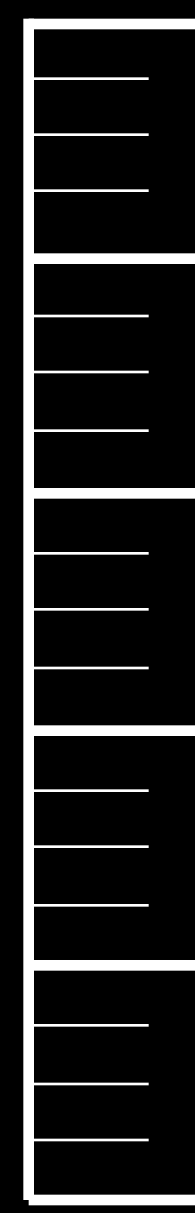
To make two shapes look similar,  
they often have to be made dissimilar



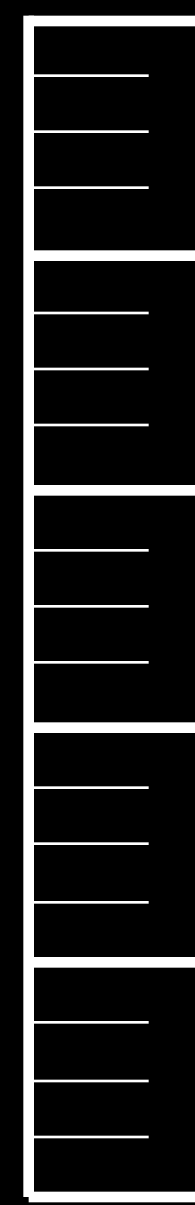
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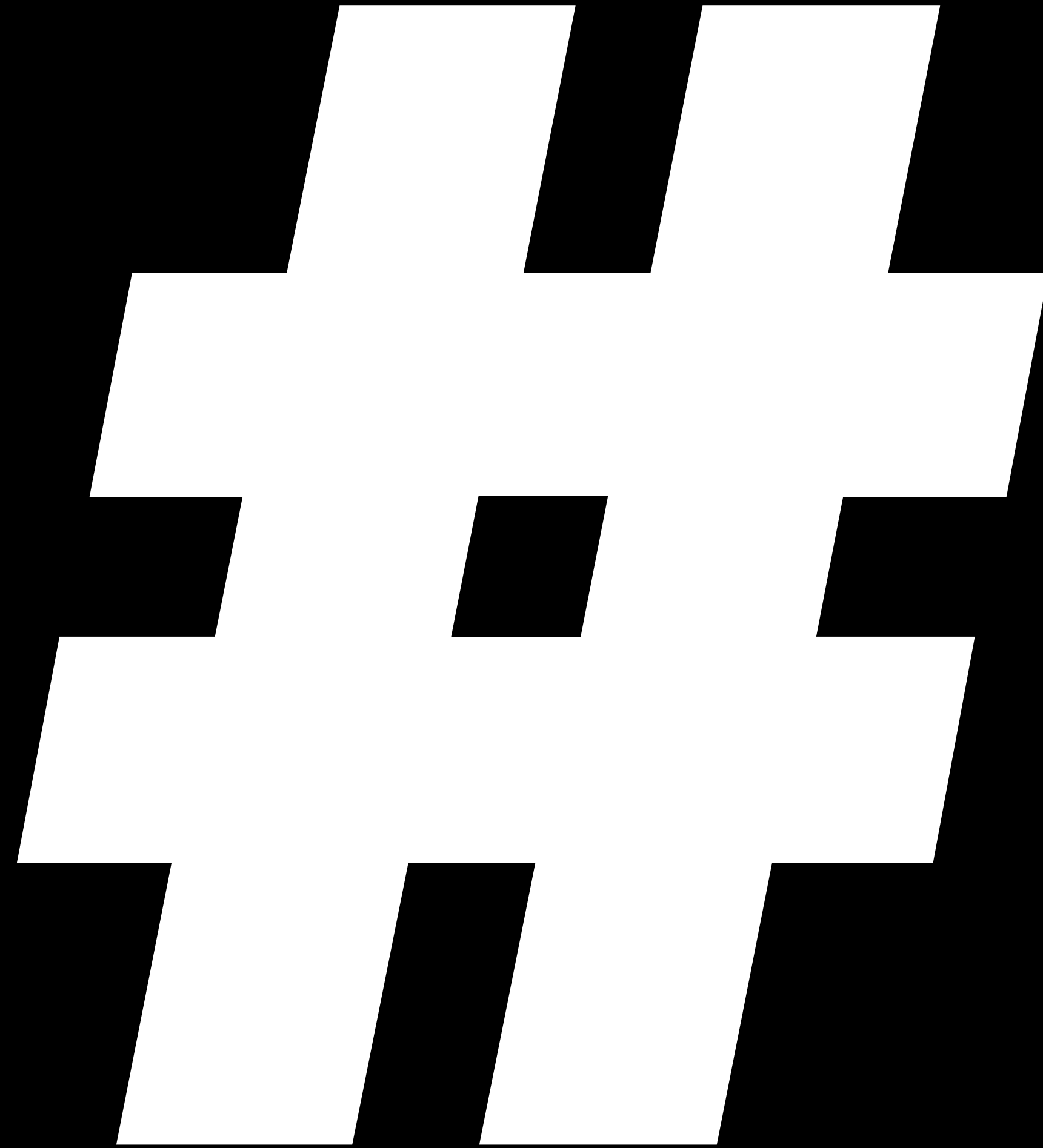


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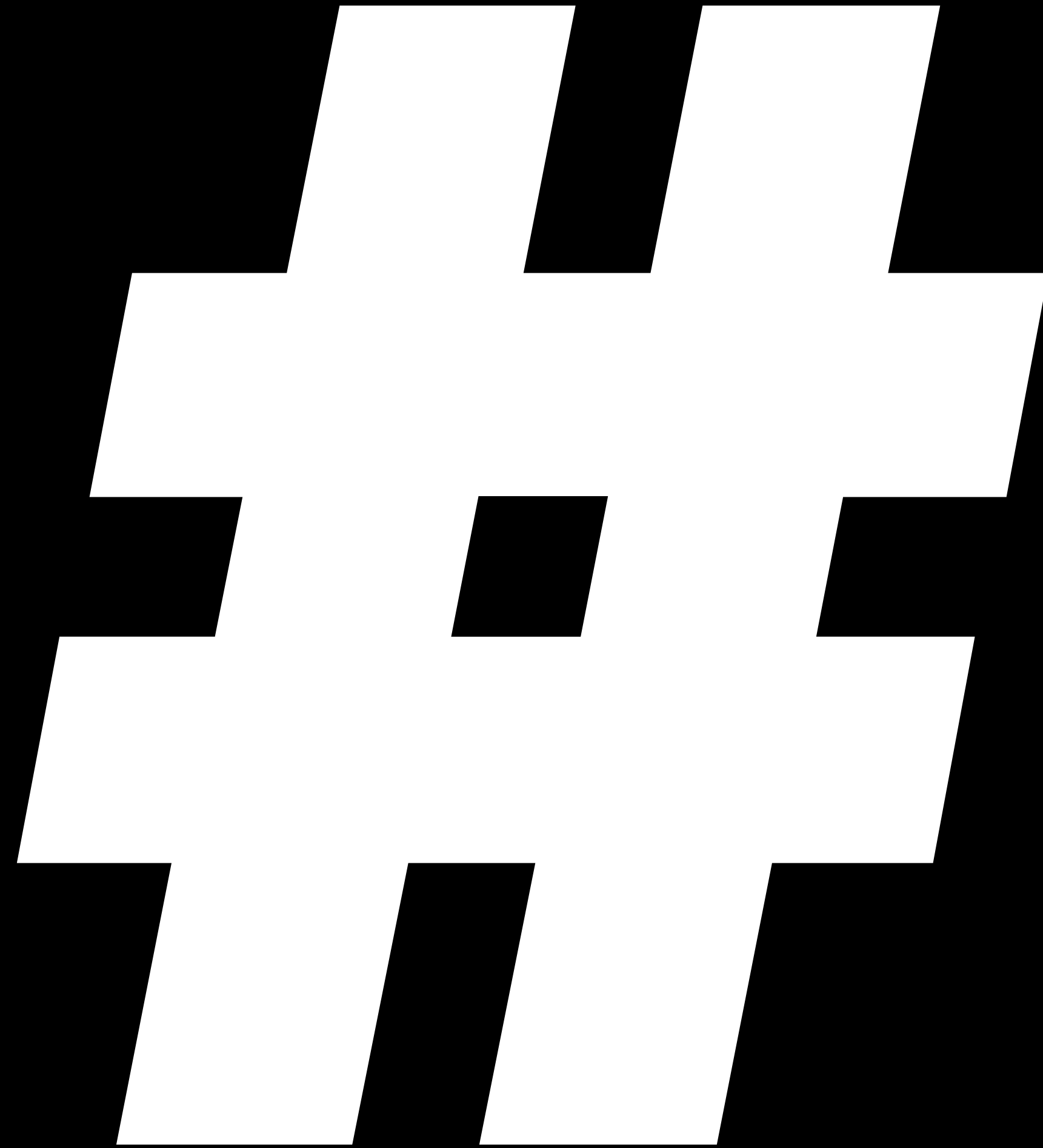


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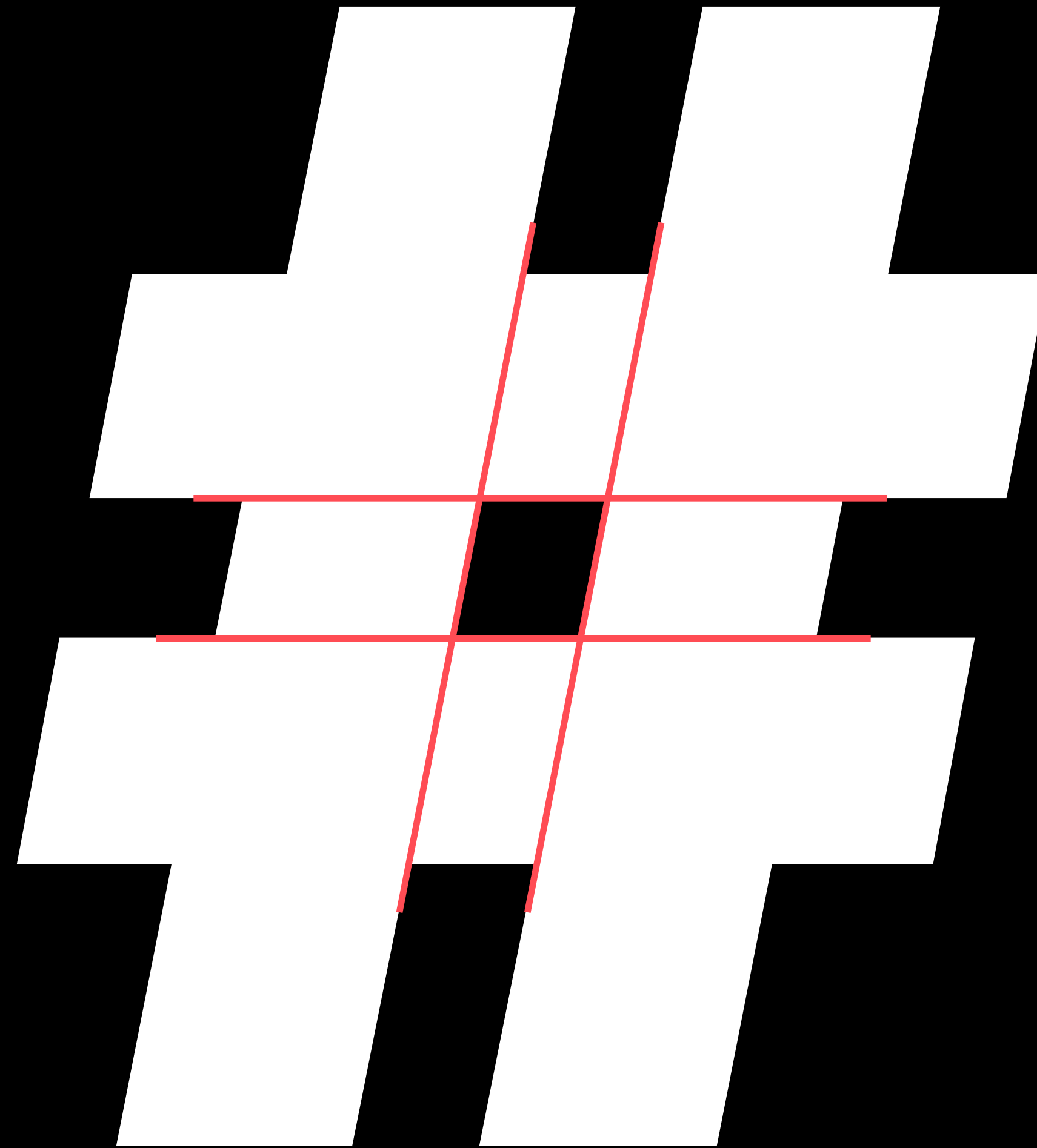
Bonus



Bonus: Octothorpe



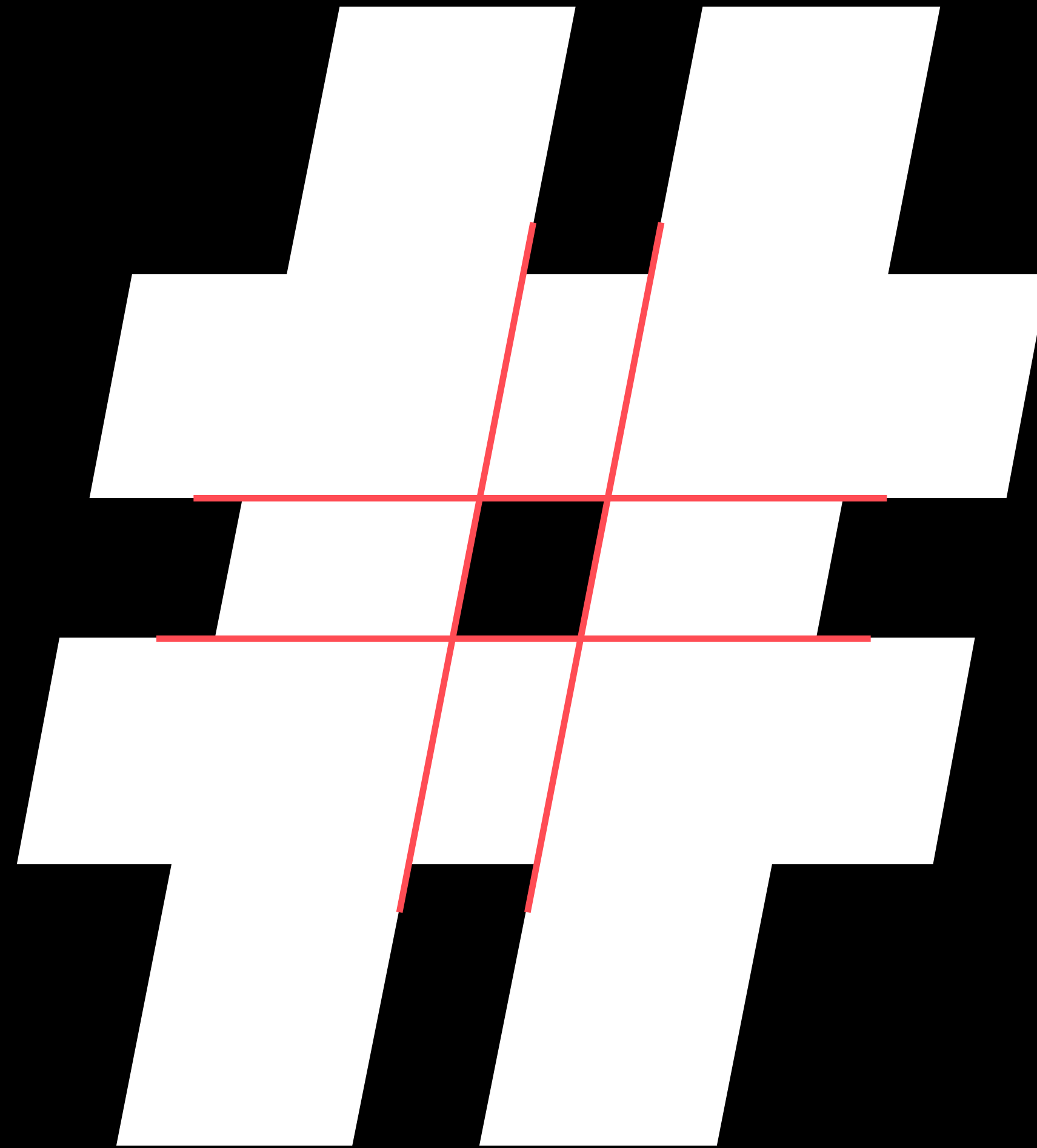
Bonus: Octothorpe



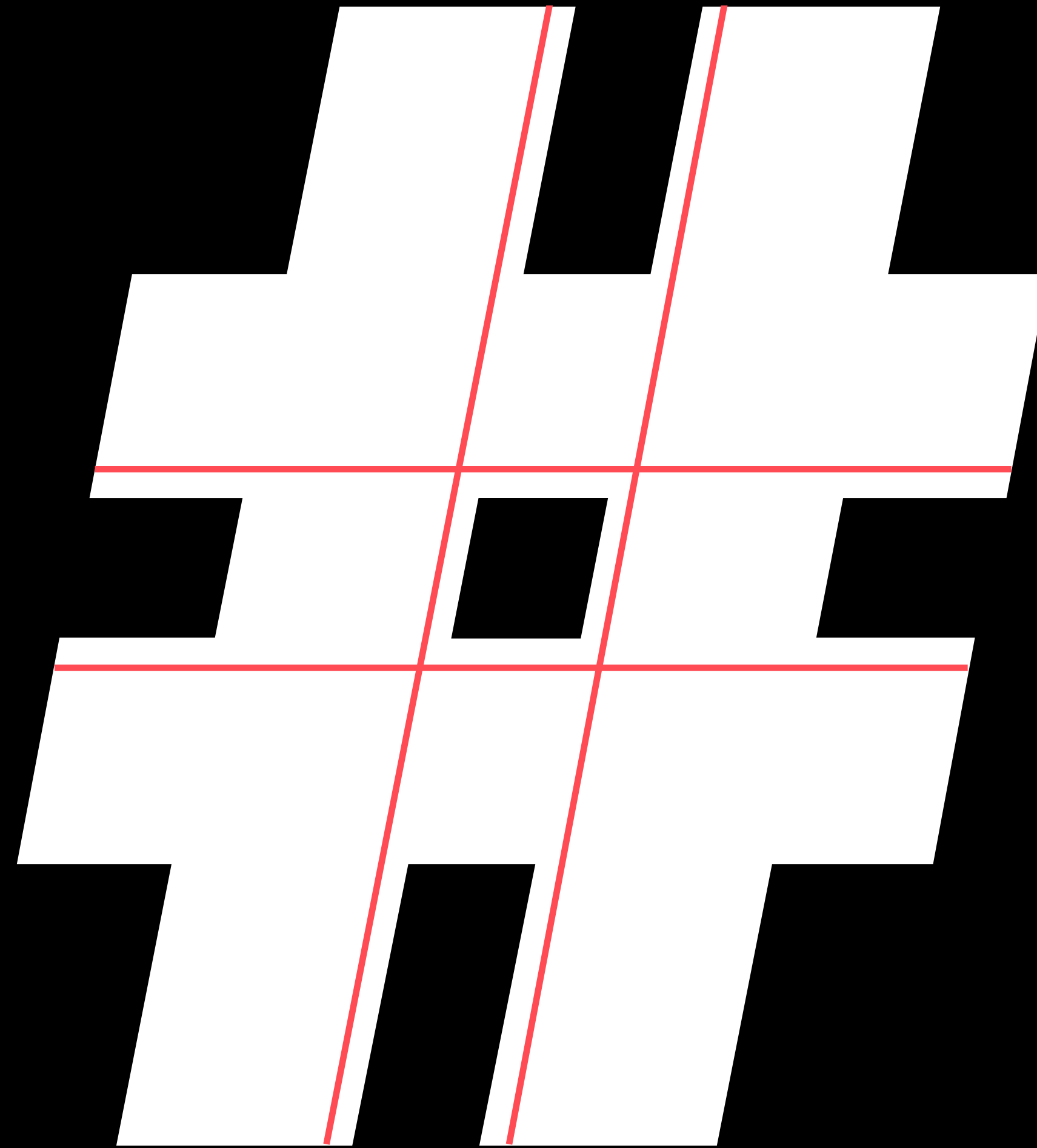
# Bonus: Octothorpe

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Bonus: Octothorpe

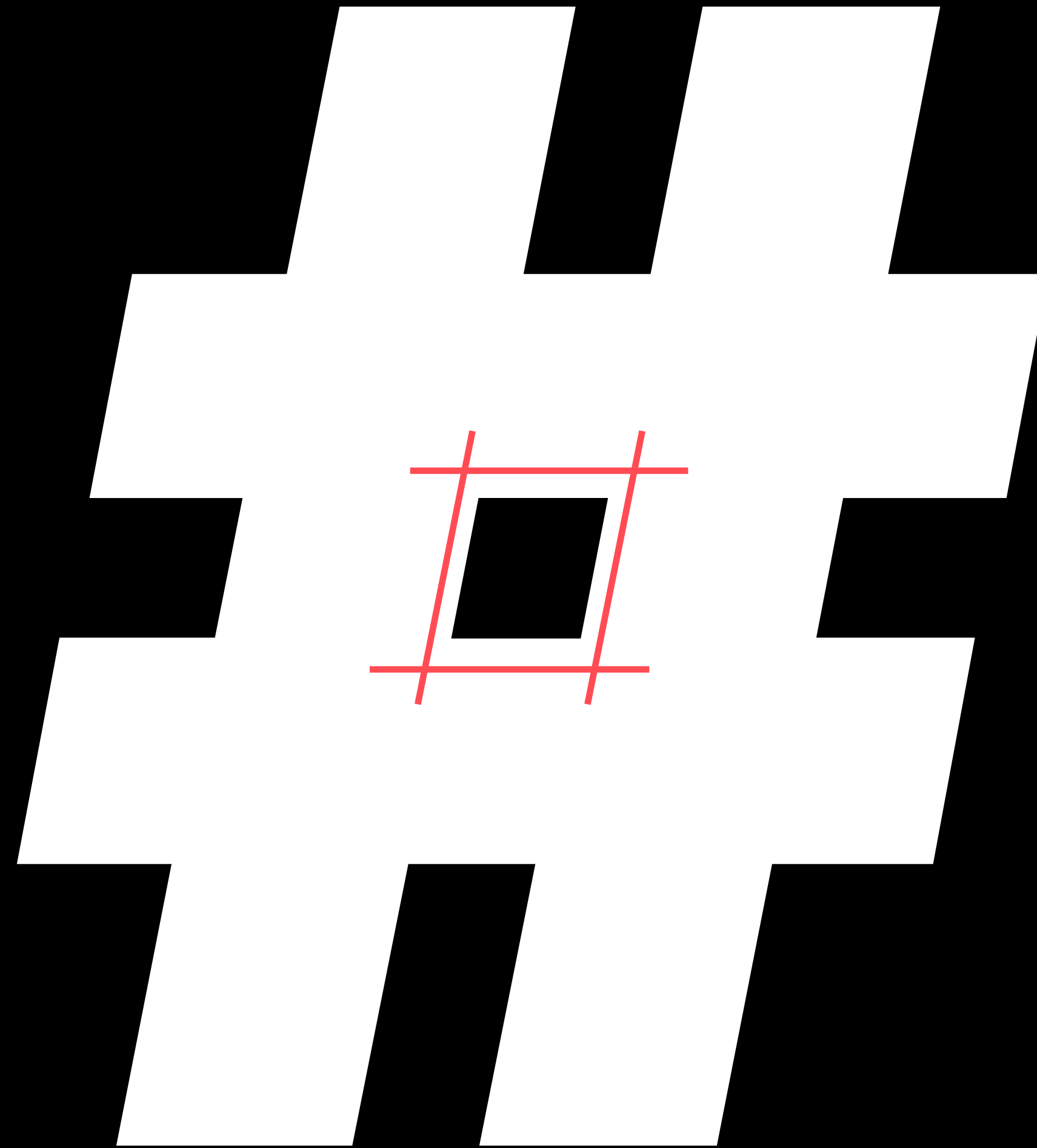


Bonus: Octothorpe

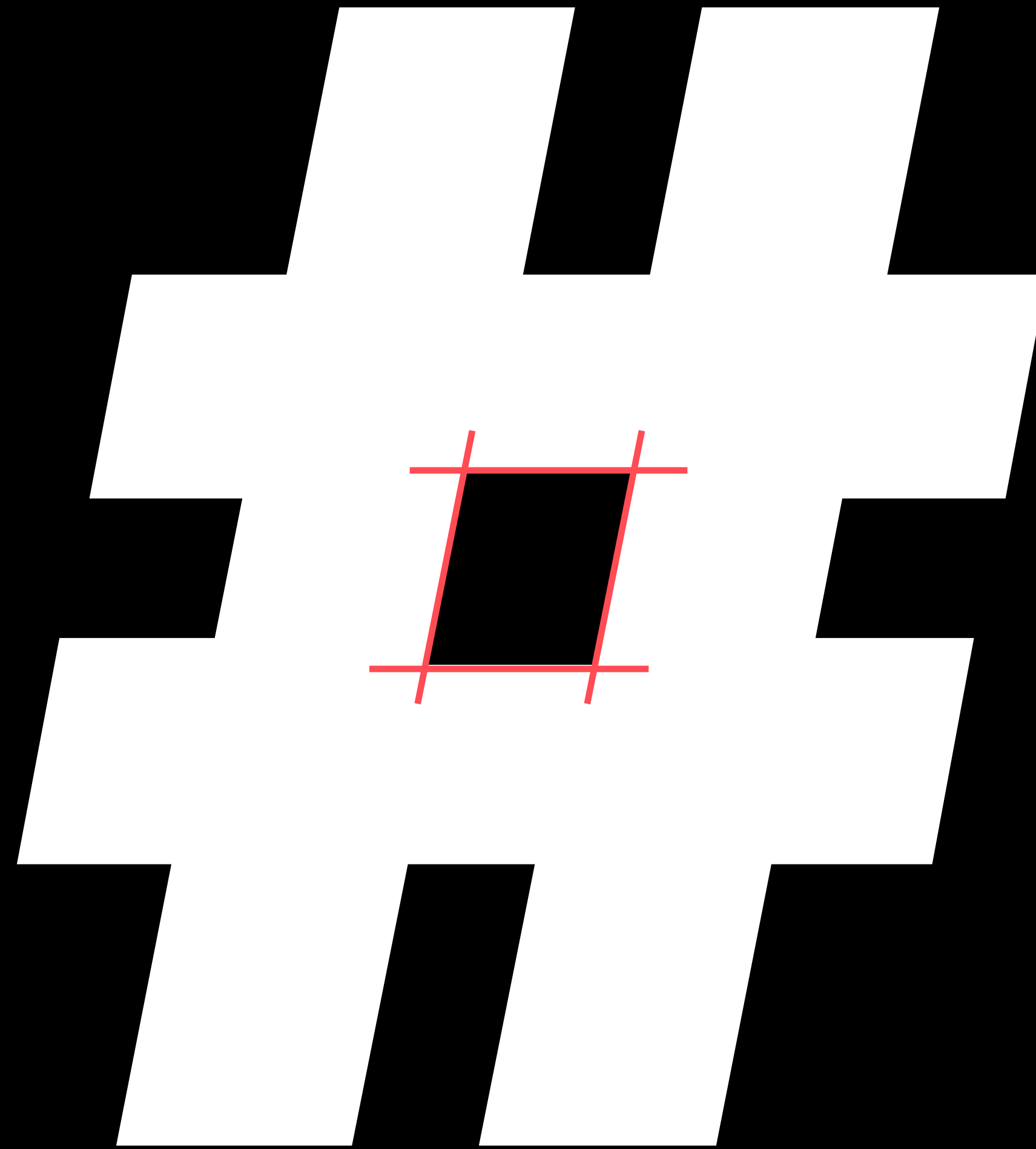




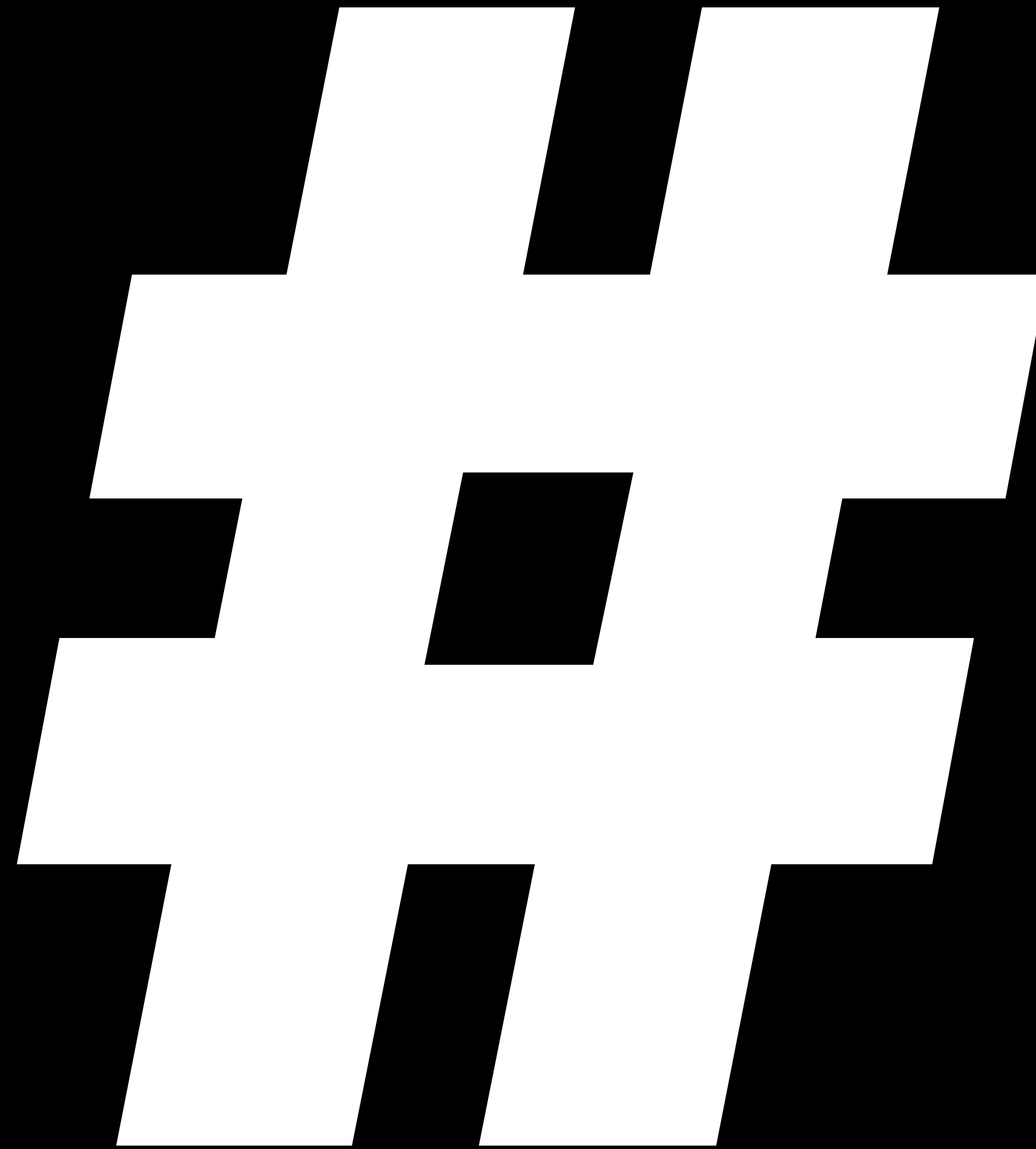
Bonus: Octothorpe



Bonus: Octothorpe



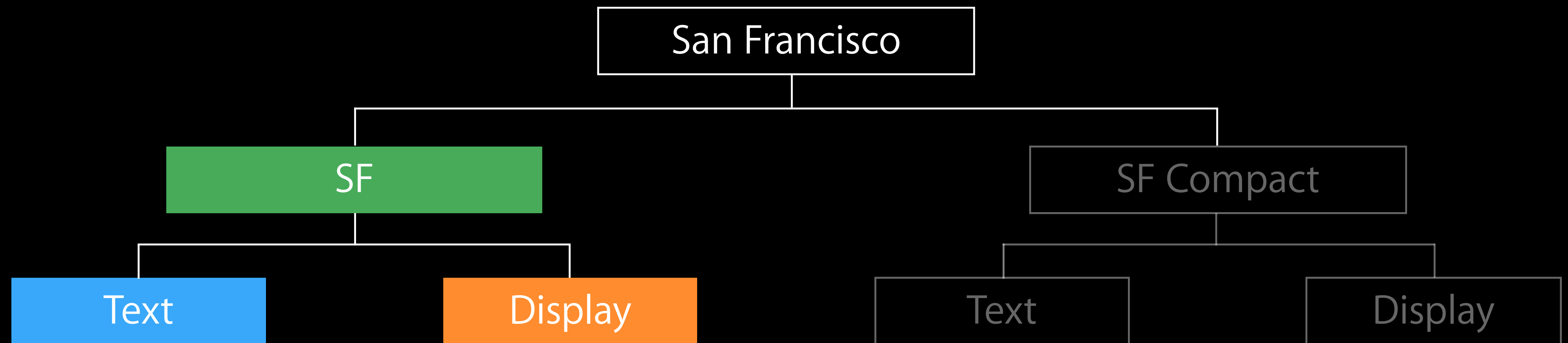
Bonus: Octothorpe



Visual perception is  
largely about illusion

Optical Sizes

# Optical Sizes





Same Font, Different Sizes

120pt hamburgefonstiv

Same Font, Different Sizes

120pt

hamburgetonstiv

15pt

hamburgetonstiv

Same Font, Different Sizes

hamburgetonstiv

hamburgetonstiv

Same Font, Different Sizes

hamburgetonstiv

hamburgetonstiv

Display Versus Text

hamburgefonstiv

hamburgefonstiv

Display Versus Text

hamburgefonstiv

hamburgefonstiv



Negative Space

inambourderonstiv

inambourderonstiv

Negative Space

manbuntomom

manbuntomom

# Negative Space

negative space ▼

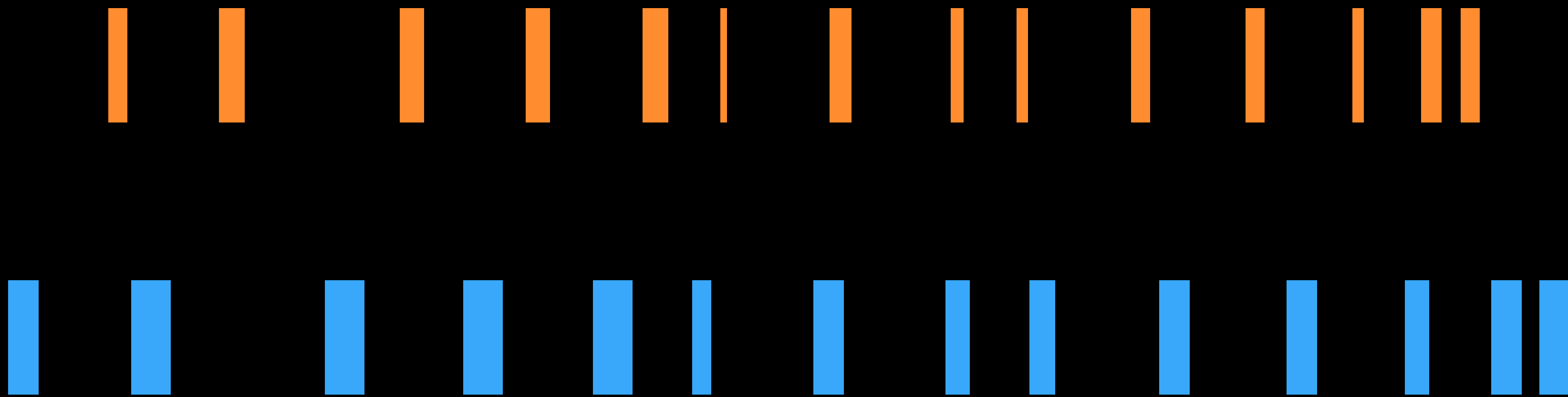
negative space ▼

Negative Space

hamburgenstiv

hamburgenstiv

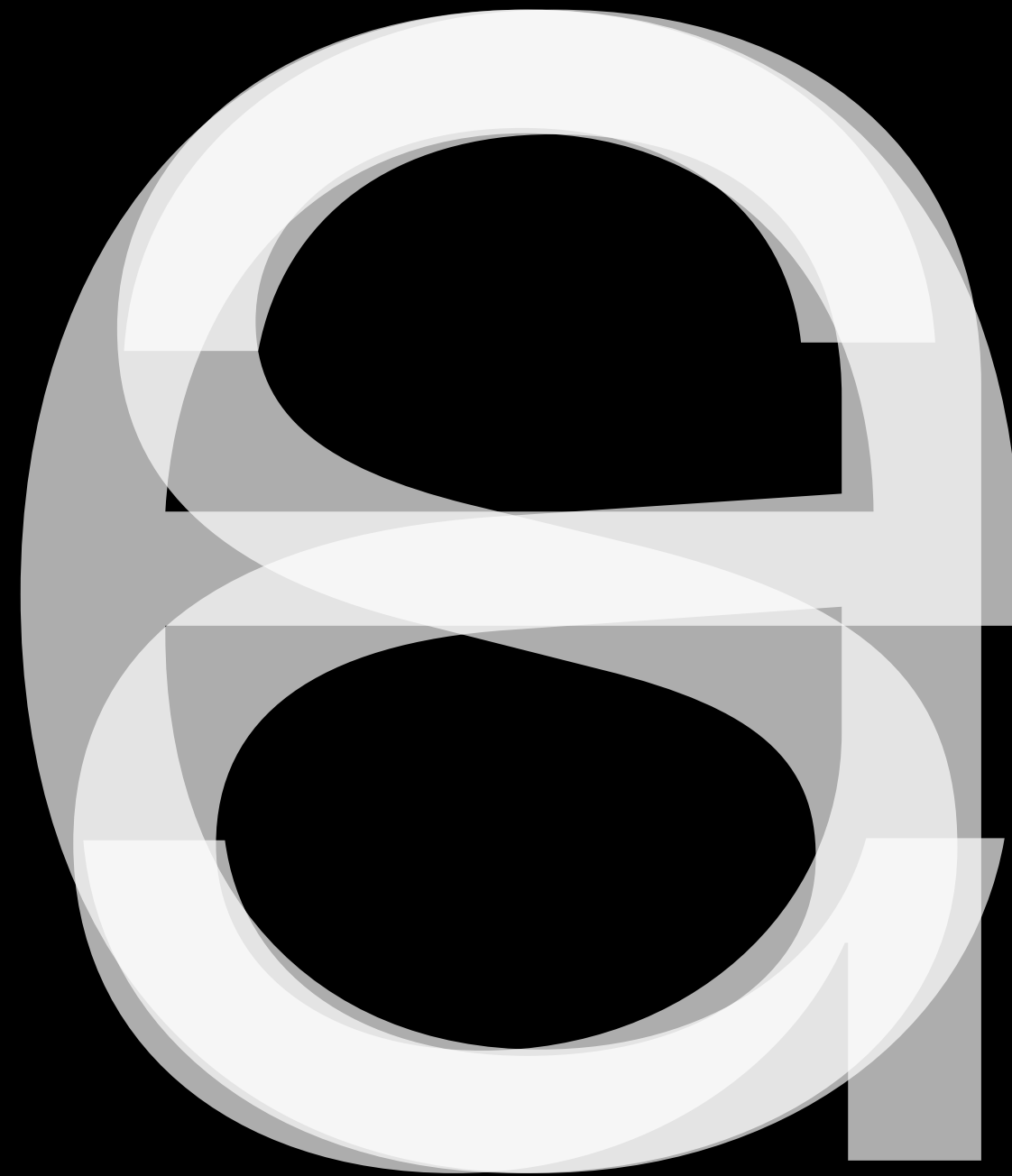
# Negative Space



Confusable Shapes

S a e

# Confusable Shapes





# Confusable Shapes



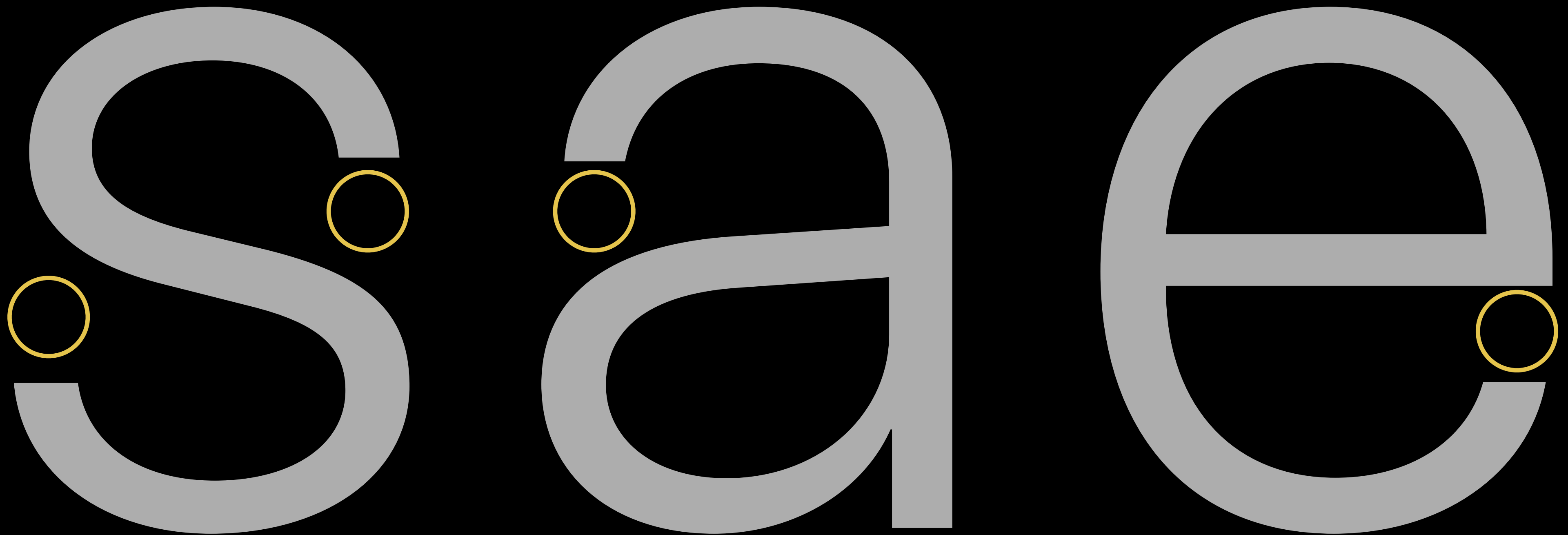
# Confusable Shapes



# Confusable Shapes



# Confusable Shapes



Display Versus Text

h a m m b o w

# Display Versus Text

hamburger

hamburger

hamburger

# Display Versus Text

hamburger

hamburger





# Display Versus Text

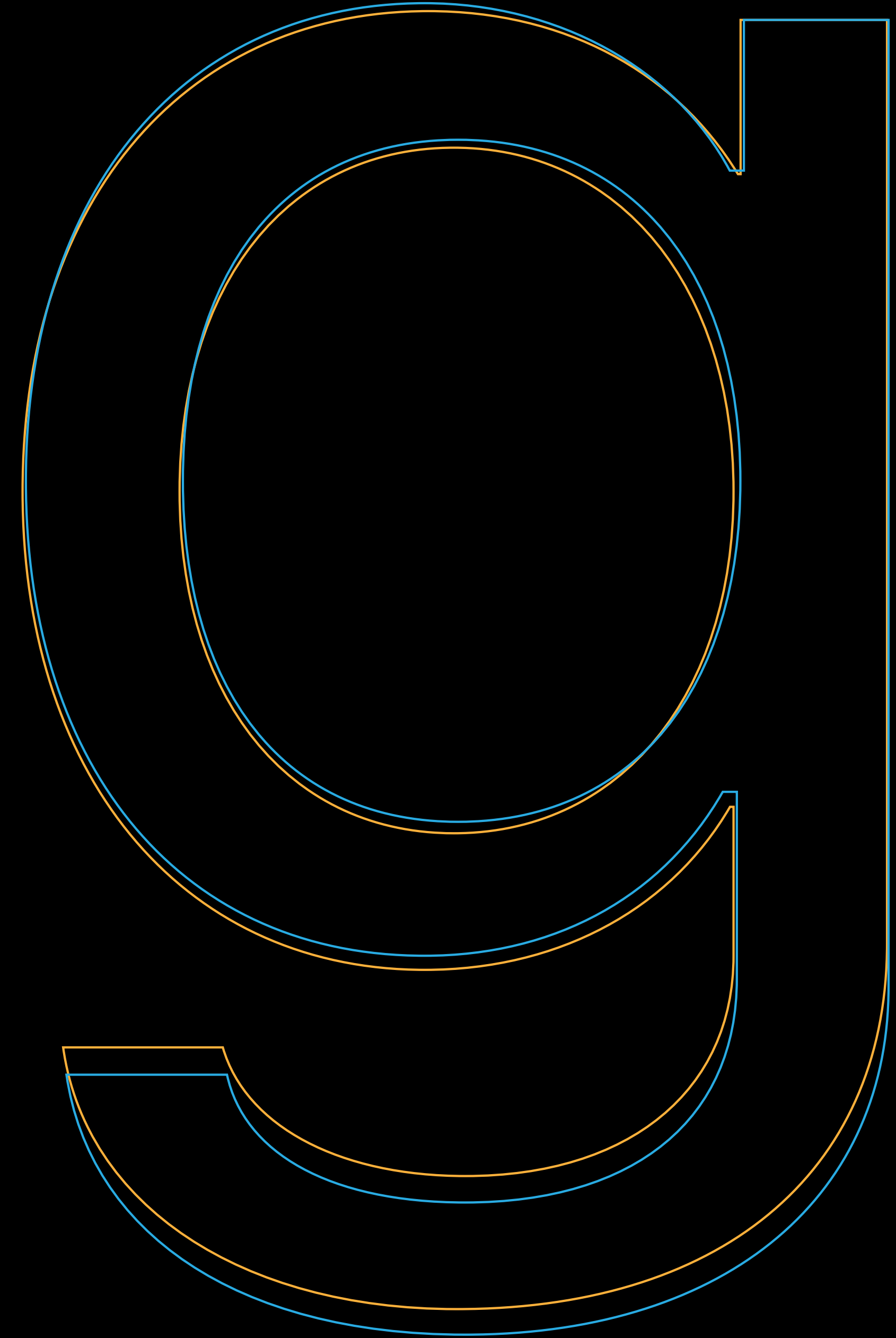
hamburger

hamburger



# Display Versus Text

ambur g efons  
mbur g efons



# Display Versus Text

ambur g efons  
mbur g efons



# Display Versus Text

gefontiv  
gefontiv



# Display Versus Text

gefontiv

s

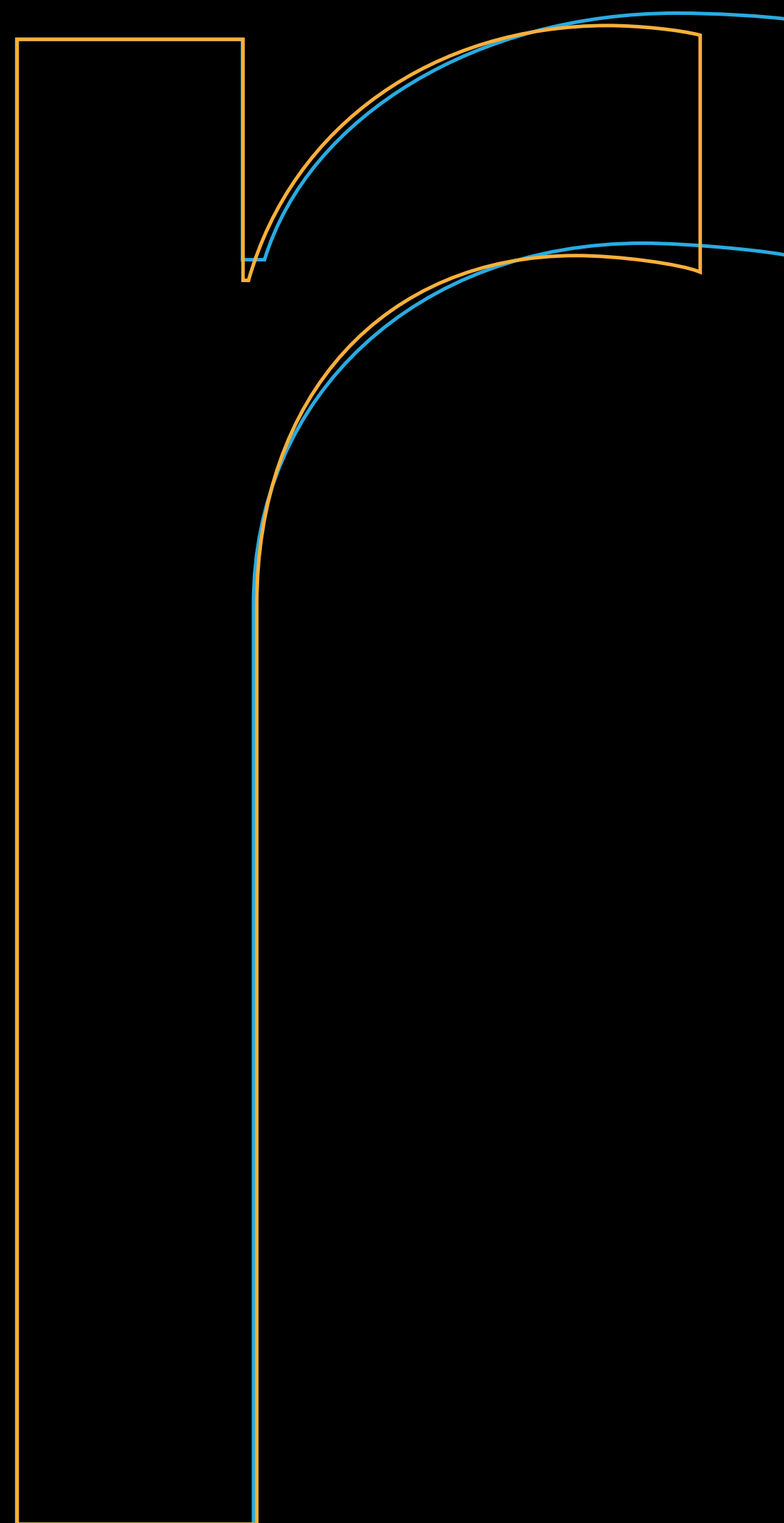
gefontiv

s



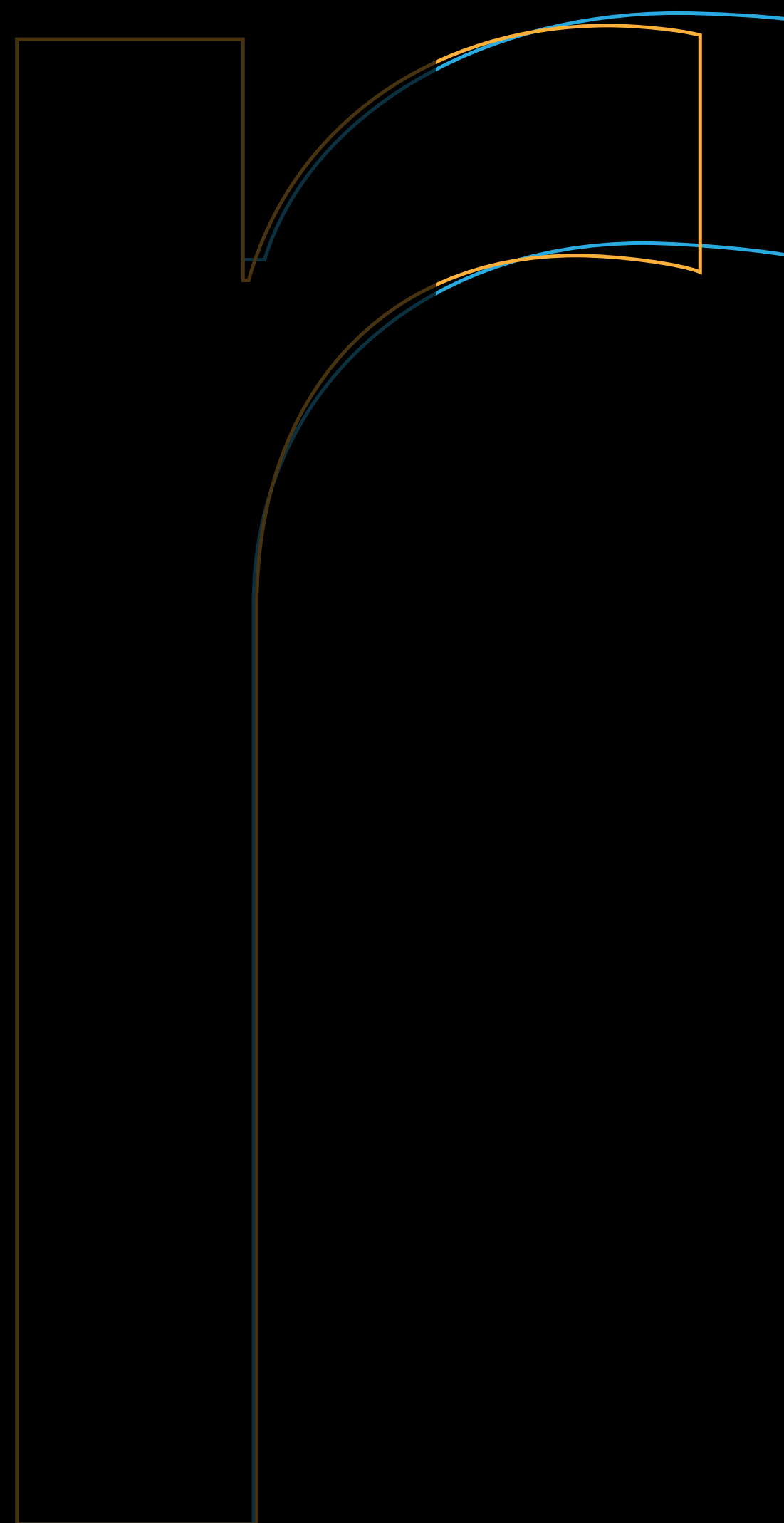
# Display Versus Text

ambur gefons  
ambur gefon



# Display Versus Text

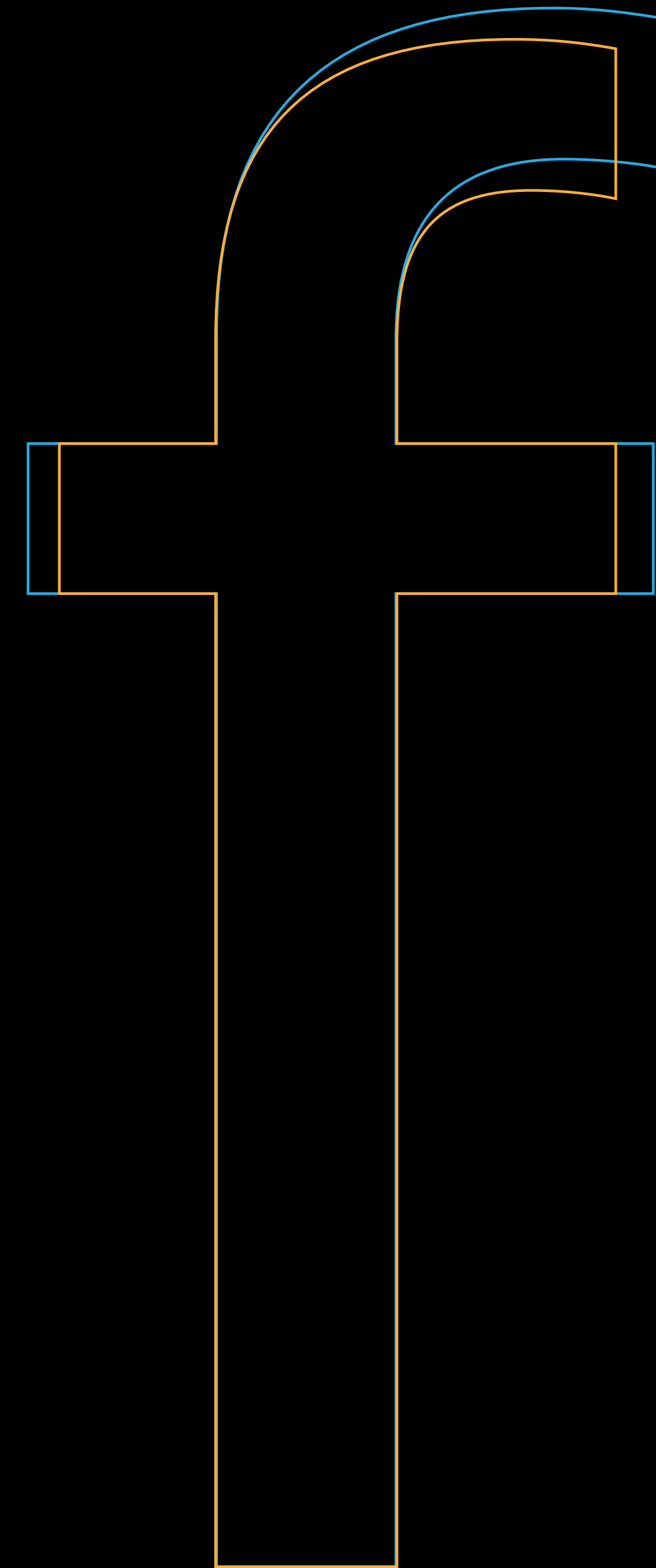
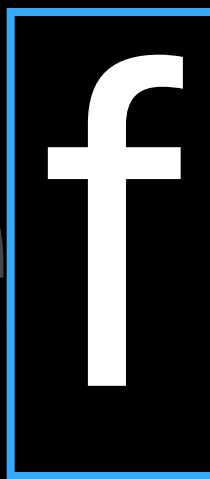
ambur gefons  
ambur gefon





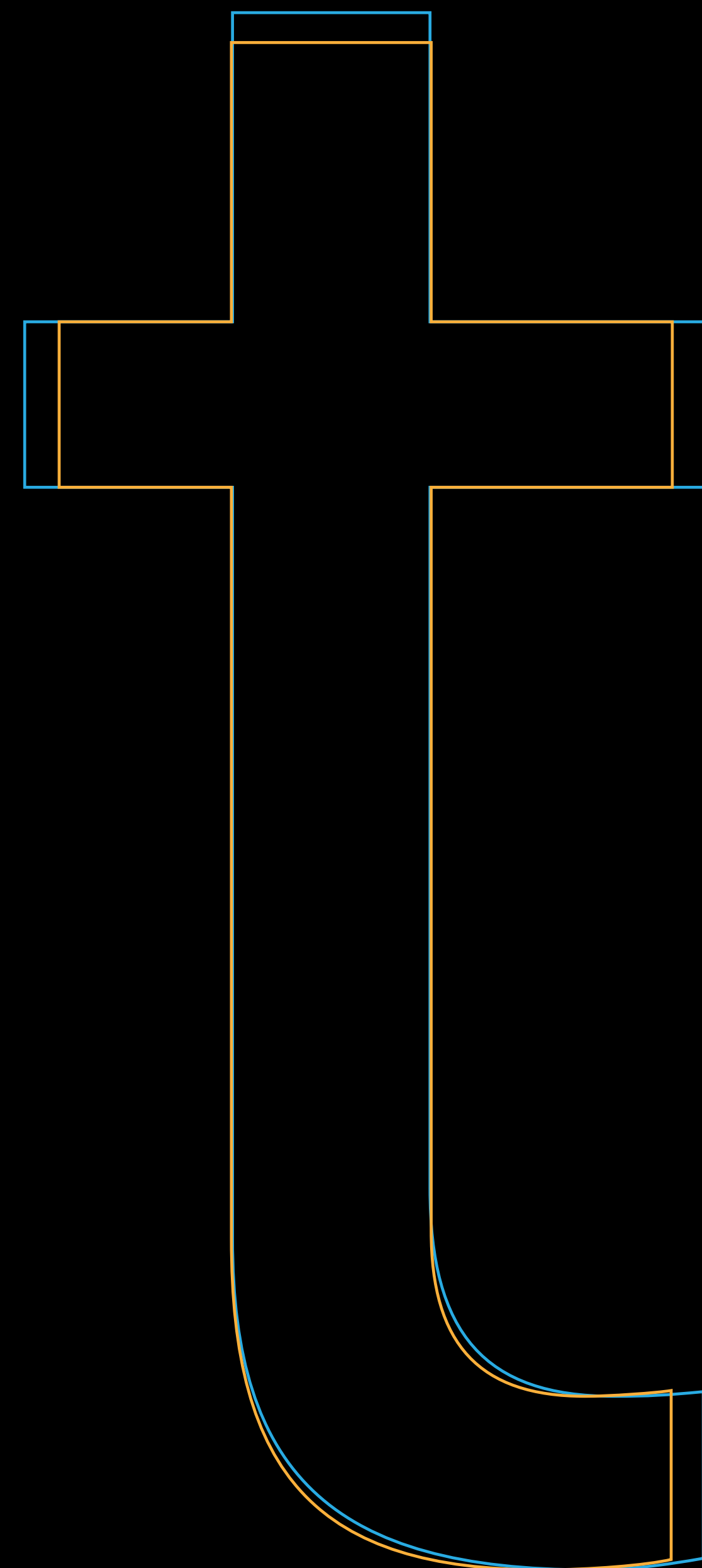
# Display Versus Text

bourgeoisie  
bourgeoisie



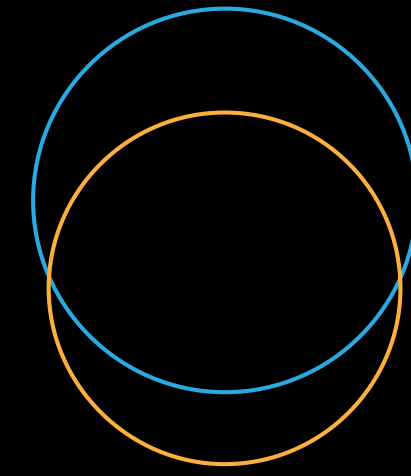
# Display Versus Text

refonsiv  
refonsiv



# Display Versus Text

efonstiv  
fonstiv



# Display Versus Text

40pt hamburgefonstiv

30pt hamburgefonstiv

Display 20pt hamburgefonstiv

---

Text 19pt hamburgefonstiv

18pt hamburgefonstiv

17pt hamburgefonstiv

16pt 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

hamburgetonstiv

Tracking

hamburgefonstiv

# Tracking Versus Kerning

ННННООООНННН

# Tracking

# Positive

Tracking

HHHO OOO HHH

# Tracking

Negative

HHHHHOOOOHHHH



Tracking

Negative

HHHO OOH HHH

# Tracking

Negative

HHHO OOH HHH

# Kerning

ННННООООНННН

# Kerning

ННННООООНННН

# Kerning

HHHHOOOOHHHH

HHHHHLTHHH

# Kerning

HHHO OOH HHH

HHHHL T HHH

# Kerning

Negative

HHHHOOOOHHHH

HHHHHLTHHHH

# Tracking Versus Kerning

H H H H O O O O H H H H

H H H H L T H H H H

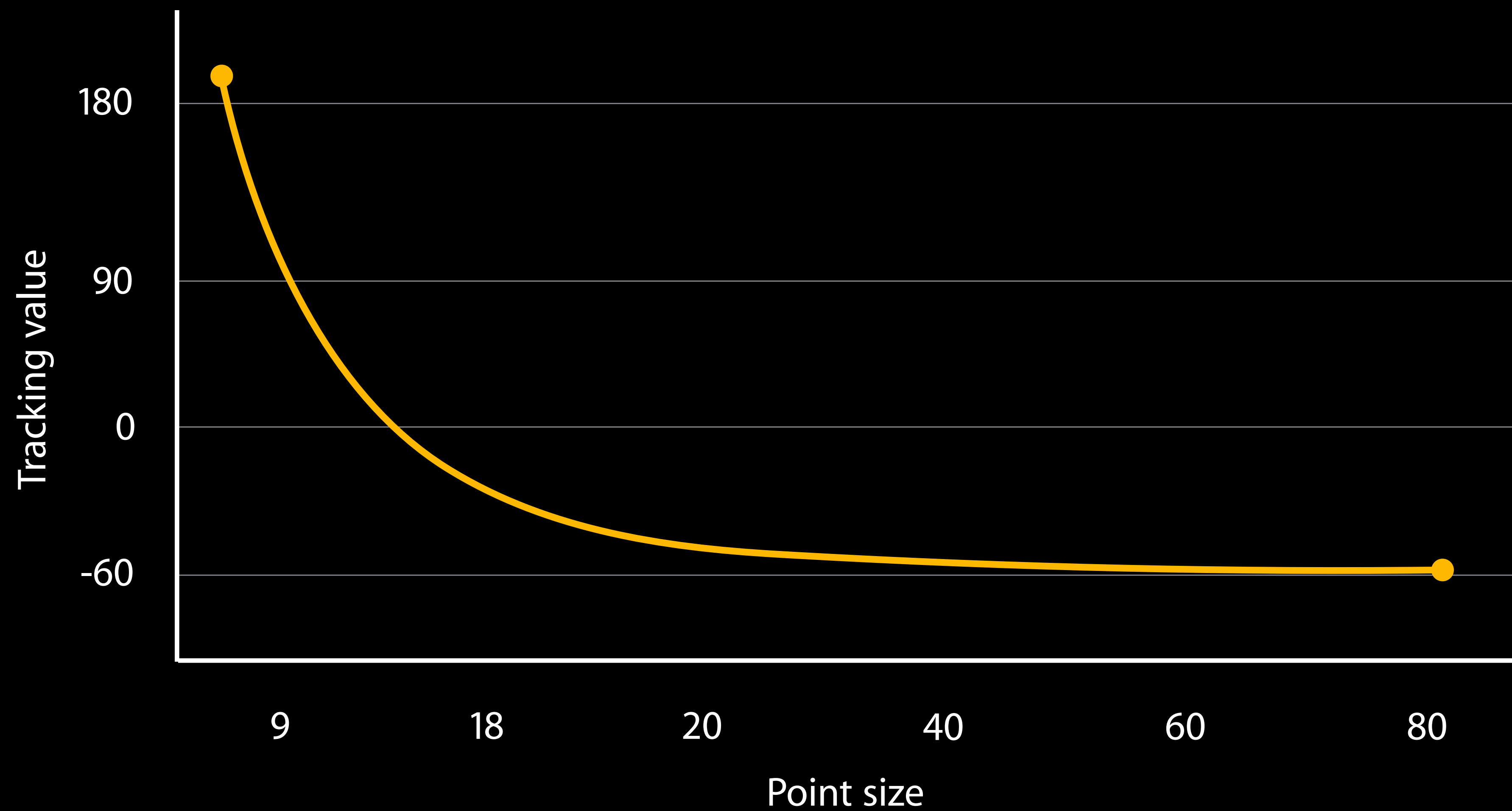


# Tracking Versus Kerning

HHHHHOOOOHHHH

HHHHHLTHHHH

# Tracking Is Size-Specific



# Tracking Is Size-Specific

40pt 10T

hamburgetonstiv

30pt 11T

hamburgetonstiv

Display 20pt 19T

hamburgetonstiv

Text 19pt -25T

hamburgetonstiv

18pt -24T

hamburgetonstiv

17pt -24T

hamburgetonstiv

16pt -20T

hamburgetonstiv

# 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

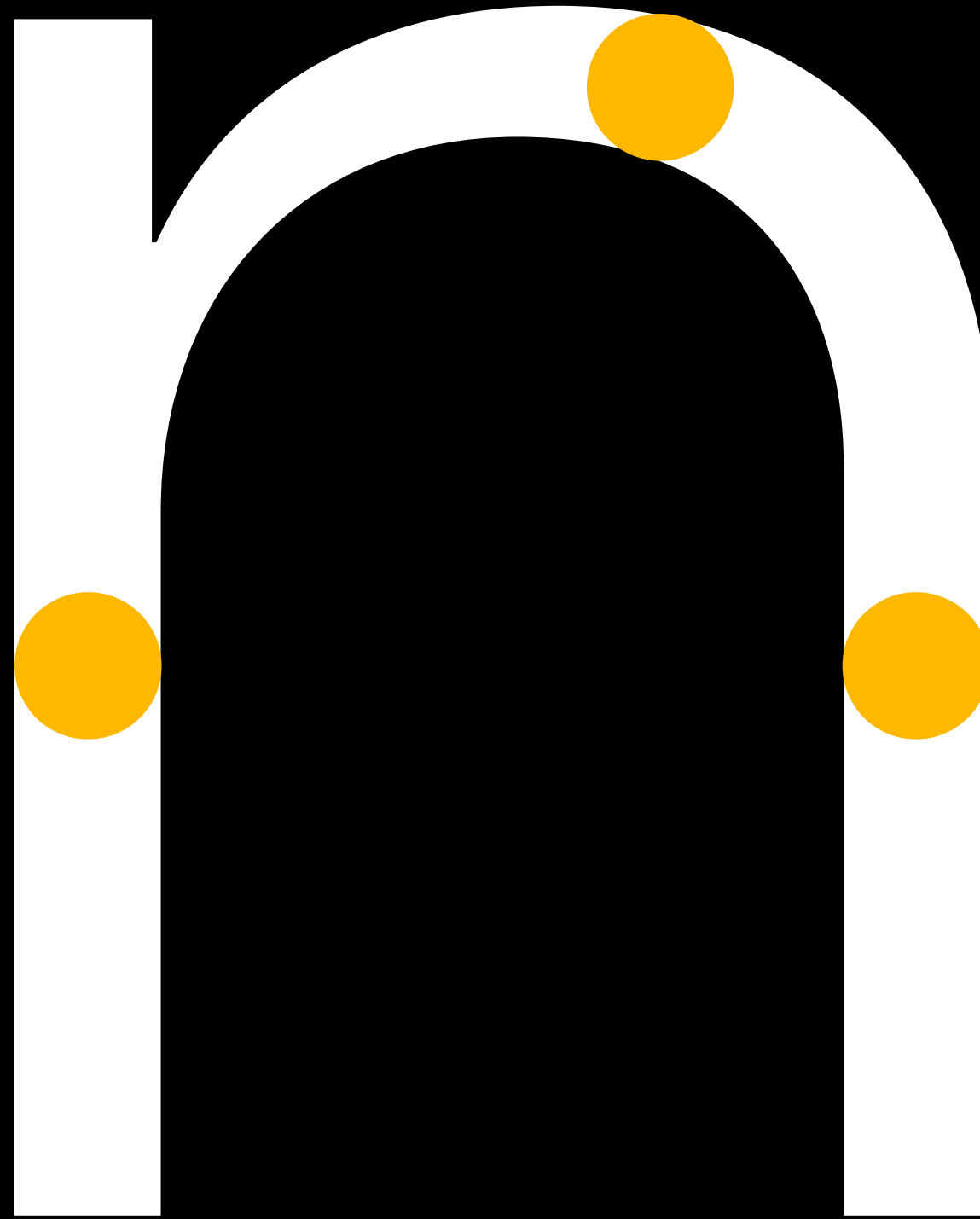
Weights

Font Weight

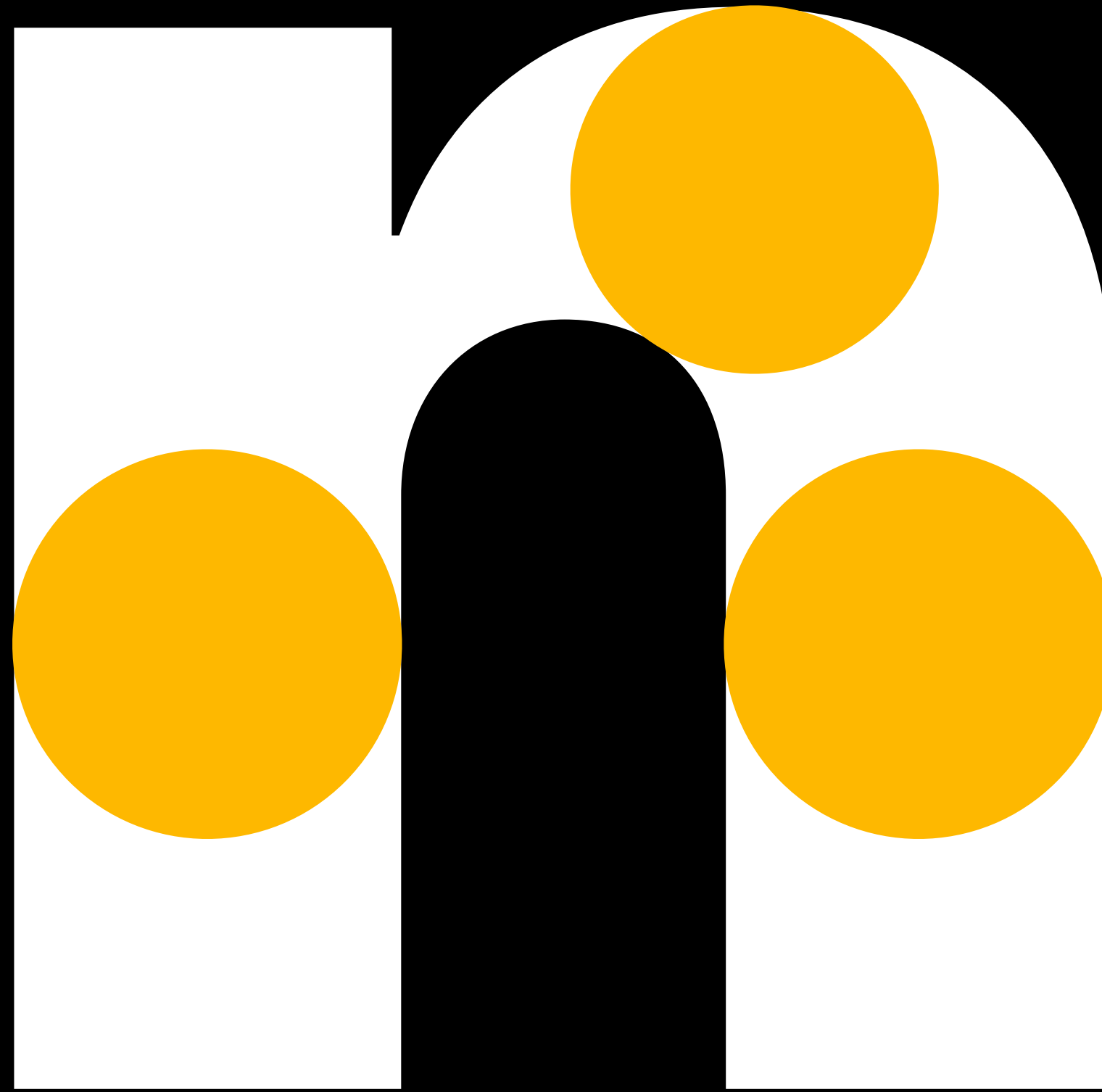
**n**



# Font Weight



# Font Weight



# Text Weights

Light

Regular

Medium

**Semibold**

**Bold**

**Heavy**

# Text Weights

Light

*Light Italic*

Regular

*Regular Italic*

Medium

*Medium Italic*

Semibold

*Semibold Italic*

Bold

*Bold Italic*

Heavy

*Heavy Italic*

# Display Weights

Ultralight

Thin

Light

Regular

Medium

**Semibold**

**Bold**

**Heavy**

**Black**

# Display Weights

Ultralight

Thin

Light

Regular

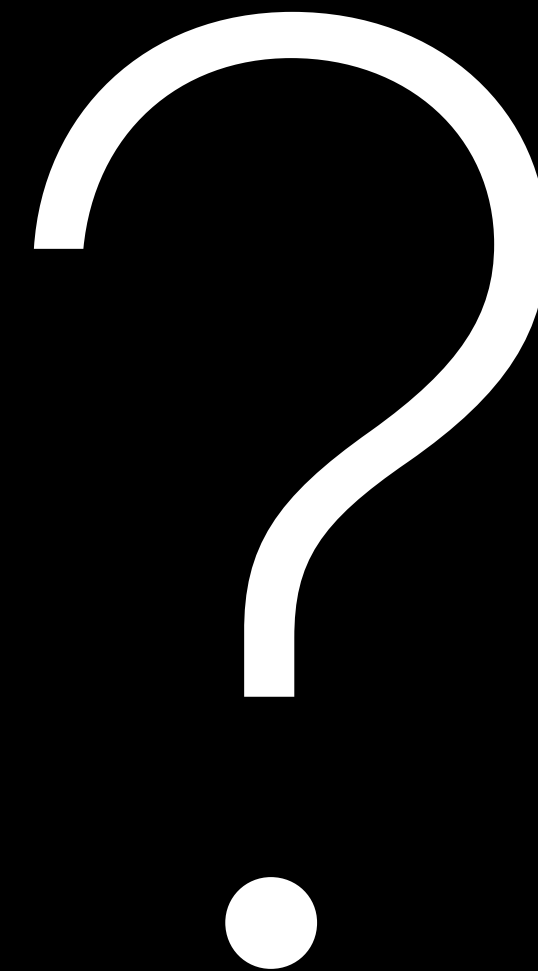
Medium

Semibold

Bold

Heavy

**Black**



# 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. 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.

the other things, not beca  
easure the best of our ene  
g to postpone, and one w  
We come in peace for all m

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.

re? We choose to go to th  
e hard, because that goa  
s one that we are willing to  
the planet Earth first set to

**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.**

**from the planet Earth  
d. Never in all their hi  
sphere, a globe, havi  
meet in which there i**

# New Weights Adoption

NEW

New System Font weight APIs in AppKit and UIKit



# New Weights Adoption

NEW

New System Font weight APIs in AppKit and UIKit

```
NSFont.systemFontSize(SIZE, weight: WEIGHT)
```

```
UIFont.systemFontSize(SIZE, weight: WEIGHT)
```

# New Weights Adoption

NEW

New System Font weight APIs in AppKit and UIKit

`NSFont.systemFontSize(SIZE, weight: WEIGHT)`

`UIFont.systemFontSize(SIZE, weight: WEIGHT)`

`NSFontWeightUltralight`

`NSFontWeightThin`

`NSFontWeightLight`

`NSFontWeightRegular`

`NSFontWeightMedium`

`NSFontWeightSemibold`

`NSFontWeightHeavy`

`NSFontWeightBlack`

`UIFontWeightUltralight`

`UIFontWeightThin`

`UIFontWeightLight`

`UIFontWeightRegular`

`UIFontWeightMedium`

`UIFontWeightSemibold`

`UIFontWeightHeavy`

`UIFontWeightBlack`

# 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.



# Weight-Use in Differentiation and Hierarchy

**Today's** weather is great.

# Weight-Use in Differentiation and Hierarchy

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

Light

2

Light

ABC

# 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

# Weight Used for Voice

## Bee Weather

<b>Monday</b>	<b>39°C</b>
---------------	-------------

<b>Tuesday</b>	<b>37°C</b>
----------------	-------------

<b>Wednesday</b>	<b>39°C</b>
------------------	-------------

<b>Thursday</b>	<b>38°C</b>
-----------------	-------------

<b>Friday</b>	<b>37°C</b>
---------------	-------------

<b>Saturday</b>	<b>38°C</b>
-----------------	-------------

<b>Sunday</b>	<b>40°C</b>
---------------	-------------

# Weight Used for Voice

## Bee Weather

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

Sunday

## Dove Weather

Monday	20°C
--------	------

Tuesday	23°C
---------	------

Wednesday	20°C
-----------	------

Thursday	22°C
----------	------

Friday	23°C
--------	------

Saturday	22°C
----------	------

Sunday	20°C
--------	------

# Weight Used for Voice

## Zebra Weather

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

Sunday

## Dove Weather

Monday	20°C
--------	------

Tuesday	23°C
---------	------

Wednesday	20°C
-----------	------

Thursday	22°C
----------	------

Friday	23°C
--------	------

Saturday	22°C
----------	------

Sunday	20°C
--------	------

# 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

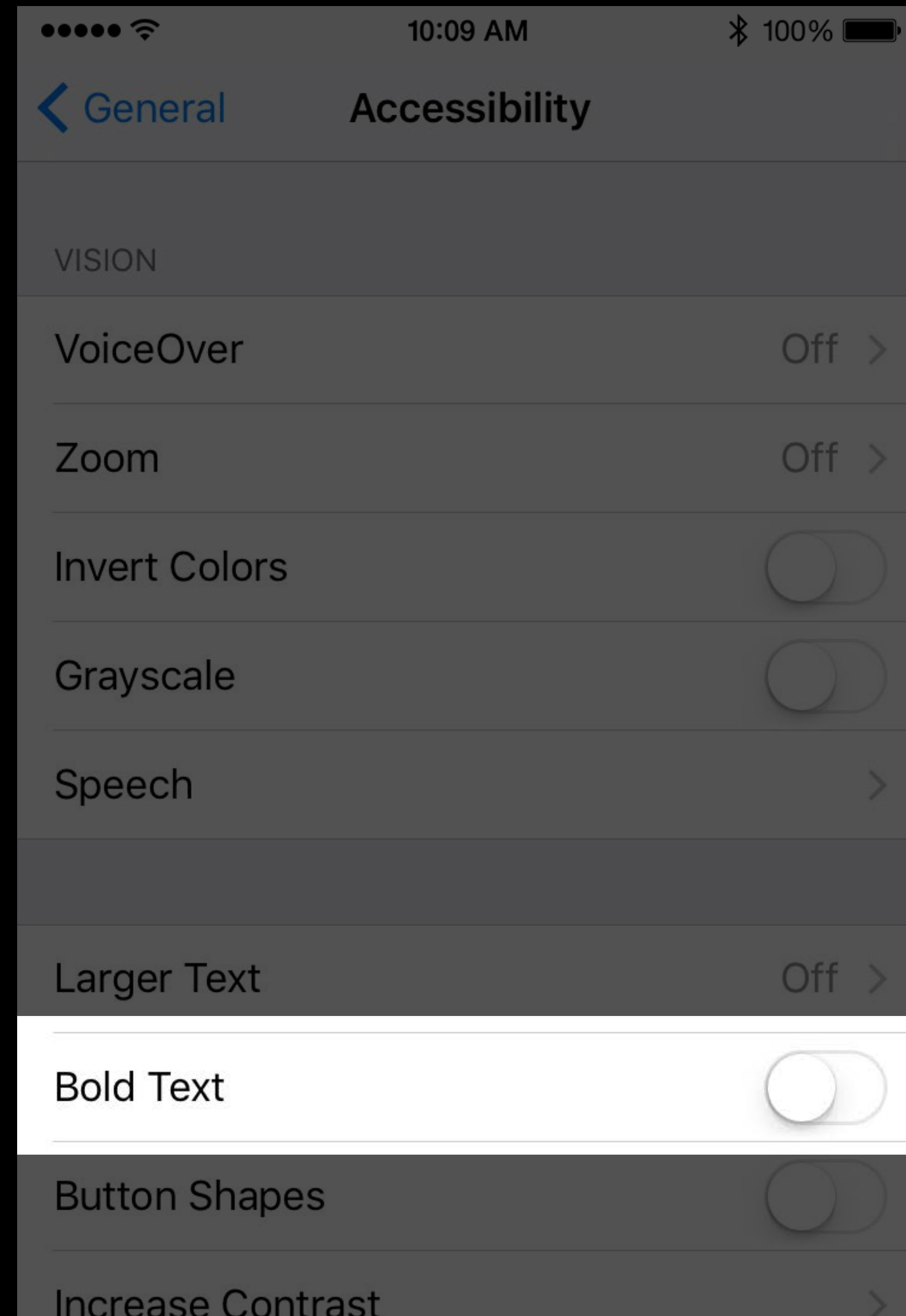
- Establish hierarchy with consistency and clarity
- On iOS, use Text Style APIs and adopt Dynamic Type



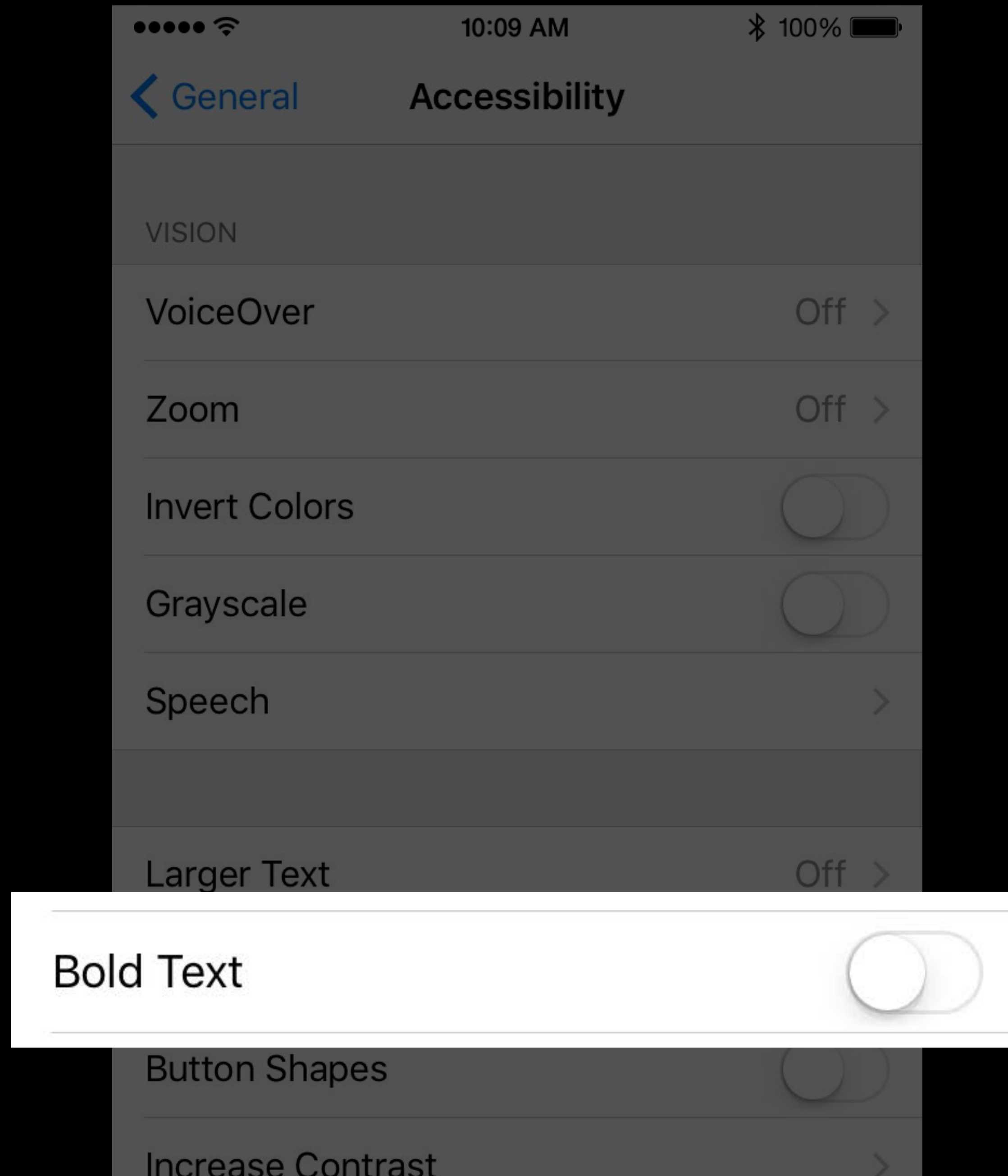
# Settings > General > Accessibility > Bold Text



# 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

$\frac{1}{2}$



# Feature Example: Fractions

$1/2$     $\frac{1}{2}$

# Feature Example: Fractions

1/2 ½

U+00BD VULGAR FRACTION ONE HALF

# Feature Example: Fractions

$\frac{2}{9}$

# Feature Example: Fractions

$2/9$  ?

# Feature Example: Fractions

$$\boxed{2}/9 \quad 2$$

# Feature Example: Fractions

2/9 2/

# Feature Example: Fractions

2/9 2/9

# Feature Example: Fractions

$2/9$       $2/9$



# Feature Example: Fractions

2/9 2⁄9

U+2044 FRACTION SLASH

# Feature Example: Fractions

$\frac{2}{9}$

# Feature Example: Fractions



A diagram illustrating a feature transformation for fractions. On the left, the fraction  $2/9$  is enclosed in a yellow square box. A yellow arrow points from this box to the right, where the fraction  $\frac{2}{9}$  is displayed in a standard mathematical notation.

# Feature Example: Fractions



A diagram illustrating a feature transformation for fractions. On the left, the fraction  $65/324$  is enclosed in a yellow rectangular box. A yellow arrow points from the right side of this box to the fraction  $65/324$  on the right. The fraction on the right is rendered with the numerator  $65$  positioned higher than the denominator  $324$ , representing a normalized or spaced-out representation of the fraction.

# Feature Example: Fractions



# Feature Example: Fractions



# Feature Example: Fractions



# Feature Example: Fractions





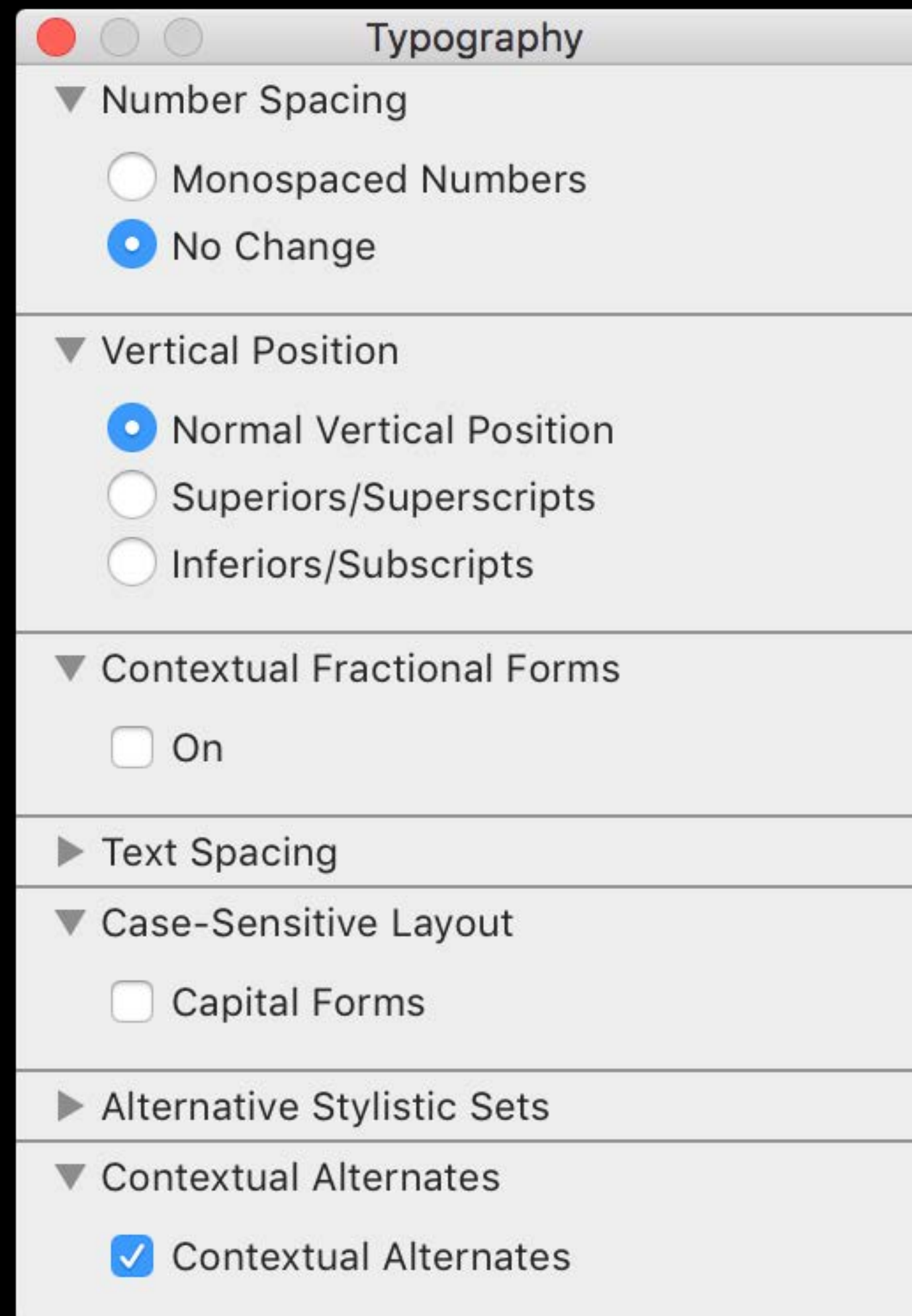
# Feature Example: Fractions



# Feature Example: Fractions



# Enabling Features: Typography Panel



# Enabling Features: Code

```
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

```
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

```
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

```
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)
```

# Enabling Features: Code

```
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

```
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)
```

# Feature Example: Superiors/Superscripts

$$e=mc^2$$

# Feature Example: Superiors/Superscripts

$$e=mc2 \quad e=mc^2$$

# Feature Example: Superiors/Superscripts

$$e=mc2 \quad e=mc^2$$


# Feature Example: Inferiors/Subscripts



# Feature Example: Inferiors/Subscripts

C3H8

C<sub>3</sub>H<sub>8</sub>

# Feature Example: Inferiors/Subscripts

C3H8

C<sub>3</sub>H<sub>8</sub>

Two yellow arrows point upwards from the bottom of the image to the subscripts '3' and '8' in the chemical formula C<sub>3</sub>H<sub>8</sub>, highlighting the inferior feature.

# 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



Wed 9:41 AM





# Special Feature:Vertically Centered Colon

9:41

Friday, June 12



Wed 9:41 AM



9:41

Sunset 7:10PM

9HRS 1MIN

Cupertino, CA



14:59



7:00



00:46

# Special Feature:Vertically Centered Colon

9:41


Friday, June 12


00:02.37  
00:26.22


 Wed 9:41 AM  

9:41

Sunset 7:10PM  
9HRS 1MIN  
Cupertino, CA

  
14:59

  
7:00

  
00:46

Special Feature:Vertically Centered Colon

9:41 9:41

Special Feature: Vertically Centered Colon

9:41

9:41



Special Feature: Alternate Six and Nine

6 9

Special Feature: Alternate Six and Nine

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

2<sup>65</sup>/324

Display

2<sup>65</sup>/324

Text



# Features Summary

# 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

0 1 2 3 4 5 6 7 8 9

# Number Spacing

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

# Monospaced (Tabular) Numbers

0 1 2 3 4 5 6 7 8 9





# Monospaced (Tabular) Numbers

235,667+

30,521+

1,273,313+

9,831+

127,053+

9,967,345+

# Monospaced (Tabular) Numbers

	2	3	5	,	6	6	7	+	
		3	0	,	5	2	1	+	
1	,	2	7	3	,	3	1	3	+
		9	,	8	3	1		+	
	1	2	7	,	0	5	3	+	
9	,	9	6	7	,	3	4	5	+

# Monospaced (Tabular) Numbers

	2	3	5	,	6	6	7	+	
		3	0	,	5	2	1	+	
1	,	2	7	3	,	3	1	3	+
			9	,	8	3	1	+	
	1	2	7	,	0	5	3	+	
9	,	9	6	7	,	3	4	5	+

2015/06/12 12:34

2014/12/03 00:33

2013/06/22 22:35

2012/10/30 04:04

2011/01/01 08:54

2011/03/12 12:38

2010/05/12 06:27

# Monospaced (Tabular) Numbers

	2	3	5	,	6	6	7	+	
		3	0	,	5	2	1	+	
1	,	2	7	3	,	3	1	3	+
		9	,	8	3	1	+		
	1	2	7	,	0	5	3	+	
9	,	9	6	7	,	3	4	5	+

2015/06/12	12:34
2014/12/03	00:33
2013/06/22	22:35
2012/10/30	04:04
2011/01/01	08:54
2011/03/12	12:38
2010/05/12	06:27

# Monospaced (Tabular) Numbers

0 1 2 3 4 5 6 7 8 9



# 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 12<sup>th</sup>

# Proportionals for Static Labels

Friday,  
June 12<sup>th</sup>

+1 (123) 300-4000

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Inbox (3172 messages, 2 unread)

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seanjohnson21@icloud.com

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<http://www.apple.com/pr/library/2015/06/08Apple-Previews-iOS-9.html>

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Friday,  
June 12<sup>th</sup>

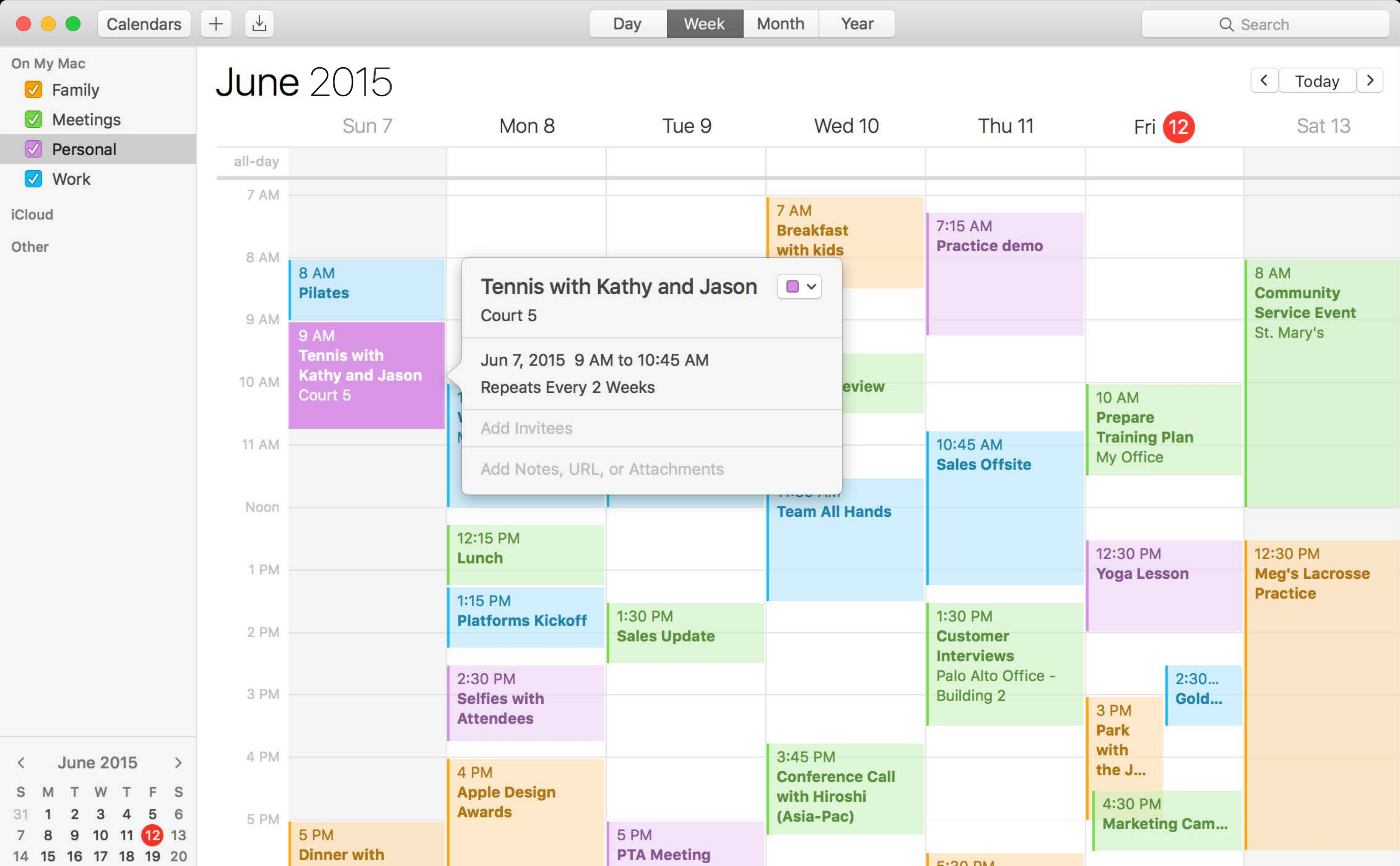
+1 (123) 300-4000

Inbox (3172 messages, 2 unread)

seanjohnson21@icloud.com

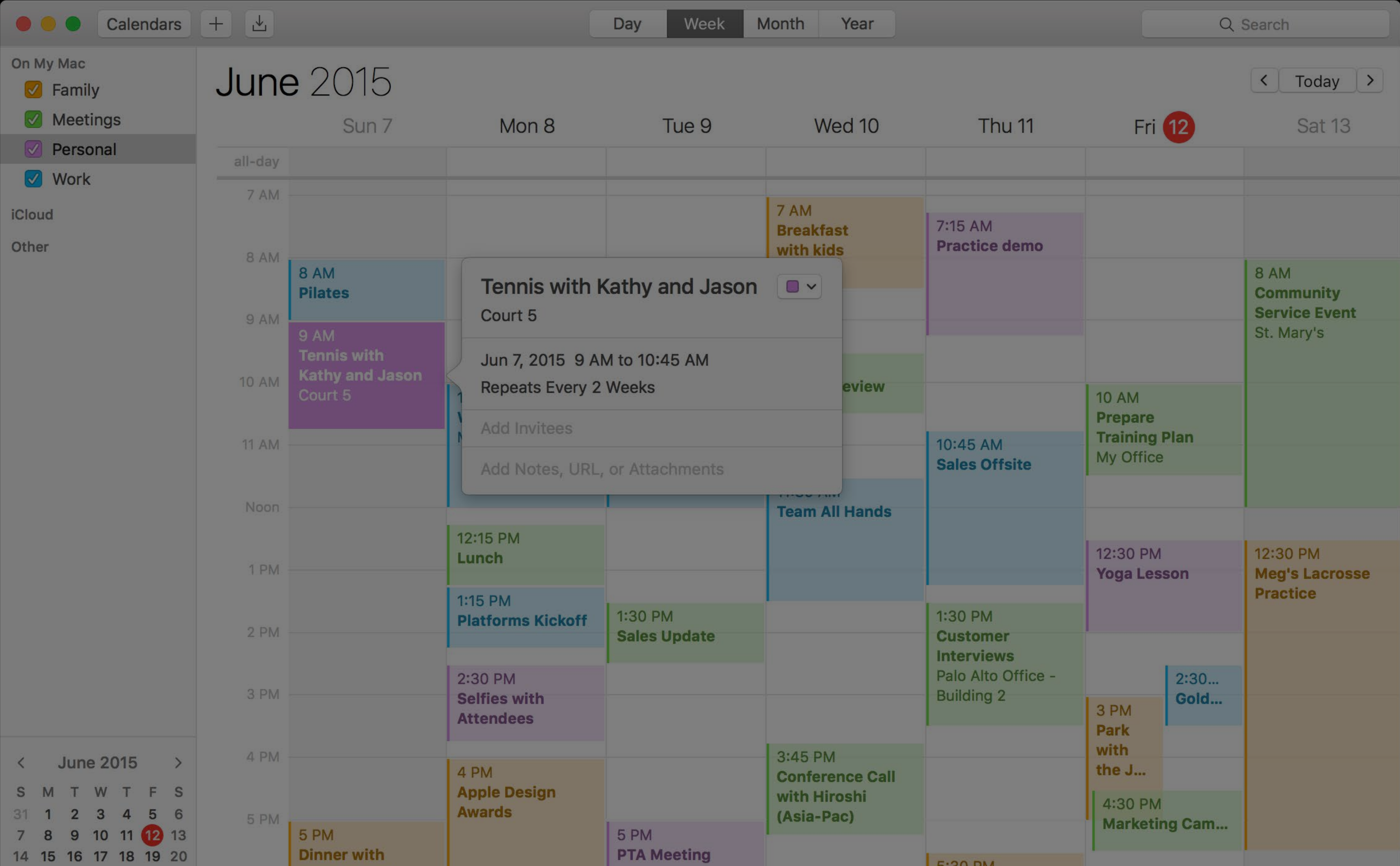
<http://www.apple.com/pr/library/2015/06/08Apple-Previews-iOS-9.html>

# Proportionals for Static Labels



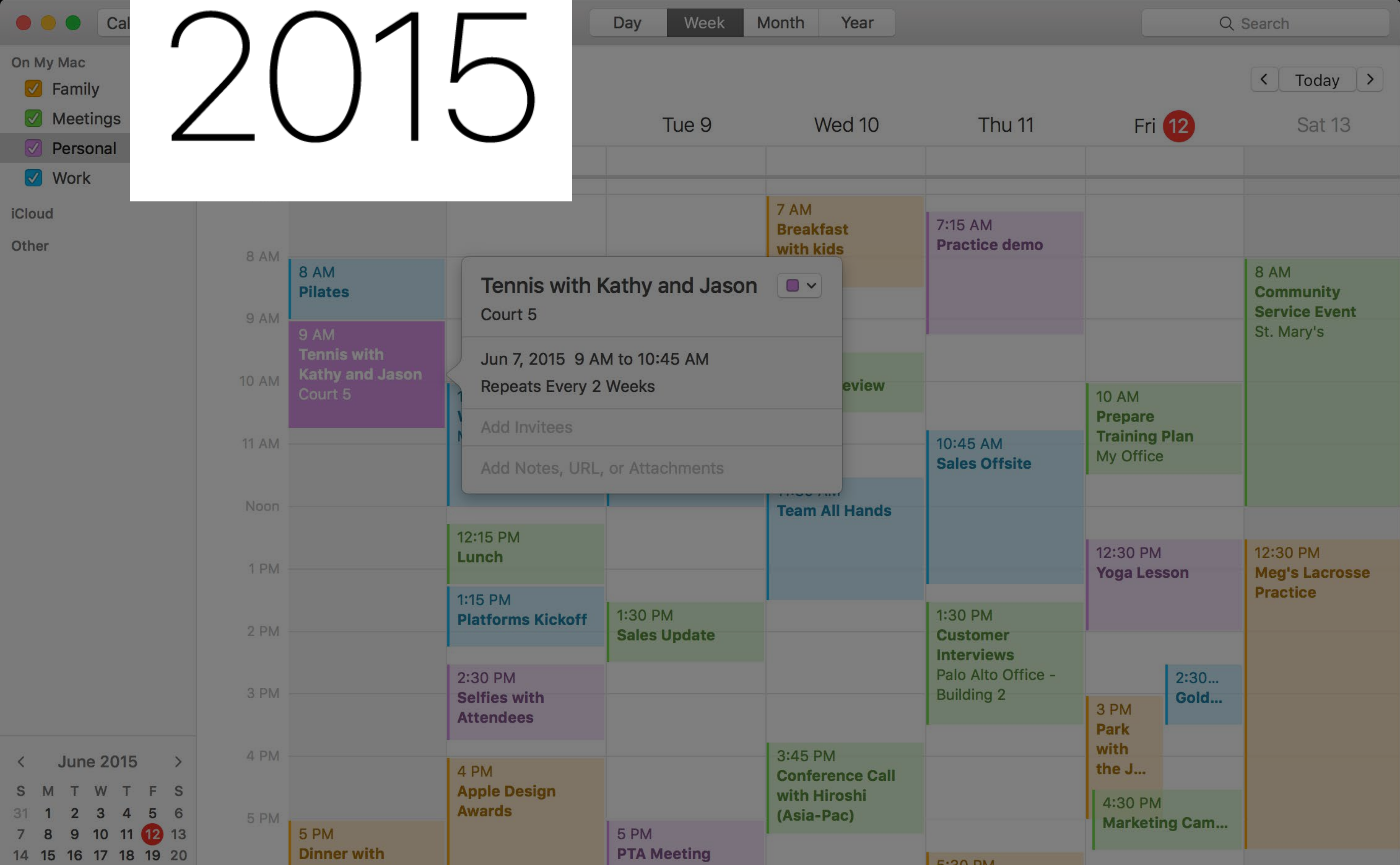


# Proportionals for Static Labels



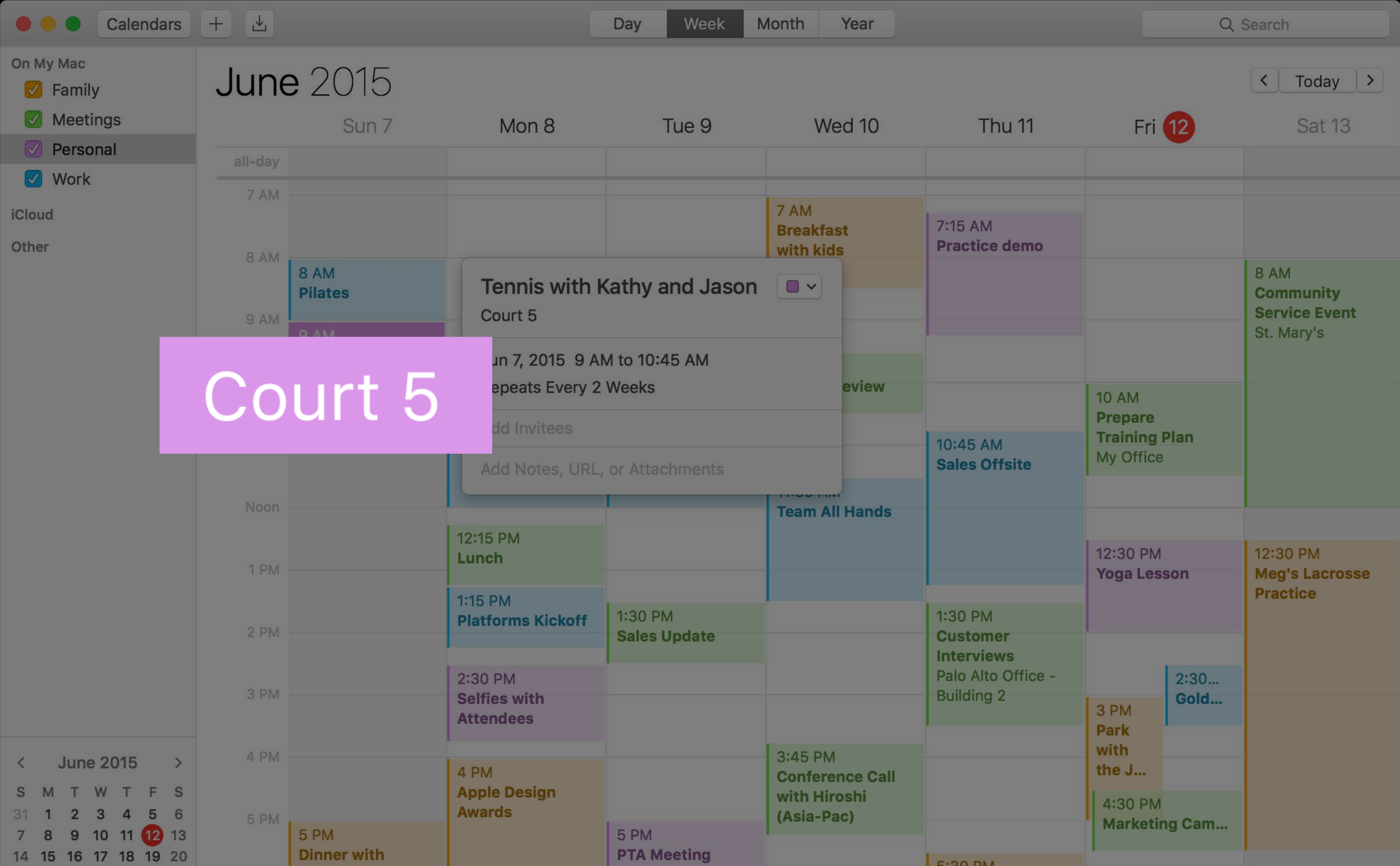
# Proportionals for Static Labels

2015

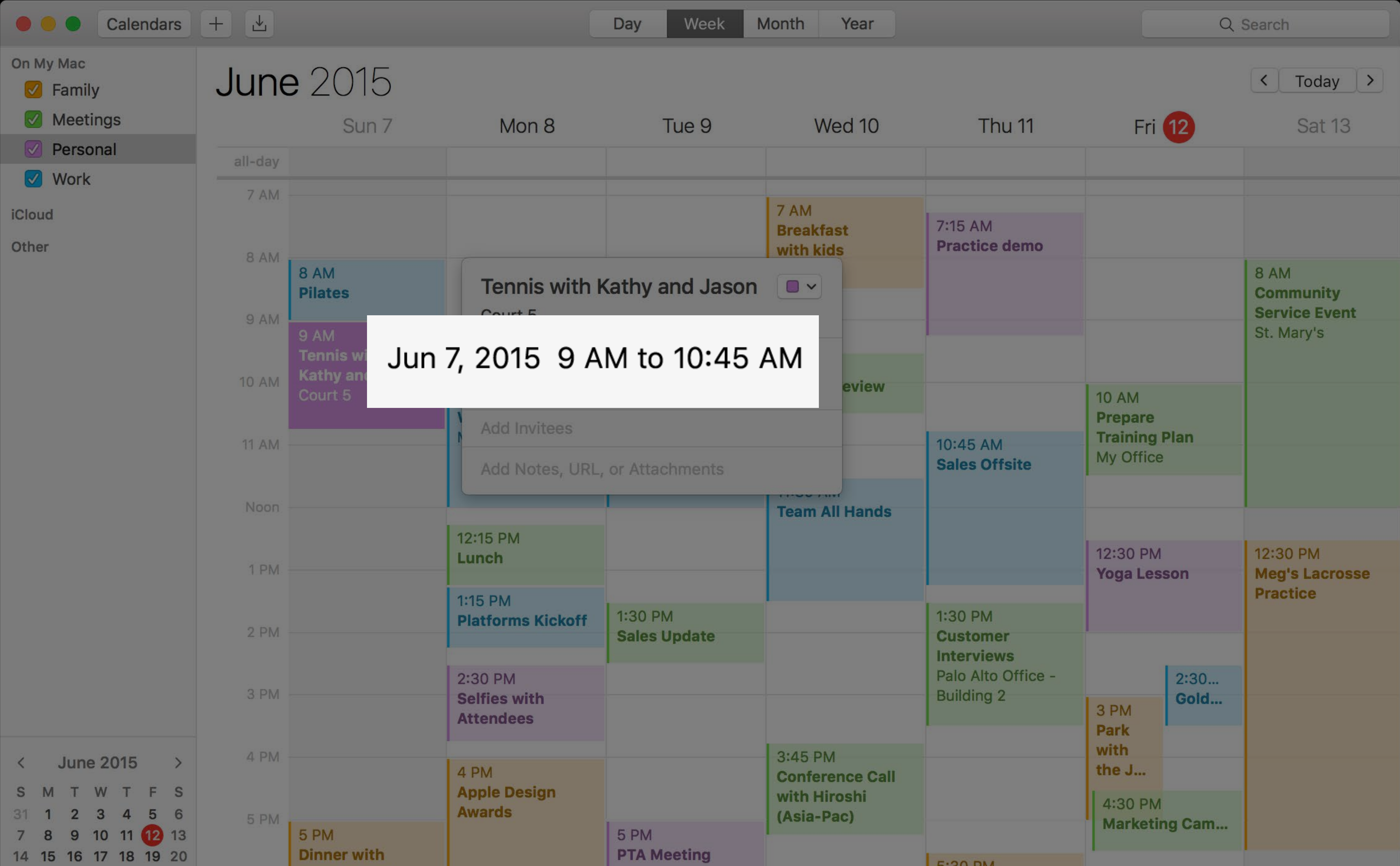




# Proportionals for Static Labels

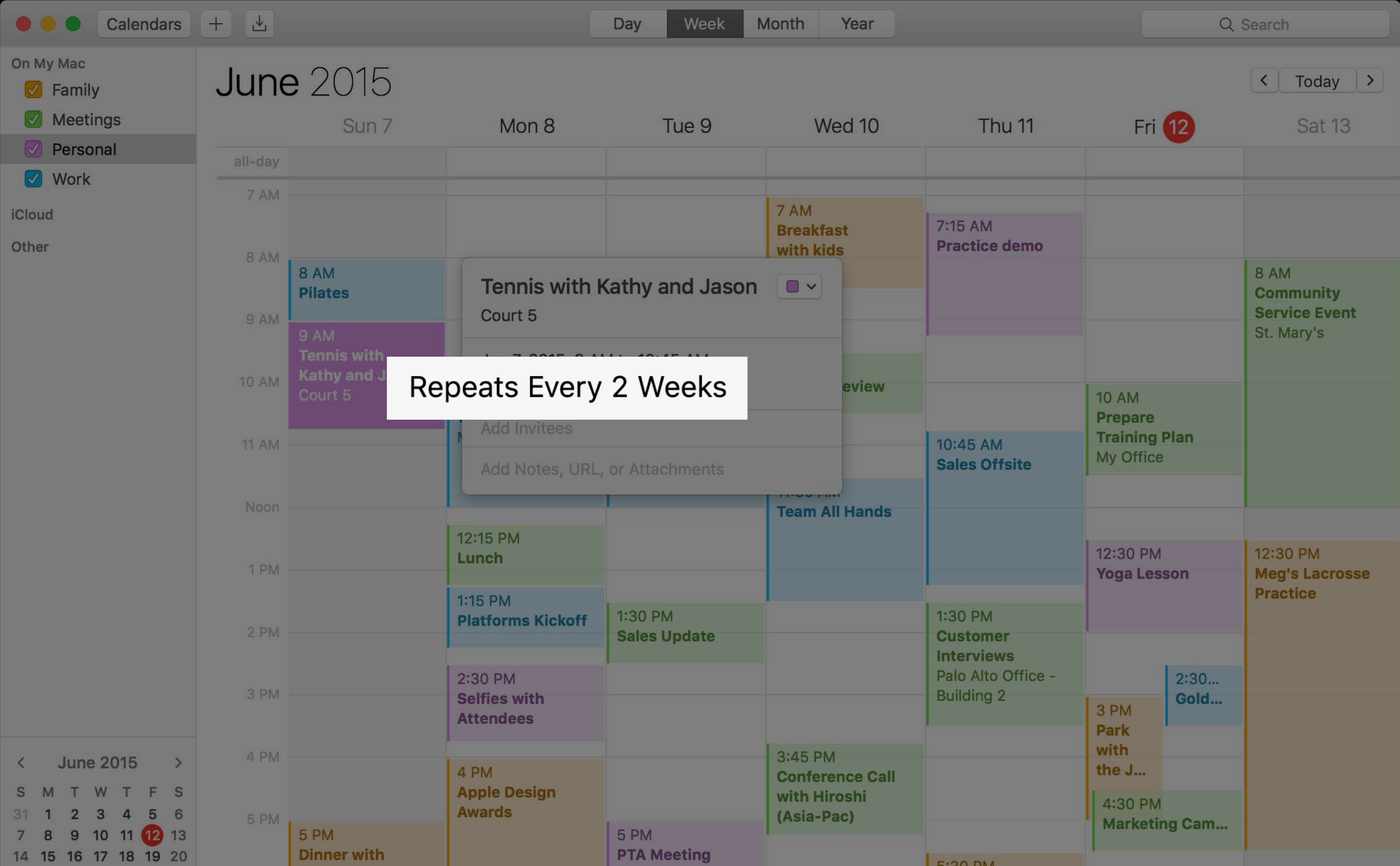


# Proportionals for Static Labels

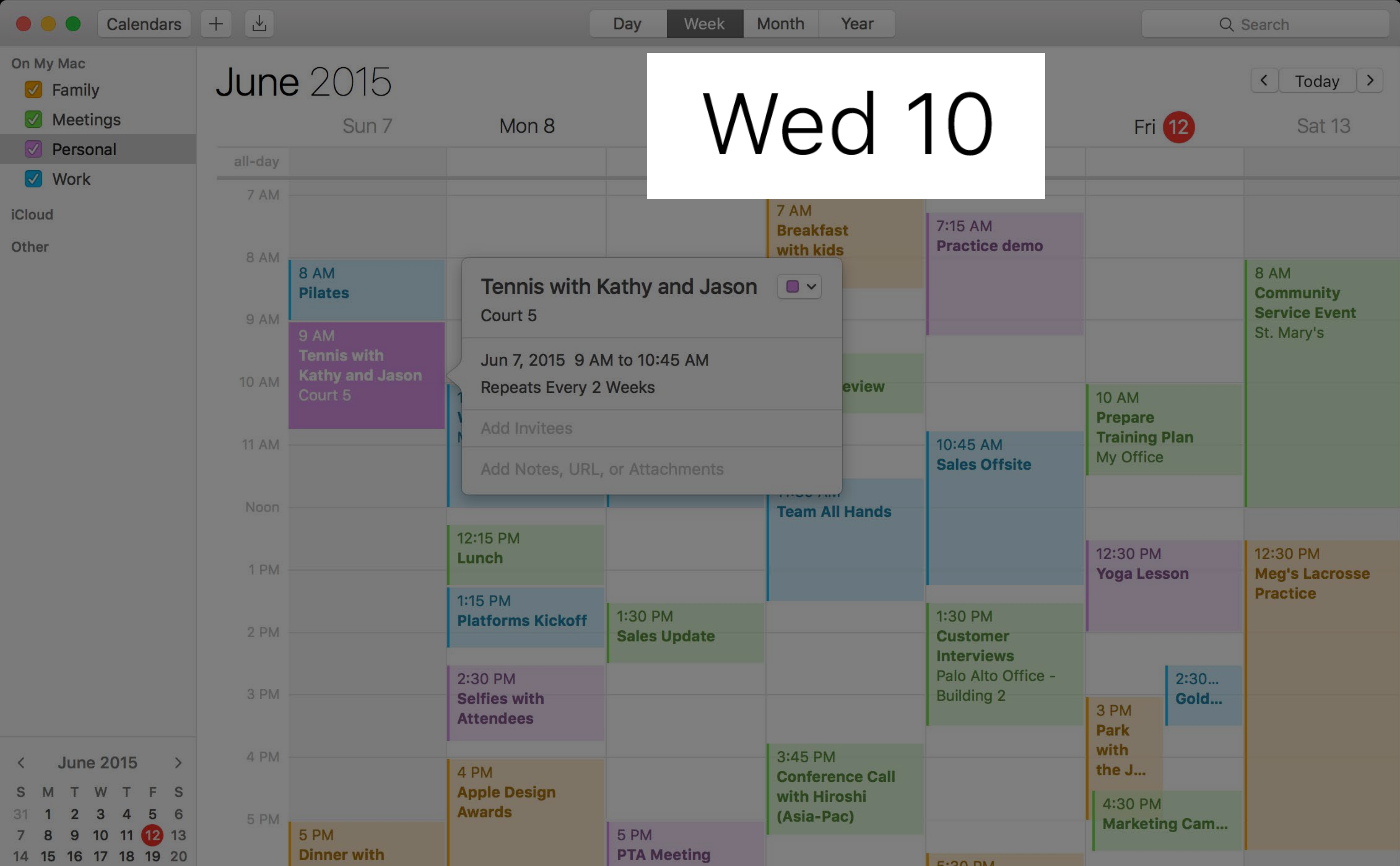




# Proportionals for Static Labels



# Proportionals for Static Labels





# Proportionals for Static Labels

Calendars

On My Mac

Family

Meetings

Personal

Work

iCloud

Other

Day

Week

Month

Year

Search

Today

June 2015

Sun 7

Mon 8

Tue 9

Wed 10

Thu 11

Sat 13

all-day

7 AM

8 AM

9 AM

10 AM

11 AM

Noon

1 PM

2 PM

3 PM

4 PM

5 PM

8 AM Pilates

9 AM Tennis with Kathy and Jason Court 5

7 AM Breakfast with kids

7:15 AM Practice demo

8 AM Community Service Event St. Mary's

10 AM Prepare Training Plan My Office

10:45 AM Sales Offsite

12:30 PM Yoga Lesson

12:30 PM Meg's Lacrosse Practice

1:30 PM Customer Interviews Palo Alto Office - Building 2

3 PM Park with the J...

4:30 PM Marketing Cam...

5 PM PTA Meeting

5:30 PM

Team All Hands

review

Selfies with Attendees

Apple Design Awards

Dinner with

Lunch

Platforms Kickoff

Sales Update

Conference Call with Hiroshi (Asia-Pac)

Tennis with Kathy and Jason

Court 5

Jun 7, 2015 9 AM to 10:45 AM

Repeats Every 2 Weeks

Add Invitees

Add Notes, URL, or Attachments

12

< June 2015 >

S M T W T F S

31 1 2 3 4 5 6

7 8 9 10 11 12 13

14 15 16 17 18 19 20

Proportional numbers  
by default, opt into  
monospaced



# Numbers Summary

NEW

# Numbers Summary

NEW

Numbers are now proportional by default

# Numbers Summary

NEW

Numbers are now proportional by default

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

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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

NEW

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



```
let myFont = UIFont.systemFontSize(mySize)
```

...later in the code...

```
let myOtherFont = UIFont.fontWithName(myFont.familyName size:mySize)
```



# Don't Draw System Font at a Different-Than-Nominal Point Size



15pt

hamburgetonstiv

# Don't Draw System Font at a Different-Than-Nominal Point Size



15pt

hamburgetonstiv

15pt scaled up

hamburgetonst

# Don't Draw System Font at a Different-Than-Nominal Point Size



15pt

hamburgetonstiv

15pt scaled up

hamburgetonstiv

120pt

hamburgetonstiv

# 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](https://developer.apple.com/fonts)

## Designing Great Apps

[developer.apple.com/design](https://developer.apple.com/design)

## Technical Support

Apple Developer Forums  
[developer.apple.com/forums](https://developer.apple.com/forums)

## Developer Technical Support

[developer.apple.com/support/technical](https://developer.apple.com/support/technical)

## General Inquiries

Curt Rothert, App Frameworks Evangelist  
[rothert@apple.com](mailto:rothert@apple.com)

Mike Stern, User Experience Evangelist  
[stern@apple.com](mailto:stern@apple.com)

# Related Session and Lab

Apple Watch Design Tips and Tricks	Presidio	Friday 3:30PM
Text and Fonts Lab	Frameworks Lab D	Friday 3:30PM

