

#WWDC18

What's New in tvOS 12

Session 208

Hans Kim, tvOS Engineering

Agenda

Agenda

Password AutoFill

Agenda

Password AutoFill

Focus Engine enhancement

Agenda

Password AutoFill

Focus Engine enhancement

UI patterns

Password AutoFill

Alex Sanciangco, tvOS Engineering
Conrad Shultz, tvOS Engineering

shiny.

Log In

Demo



Ensure QuickType bar appears

Ensure QuickType bar appears

Get your app's credentials on the QuickType bar

Ensure QuickType bar appears

Get your app's credentials on the QuickType bar

Enable one-tap sign in

Ensure QuickType Bar Appears

Adopt `UITextContentType`

Ensure QuickType Bar Appears

Adopt `UITextContentType`

tvOS will try to automatically detect username and password fields

Ensure QuickType Bar Appears

Adopt `UITextContentType`

tvOS will try to automatically detect username and password fields

Explicitly mark the text field types

Ensure QuickType Bar Appears

Adopt UITextContentType

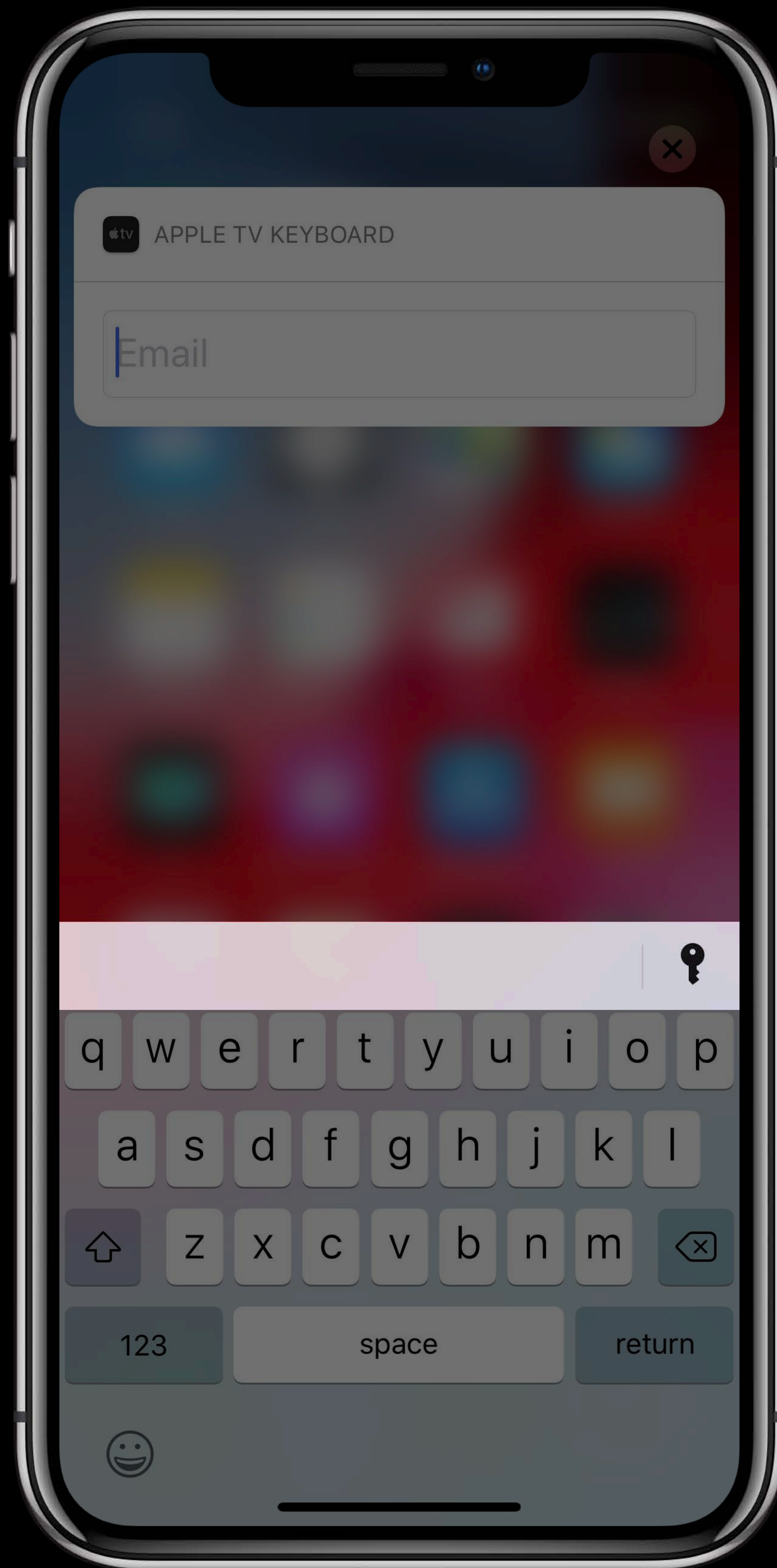
tvOS will try to automatically detect username and password fields

Explicitly mark the text field types

```
let usernameField = UITextField()
let passwordField = UITextField()

usernameField.textContentType = .username
passwordField.textContentType = .password
```



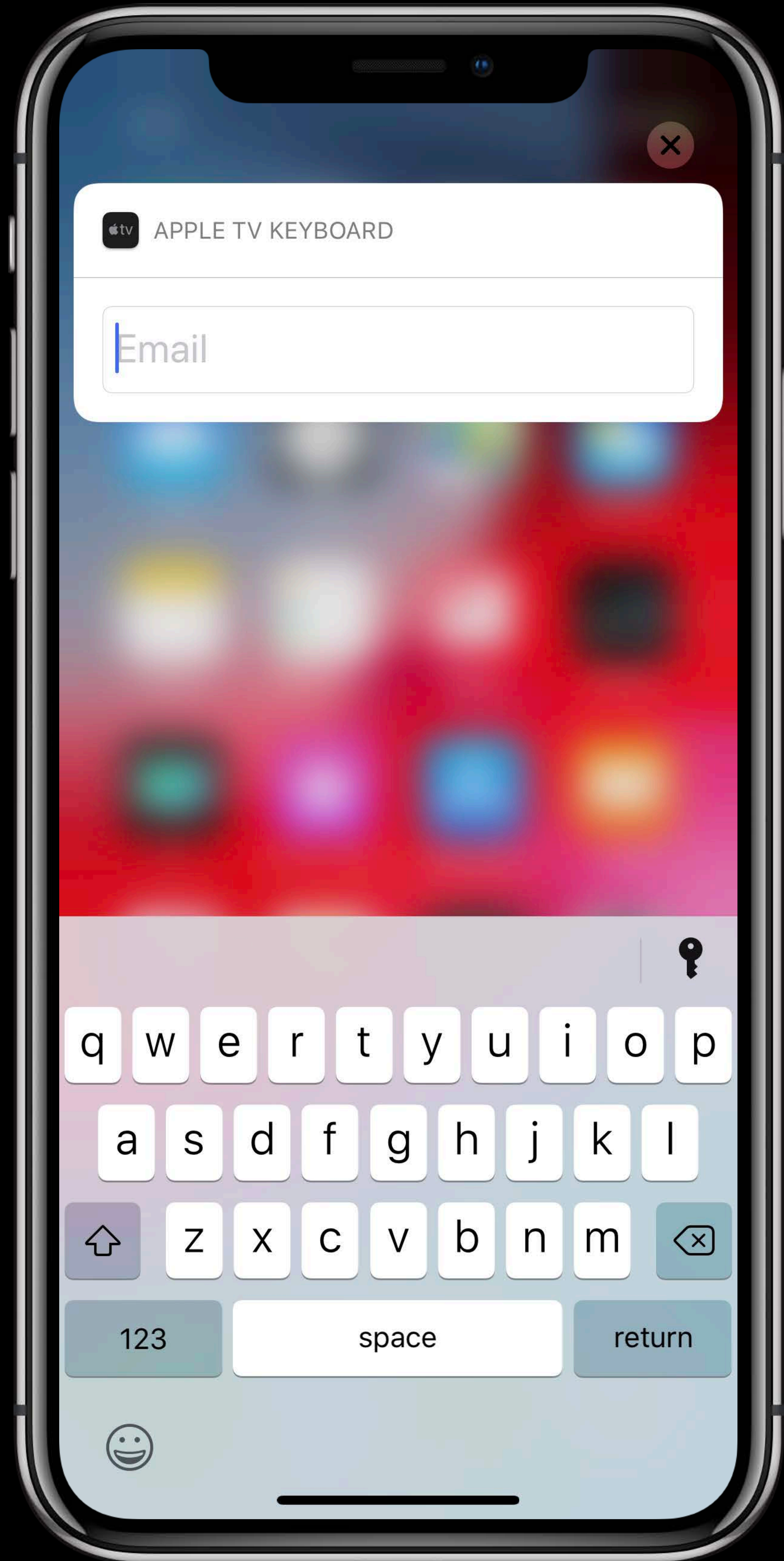



APPLE TV KEYBOARD

Email

q w e r t y u i o p
a s d f g h j k l
↑ z x c v b n m ↵
123 space return







QuickType Bar Suggestions

Associated Domains

QuickType Bar Suggestions

Associated Domains

Powers many other features

QuickType Bar Suggestions

Associated Domains

Powers many other features

Strong relationship between app and website

QuickType Bar Suggestions

Associated Domains

Powers many other features

Strong relationship between app and website

shiny.

John_Appleseed



Log In

today's shiny



Enable One-Tap Sign In
Implement `preferredFocusEnvironments`

Enable One-Tap Sign In

Implement `preferredFocusEnvironments`

AutoFill will perform a focused button's action after filling

Enable One-Tap Sign In

Implement `preferredFocusEnvironments`

AutoFill will perform a focused button's action after filling

Implement `preferredFocusEnvironments` to provide your login button for focus

```
// Sample Implementation
```

```
override var preferredFocusEnvironments: [UIFocusEnvironment] {  
    if let username = usernameTextField.text, let password = passwordTextField.text {  
        return [loginButton]  
    }  
    else {  
        return [usernameTextField]  
    }  
}
```

```
// Sample Implementation
```

```
override var preferredFocusEnvironments: [UIFocusEnvironment] {  
    if let username = usernameTextField.text, let password = passwordTextField.text {  
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override var preferredFocusEnvironments: [UIFocusEnvironment] {
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```
    if let username = usernameTextField.text, let password = passwordTextField.text {
```

```
        return [loginButton]
```

```
    }
```

```
    else {
```

```
        return [usernameTextField]
```

```
    }
```

```
}
```



```
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Summary

Summary

Reduce the friction of signing into your app with Password AutoFill

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Reduce the friction of signing into your app with Password AutoFill

Tag your text fields with appropriate `UITextContentType`

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Tag your text fields with appropriate `UITextContentType`

Adopt Associated Domains

Summary

Reduce the friction of signing into your app with Password AutoFill

Tag your text fields with appropriate `UITextContentType`

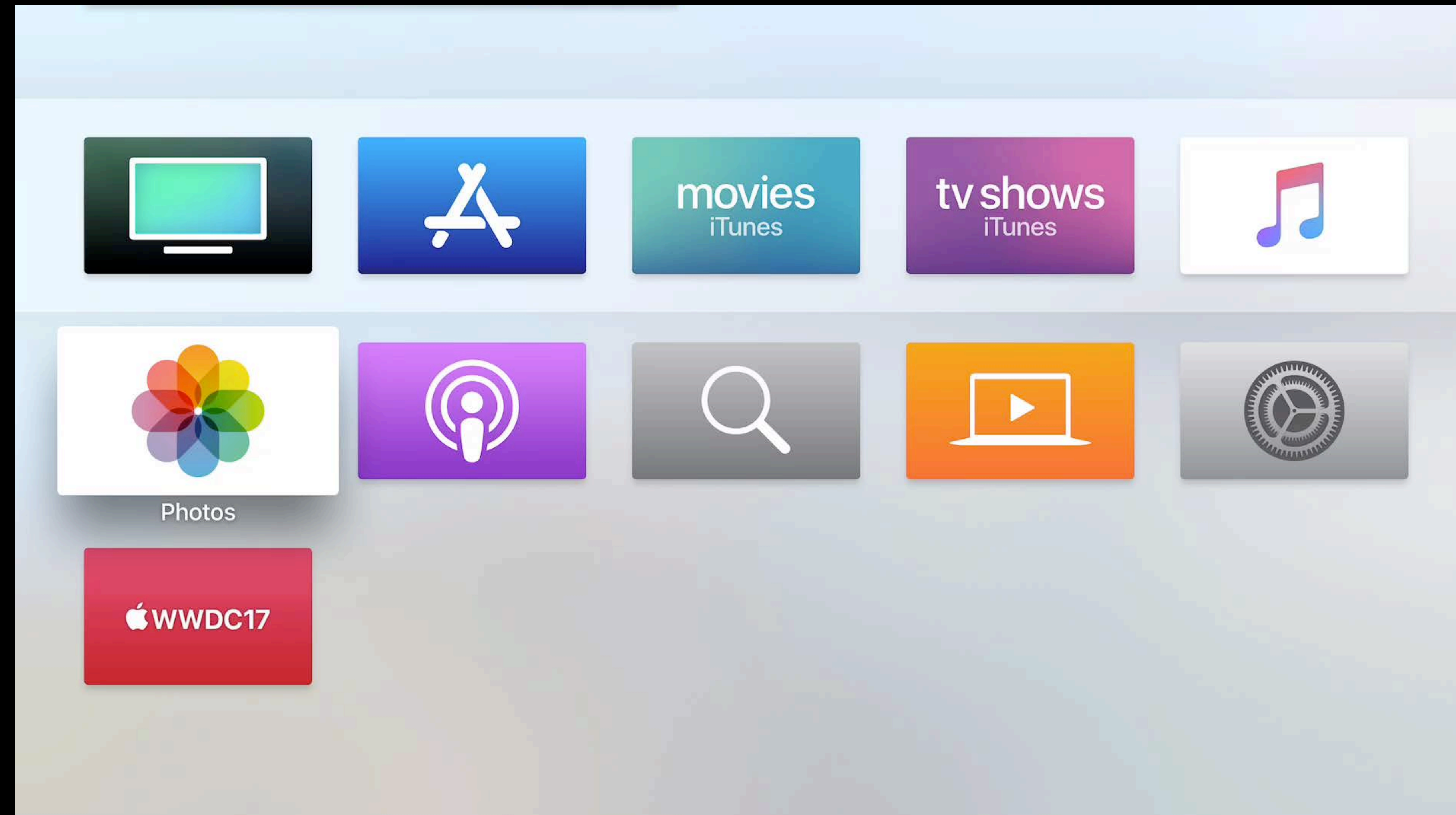
Adopt Associated Domains

Implement `preferredFocusEnvironments`

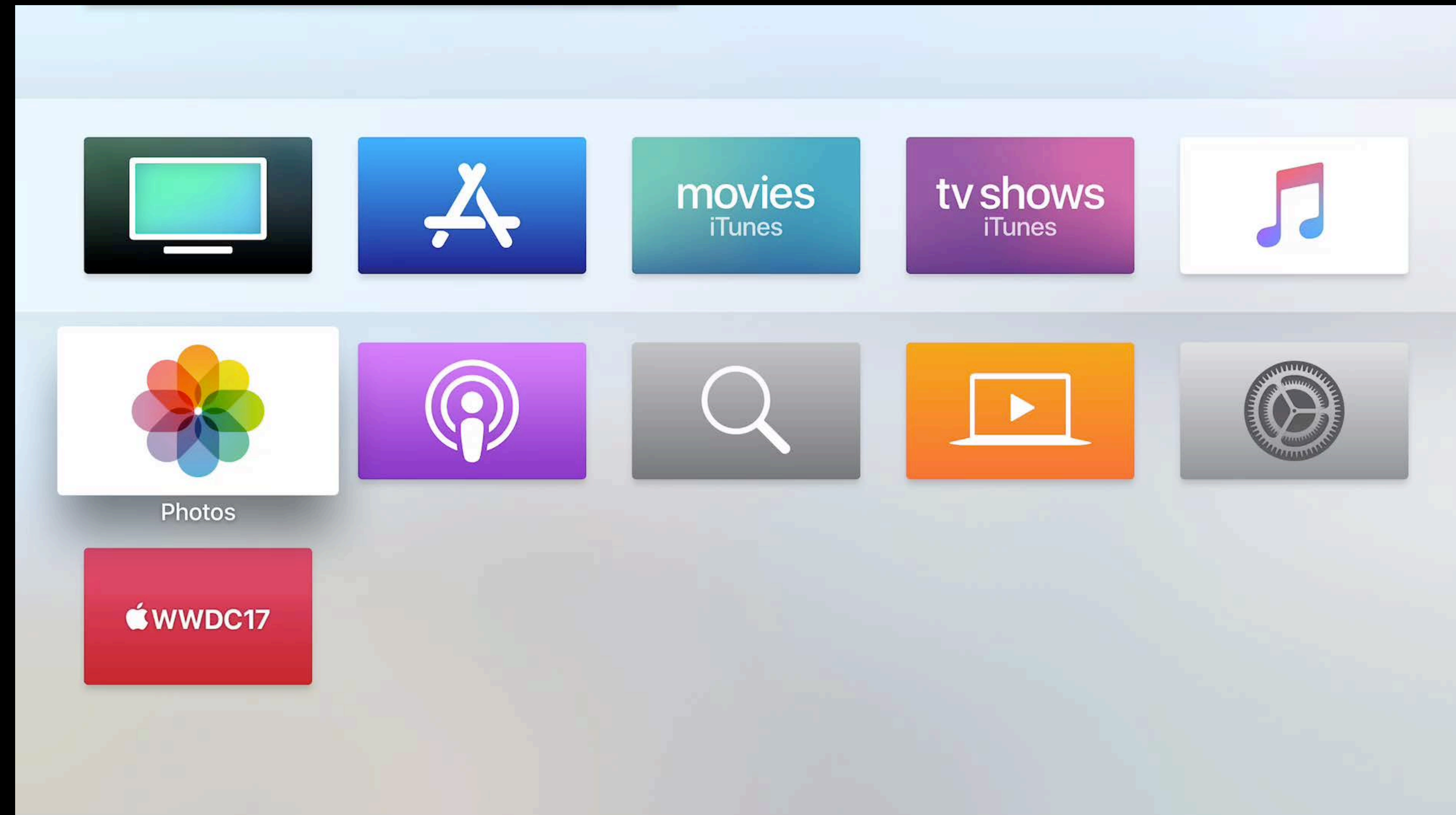
Focus Enhancements

Ada Turner, tvOS Engineering

Focus on tvOS



Focus on tvOS



Focus on tvOS



UIKit

Focus on tvOS



UIKit



SpriteKit

Focus on tvOS



UIKit



SpriteKit



SceneKit

NEW

Focus Engine now supports apps
regardless of how they are rendered.

What's Included

What's Included

State management

What's Included

State management

Focus item geometry

What's Included

State management

Focus item geometry

Accessibility

What's Included

State management

Focus item geometry

Accessibility

tvOS's native feel

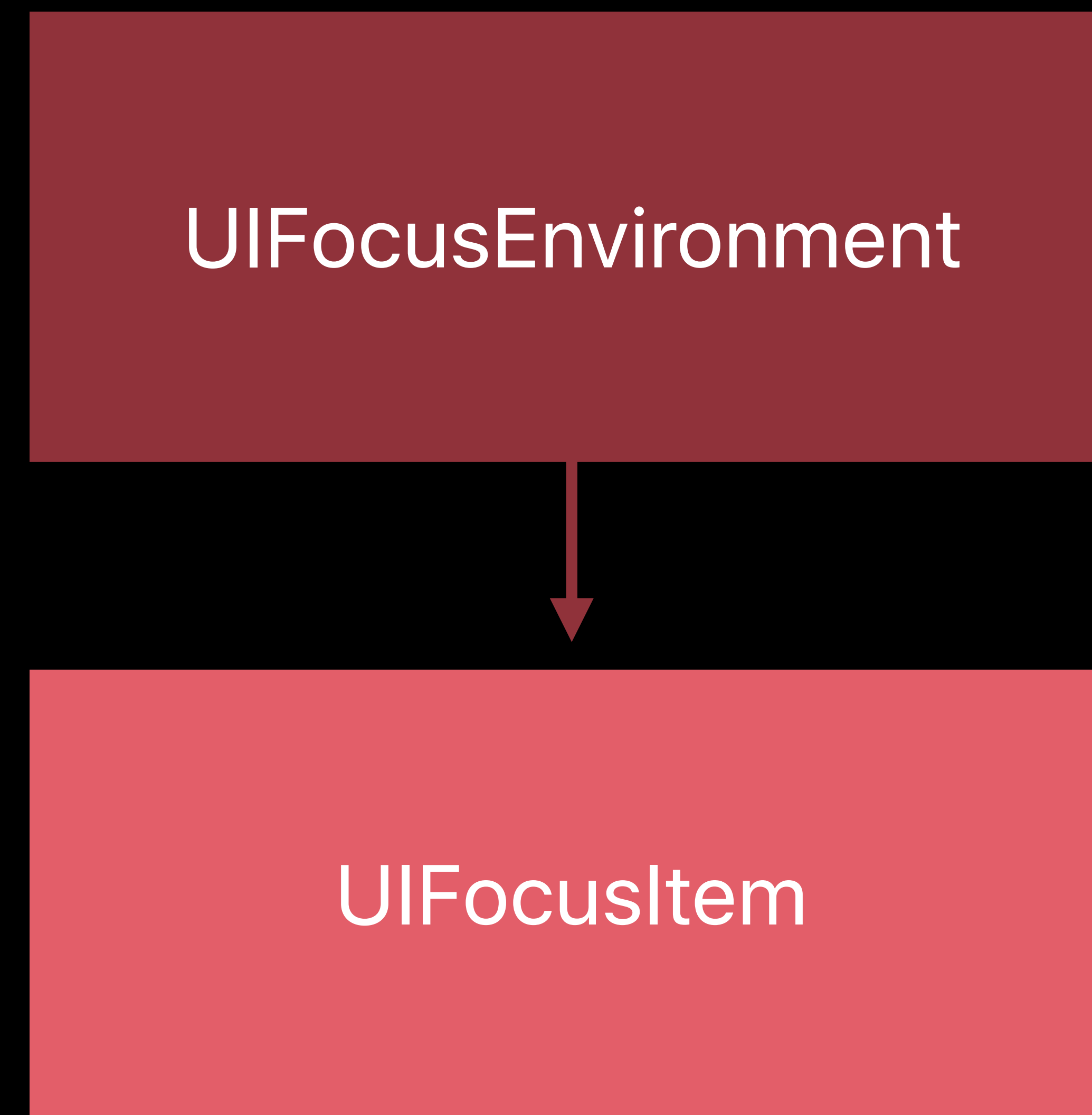
- Momentum during swipes
- Scrolling inertia
- Focus movement hinting

Focus Components

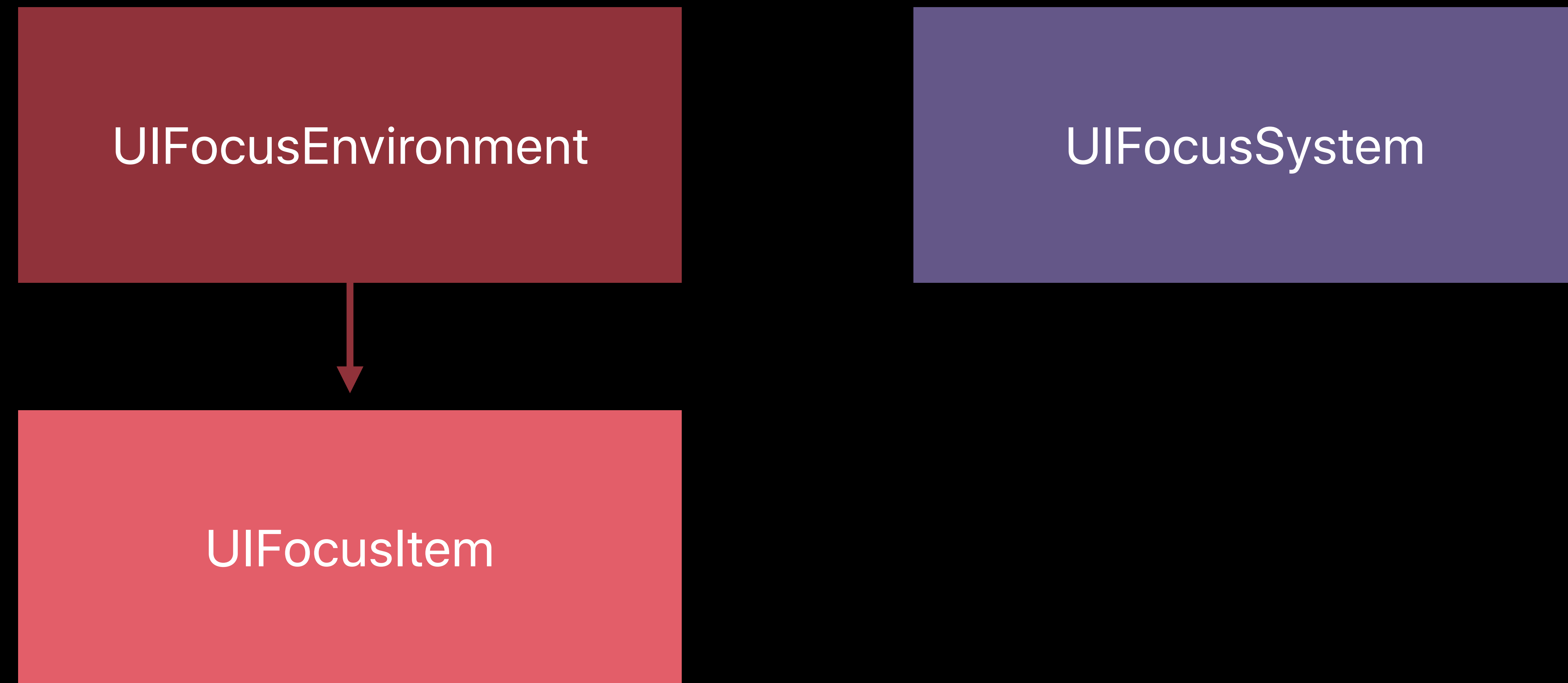
Focus Components

UIFocusEnvironment

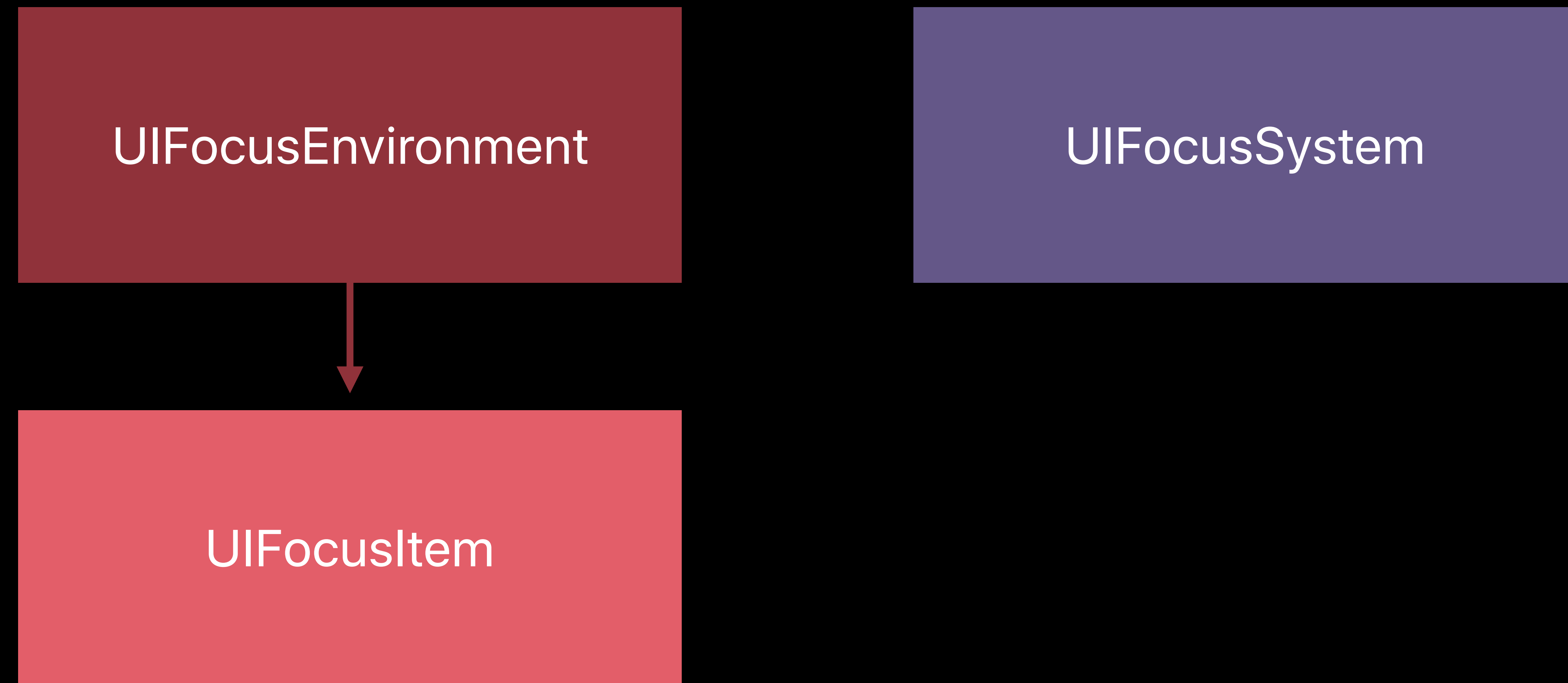
Focus Components



Focus Components

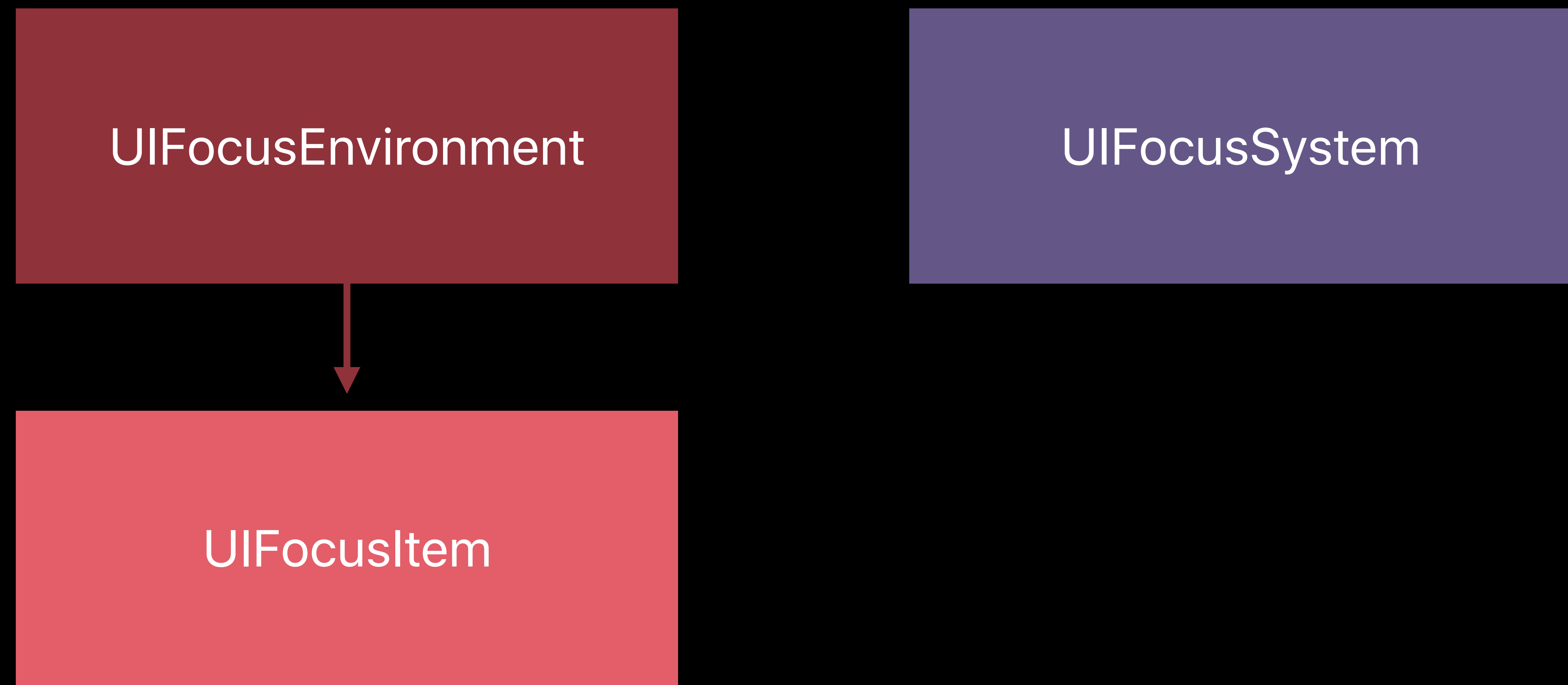


Focus Components



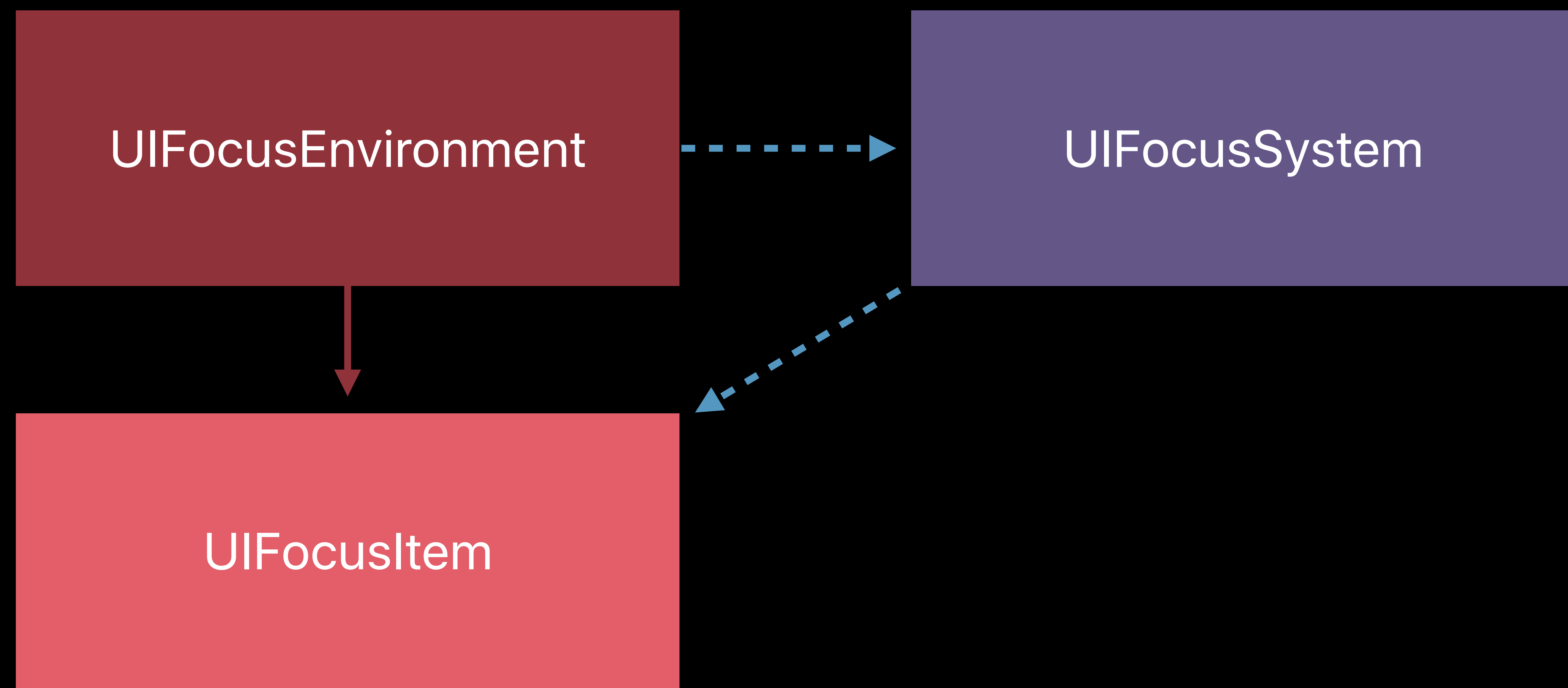
New Focus Features

New Focus Features



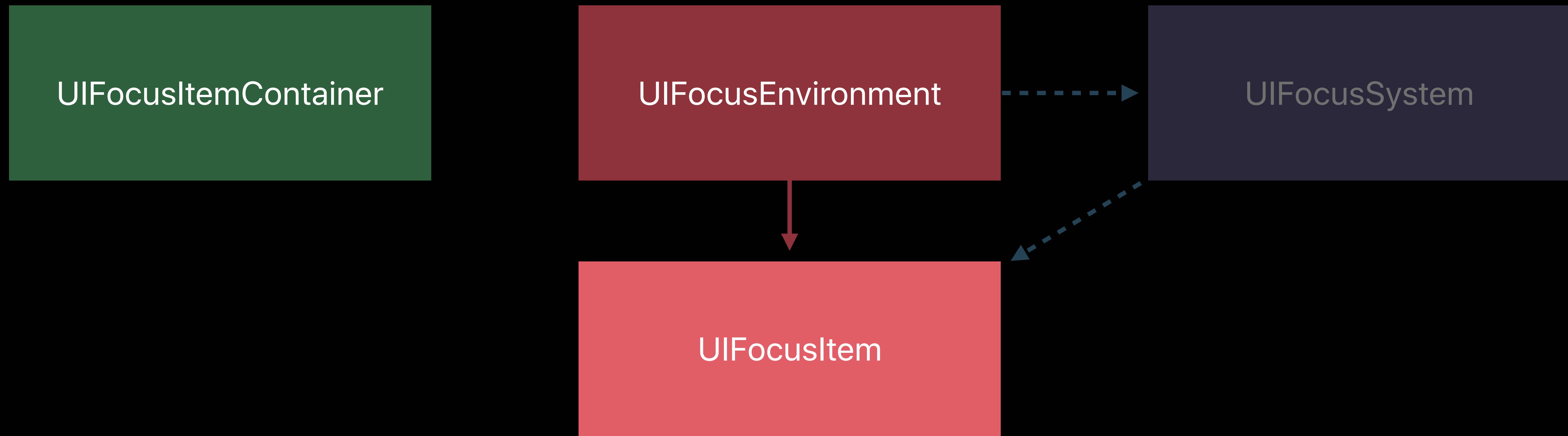
New Focus Features

NEW



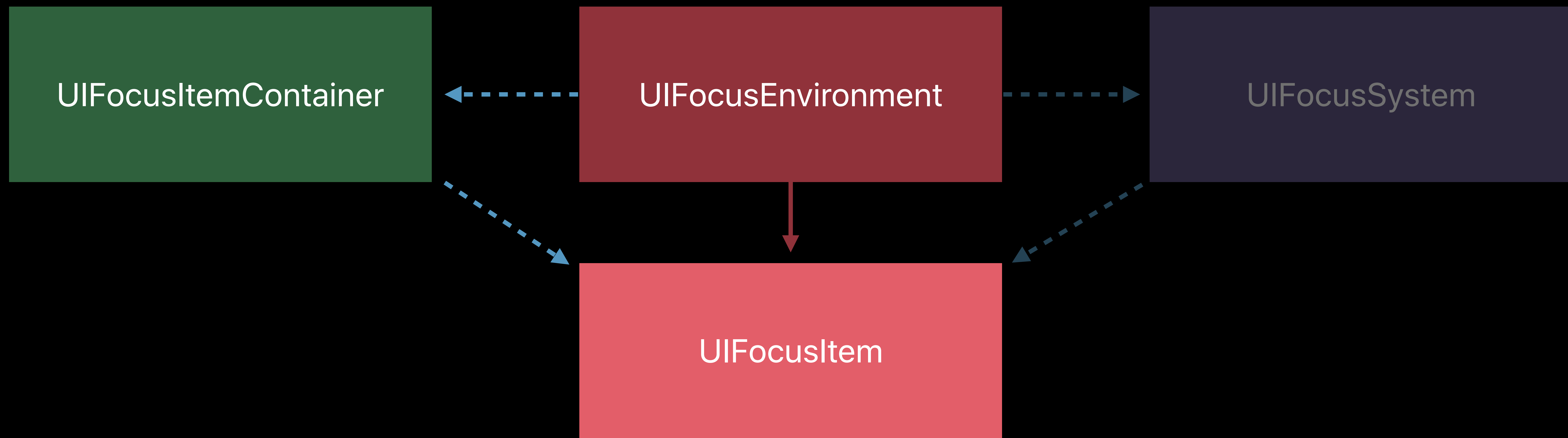
New Focus Features

NEW



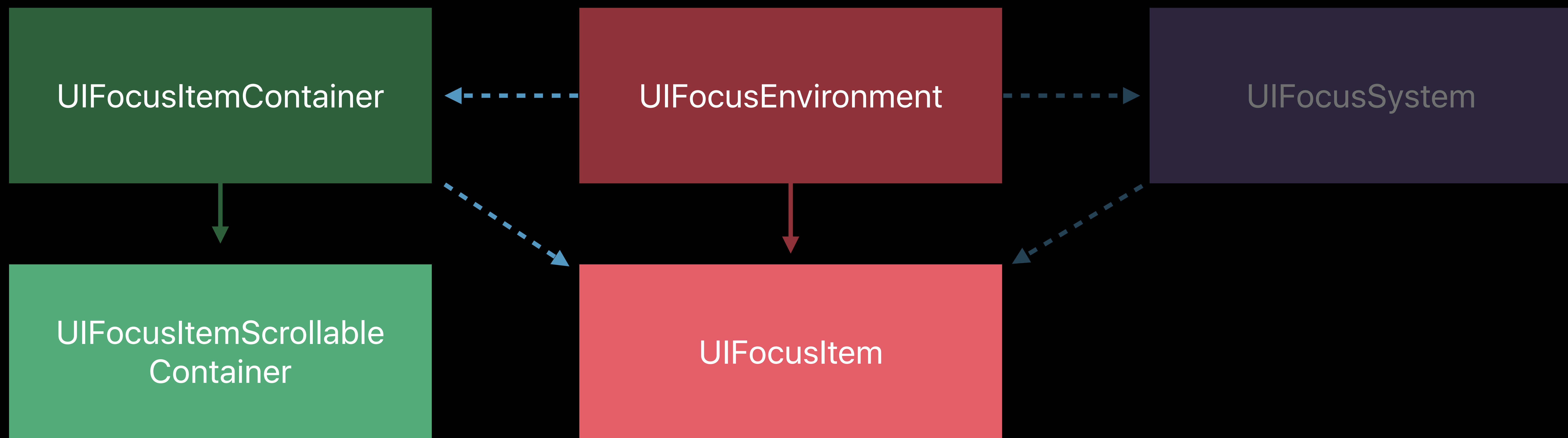
New Focus Features

NEW

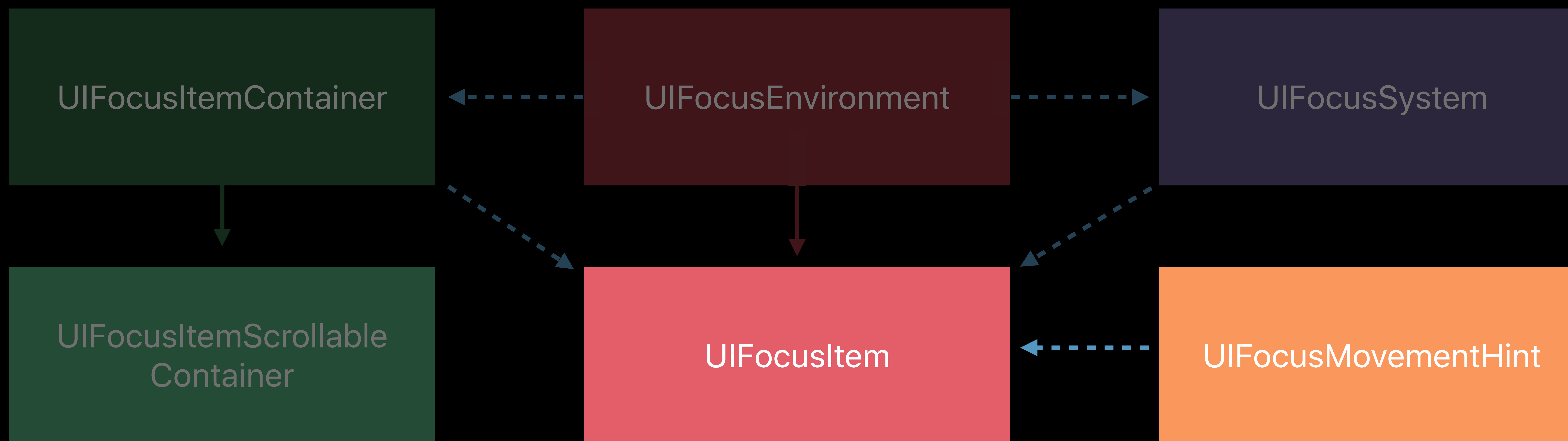


New Focus Features

NEW



New Focus Features

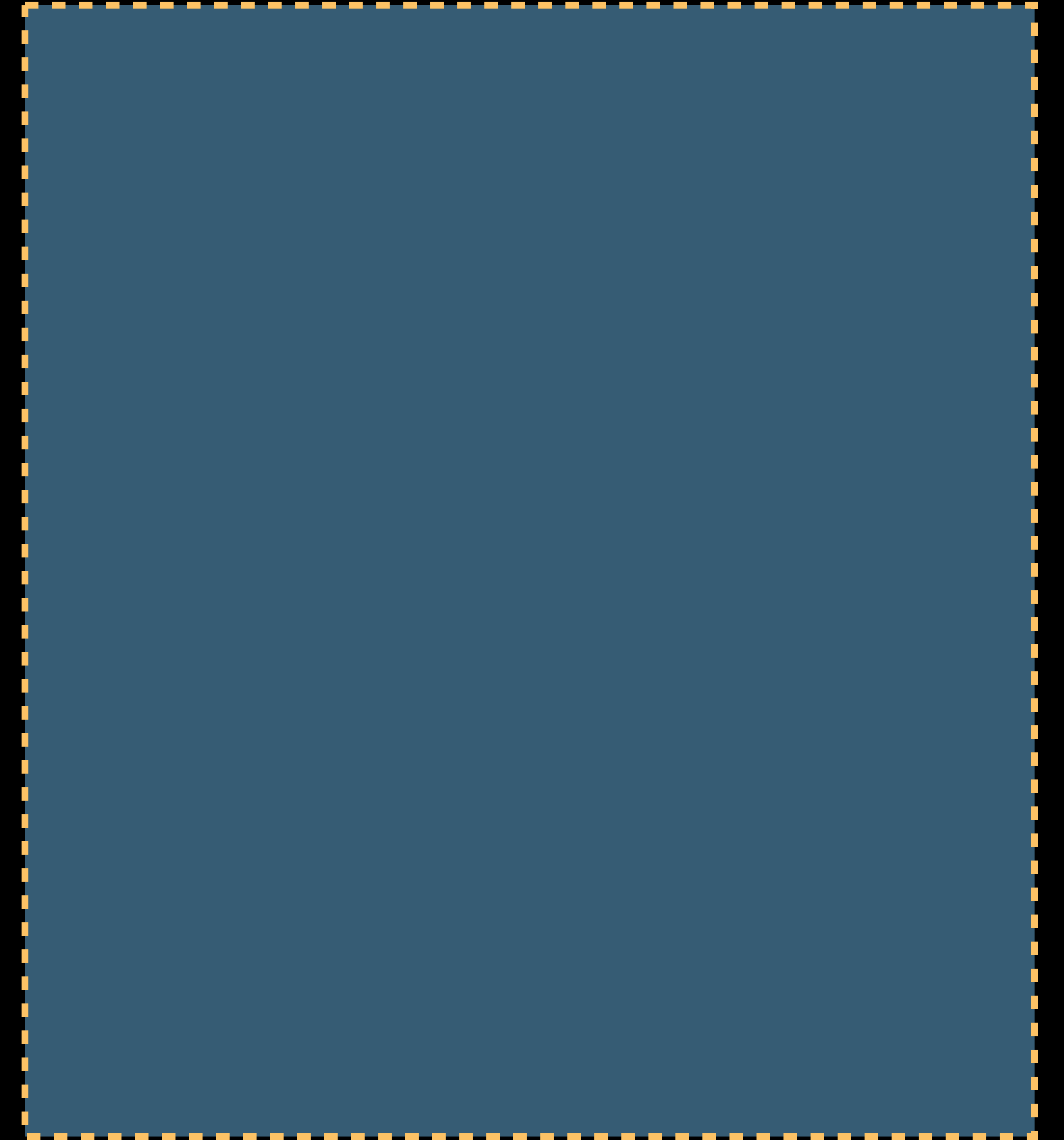


Adopting New Focus API

UIFocusEnvironment

NEW

UIFocusEnvironment



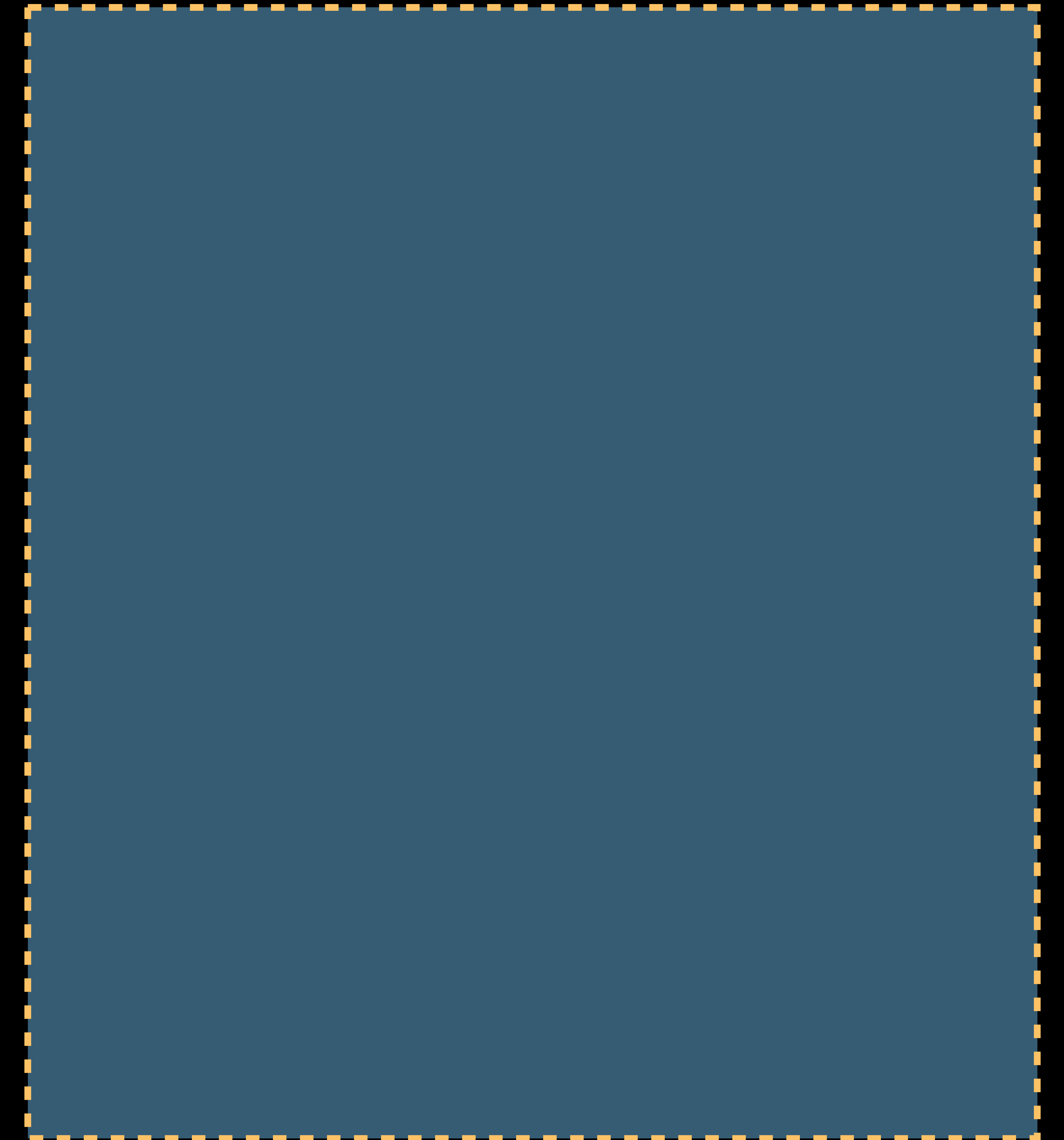
UIFocusEnvironment

NEW

Hooking into the focus engine

- `weak var` parentFocusEnvironment: UIFocusEnvironment?
- `var` focusItemContainer: UIFocusItemContainer?

UIFocusEnvironment



UIFocusEnvironment

NEW

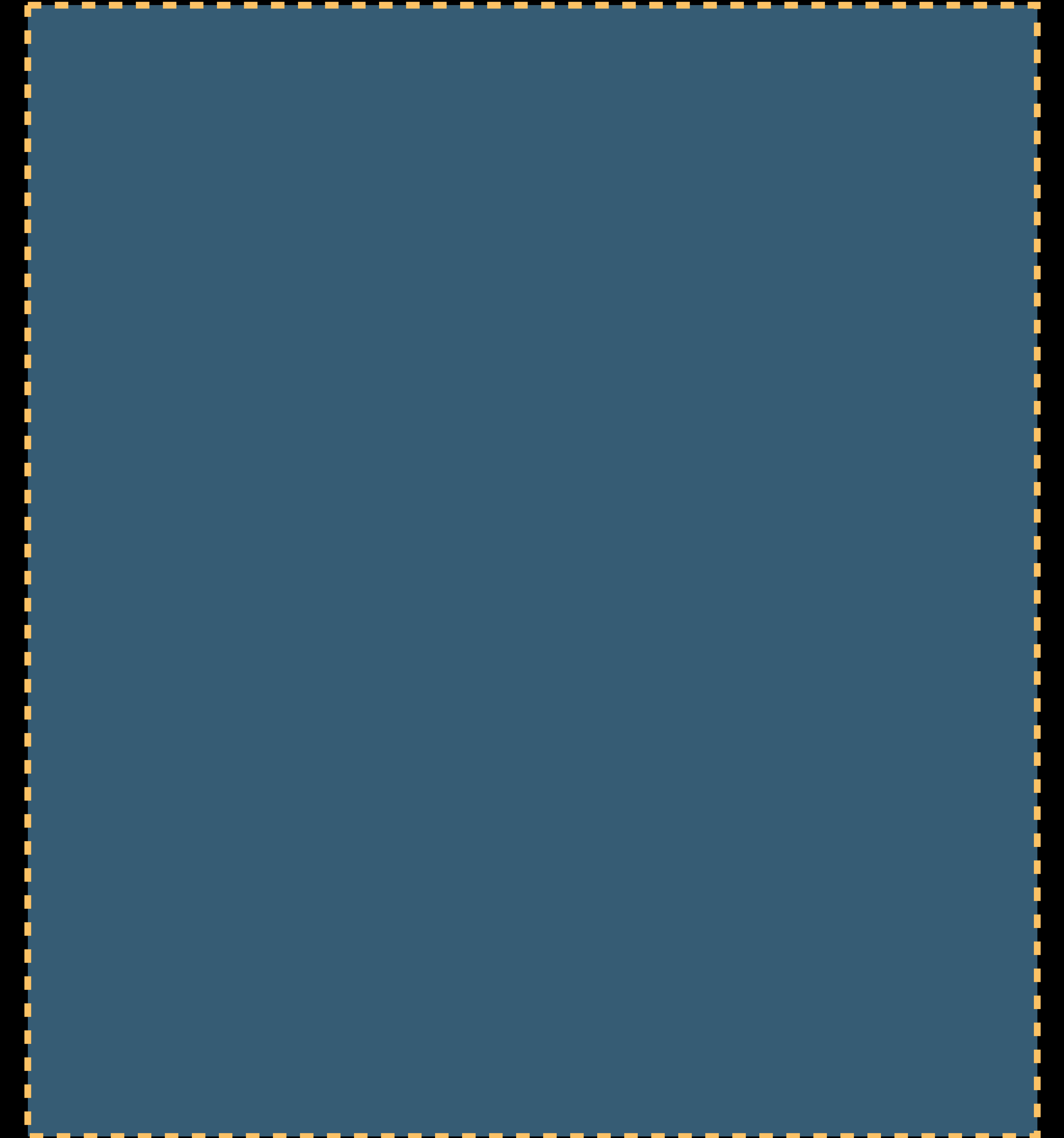
Hooking into the focus engine

- `weak var` parentFocusEnvironment: UIFocusEnvironment?
- `var` focusItemContainer: UIFocusItemContainer?

Controlling and reacting to focus updates

- `var` preferredFocusEnvironments: [UIFocusEnvironment]
- `func` shouldUpdateFocus(in context: UIFocusUpdateContext) -> Bool
- `func` didUpdateFocus(in context: UIFocusUpdateContext, with coordinator: UIFocusAnimationCoordinator)

UIFocusEnvironment

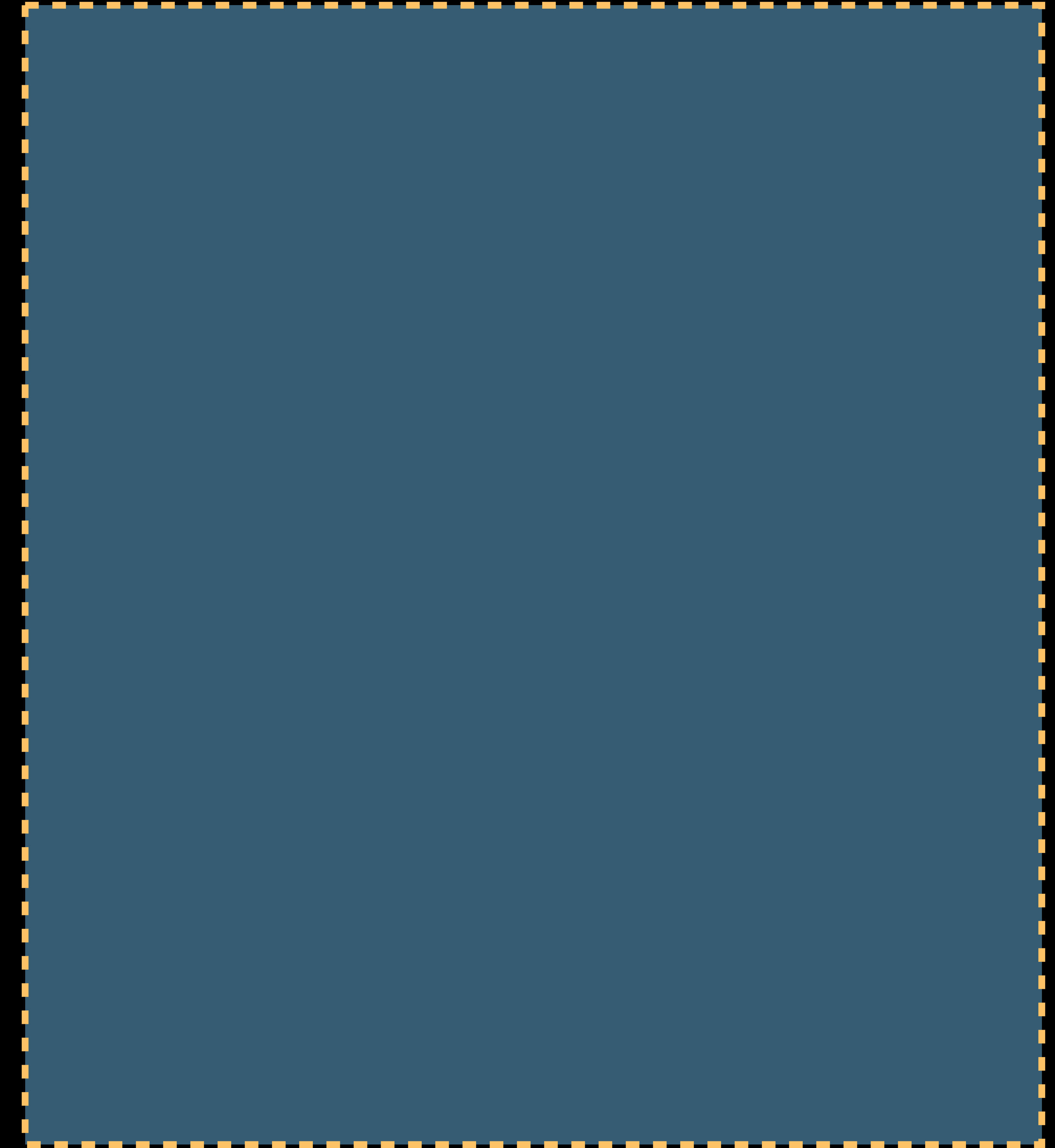


UIFocusEnvironment



Focus updating functions

UIFocusEnvironment



UIFocusEnvironment

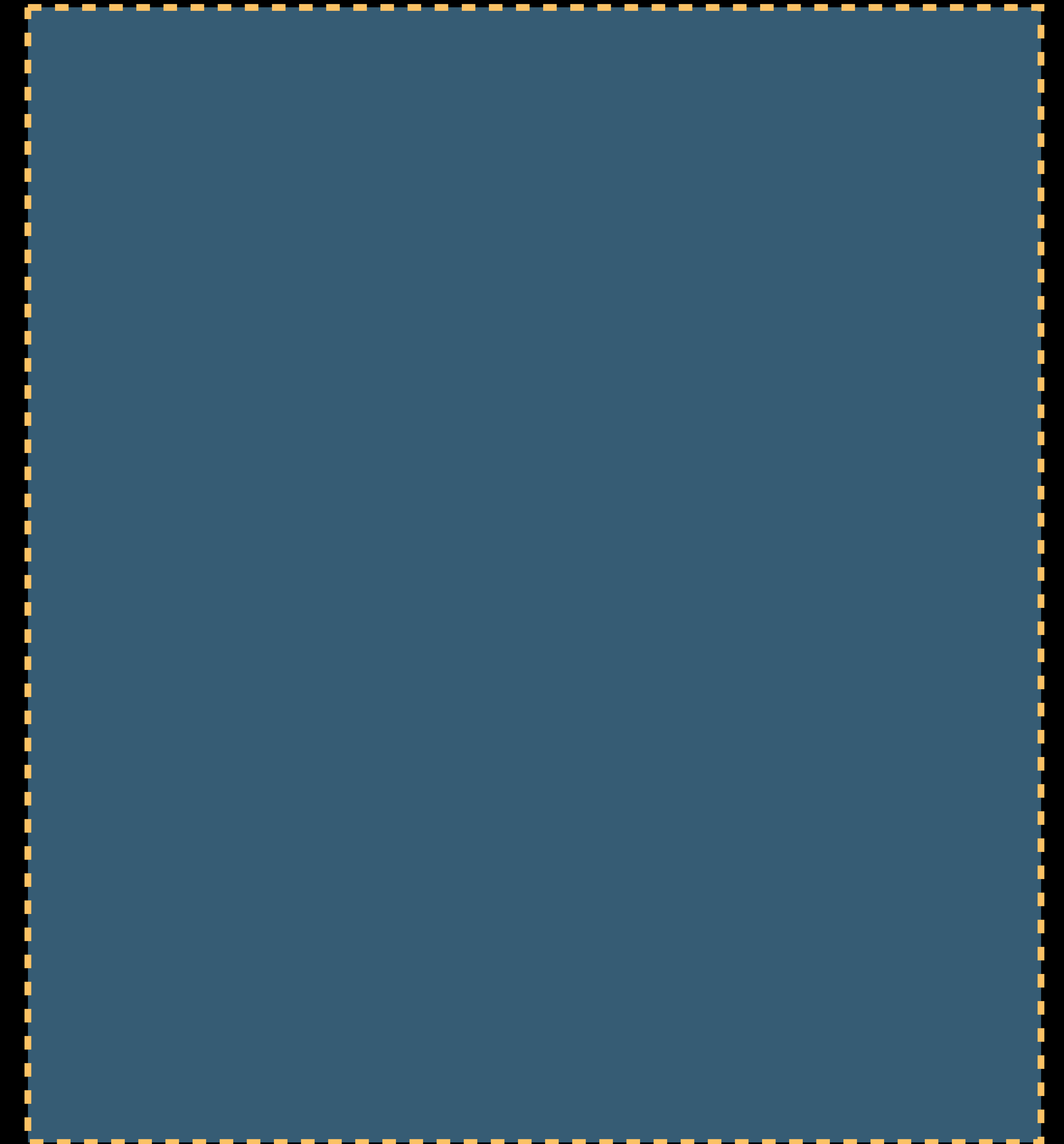
NEW

Focus updating functions

```
func setNeedsFocusUpdate() {
    UIFocusSystem(for: self)?.requestFocusUpdate(to: self)
}

func updateFocusIfNeeded() {
    UIFocusSystem(for: self)?.updateFocusIfNeeded()
}
```

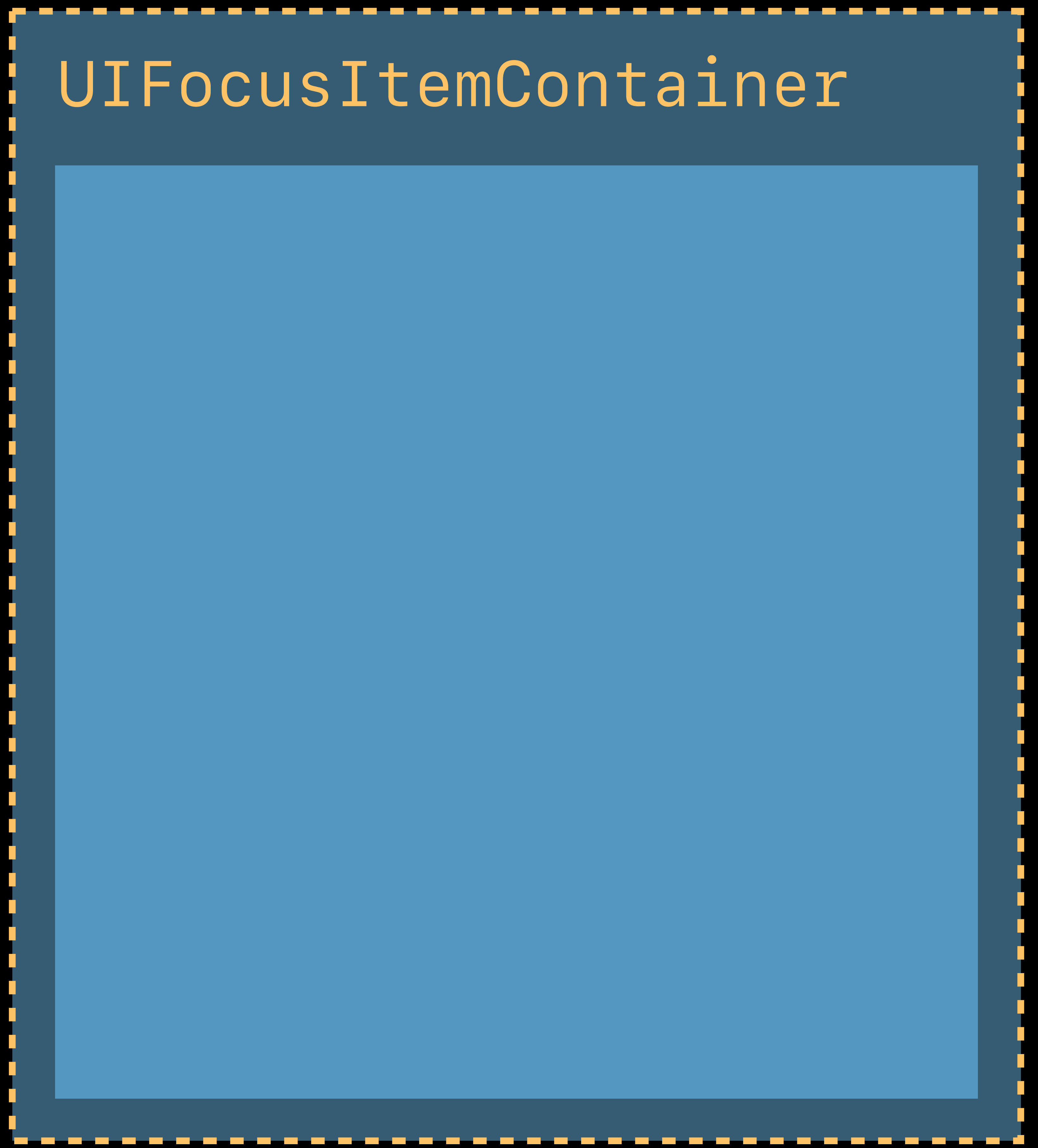
UIFocusEnvironment



UIFocusItemContainer



UIFocusEnvironment



UIFocusItemContainer

NEW

Provide a `coordinateSpace`

- `UIView` provides itself

UIFocusEnvironment

UIFocusItemContainer



UIFocusItemContainer

NEW

Provide a `coordinateSpace`

- `UIView` provides itself

Implement `focusItems(in rect: CGRect)`

- Return Focus Items whose frames intersect with `rect`
- `rect` is expressed in `coordinateSpace`
- Focus Items' frames must also be expressed in `coordinateSpace`

UIFocusEnvironment

UIFocusItemContainer



UIFocusItem

NEW

UIFocusEnvironment

UIFocusItemContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem

NEW

Inherits from UIFocusEnvironment

UIFocusEnvironment

UIFocusItemContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem

NEW

Inherits from UIFocusEnvironment

Implement `canBecomeFocused`

UIFocusEnvironment

UIFocusItemContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem

NEW

Inherits from UIFocusEnvironment

Implement `canBecomeFocused`

Implement `didHintFocusMovement(_ hint: UIFocusMovementHint)`

UIFocusEnvironment

UIFocusItemContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem

NEW

Inherits from UIFocusEnvironment

Implement `canBecomeFocused`

Implement `didHintFocusMovement(_ hint: UIFocusMovementHint)`

Provide a frame

- Same coordinate space as its containing UIFocusItemContainer

UIFocusEnvironment

UIFocusItemContainer

UIFocusItem

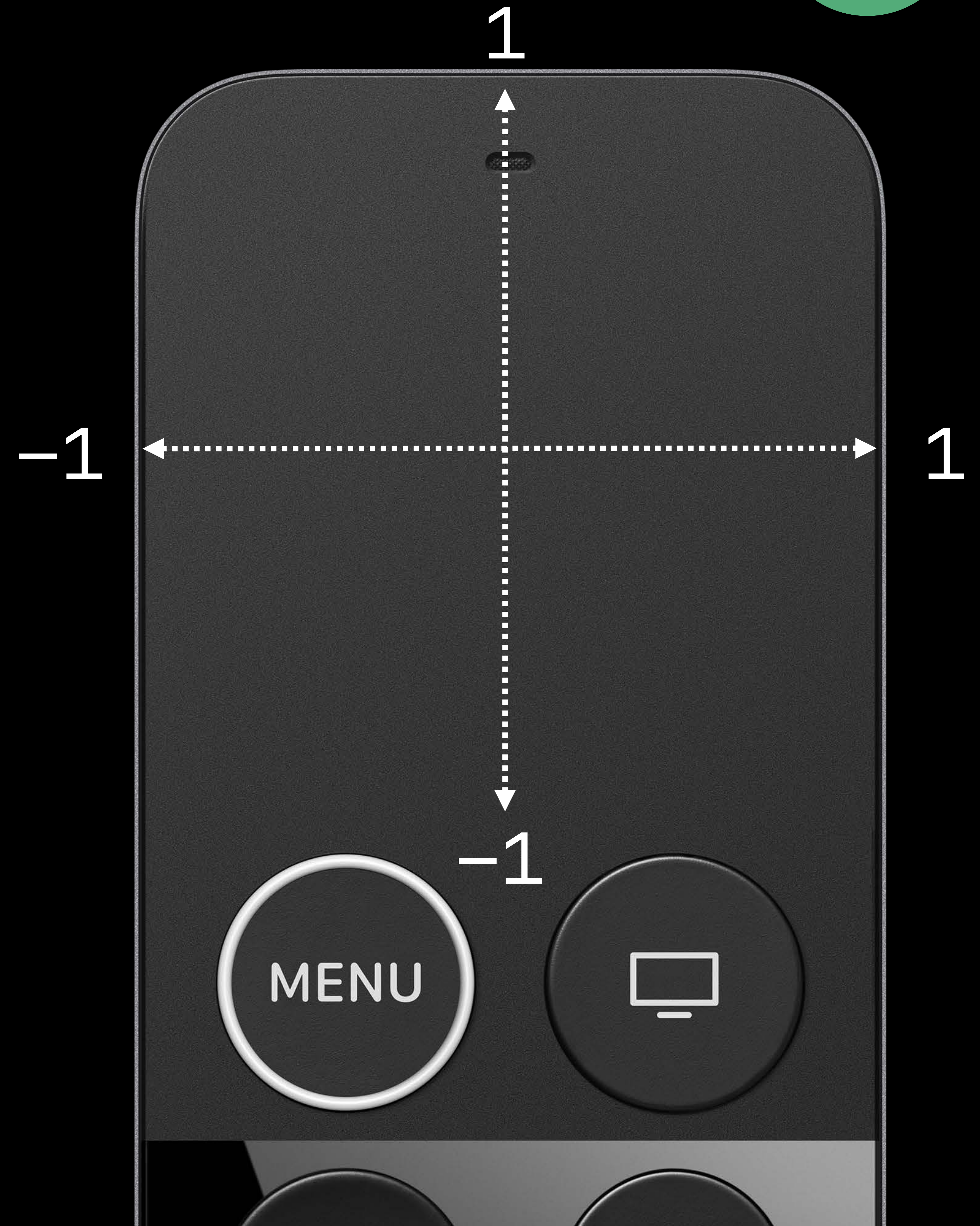
UIFocusItem

UIFocusItem

UIFocusMovementHint

NEW

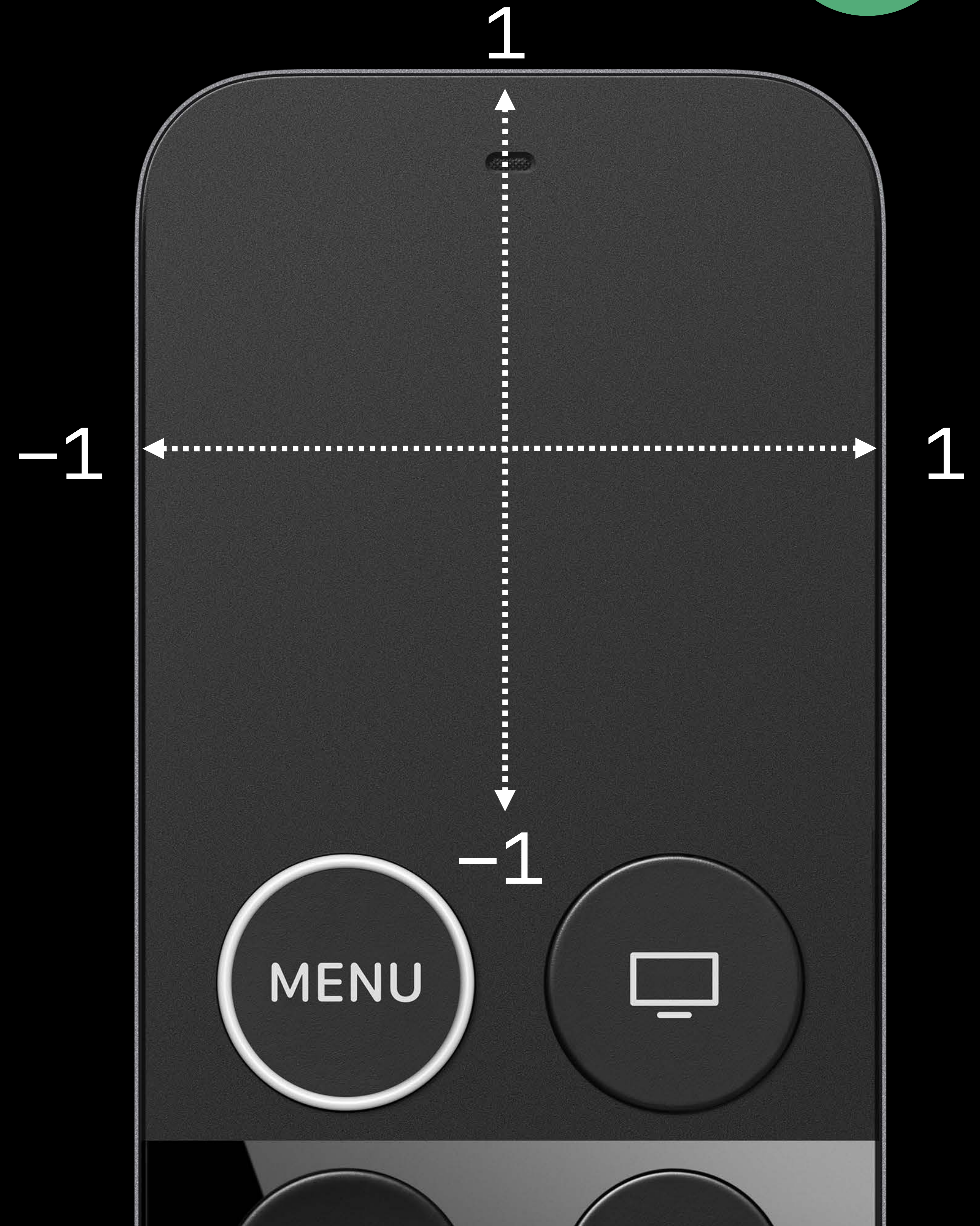
```
class UIFocusMovementHint : NSObject, NSCopying {  
    var movementDirection: CGVector { get }  
    var perspectiveTransform: CATransform3D { get }  
    var rotation: CGVector { get }  
    var translation: CGVector { get }  
    var interactionTransform: CATransform3D { get }  
}
```



UIFocusMovementHint

NEW

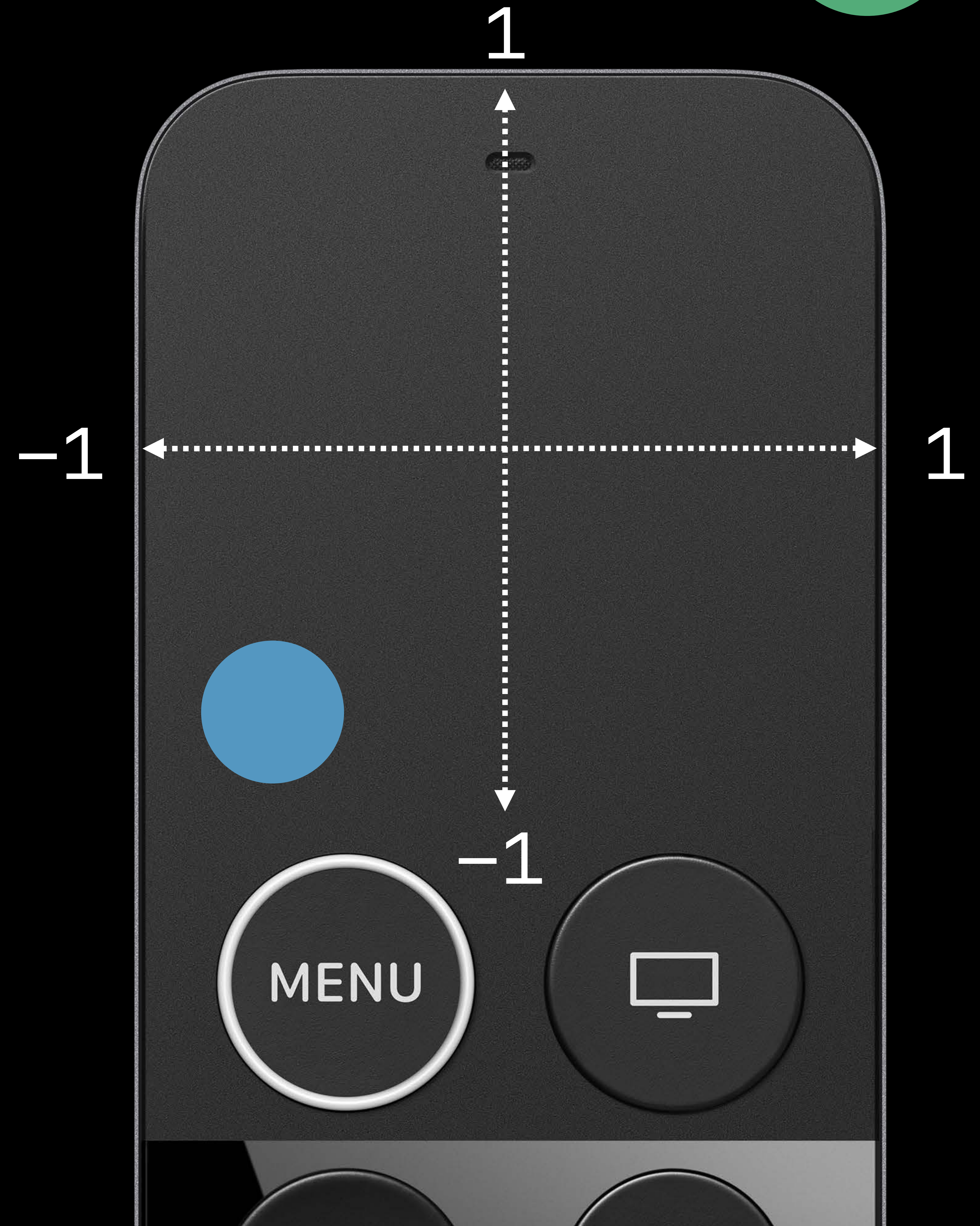
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```



UIFocusMovementHint

NEW

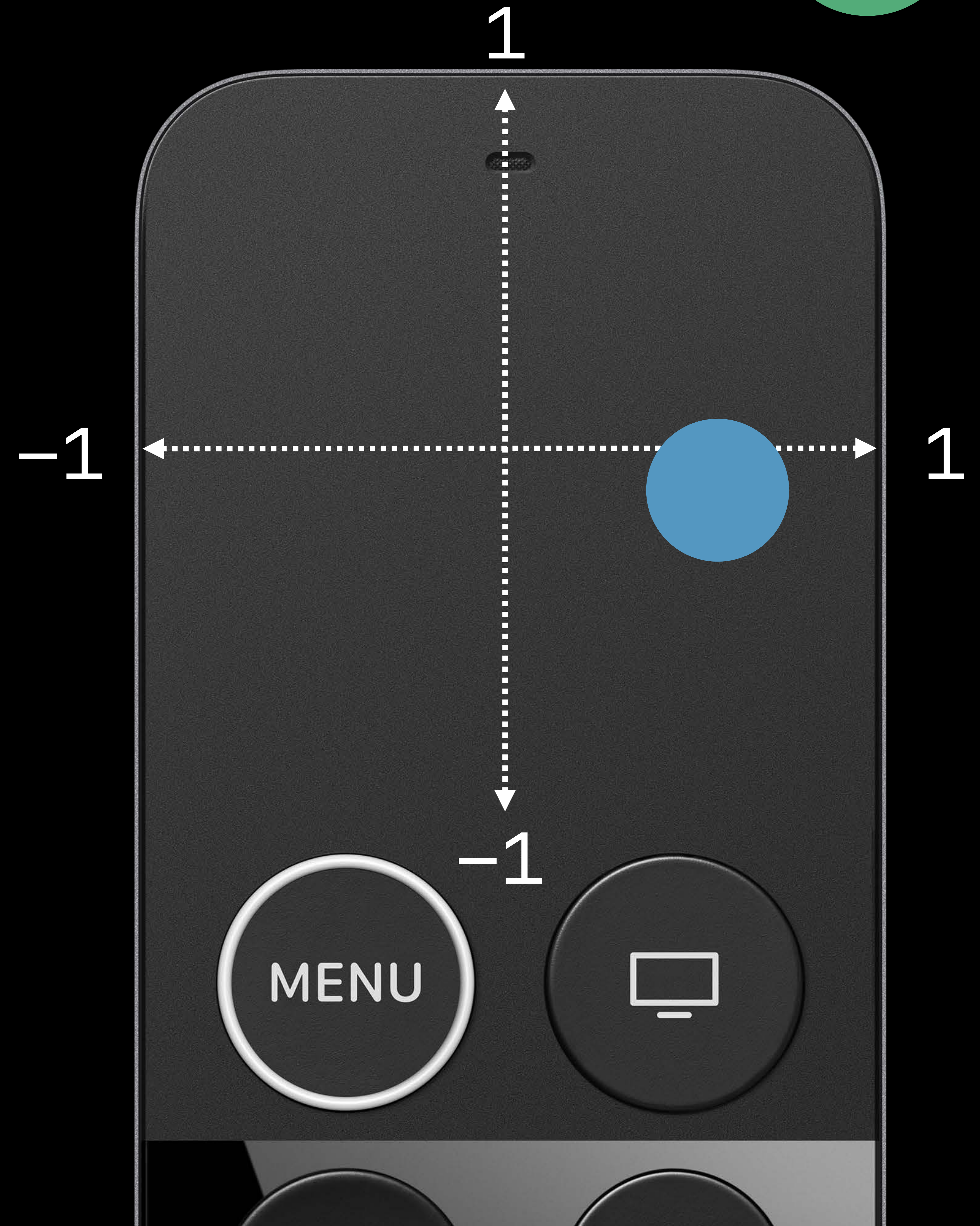
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}
```



UIFocusMovementHint

NEW

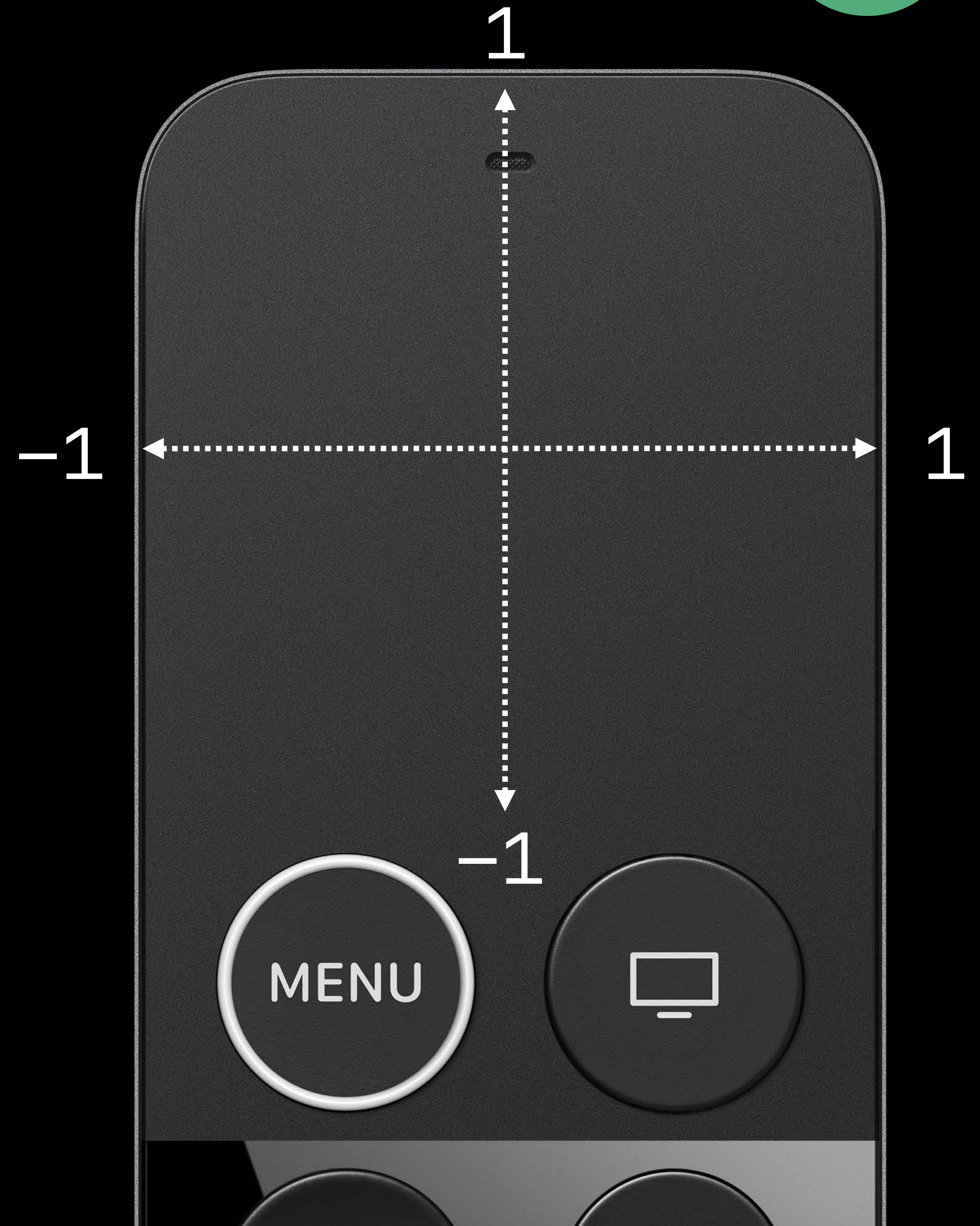
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    var interactionTransform: CATransform3D { get }  
}
```



UIFocusMovementHint

NEW

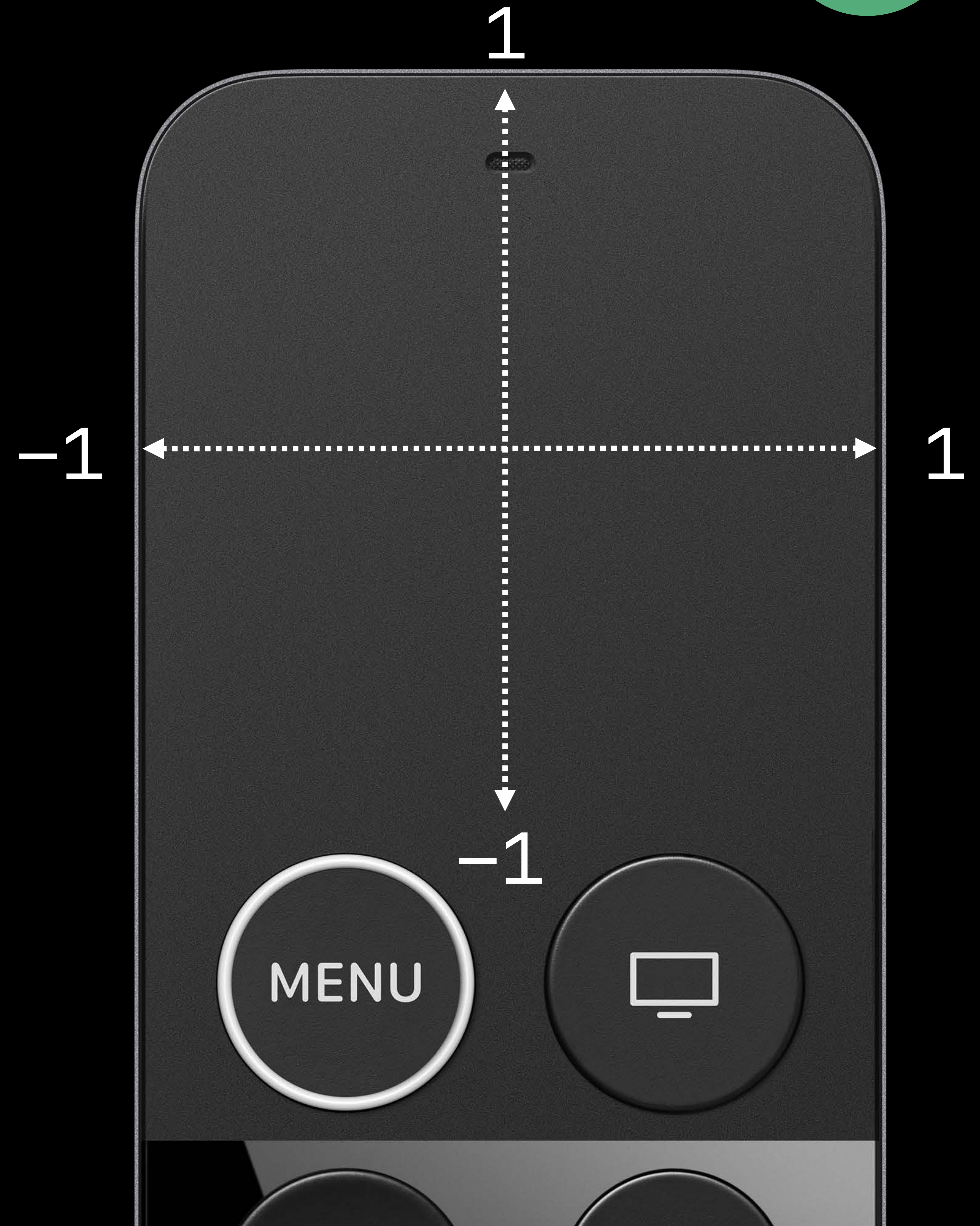
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    var rotation: CGVector { get }  
    var translation: CGVector { get }  
    var interactionTransform: CATransform3D { get }  
}
```



UIFocusMovementHint

NEW

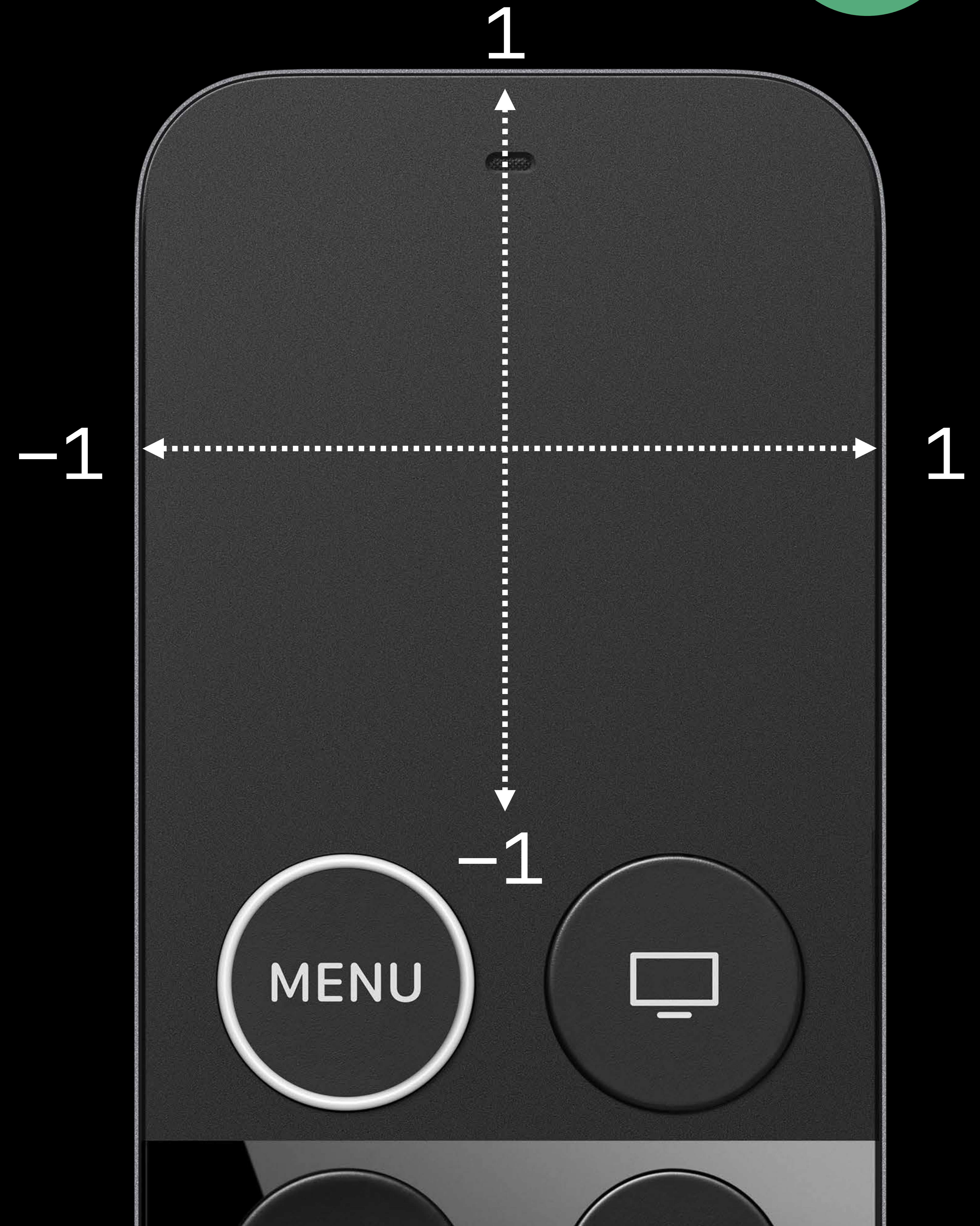
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    var translation: CGVector { get }  
    var interactionTransform: CATransform3D { get }  
}
```



UIFocusMovementHint

NEW

```
class UIFocusMovementHint : NSObject, NSCopying {  
    var movementDirection: CGVector { get }  
    var perspectiveTransform: CATransform3D { get }  
    var rotation: CGVector { get }  
    var translation: CGVector { get }  
    var interactionTransform: CATransform3D { get }  
}
```



UIFocusItemScrollableContainer

NEW

UIFocusEnvironment

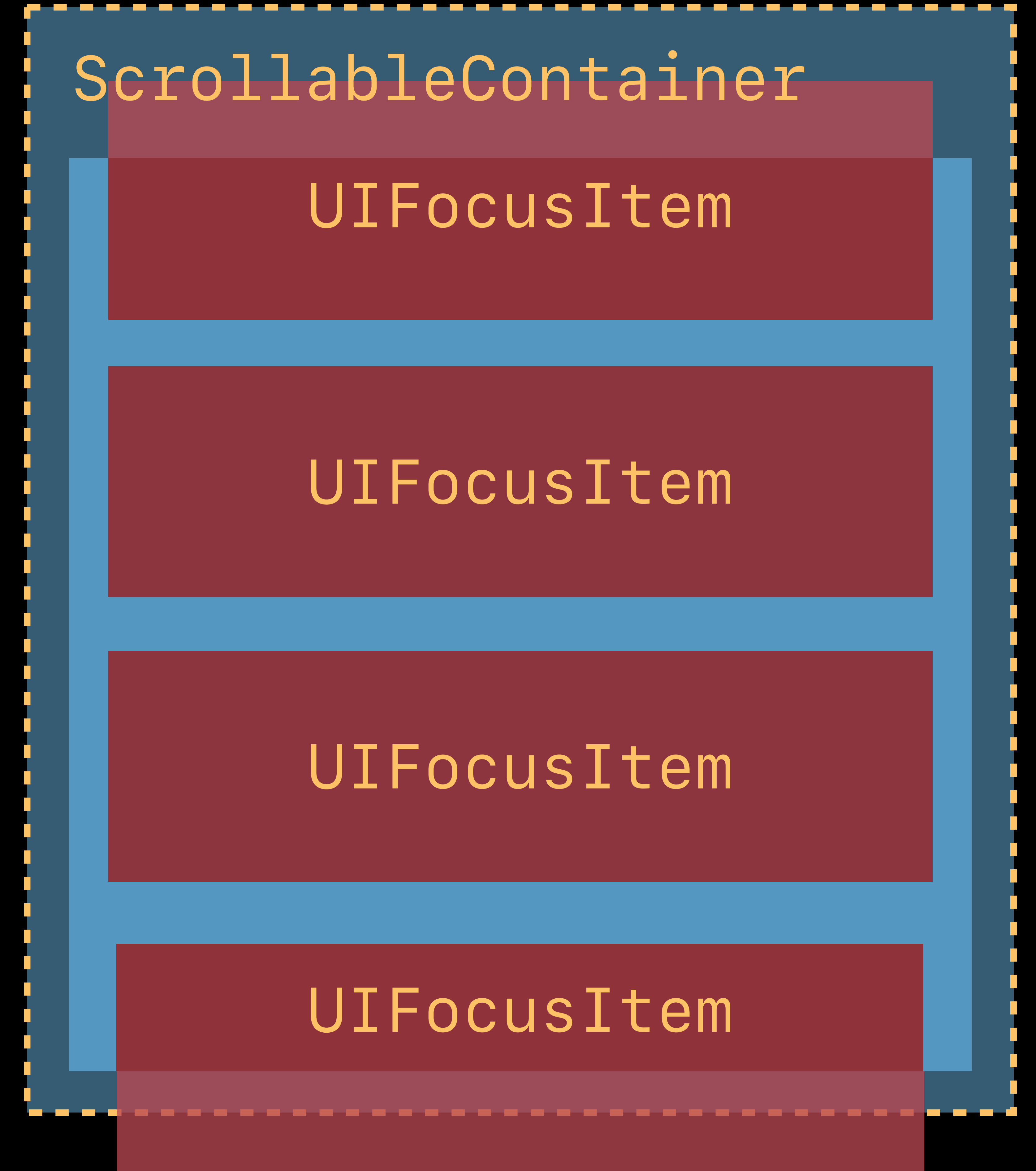
ScrollableContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem



UIFocusItemScrollableContainer

NEW

Inherits from UIFocusItemContainer

UIFocusEnvironment

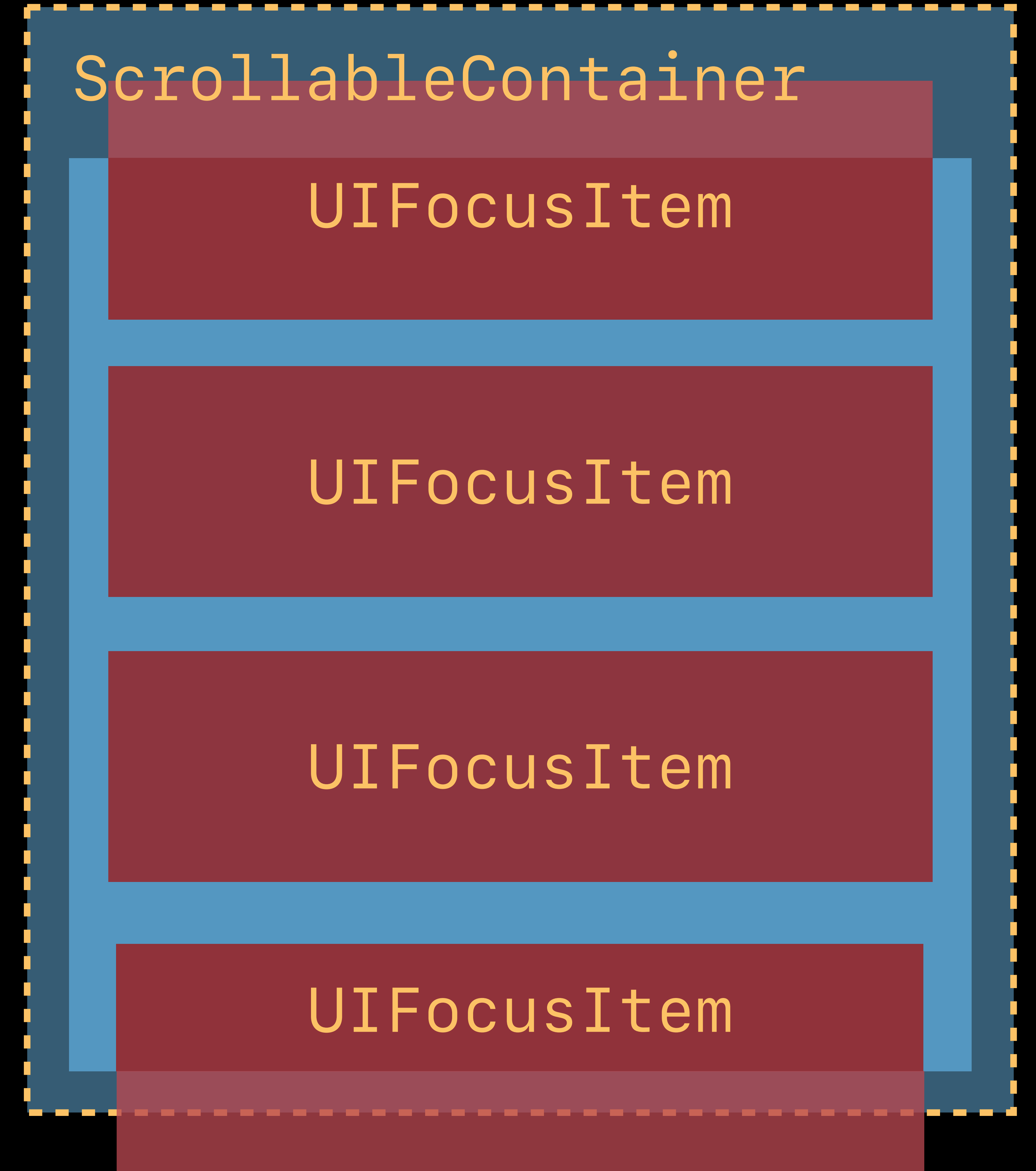
ScrollableContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem



UIFocusItemScrollableContainer

NEW

Inherits from UIFocusItemContainer

Three additional properties

UIFocusEnvironment

ScrollableContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem



UIFocusItemScrollableContainer

NEW

Inherits from UIFocusItemContainer

Three additional properties

- `var contentOffset: CGPoint { get set }`

UIFocusEnvironment

ScrollableContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem



UIFocusItemScrollableContainer

NEW

Inherits from UIFocusItemContainer

Three additional properties

- `var contentOffset: CGPoint { get set }`
- `var contentSize: CGSize { get }`

UIFocusEnvironment

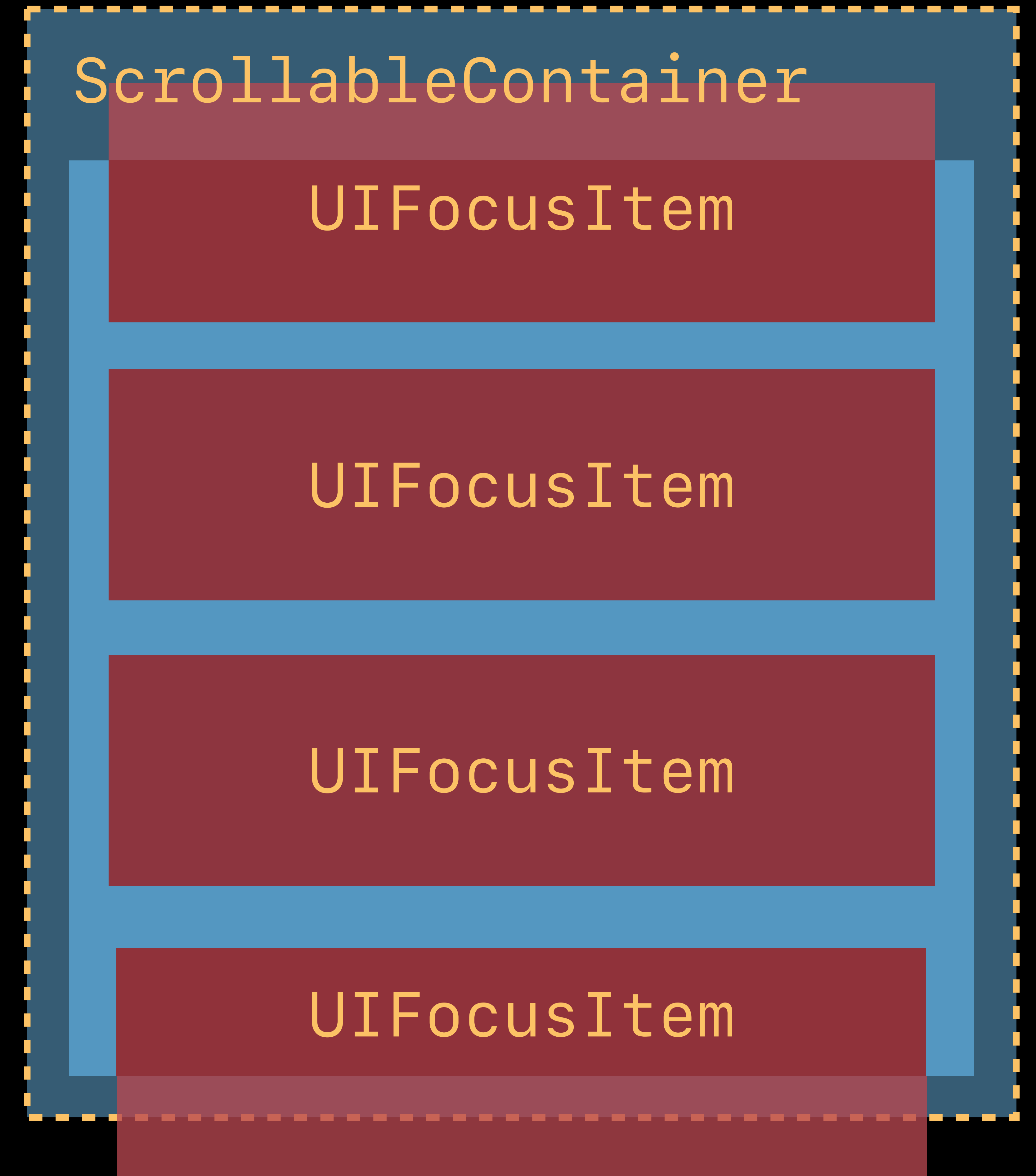
ScrollableContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem



UIFocusItemScrollableContainer

NEW

Inherits from UIFocusItemContainer

Three additional properties

- `var contentOffset: CGPoint { get set }`
- `var contentSize: CGSize { get }`
- `var visibleSize: CGSize { get }`

UIFocusEnvironment

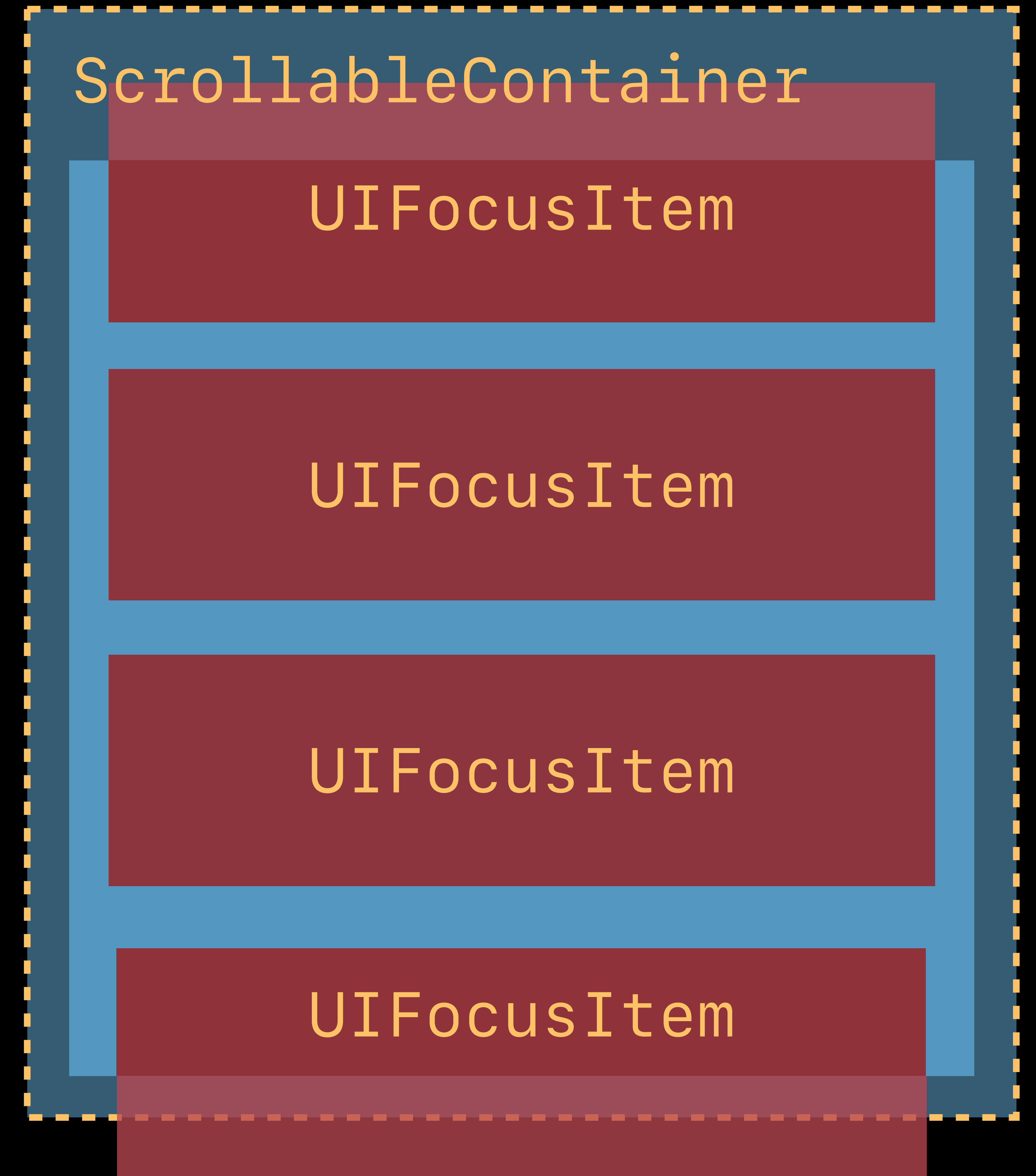
ScrollableContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem



UIFocusItemScrollableContainer

NEW

Inherits from UIFocusItemContainer

Three additional properties

- `var contentOffset: CGPoint { get set }`
- `var contentSize: CGSize { get }`
- `var visibleSize: CGSize { get }`

`contentOffset` is set automatically

UIFocusEnvironment

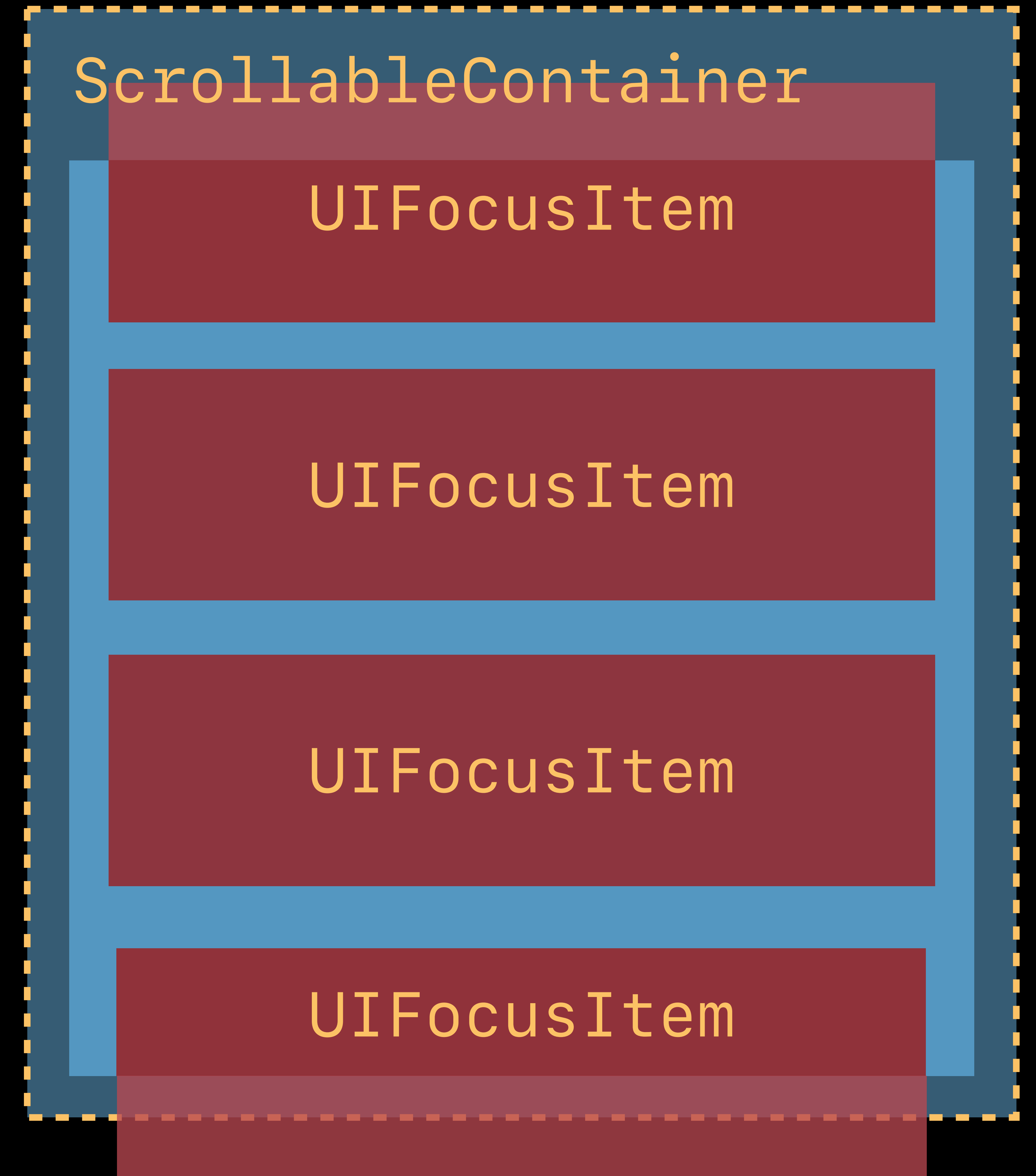
ScrollableContainer

UIFocusItem

UIFocusItem

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UIFocusItemScrollableContainer

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Inherits from UIFocusItemContainer

Three additional properties

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UIFocusEnvironment

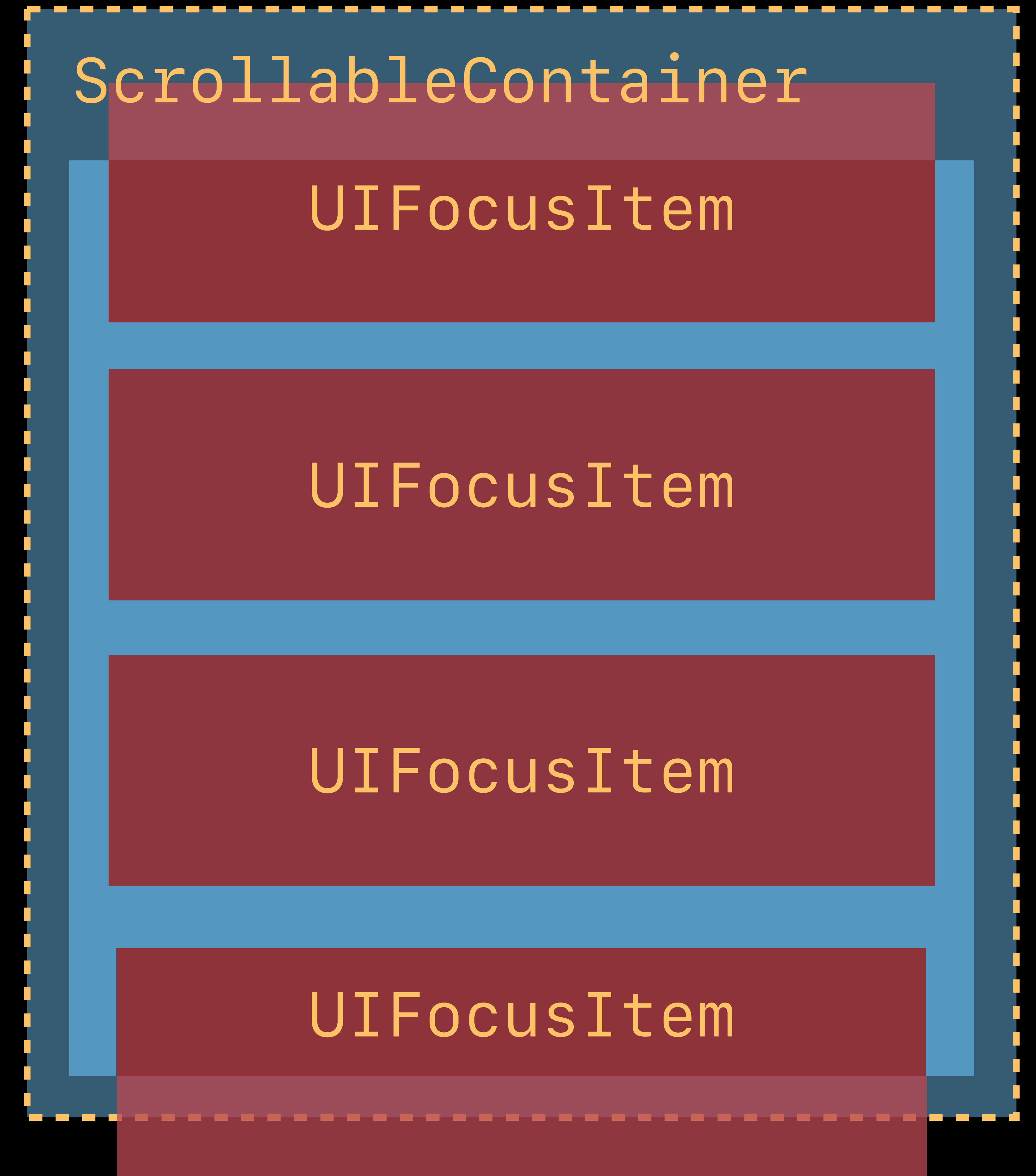
ScrollableContainer

UIFocusItem

UIFocusItem

UIFocusItem

UIFocusItem



Accessibility

Accessibility

It's incredibly easy!

Accessibility

It's incredibly easy!

Implement `UIFocusItemContainer.focusItems(in rect: CGRect)`

Accessibility

It's incredibly easy!

Implement `UIFocusItemContainer.focusItems(in rect: CGRect)`

Set `accessibilityLabel` and `accessibilityHint` on your Focus Items

Accessibility

It's incredibly easy!

Implement `UIFocusItemContainer.focusItems(in rect: CGRect)`

Set `accessibilityLabel` and `accessibilityHint` on your Focus Items

Demo

Focus-powered Metal app

Paul Schneider, tvOS Engineering

Summary

Summary

Implement custom UIFocusEnvironments and UIFocusItems

Summary

Implement custom UIFocusEnvironments and UIFocusItems

Even with non-UIKit components!

Summary

Implement custom UIFocusEnvironments and UIFocusItems

Even with non-UIKit components!

Support Focus movement with UIFocusItemContainer

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Support Focus movement with UIFocusItemContainer

Hint at interaction with UIFocusMovementHint

Summary

Implement custom UIFocusEnvironments and UIFocusItems

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Support Focus movement with UIFocusItemContainer

Hint at interaction with UIFocusMovementHint

Automatically scroll with UIFocusItemScrollableContainer

Summary

Implement custom UIFocusEnvironments and UIFocusItems

Even with non-UIKit components!

Support Focus movement with UIFocusItemContainer

Hint at interaction with UIFocusMovementHint

Automatically scroll with UIFocusItemScrollableContainer

Full accessibility support

Summary

Implement custom UIFocusEnvironments and UIFocusItems

Even with non-UIKit components!

Support Focus movement with UIFocusItemContainer

Hint at interaction with UIFocusMovementHint

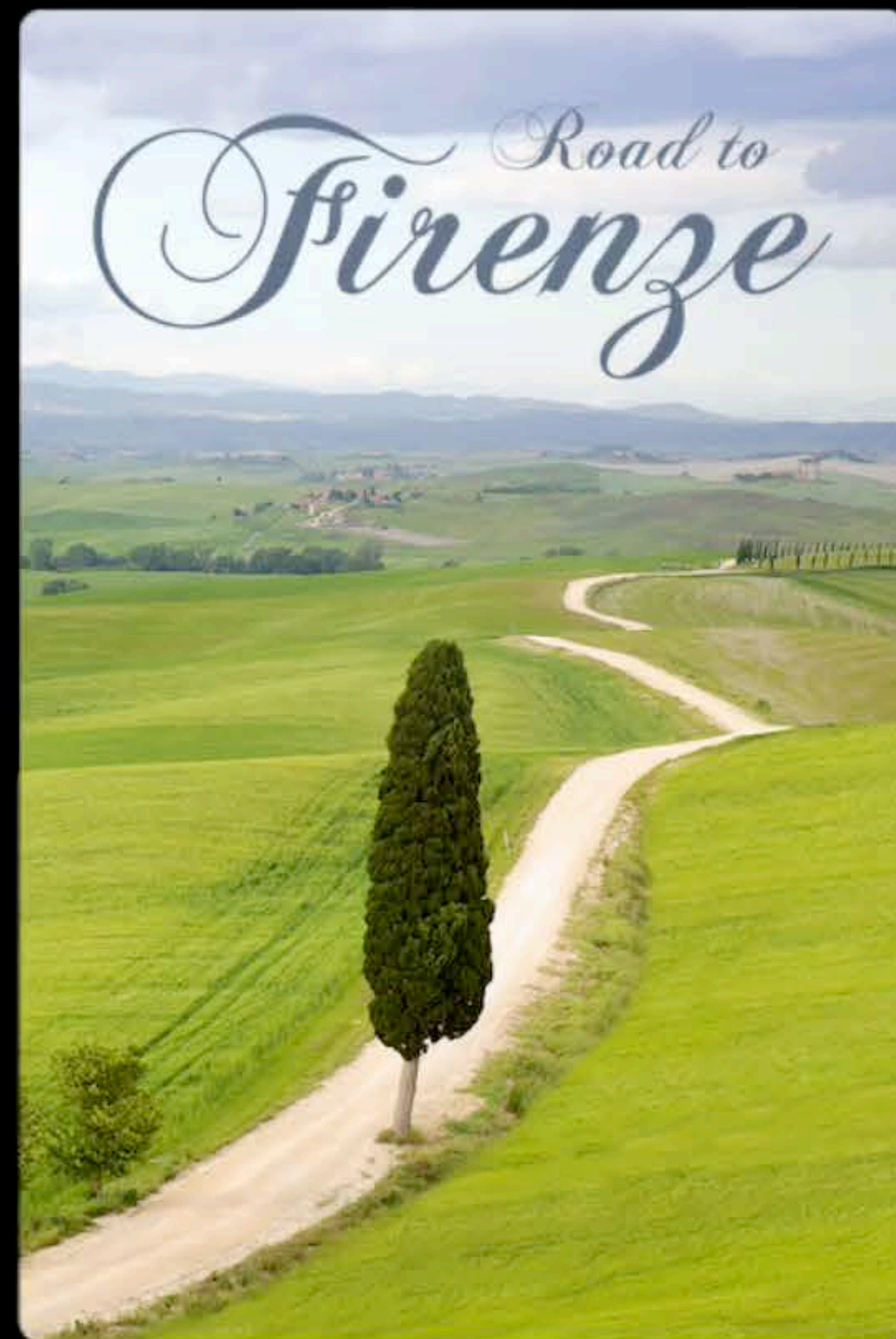
Automatically scroll with UIFocusItemScrollableContainer

Full accessibility support

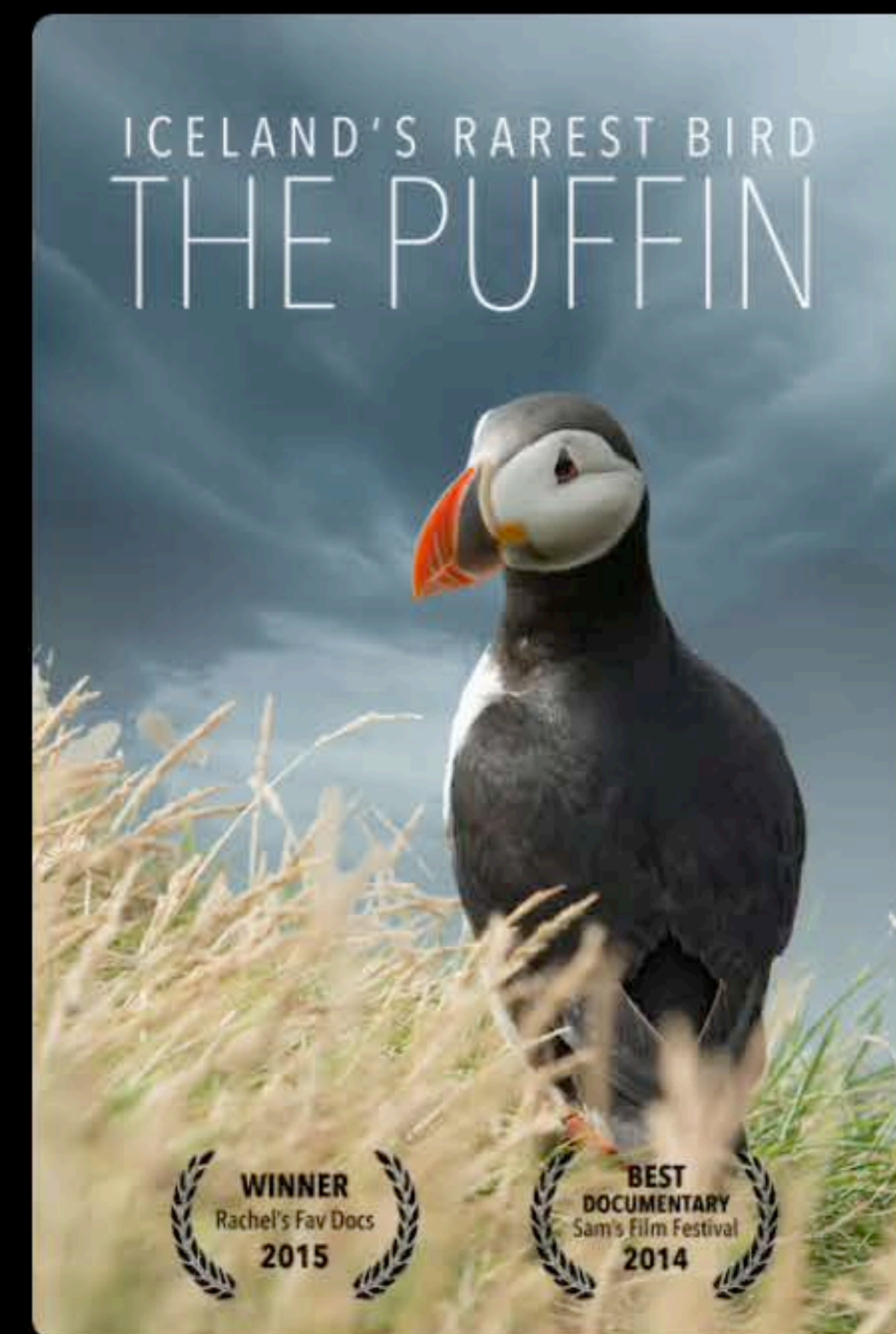
Available in the Developer Beta

UI Patterns

Hans Kim, tvOS Engineering



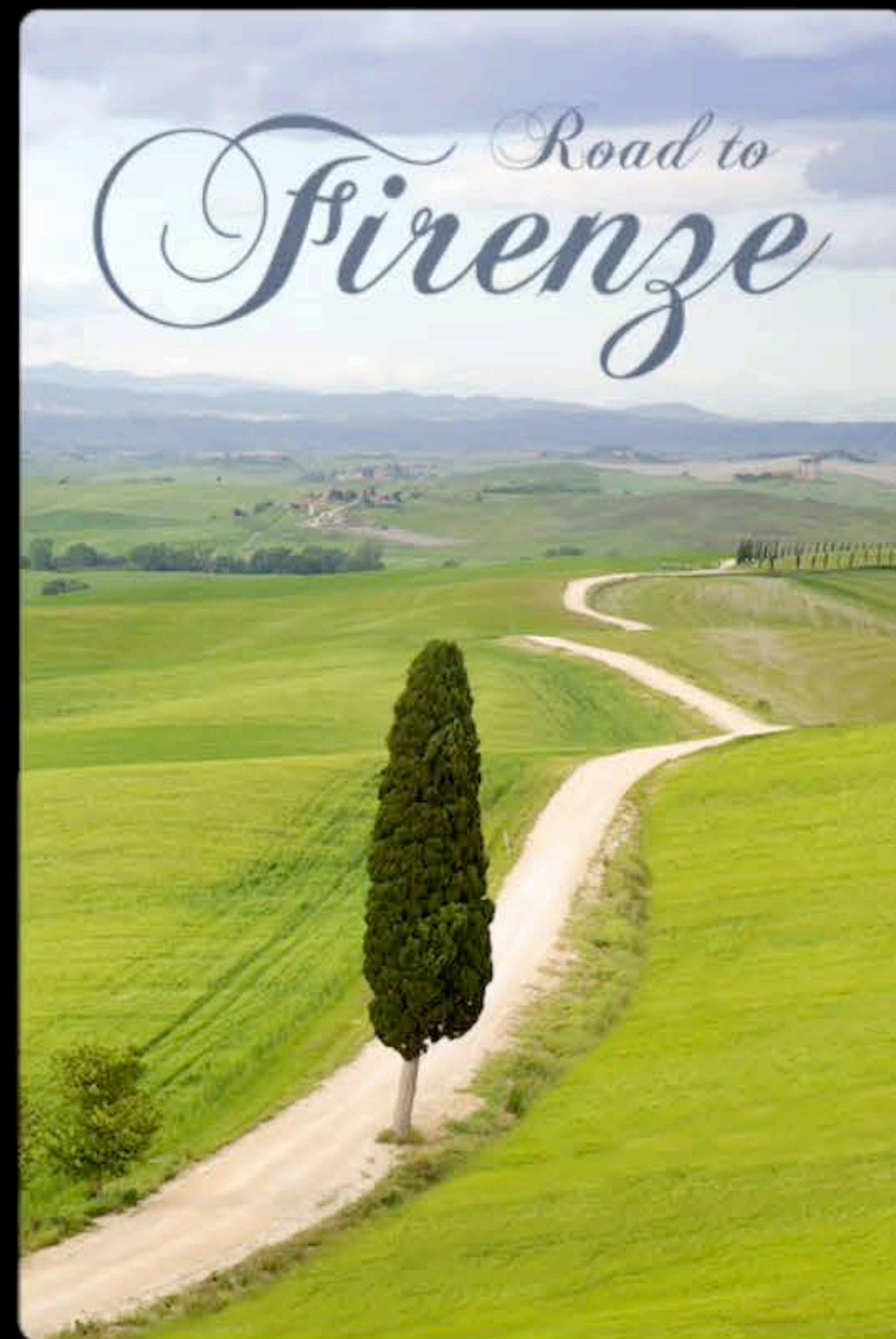
Firenze



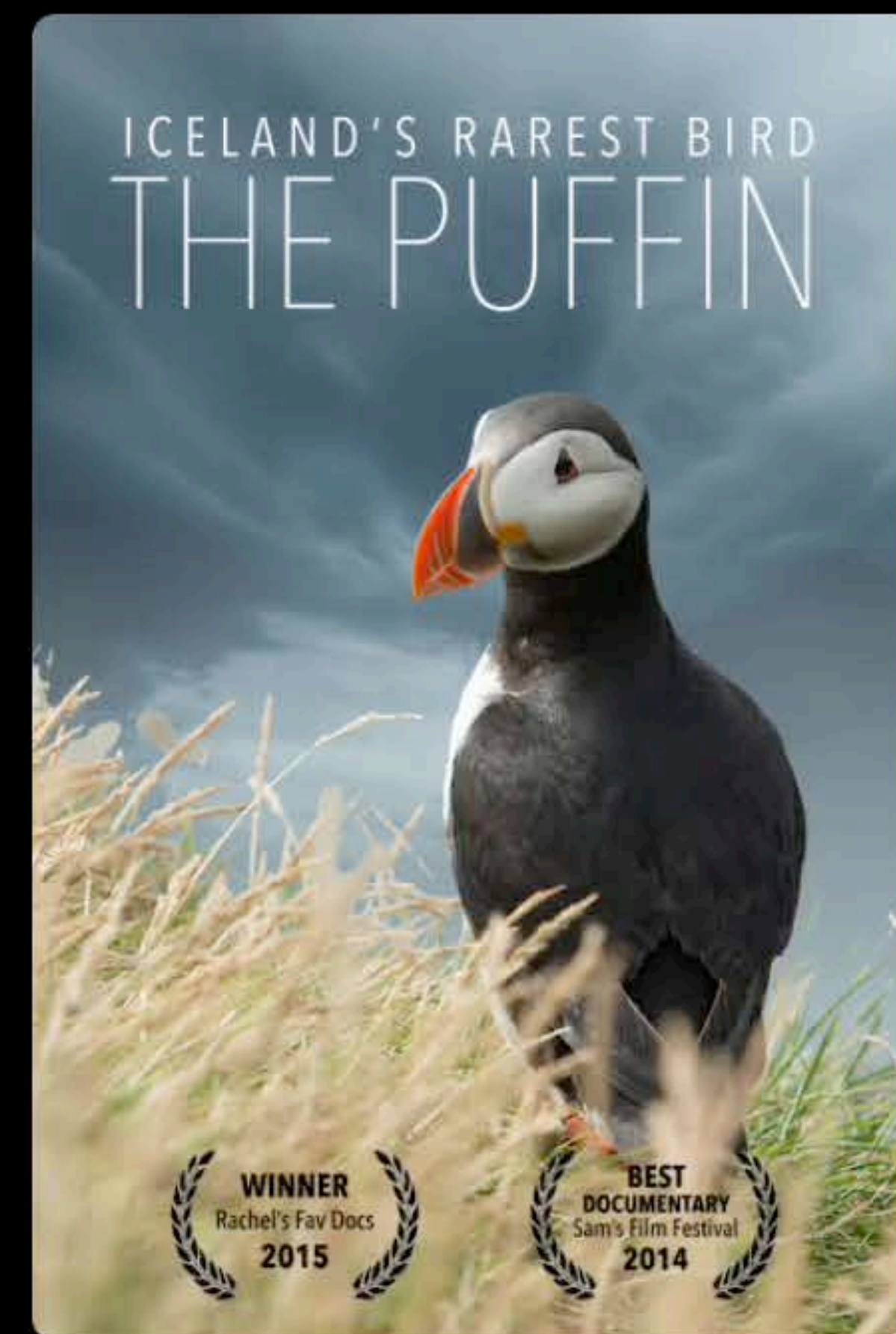
Iceland's Rarest



Surf



Firenze



Iceland's Rarest



Surf

Text Scrolling

Marquee

Text Scrolling

Marquee

Present variable-length strings in fixed geometry

Text Scrolling

Marquee



NEW

Present variable-length strings in fixed geometry

Visually highlights current focus

Kitchen Stories.

Food & Drink

Apps We Love



Cooking TV - The Co
\$1.99



Kitchen Stories Recipes



Yummly Recipes + Sh



Grubhub - Order Foo



Panna: Video Recipes



Kitche



Kitchen Stories.

Food & Drink

Apps We Love



Cooking TV - The Co
\$1.99



Kitchen Stories Recipes



Yummly Recipes + Sh



Grubhub - Order Foo



Panna: Video Recipes



Kitche



UILabel

Marquee

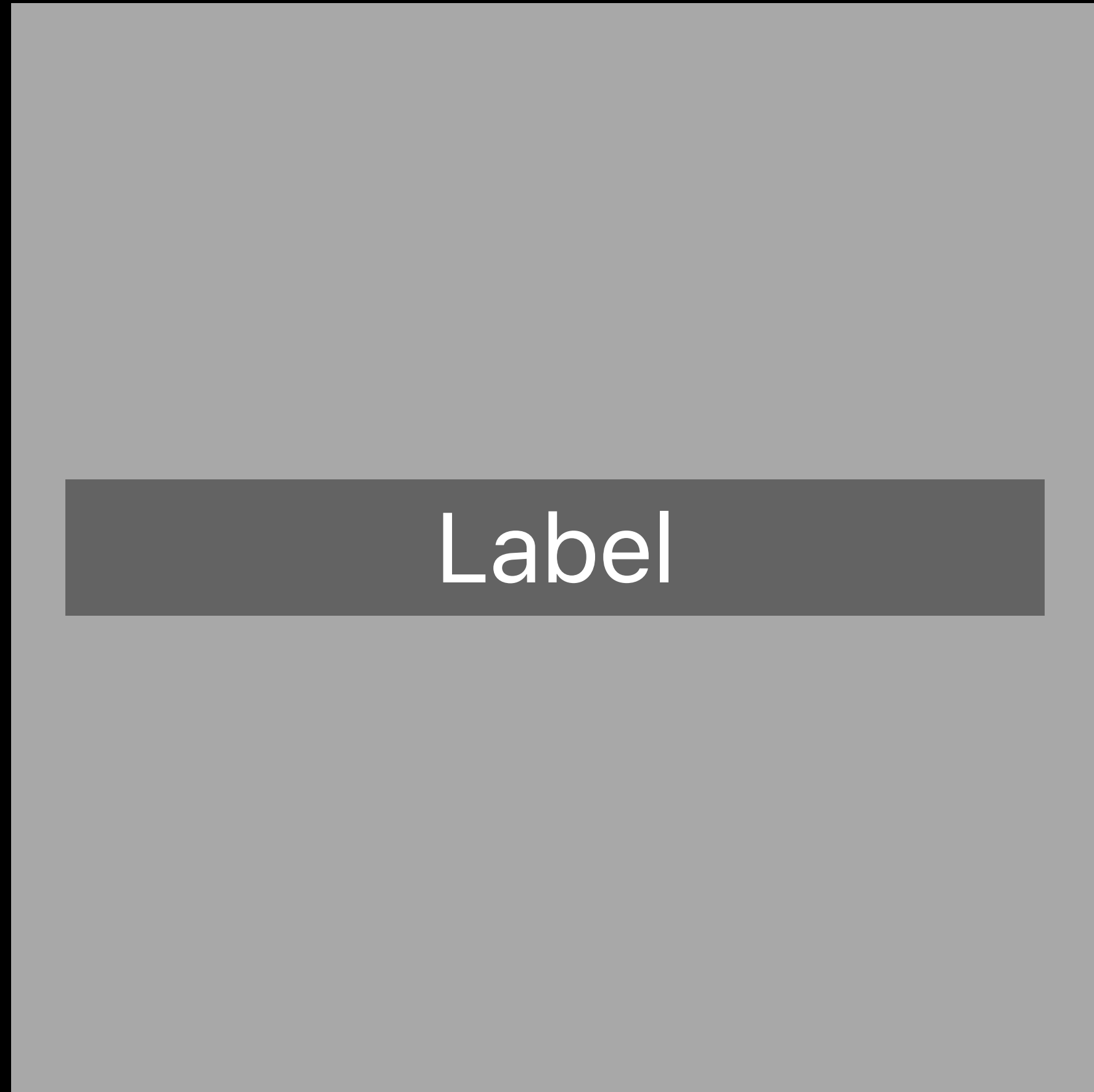
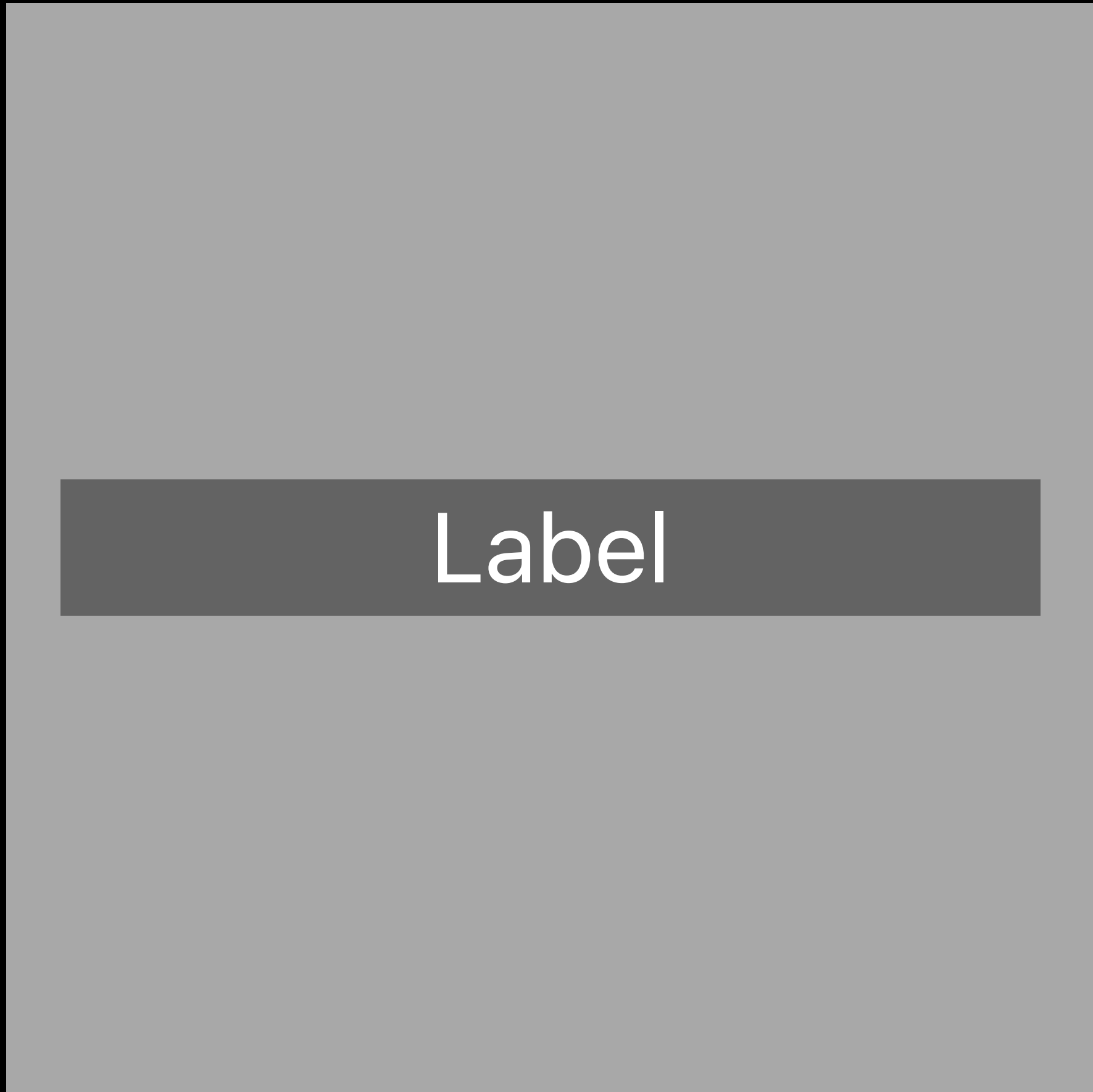
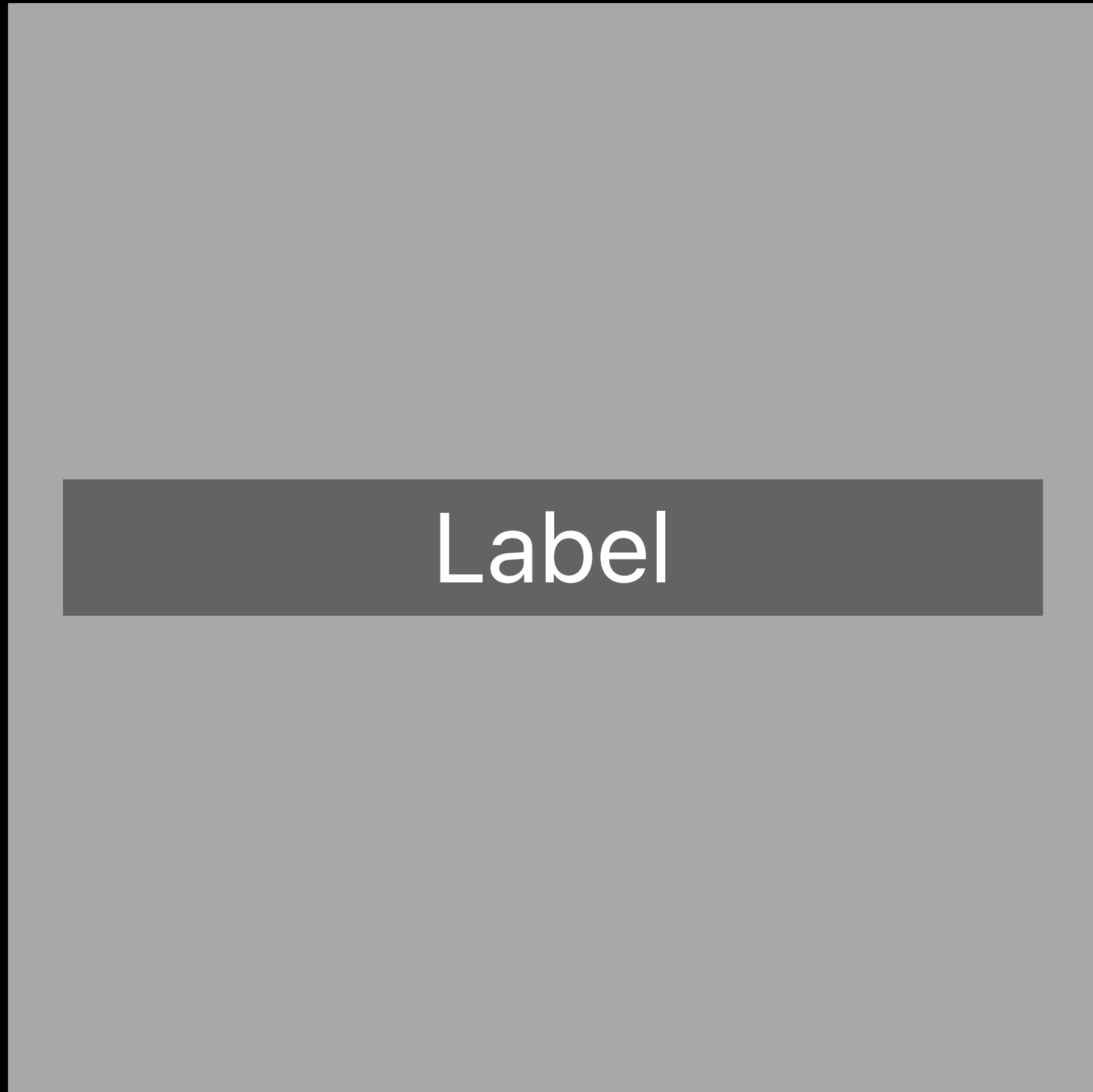
```
label.enableMarqueeWhenAncestorFocused = true
```

UILabel

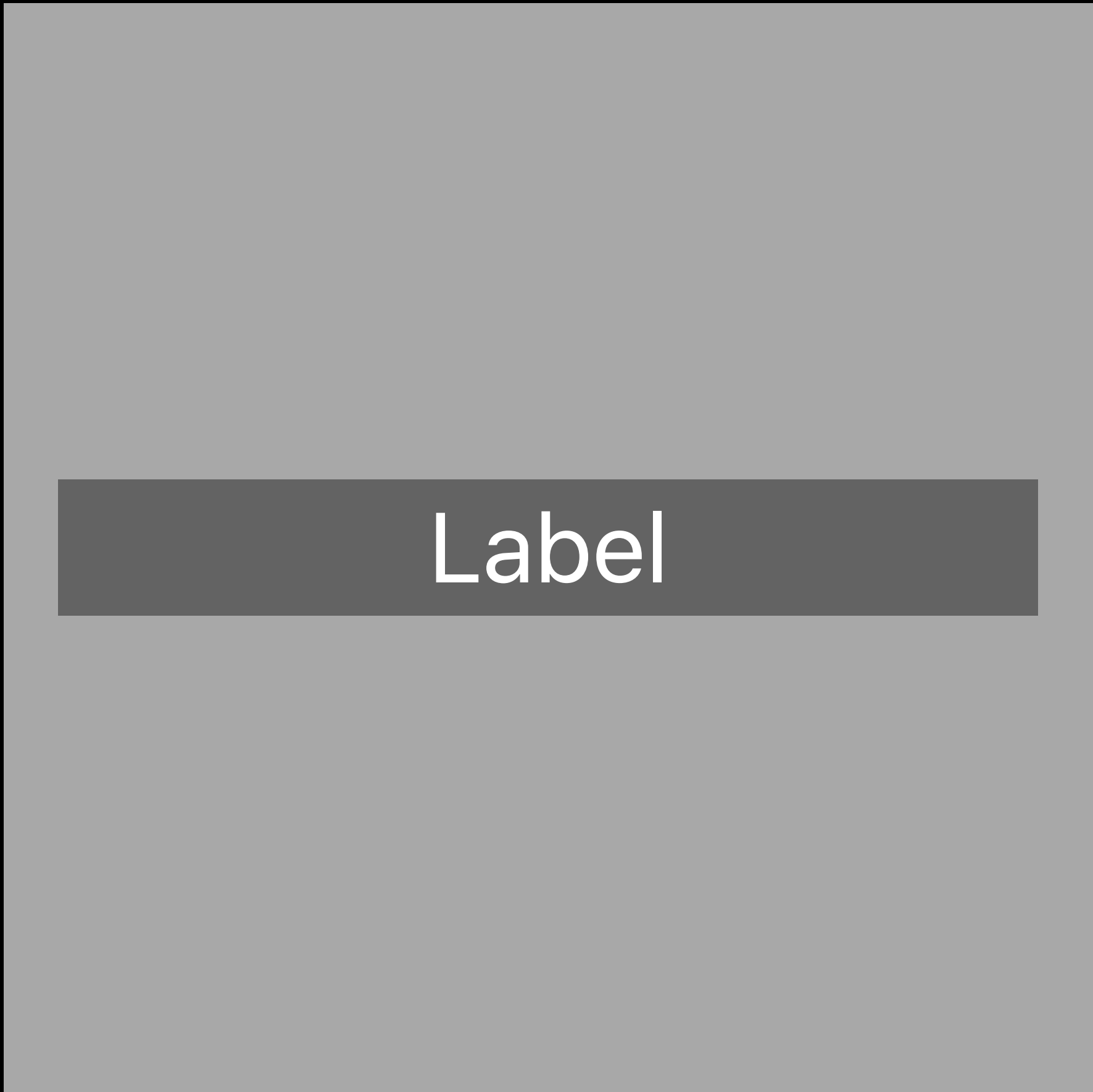
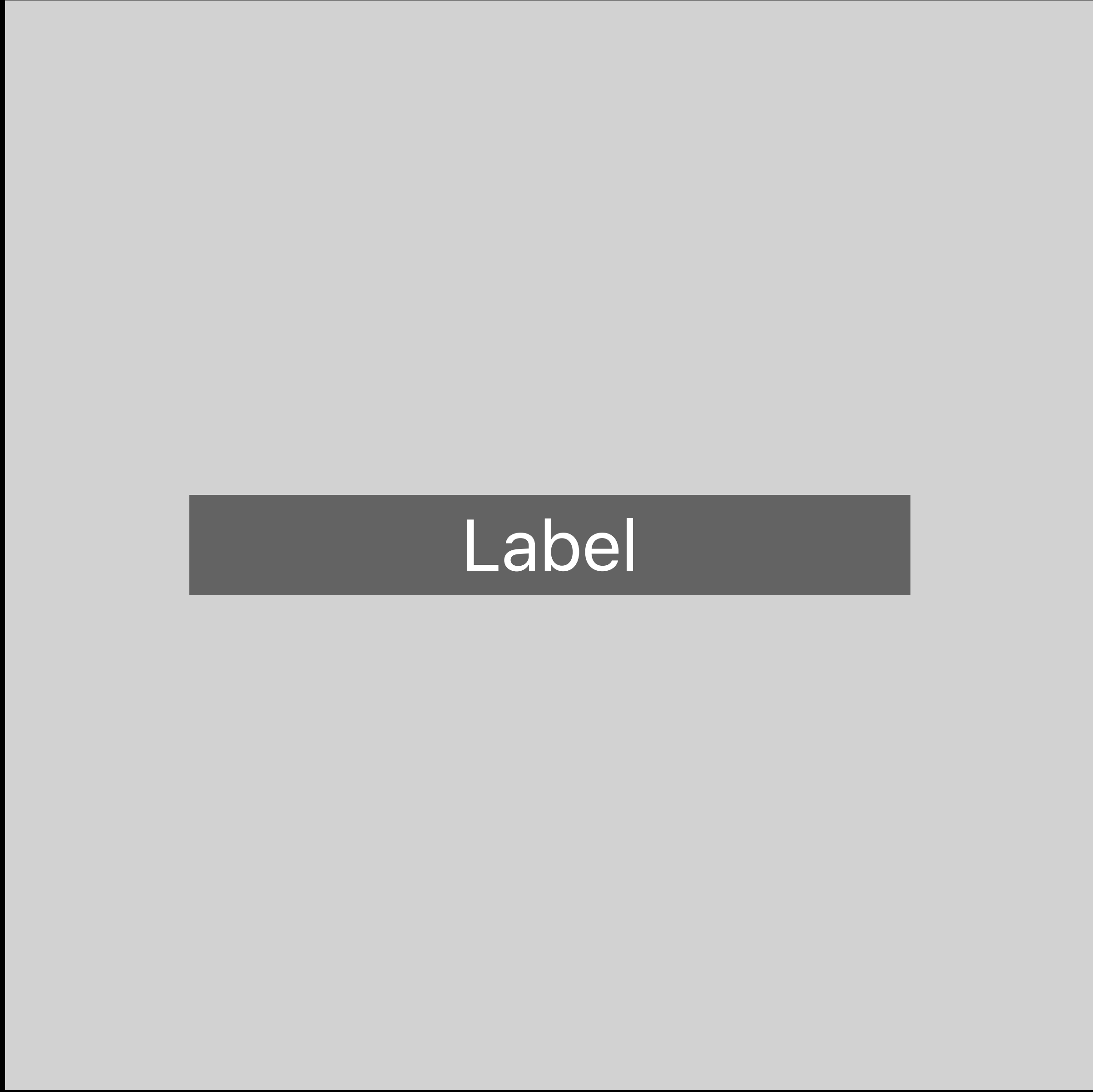
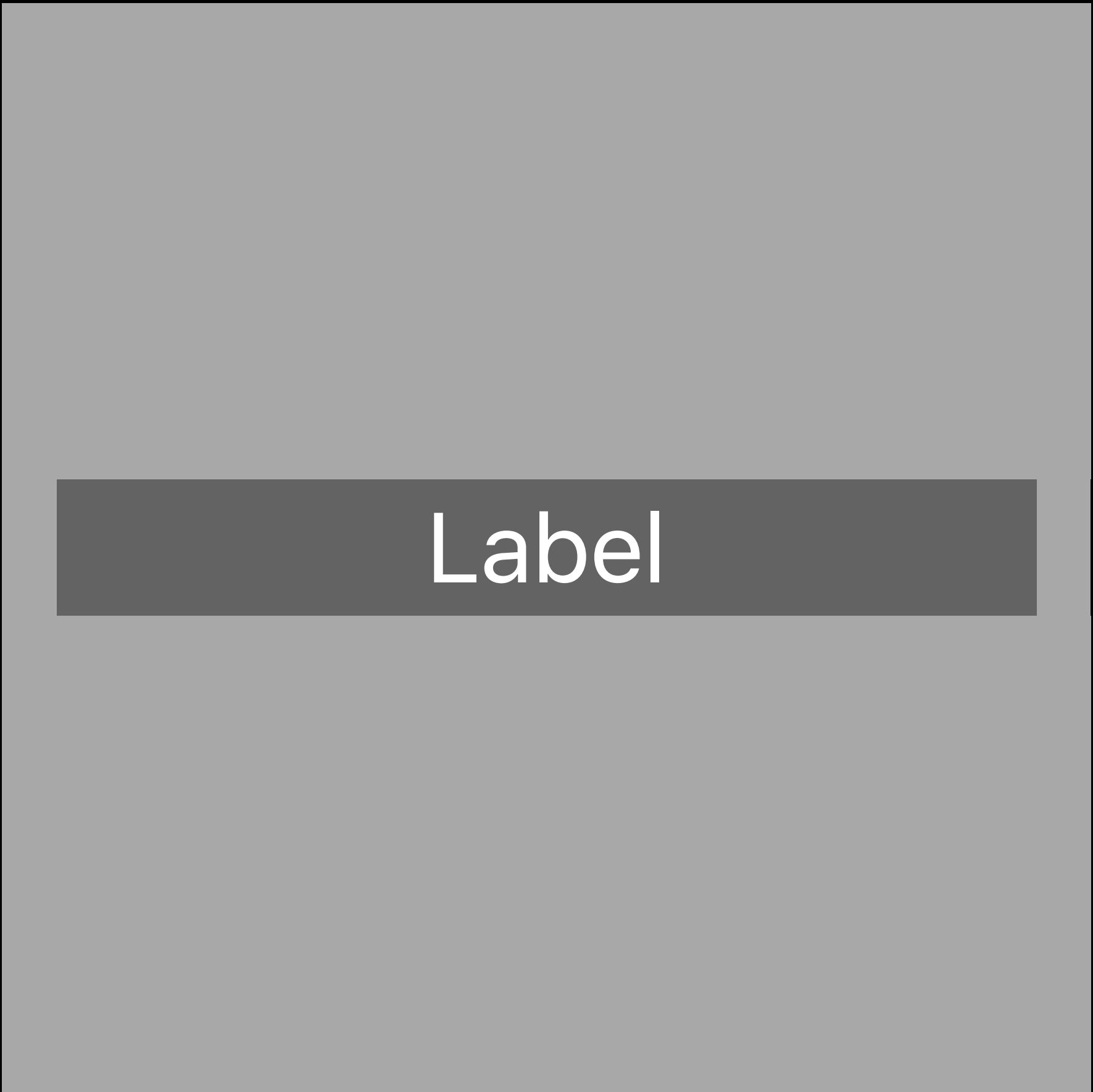
Marquee

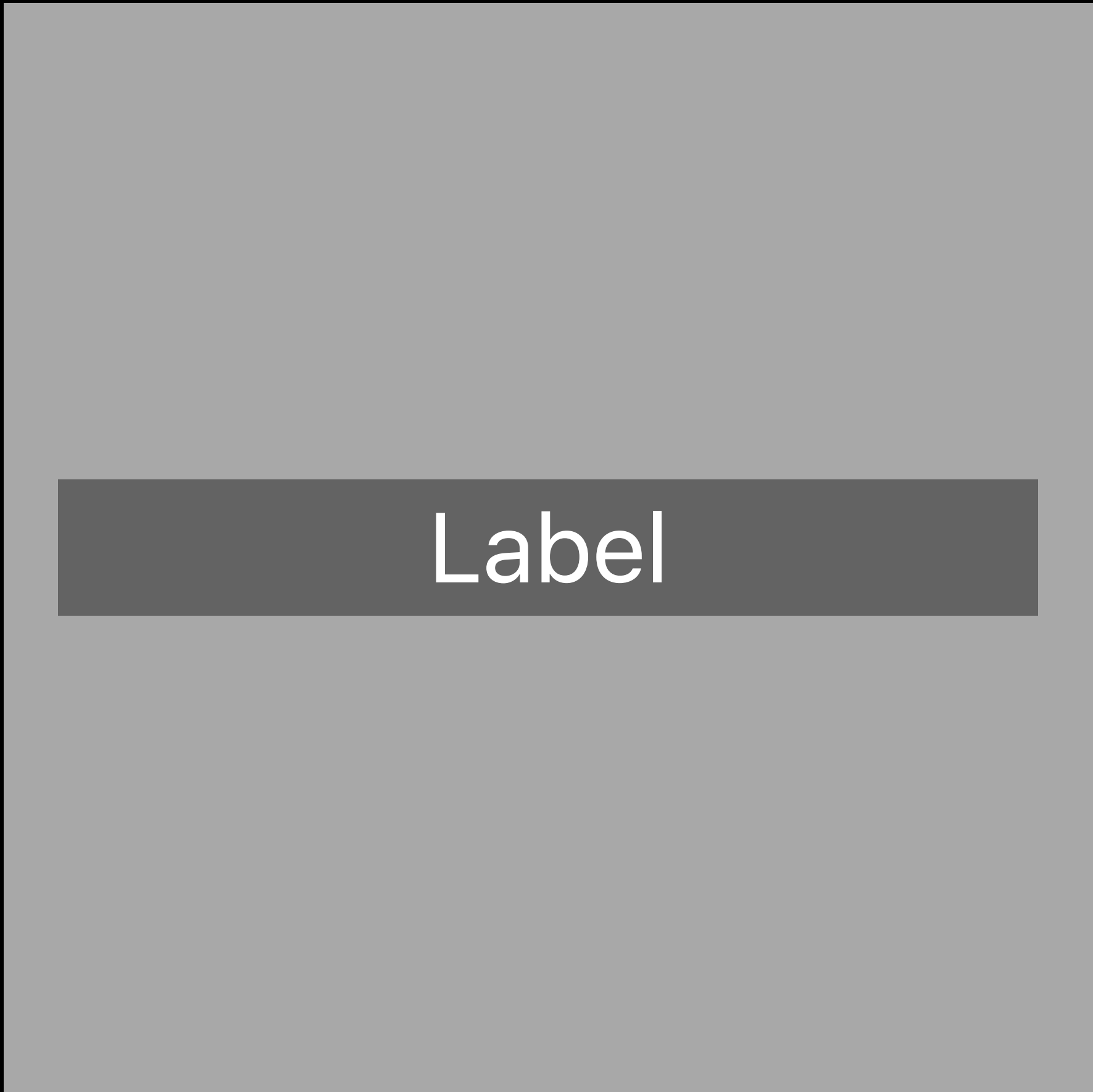
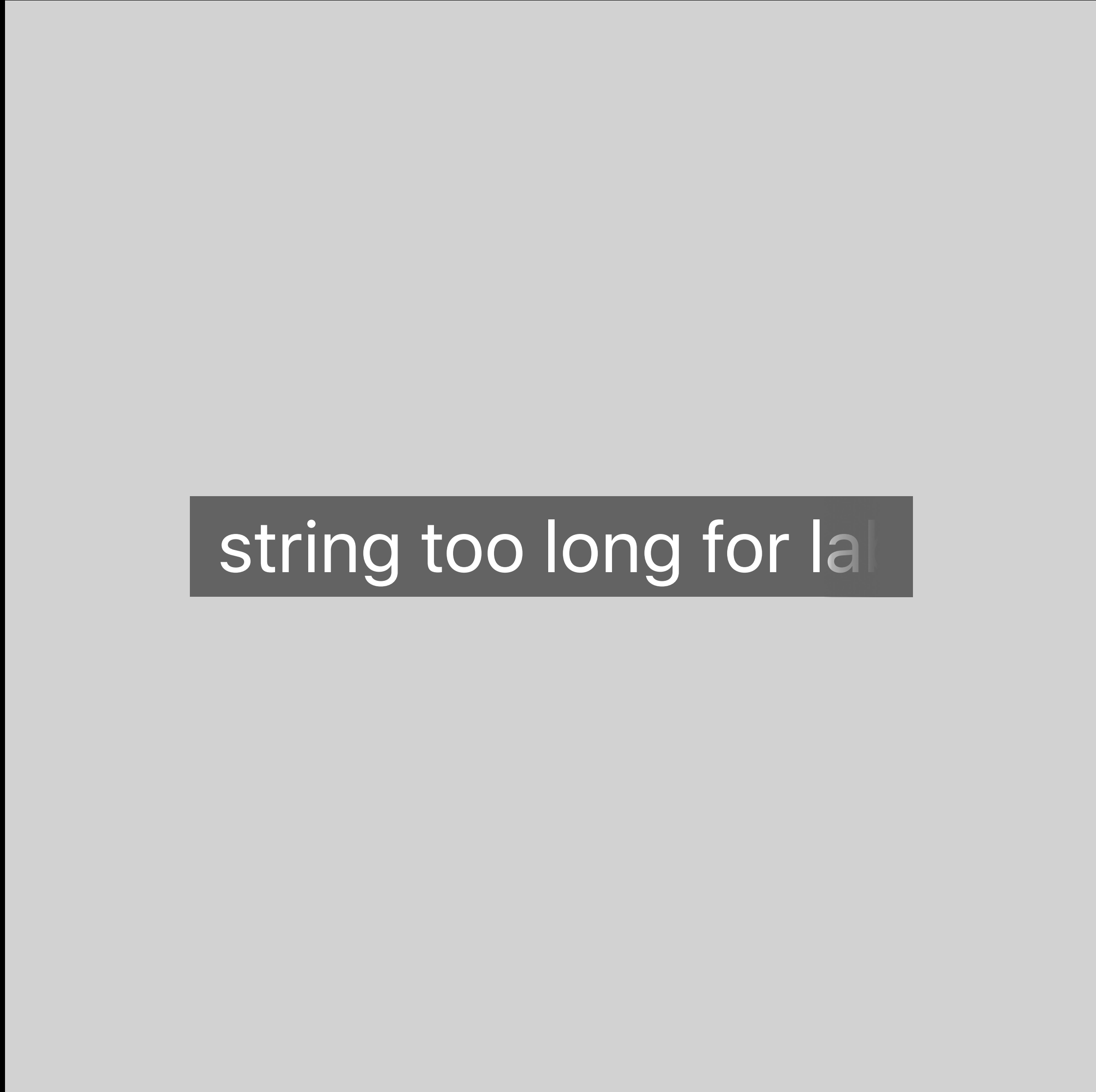
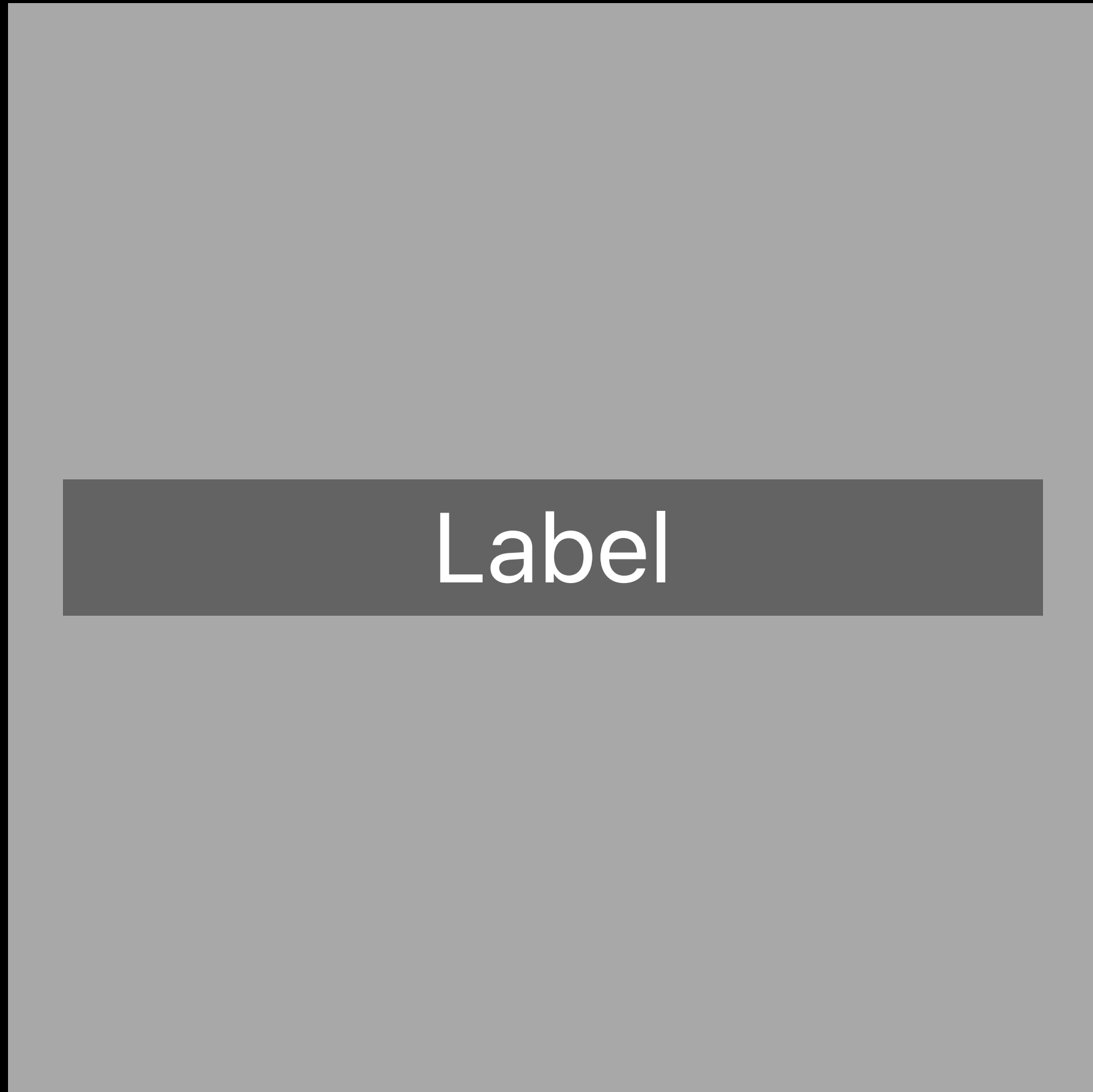
NEW

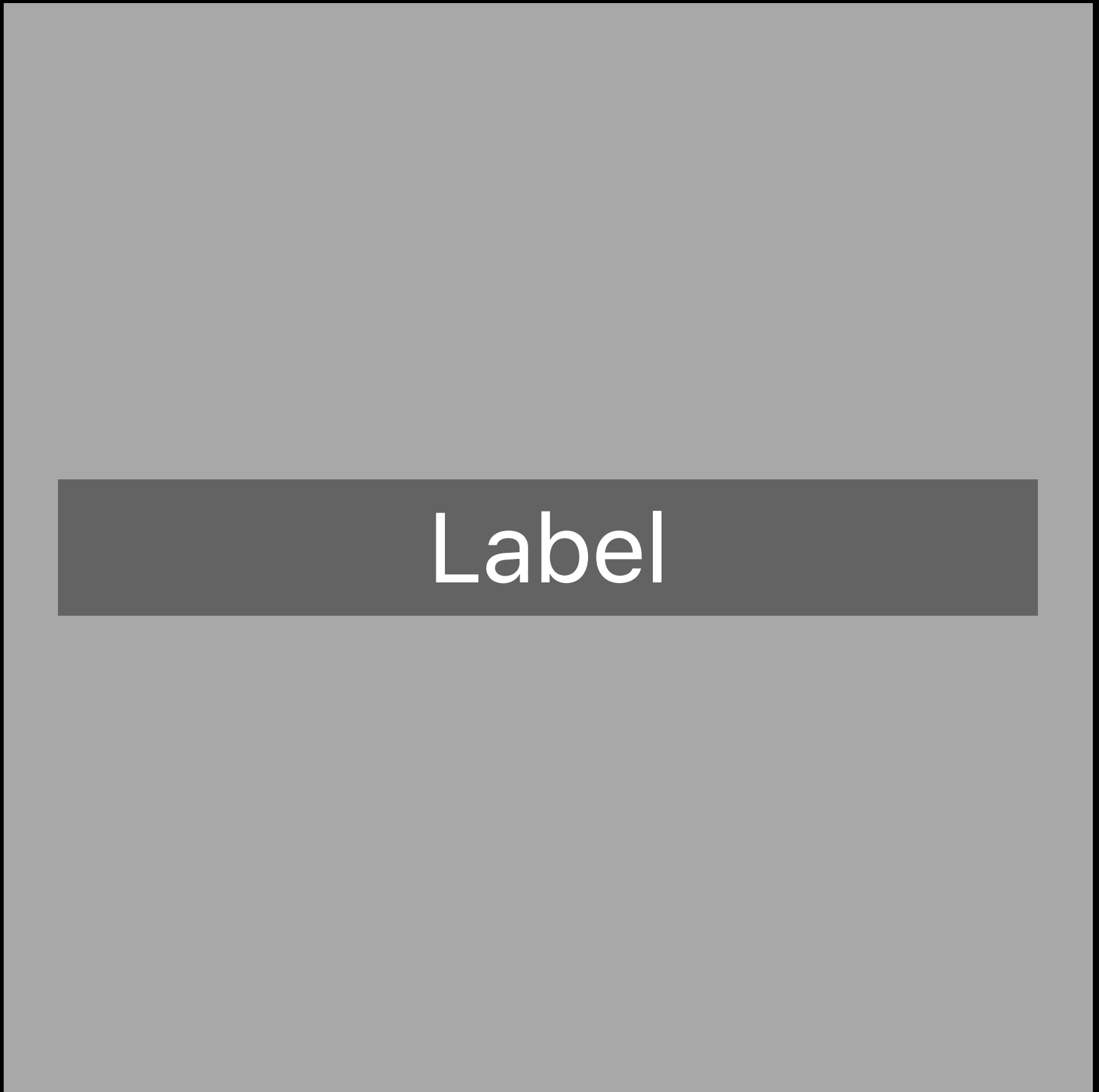
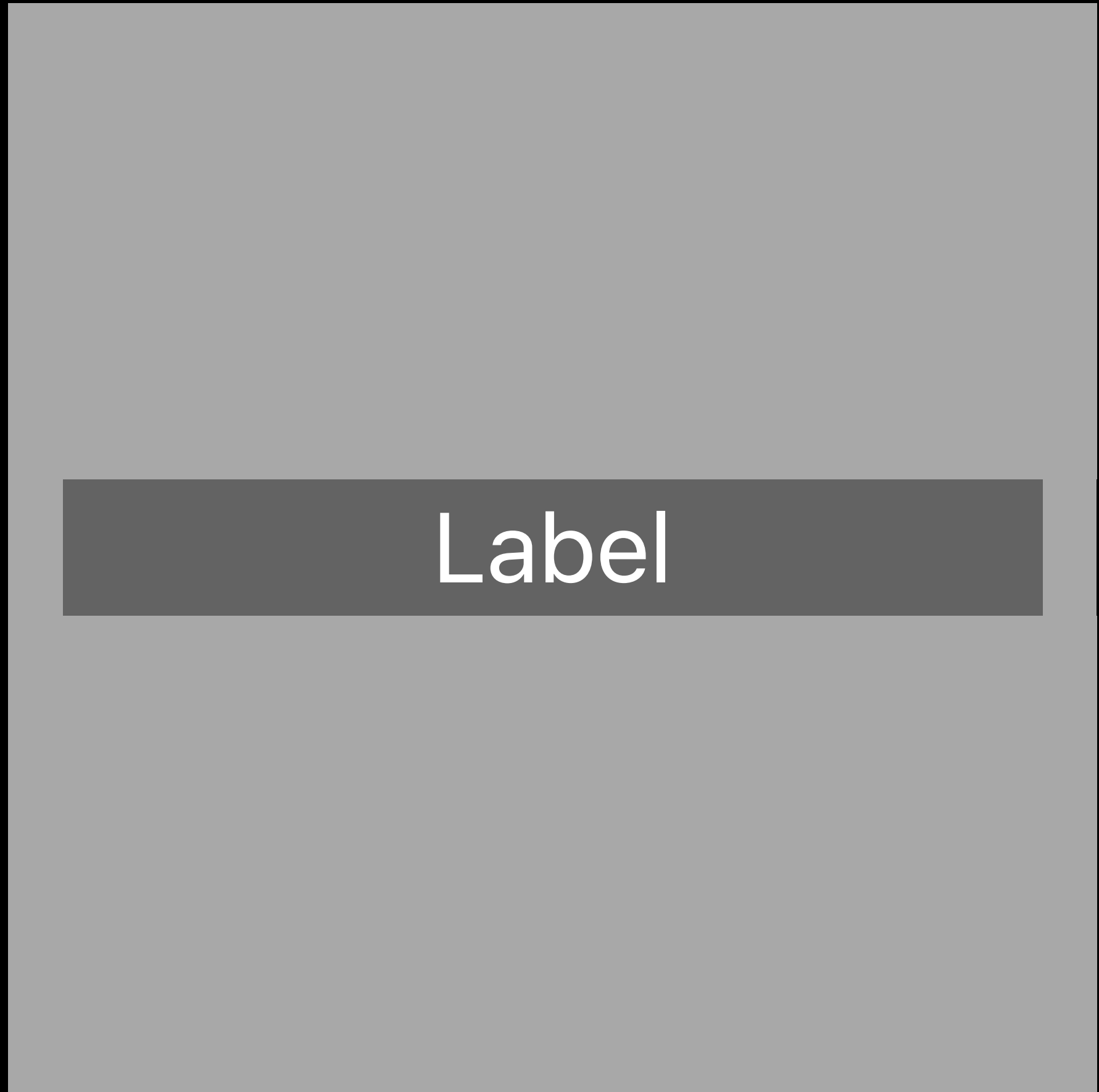
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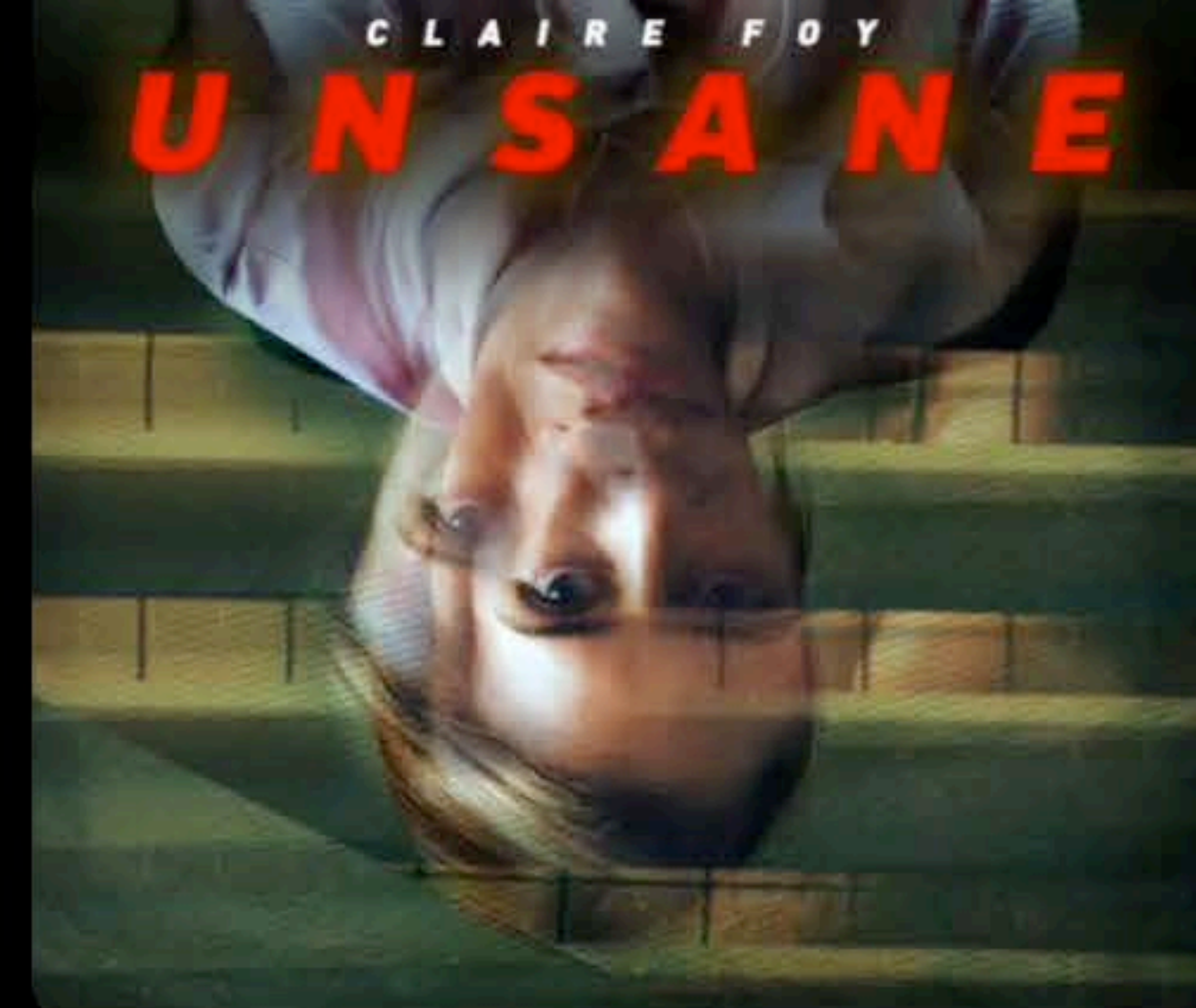


NEW

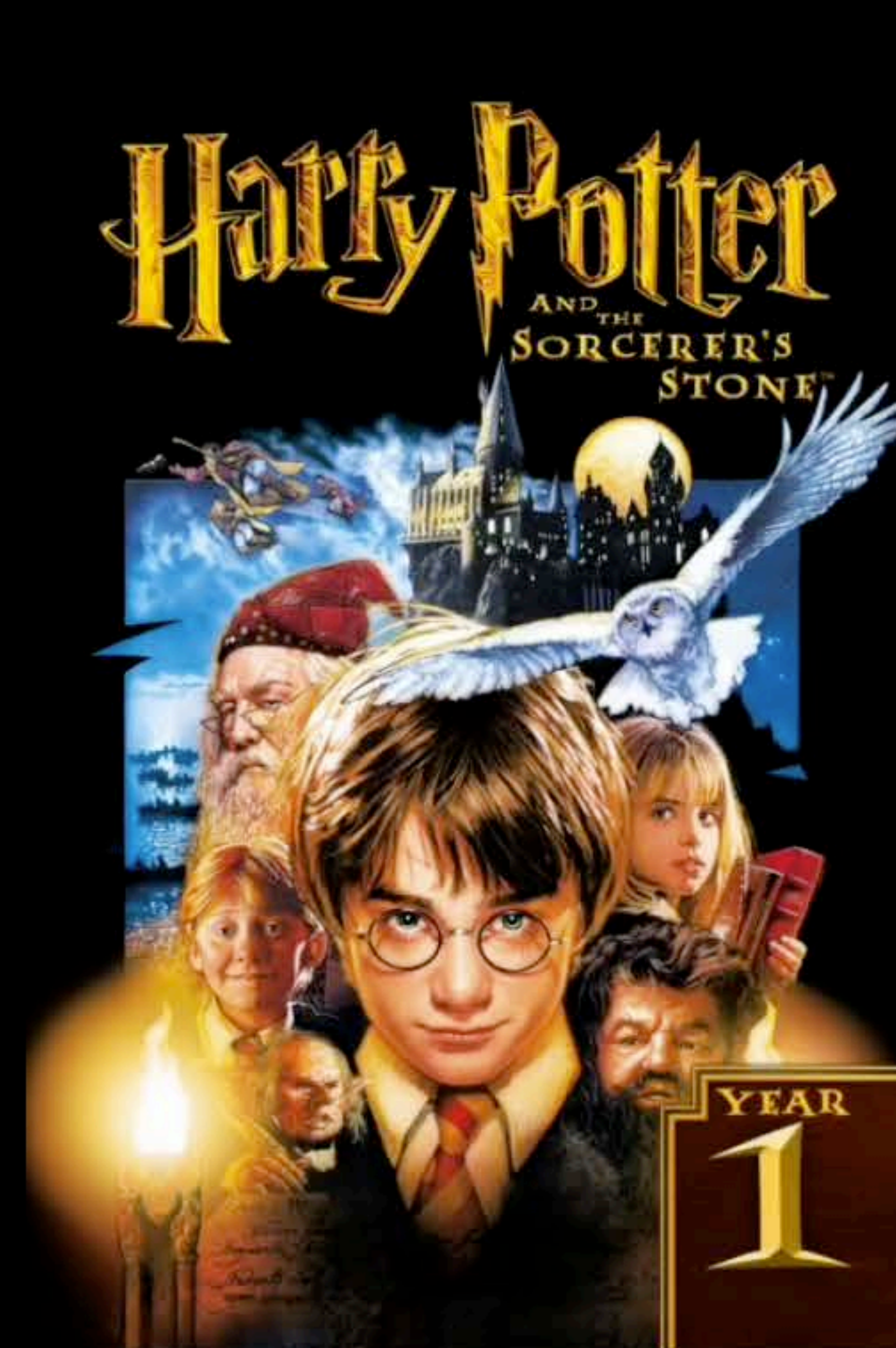
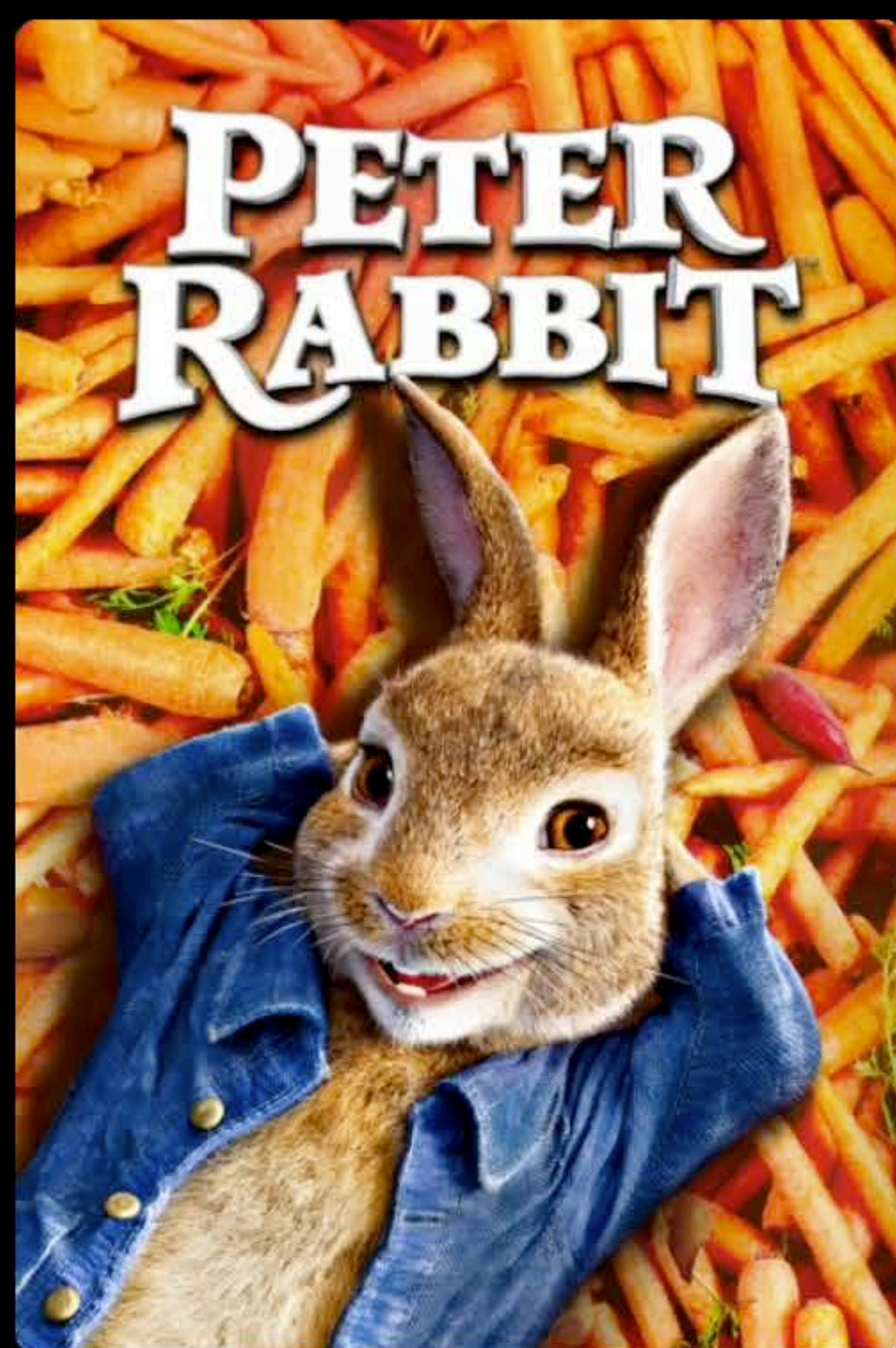






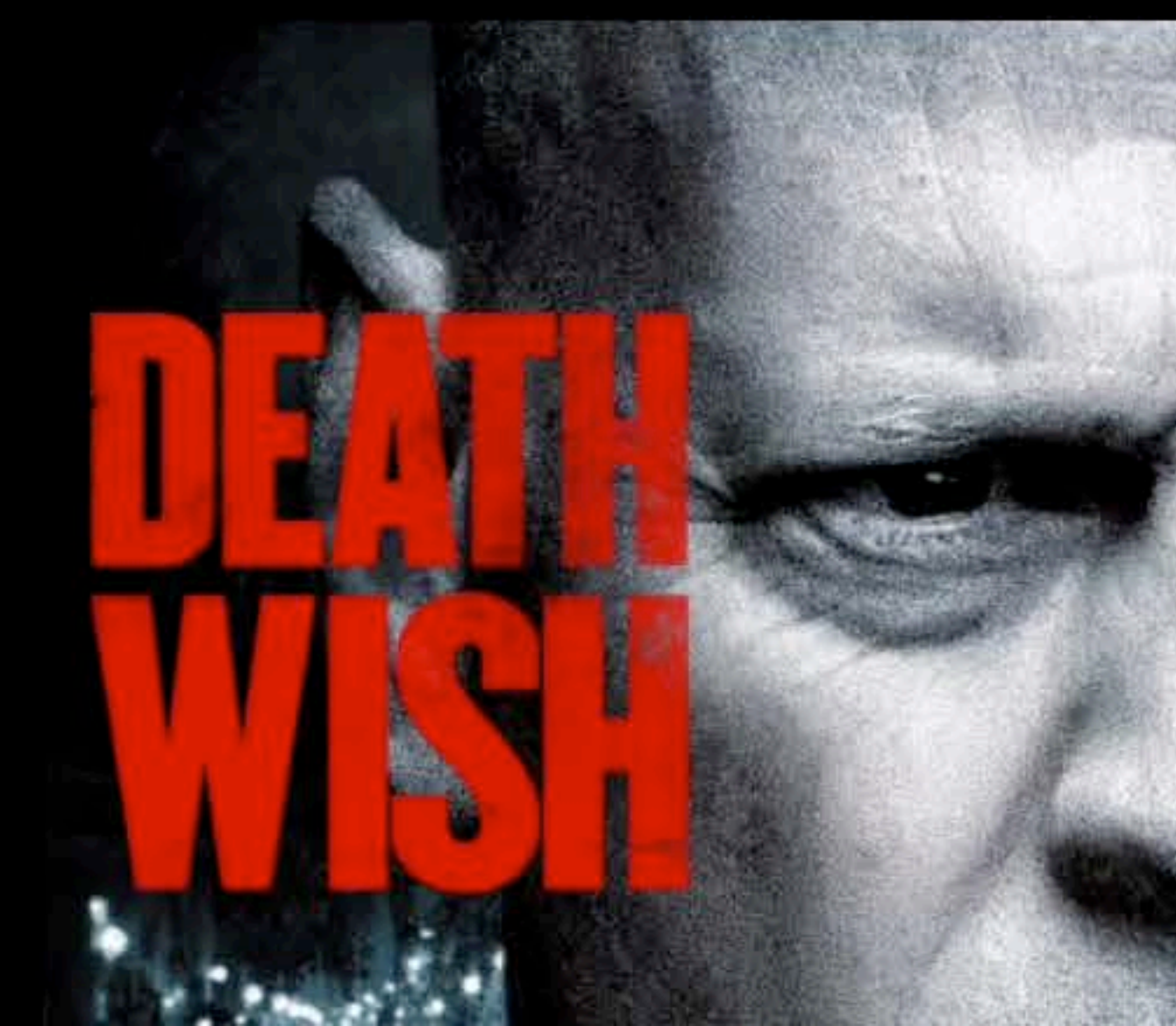


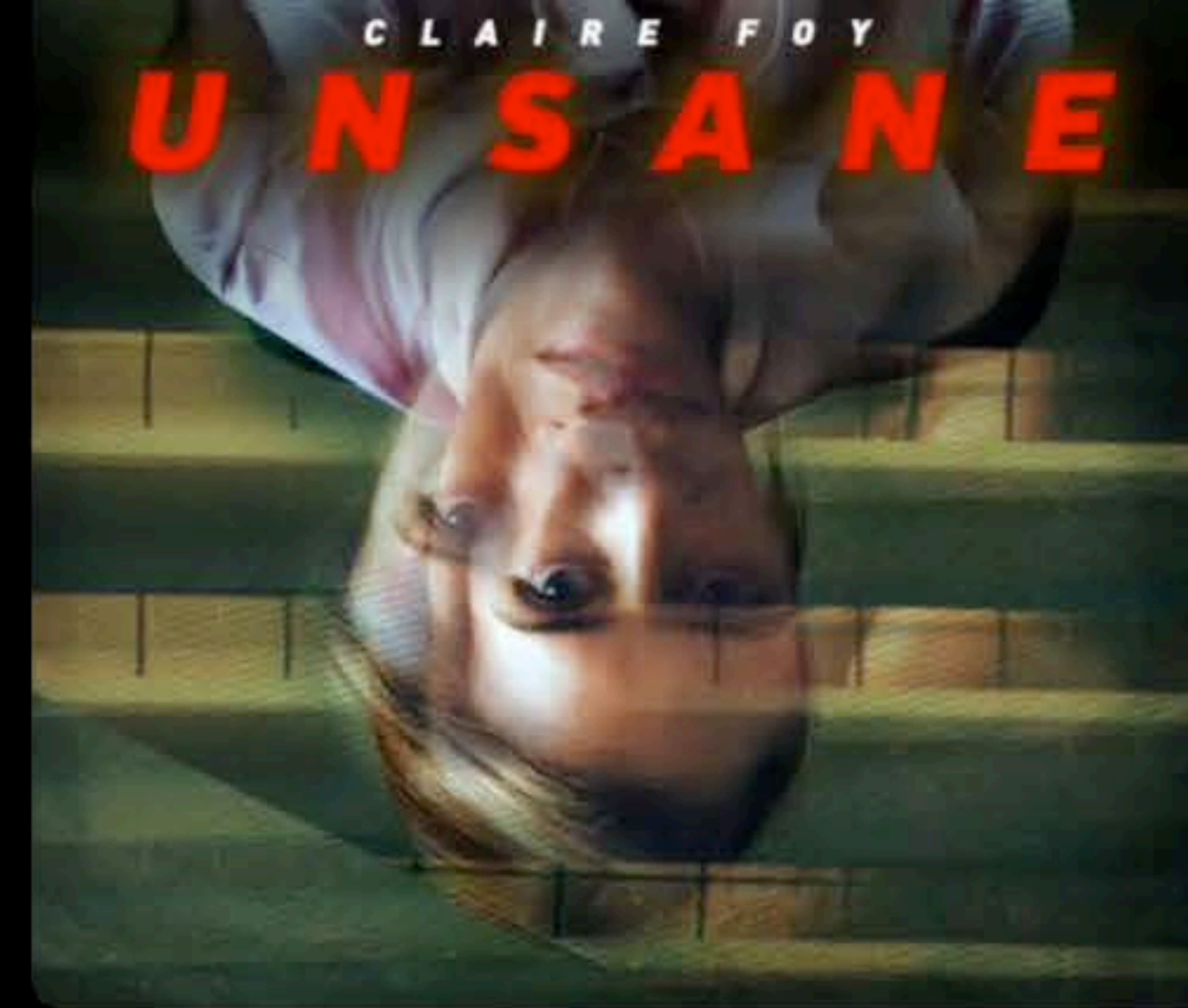
Kids & Family



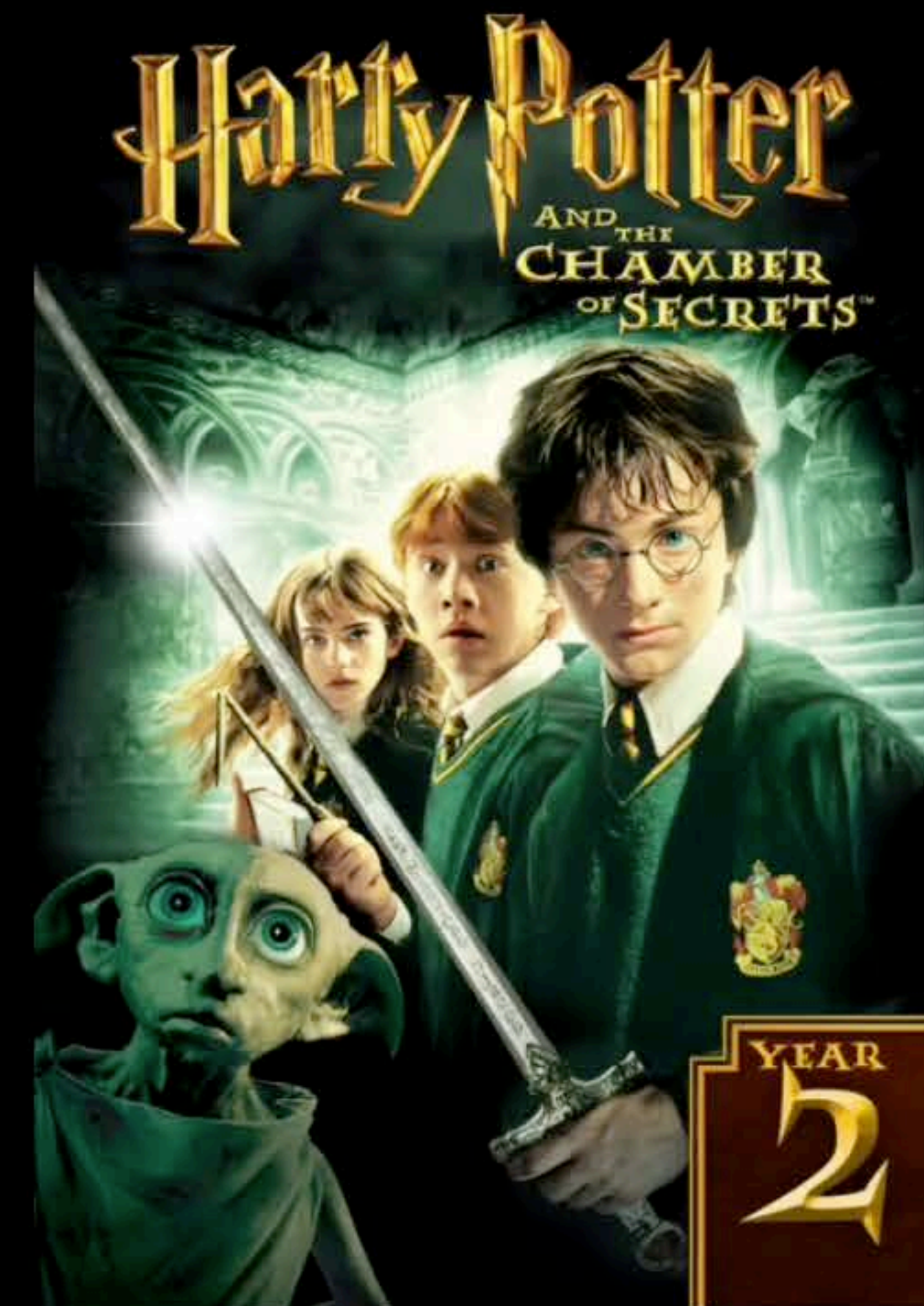
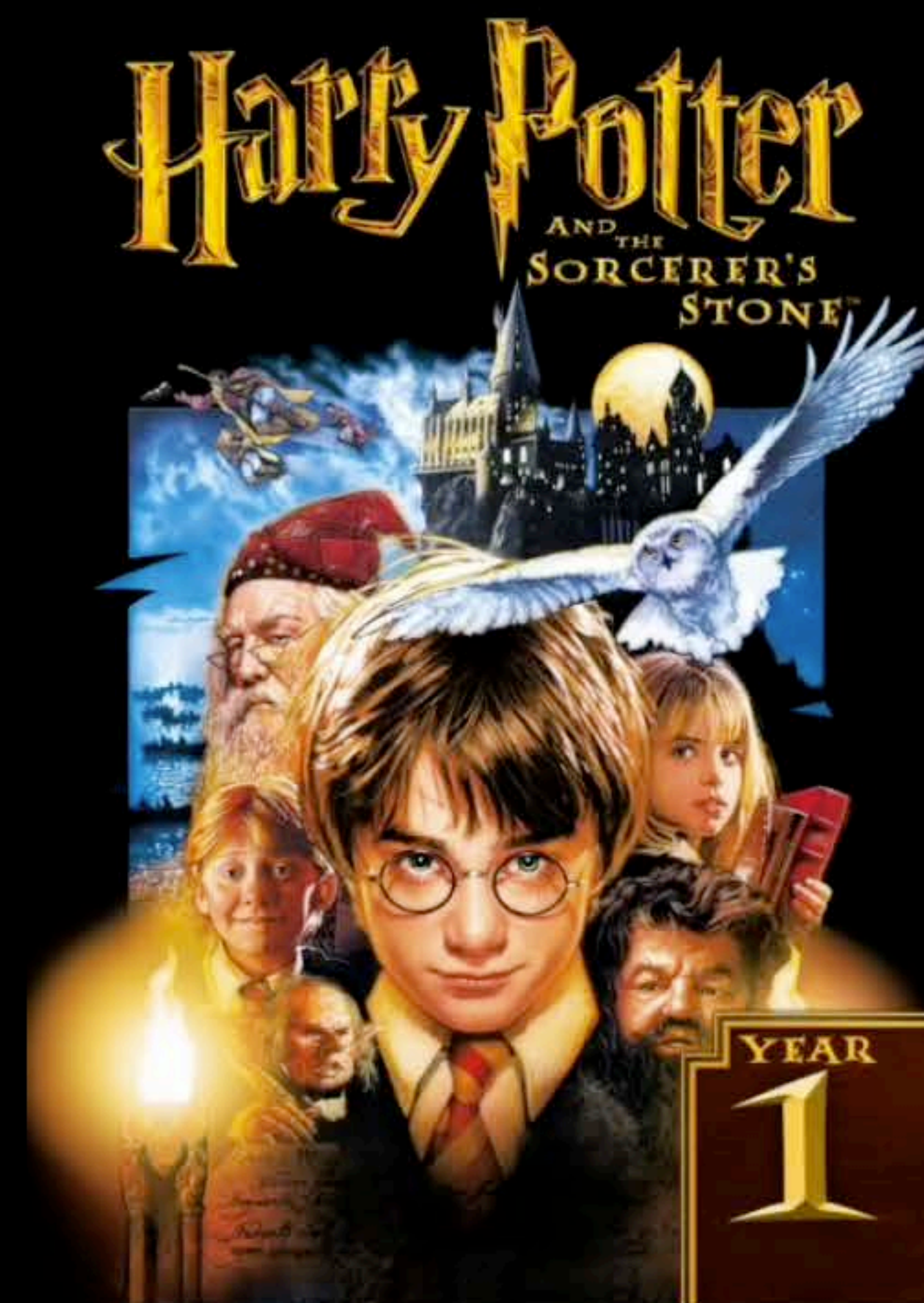
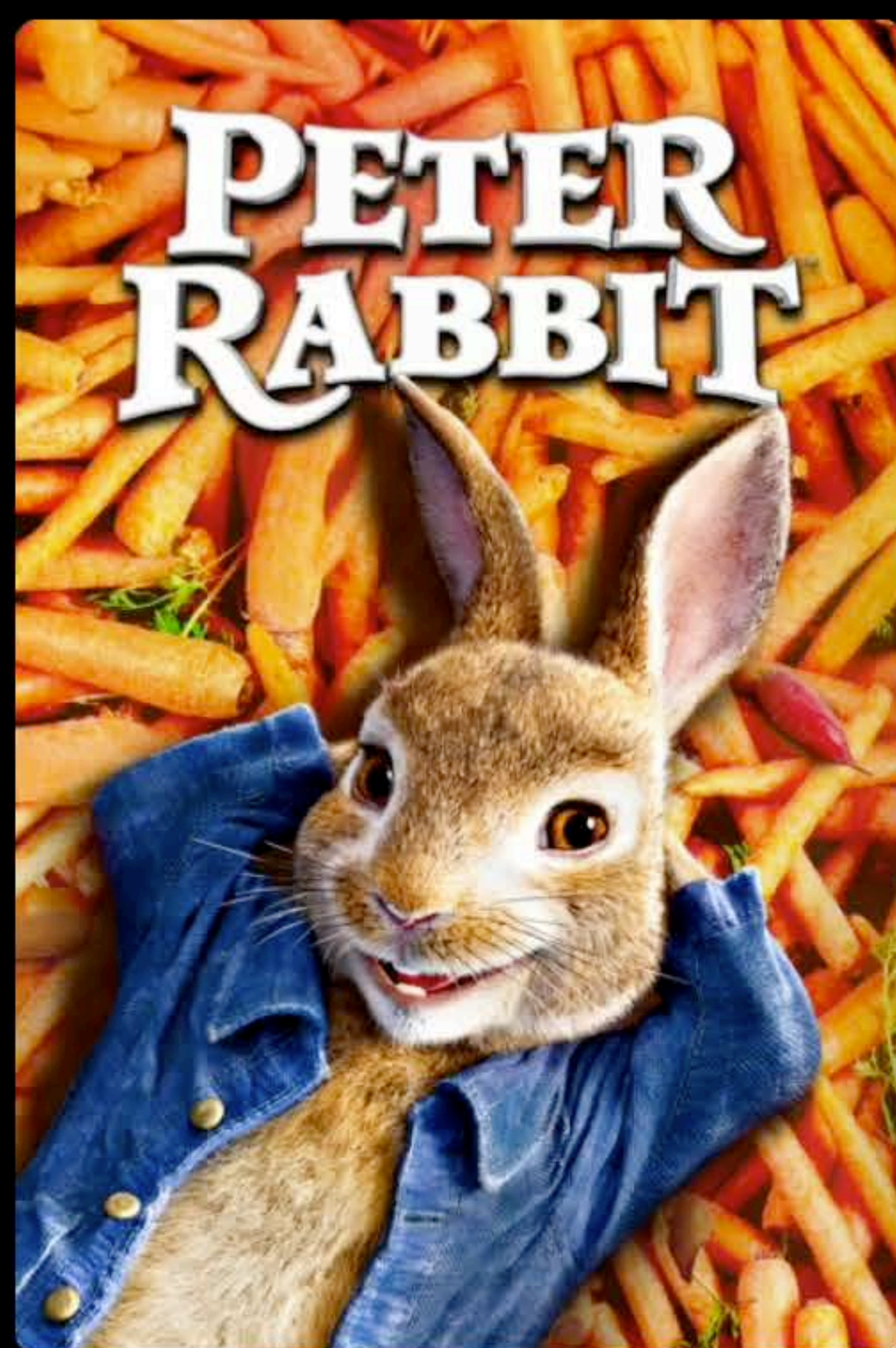
Ferdinand

Action & Adventure



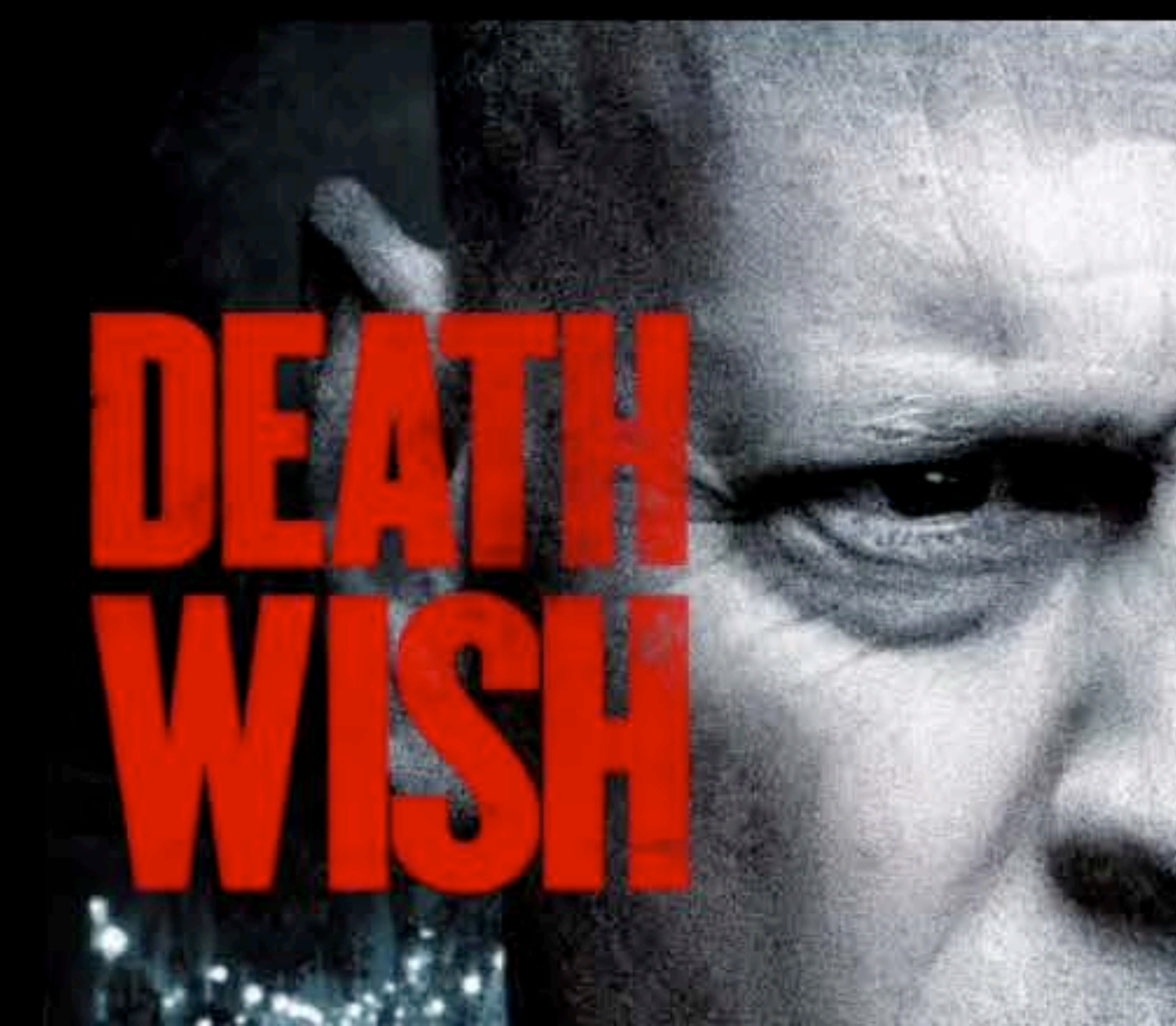


Kids & Family



Ferdinand

Action & Adventure





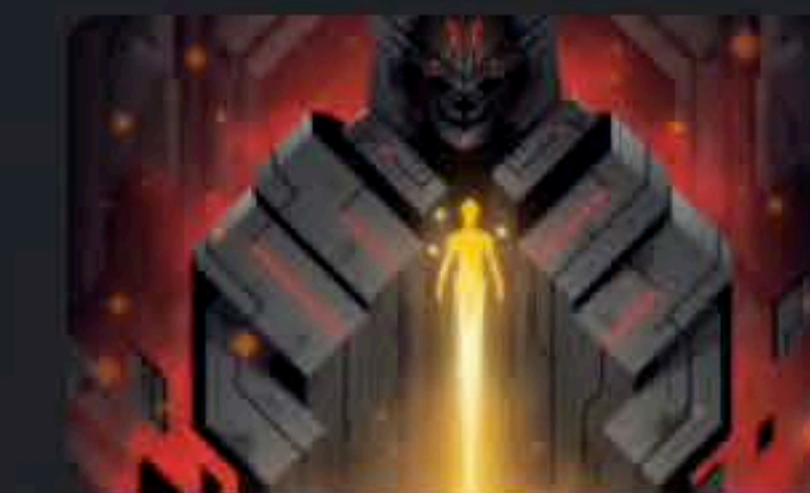
Hidden Folks
Games

\$3.99



Mushroom Guardian
Games

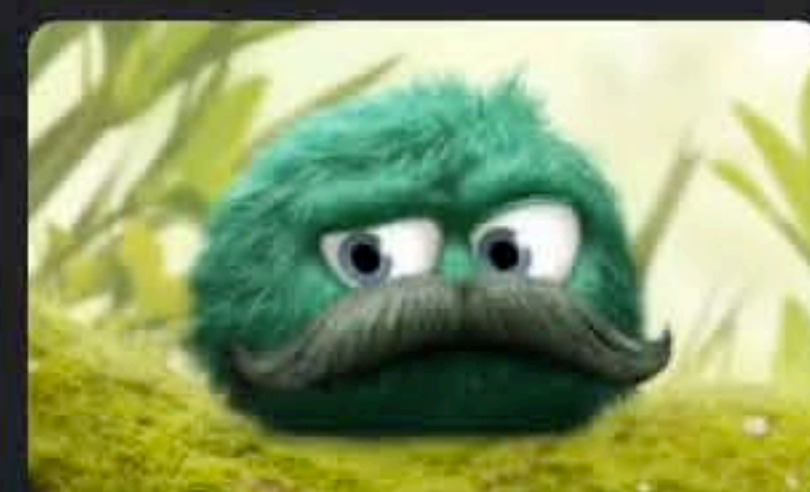
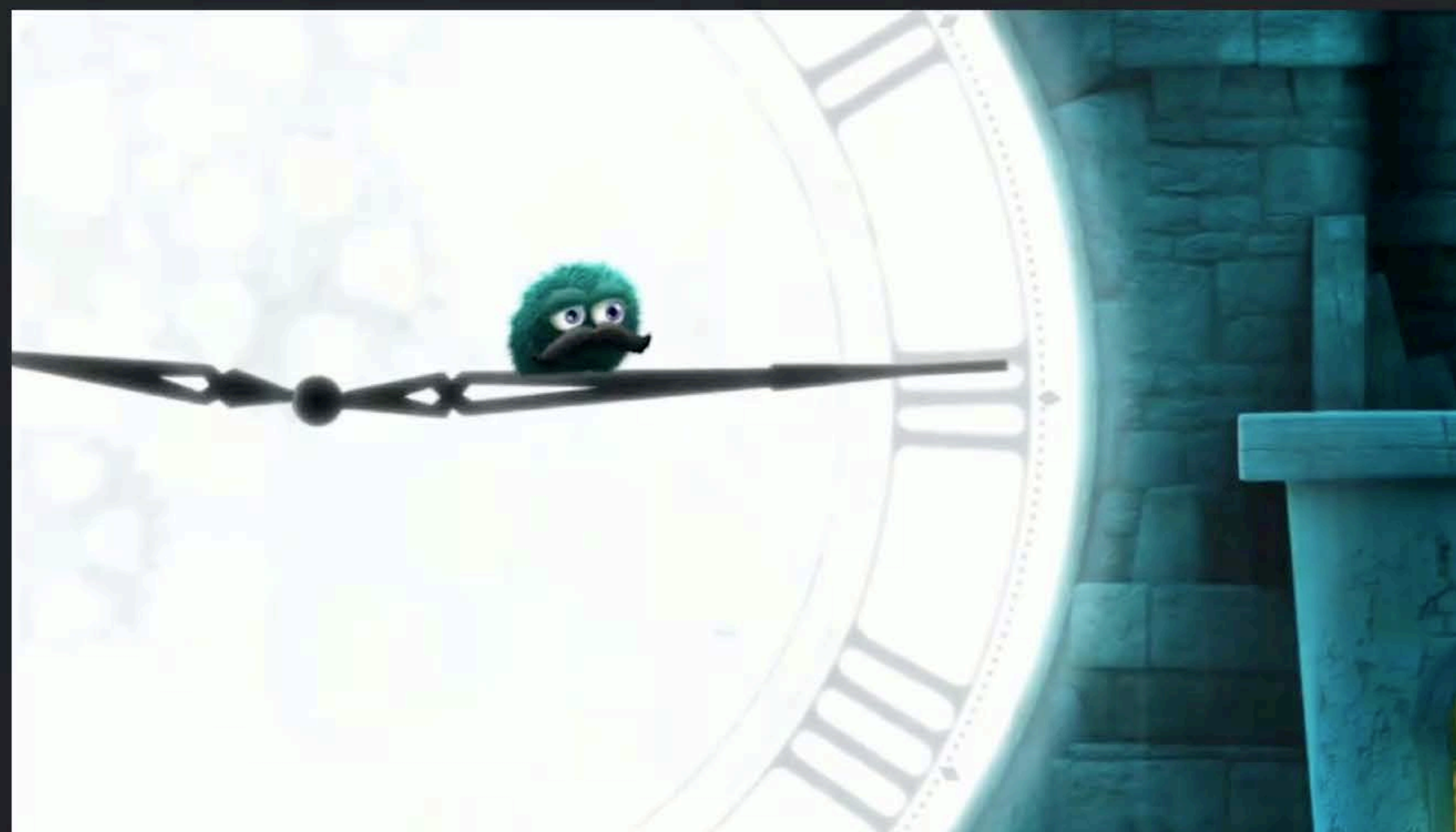
\$1.99



Hyperforma
Games

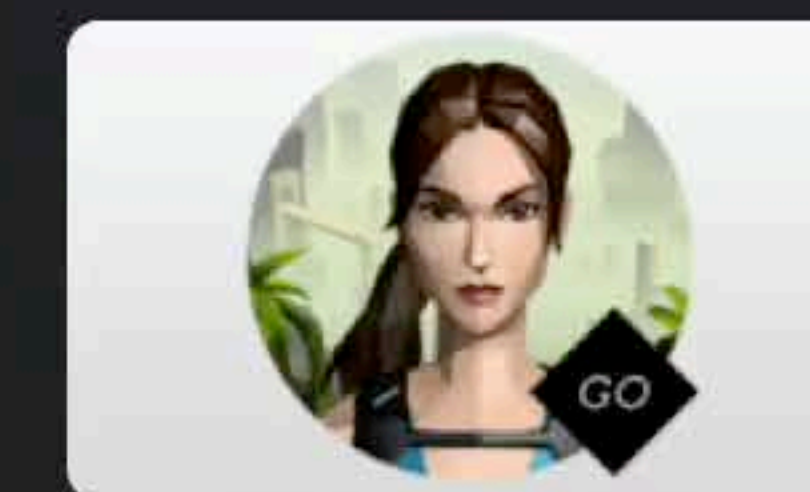
Editors' Choice

DARK ECHO

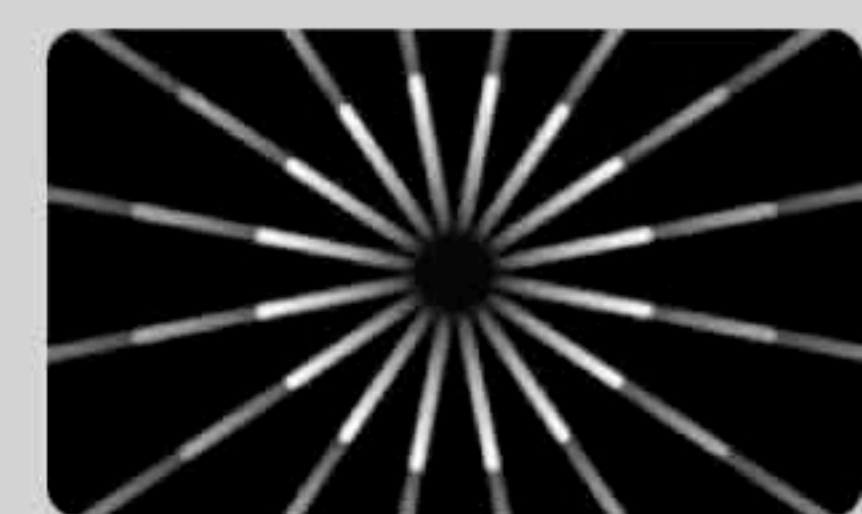


Leo's Fortune
Games

\$4.99



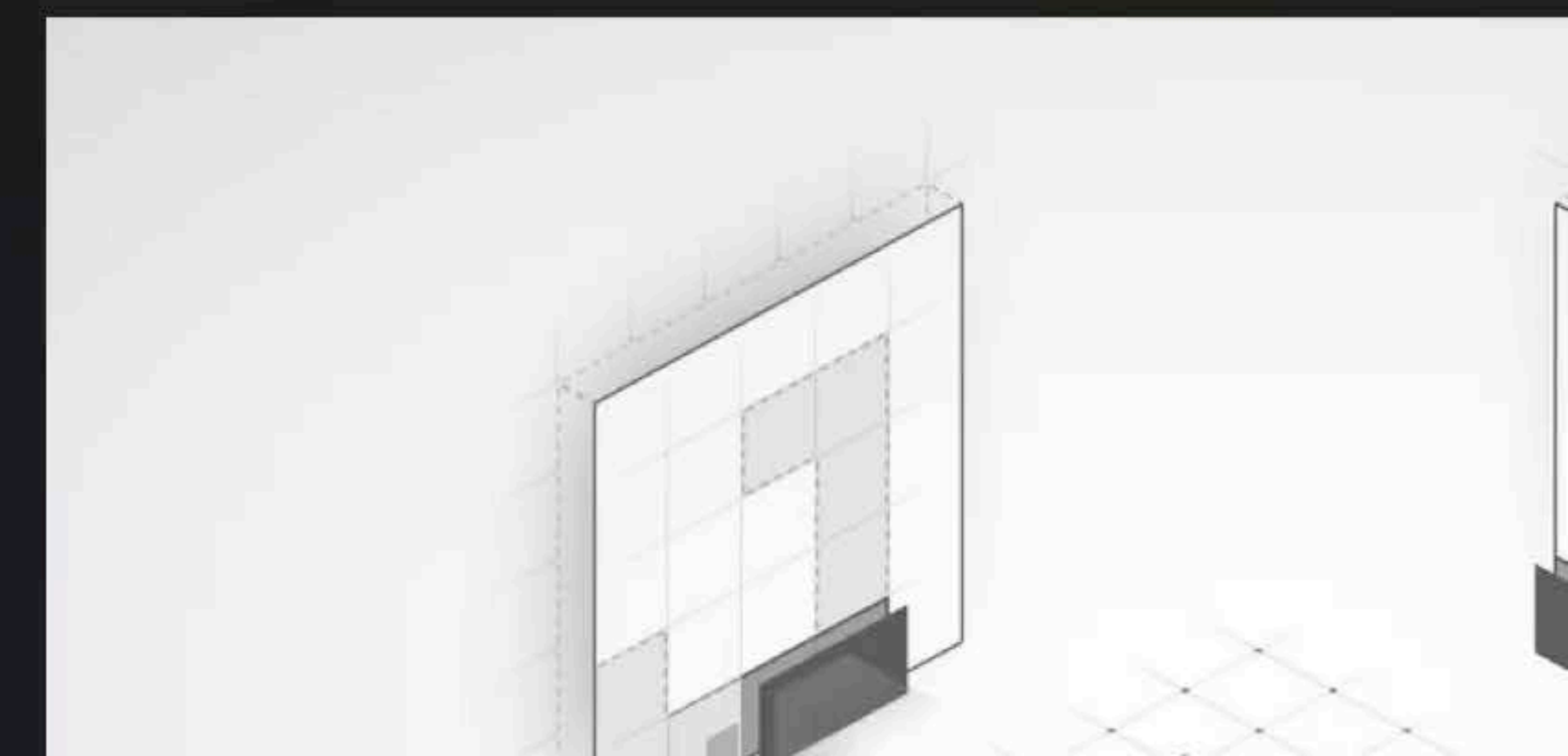
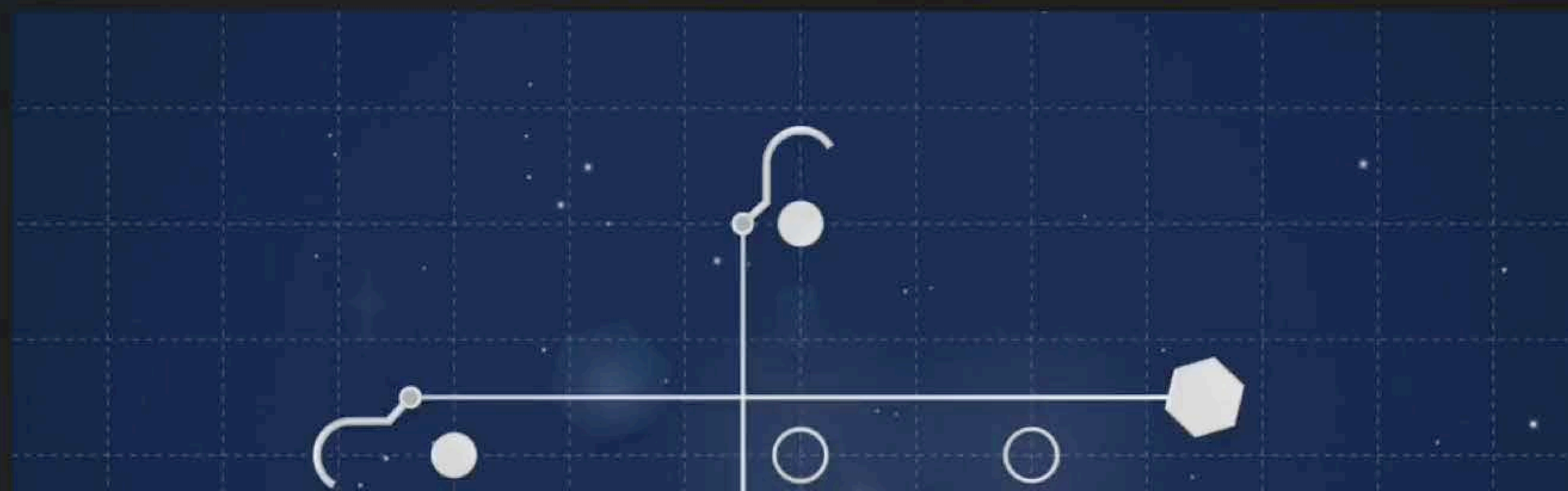
Lara Croft GO
Games



Dark Echo
Games

\$1.99

Feeling Puzzled?





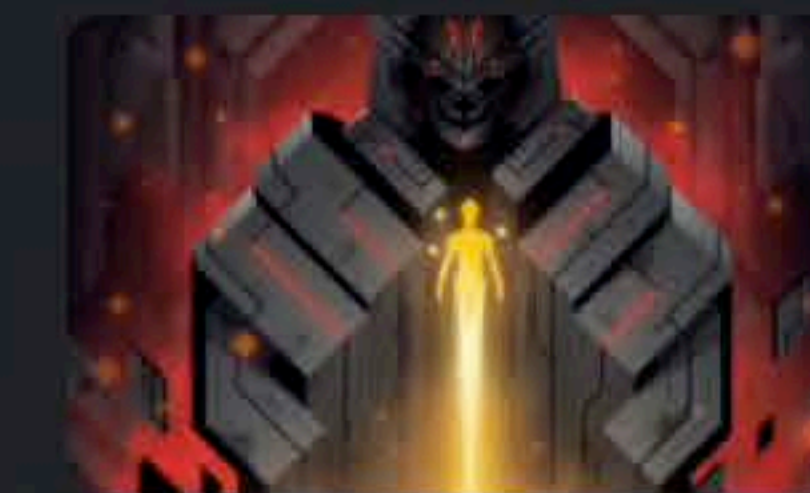
Hidden Folks Games

\$3.99



Mushroom Guardian Games

\$1.99



Hyperforma Games

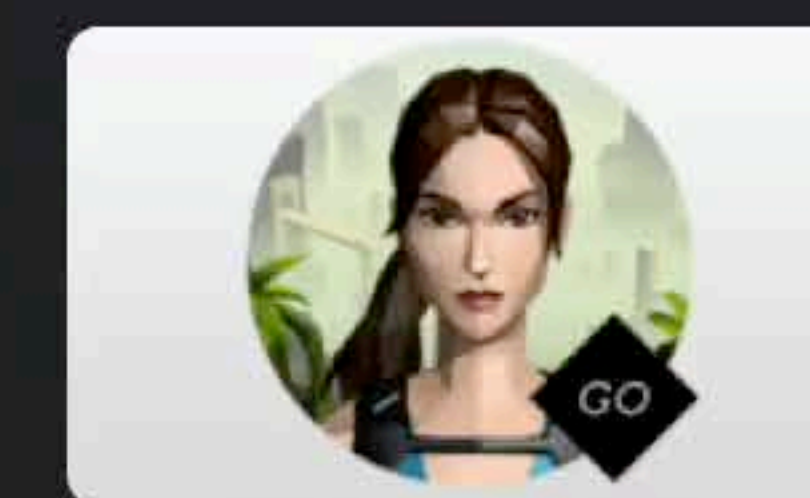
Editors' Choice

DARK ECHO

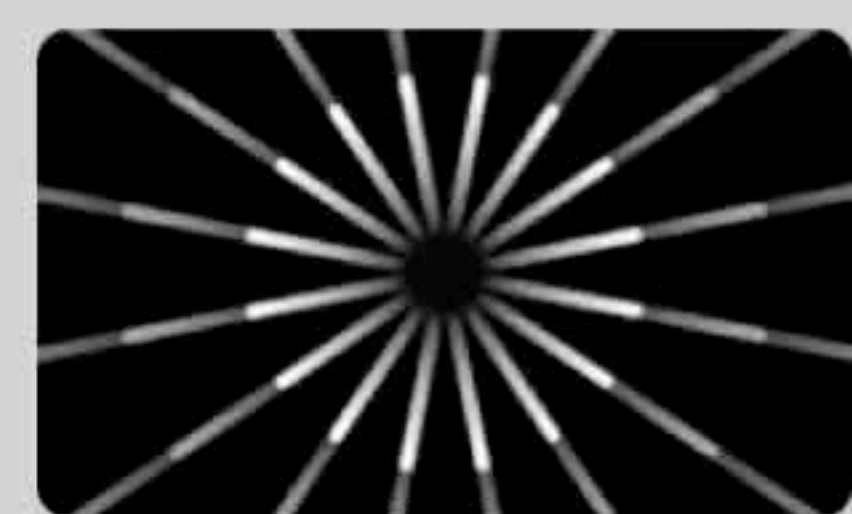


Leo's Fortune Games

\$4.99



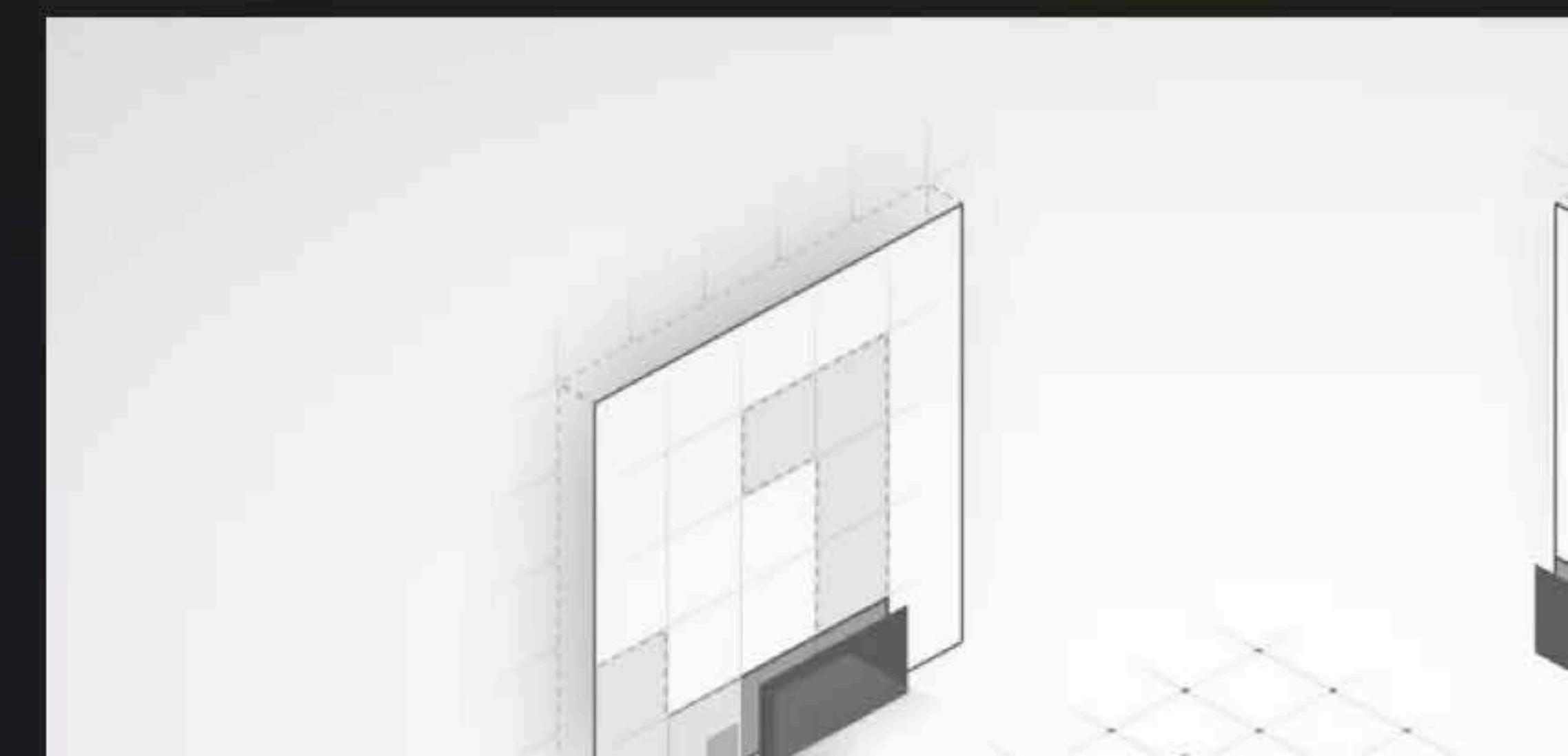
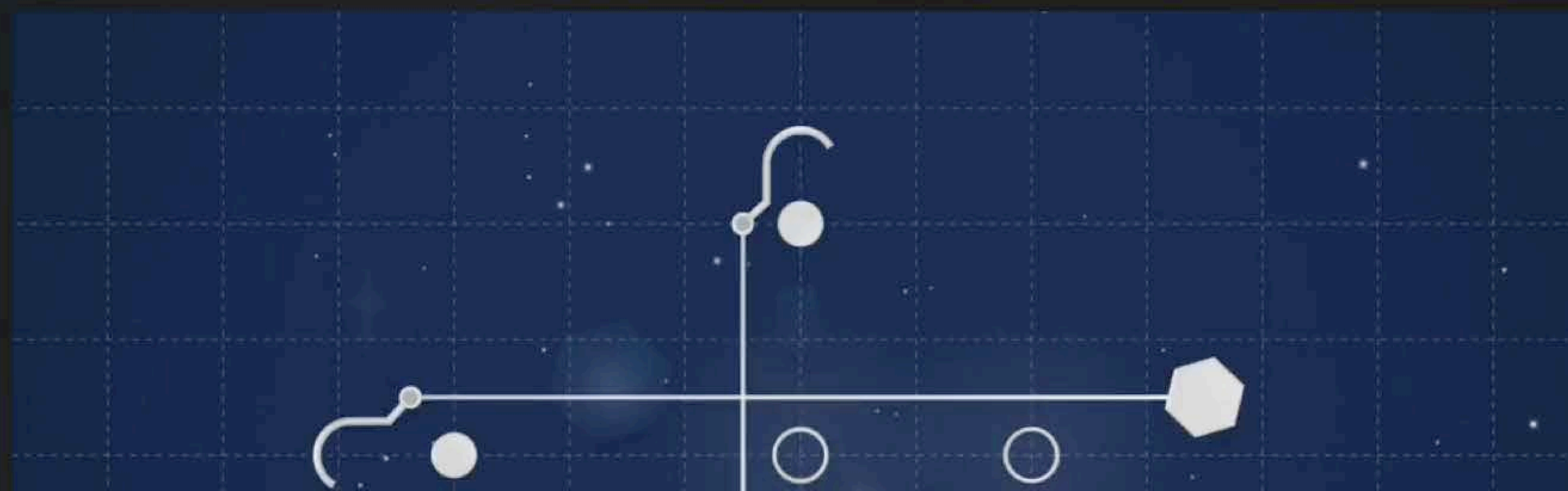
Lara Croft GO Games



Dark Echo Games

\$1.99

Feeling Puzzled?



The Post

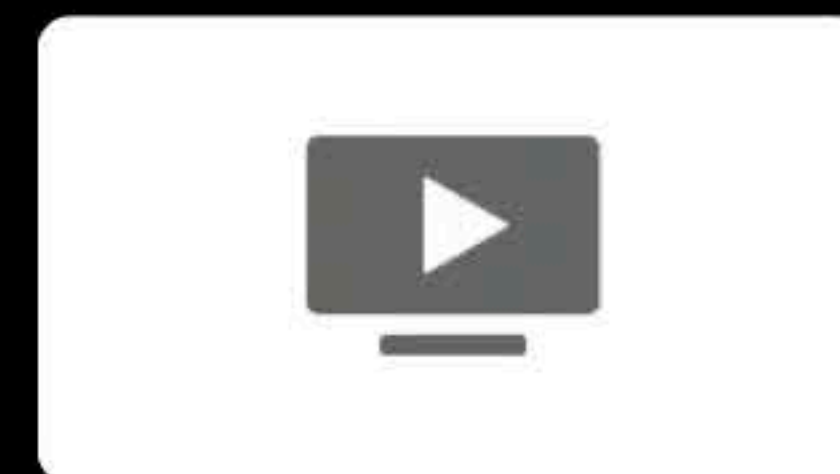
GENRE
Drama

PG-13 ✓13+ 🍌87% 1 hr 56 min 2018 **4K** **HDR** **CC** **SDH** **AD**

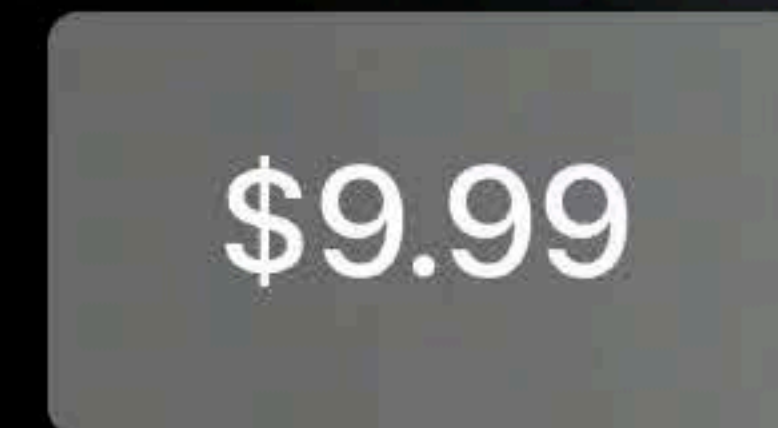
DIRECTOR
Steven Spielberg

Steven Spielberg directs Meryl Streep and Tom Hanks in **THE POST**, a thrilling drama about the unlikely partnership of Katharine Graham (Streep), the first female publisher of The Washington Post, and its driven editor Ben Bradlee (Hanks), as they race to catch up with The New York Times to... [MORE](#)

STARRING
Meryl Streep
Tom Hanks
Sarah Paulson
Bob Odenkirk
Tracy Letts



Preview



Buy

With iTunes Extras



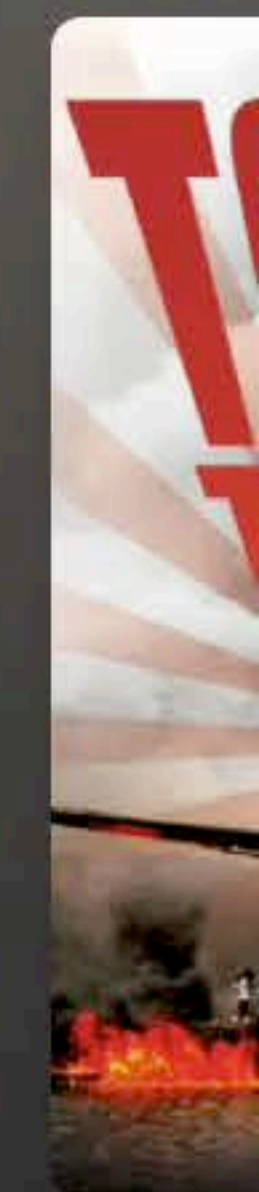
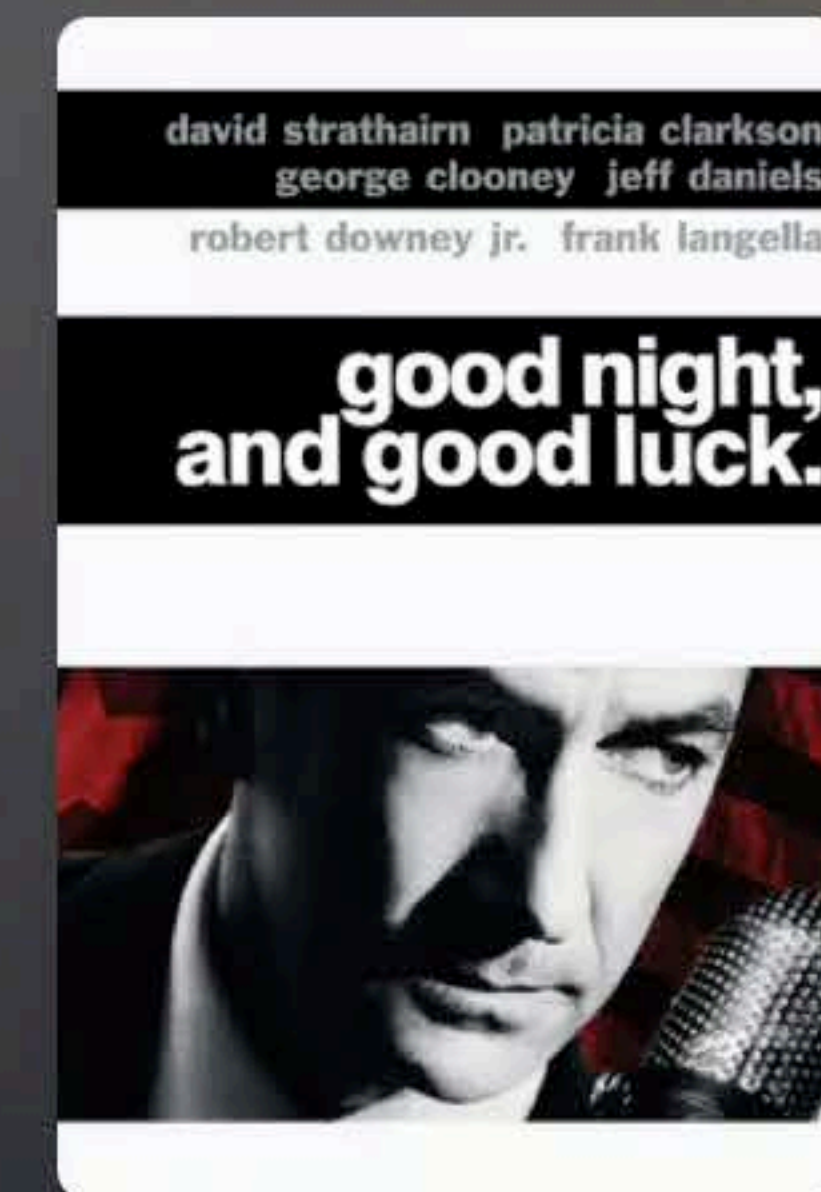
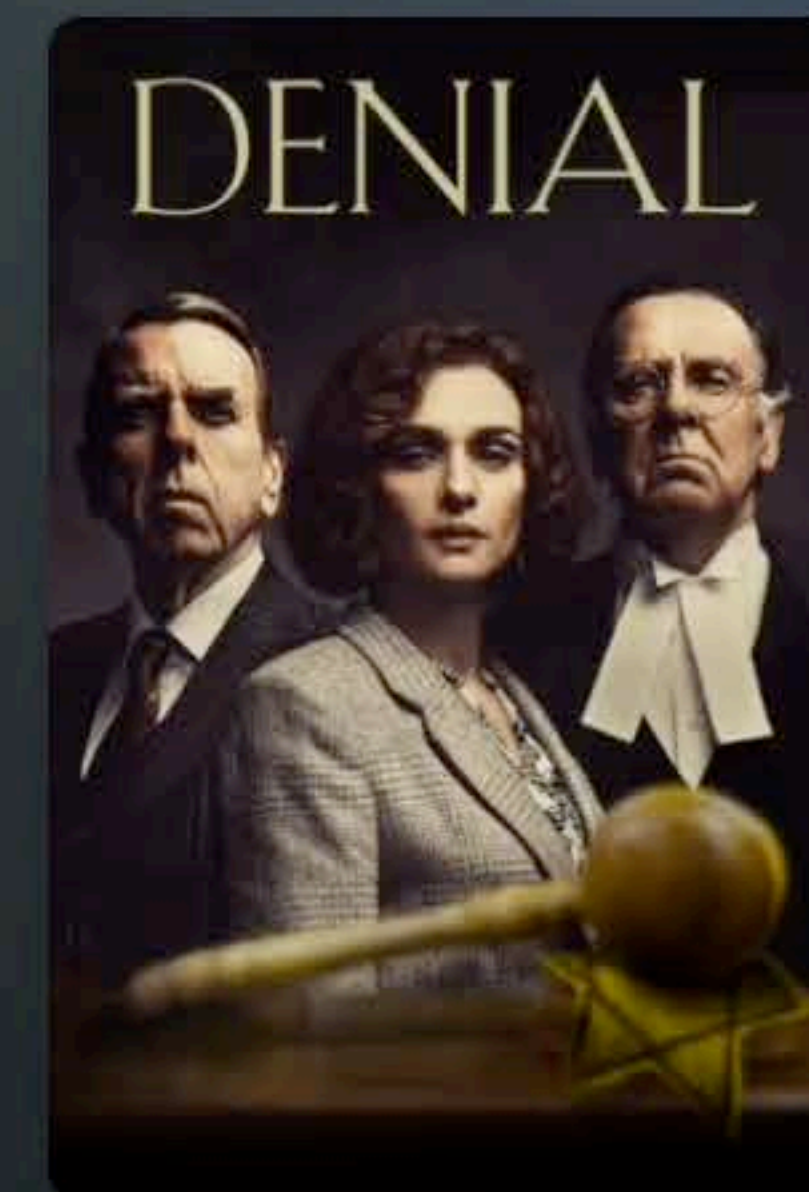
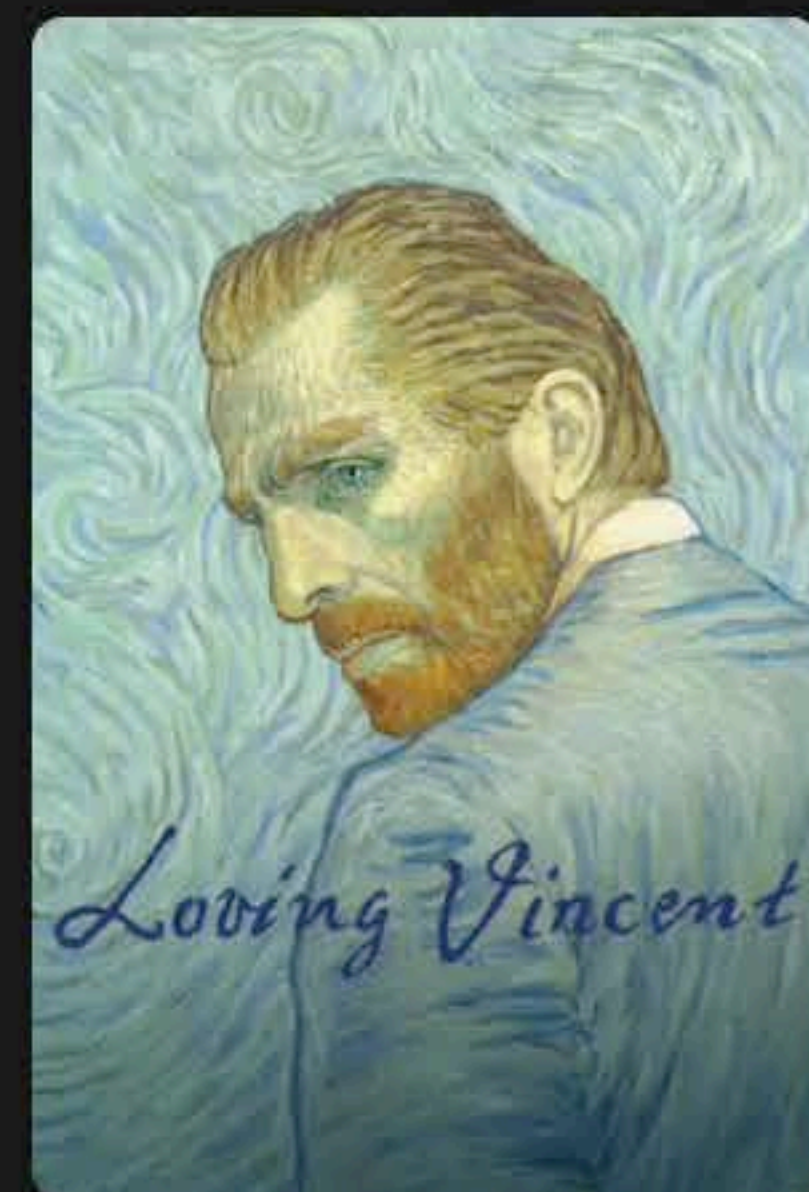
\$5.99

Rent



Wish List

Viewers Also Watched



The Post

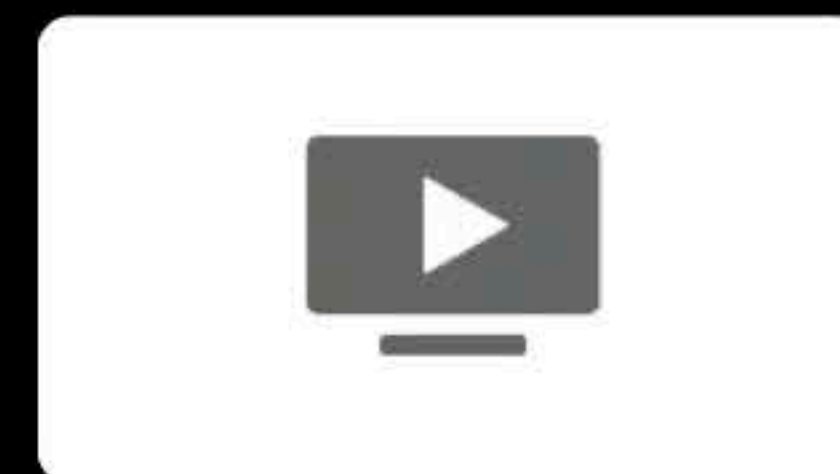
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Drama

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STARRING
Meryl Streep
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Sarah Paulson
Bob Odenkirk
Tracy Letts



Preview



Buy

With iTunes Extras



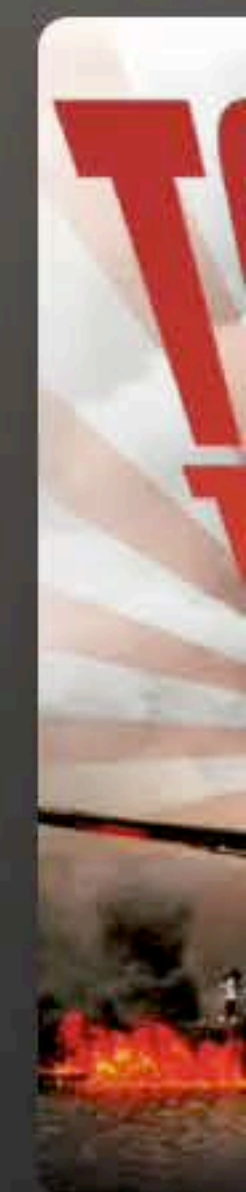
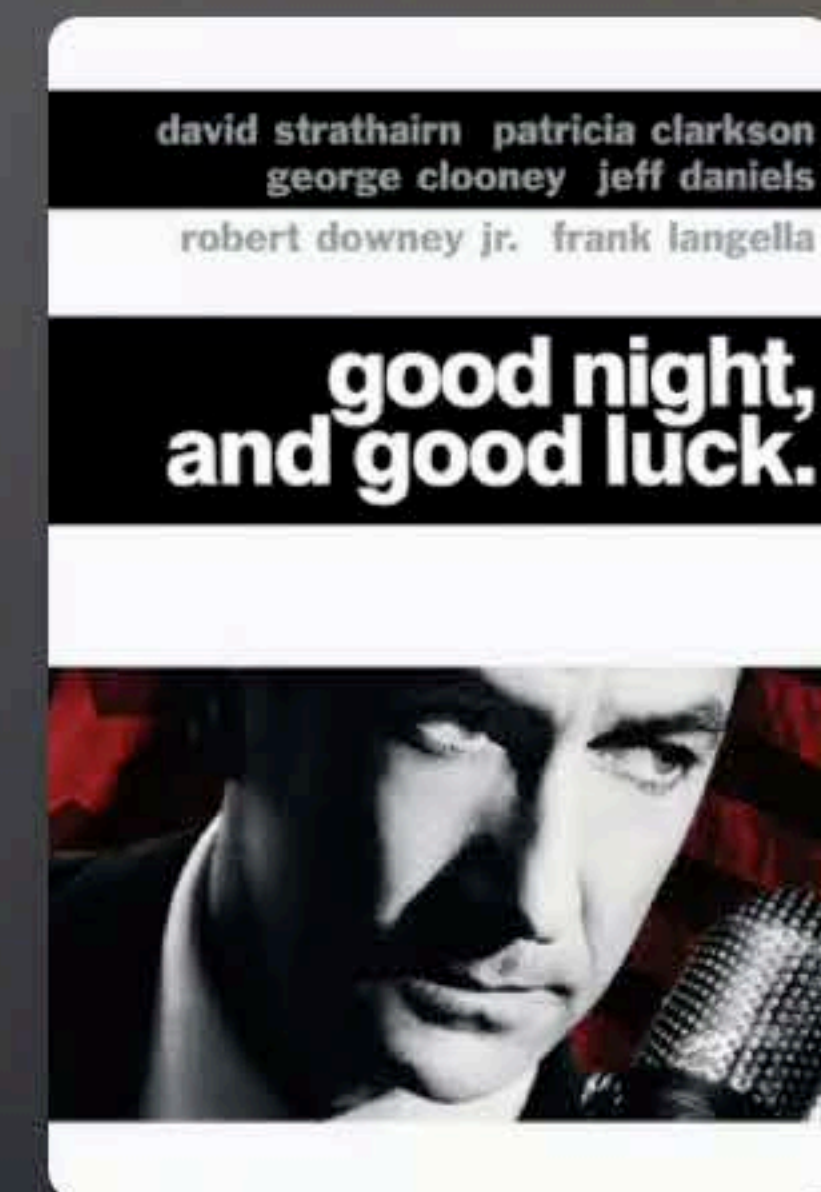
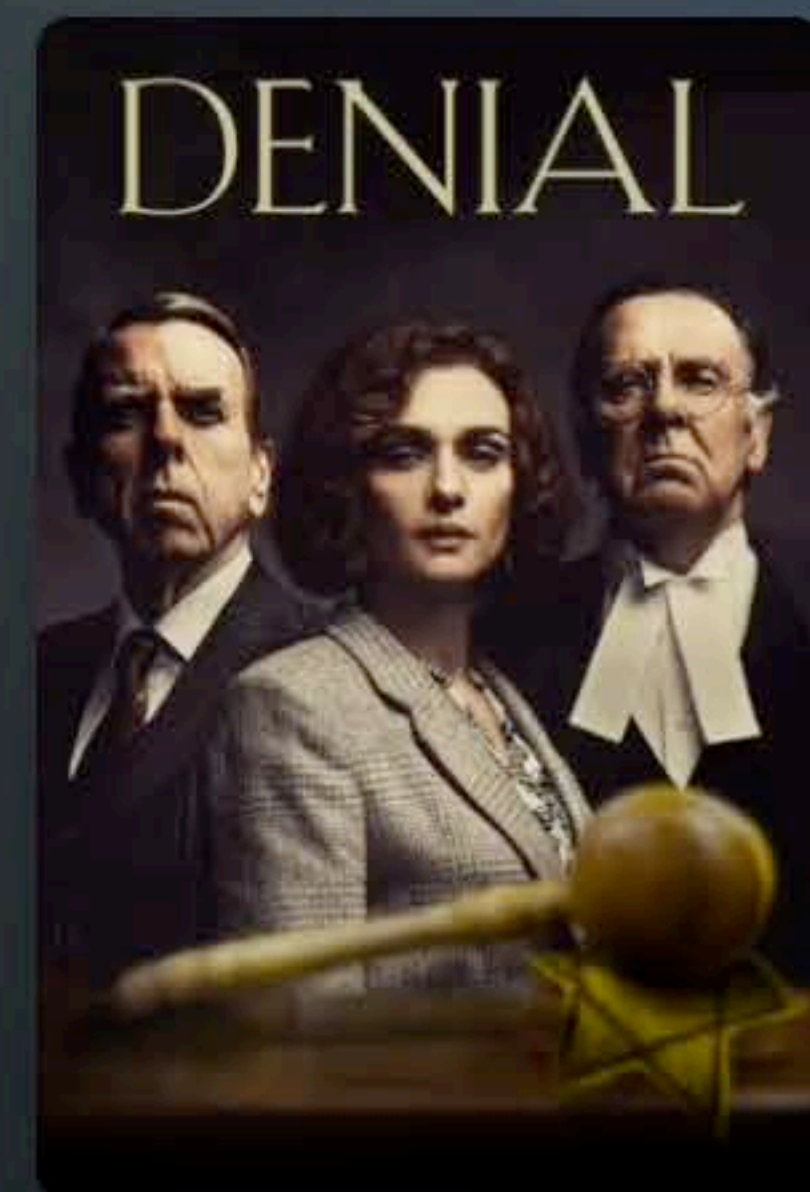
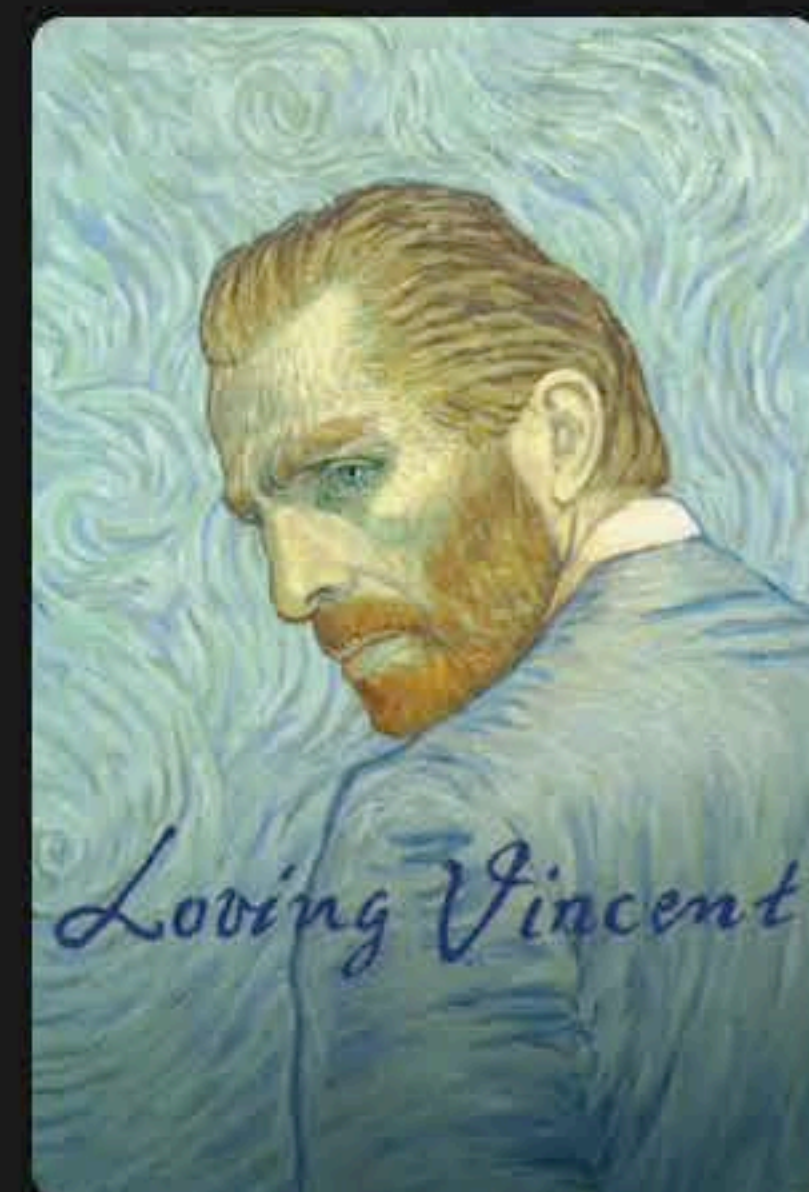
\$5.99

Rent



Wish List

Viewers Also Watched



Cast & Crew



Alicia Buchinski
ACTOR



Alvin Kwon
DIRECTOR



Cyrus Kimber
ACTOR



Dorothy Gooseff
ACTOR



Eliza Izzarelli
ACTOR



Franklin Elfvin
ACTOR

Information

Studio	Lone Bird
Genre	Drama
Released	June 5, 2018
Run Time	1 hr 38 min
Format	Widescreen
Rated	PG-13 for prolonged sequences of action violence, and a brief rude gesture.

© 2018 Lone Bird

Languages

Primary	English (Dolby Digital Plus 7.1, Dolby Digital 5.1, Subtitles, CC, AD)
Additional	Arabic (Subtitles) Cantonese (Subtitles) Croatian (Subtitles) Korean (Subtitles) Danish (Subtitles) Dutch (Subtitles) Finnish (Subtitles)

Header

- SDH** Subtitles for the deaf and hard of hearing refer to subtitles in the original language with the addition of relevant nondialog information.
- AD** Audio description refers to a narration track describing what is happening on screen, to provide context for those who are blind or have low vision.

Cast & Crew



Alicia Buchinski
ACTOR



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TVUIKit

NEW

TVUIKit

NEW

Poster

NEW

Poster

Caption Button

NEW

Poster

Caption Button

Card

NEW

Poster

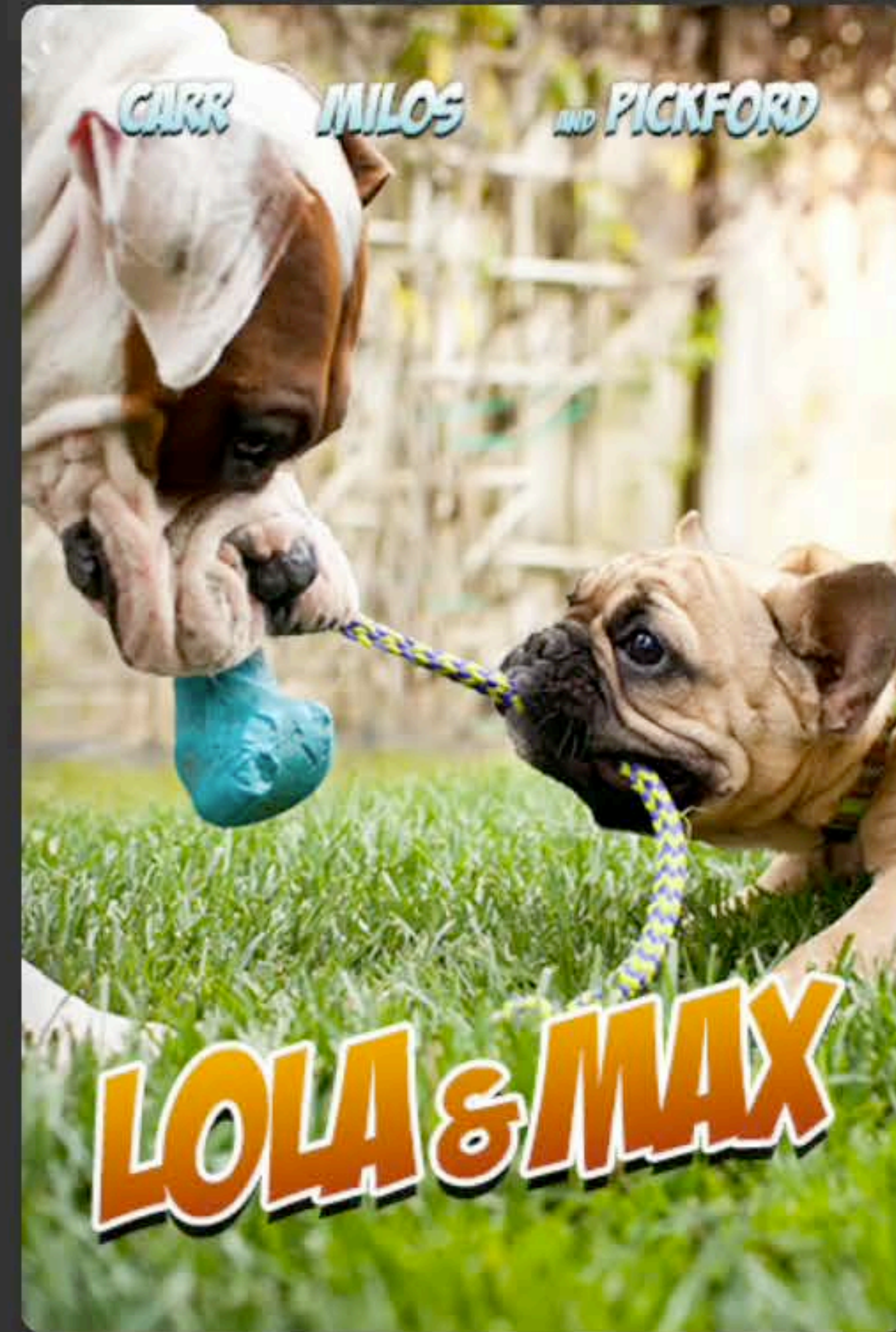
Caption Button

Card

Monogram



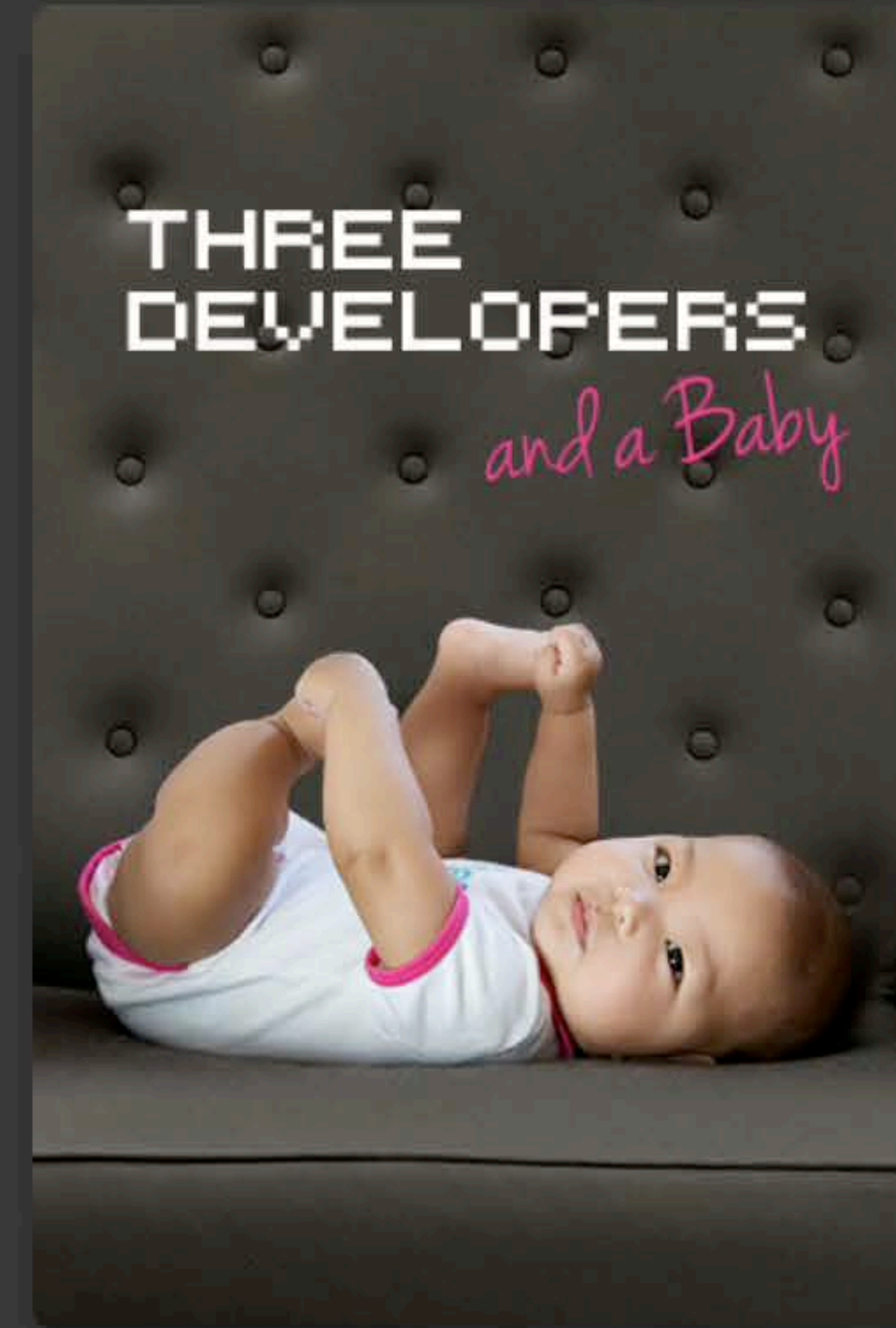
Title 1



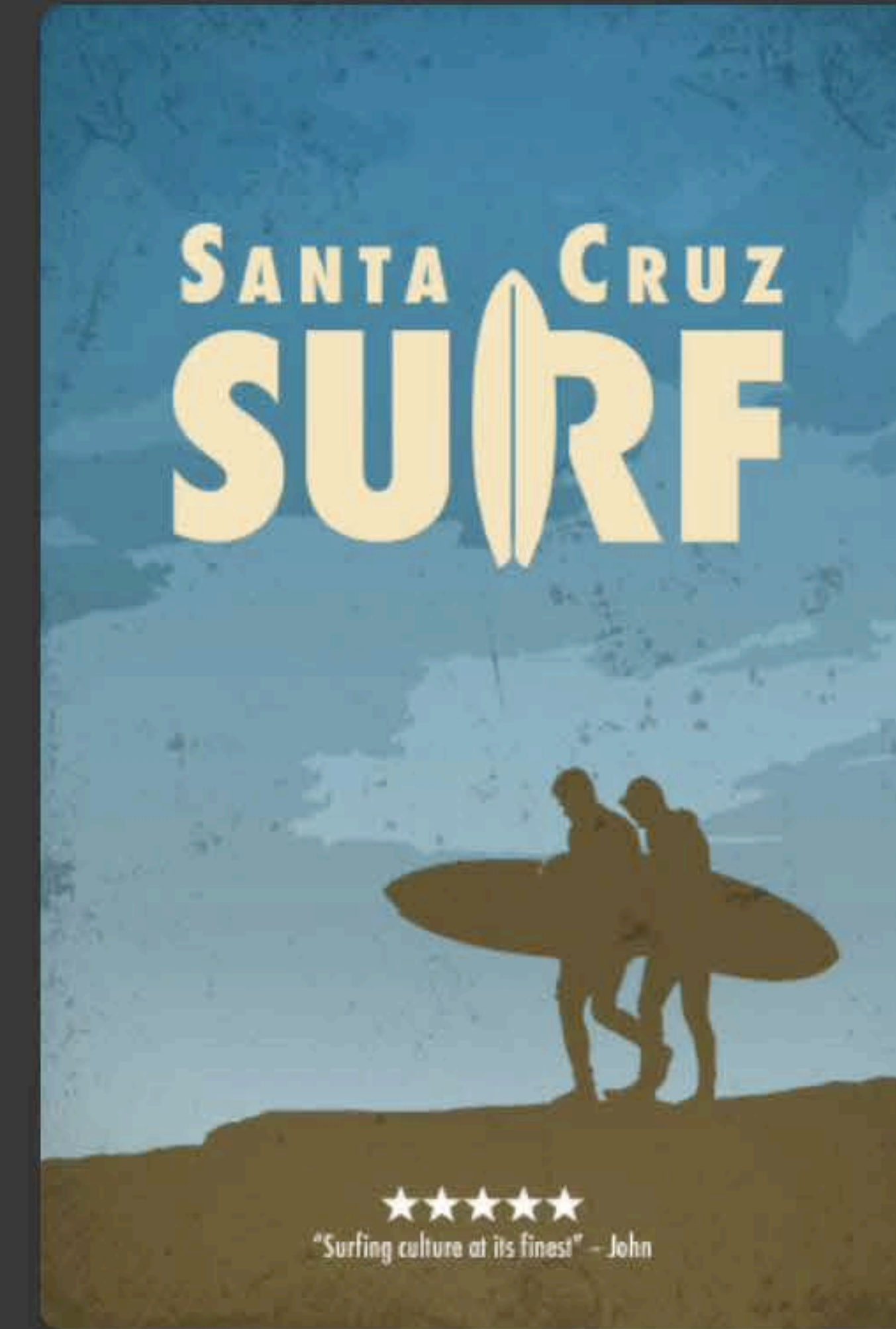
Title 2



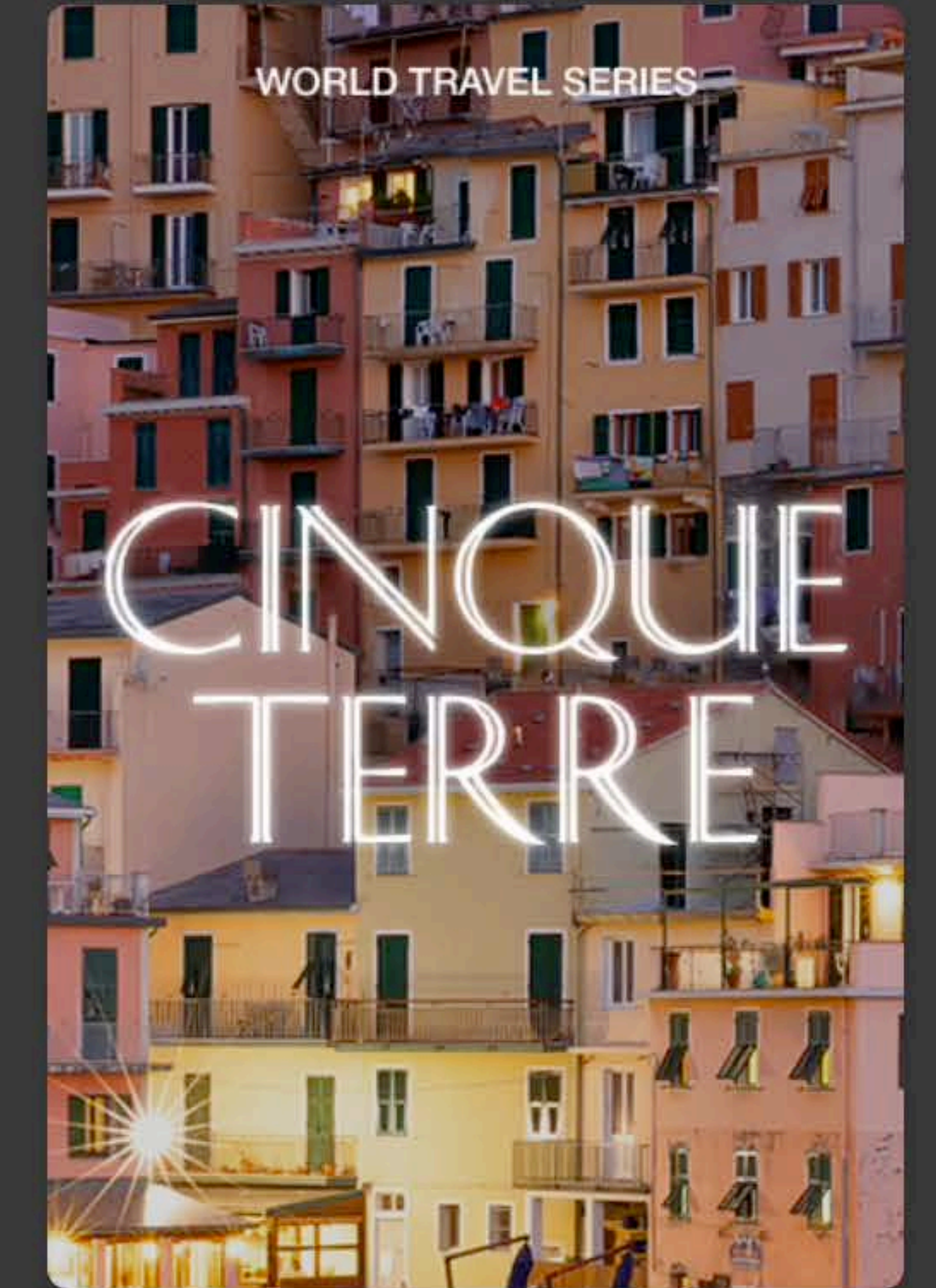
Title 3



Title 4



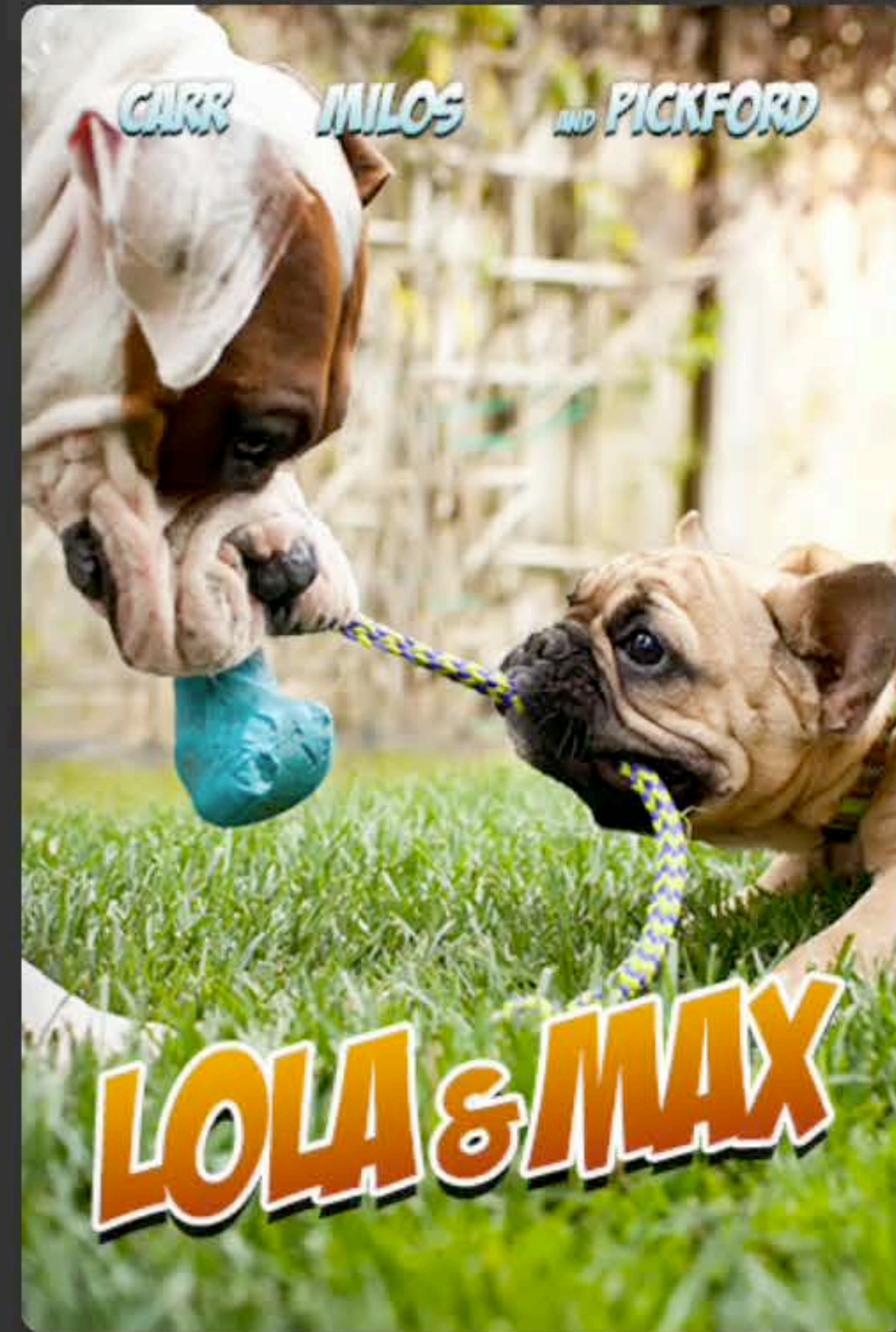
Title 5



Title 6



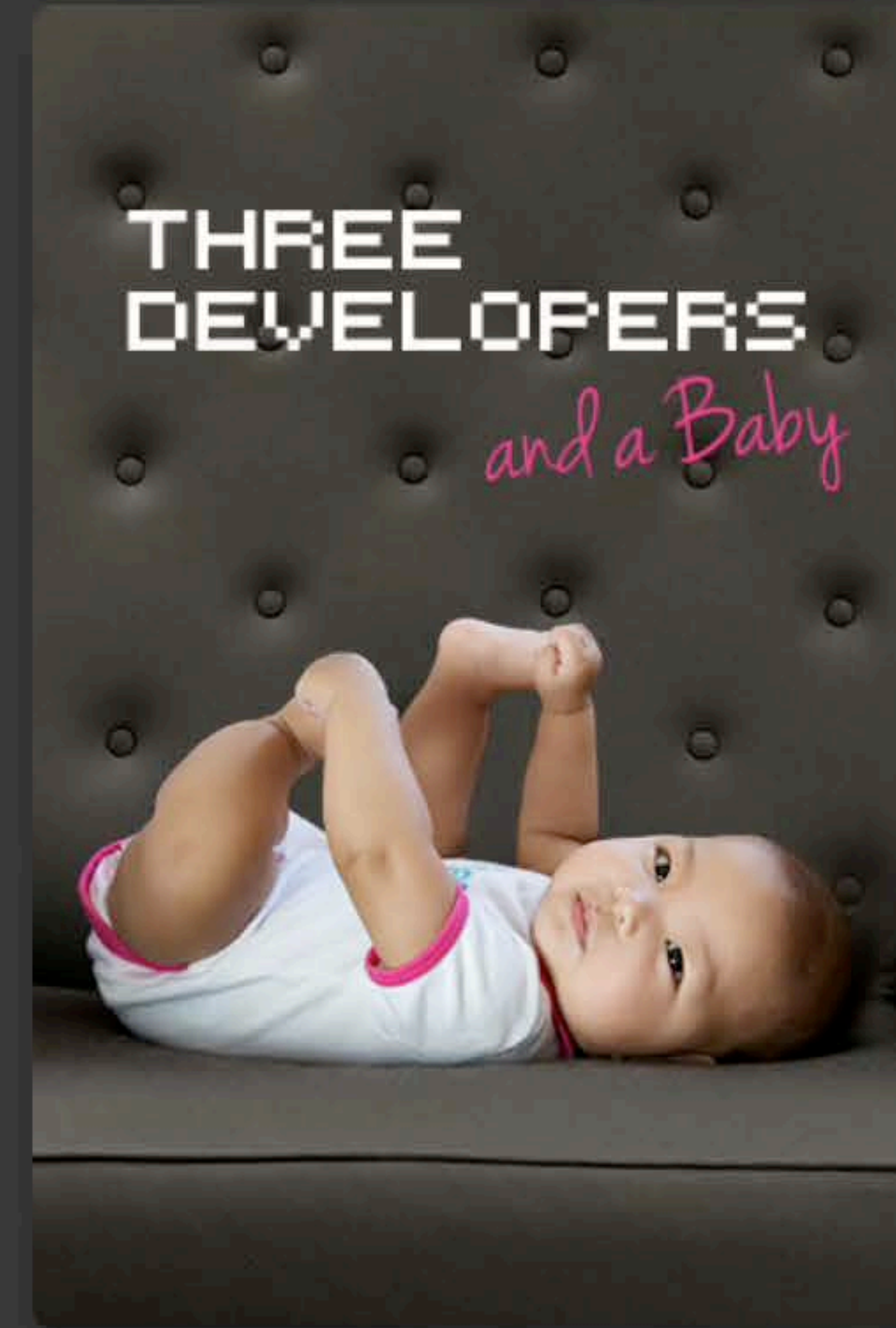
Title 1



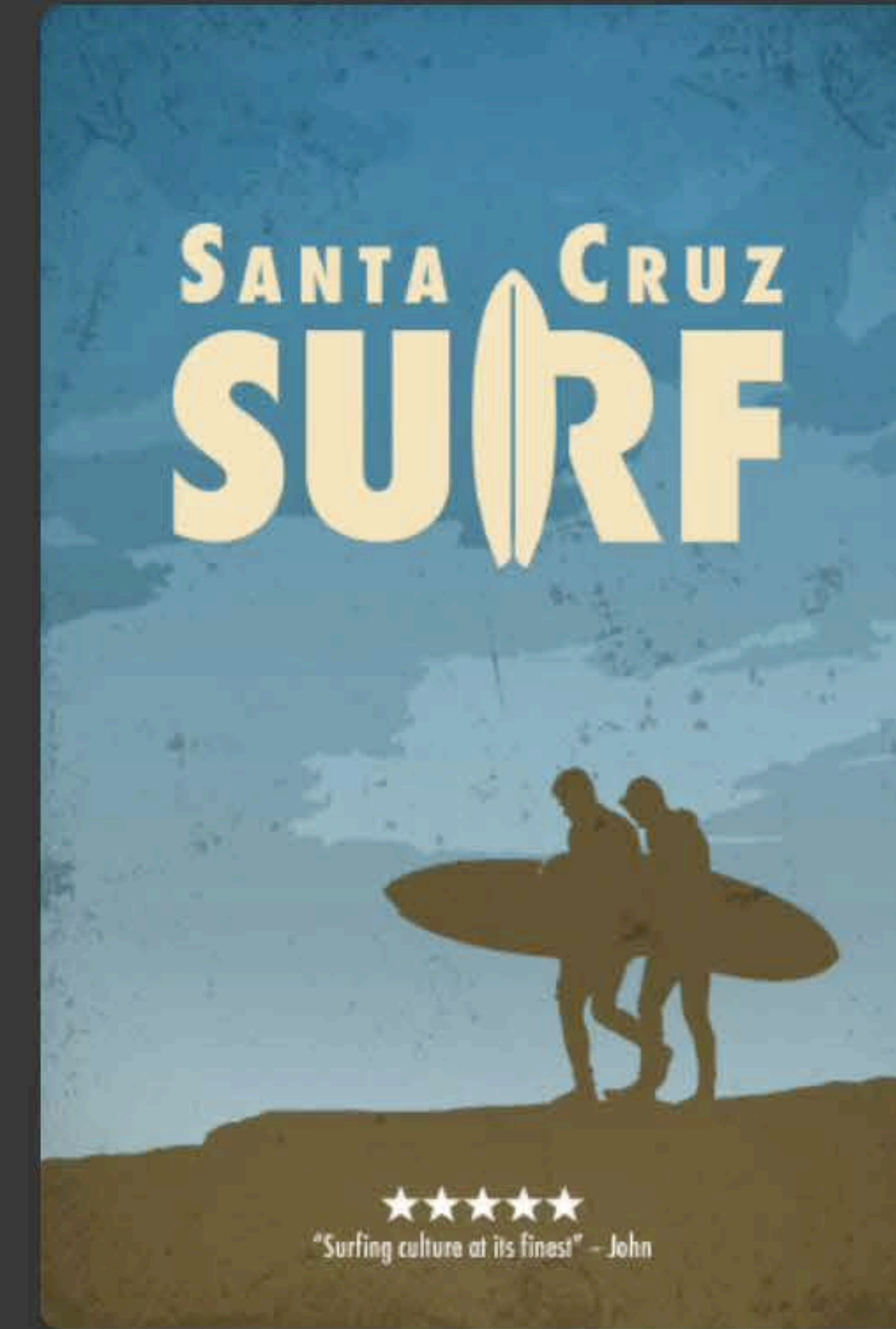
Title 2



Title 3



Title 4



Title 5



Title 6

TVPosterView

NEW

TVPosterView

NEW



image

TVPosterView

NEW



A diagram illustrating the layout of a TV poster view. It consists of three vertically stacked rectangular components. The top component is a large square with a light gray gradient, labeled 'image' in the center. Below it is a smaller, solid light gray rectangle labeled 'title'. The bottom component is another smaller, solid light gray rectangle labeled 'subtitle'.

image

title

subtitle

TVPosterView

NEW



A diagram illustrating the layout of a TV poster view. It consists of three stacked rectangular components. The top component is a large square with a light gray gradient, labeled 'image' in the center. Below it is a smaller, light gray rectangular bar labeled 'title' in the center. The bottom component is another smaller, light gray rectangular bar labeled 'subtitle' in the center.

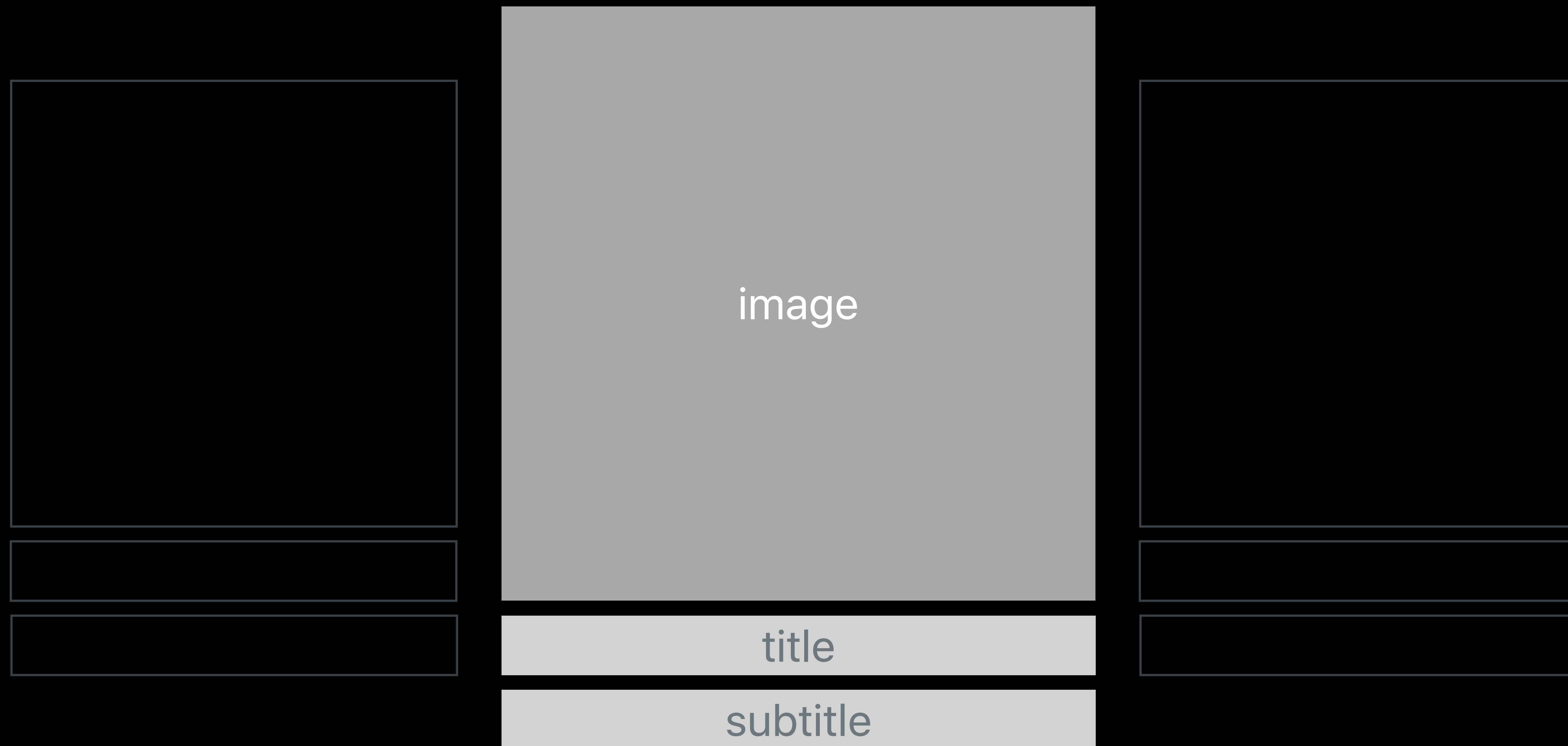
image

title

subtitle

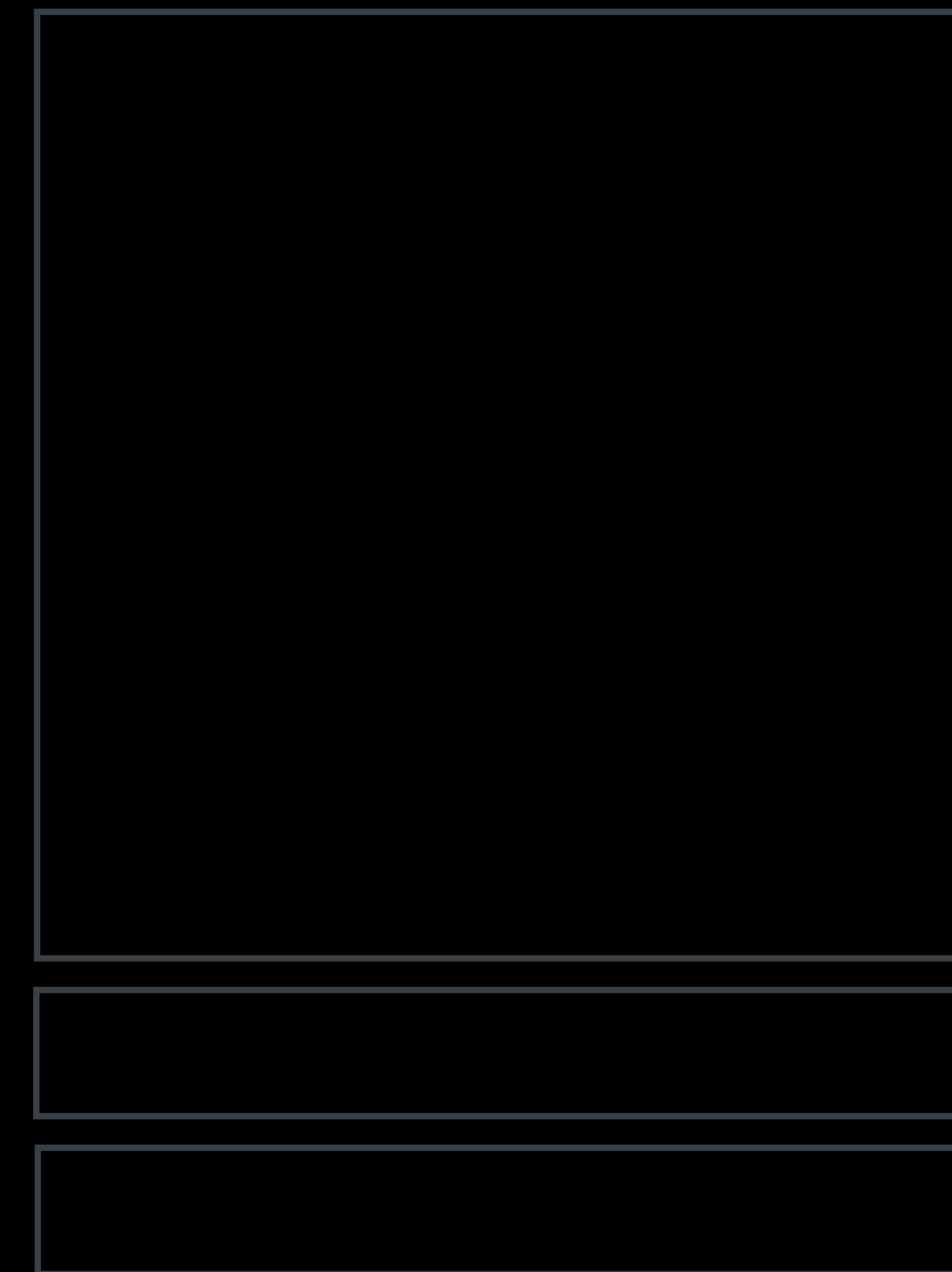
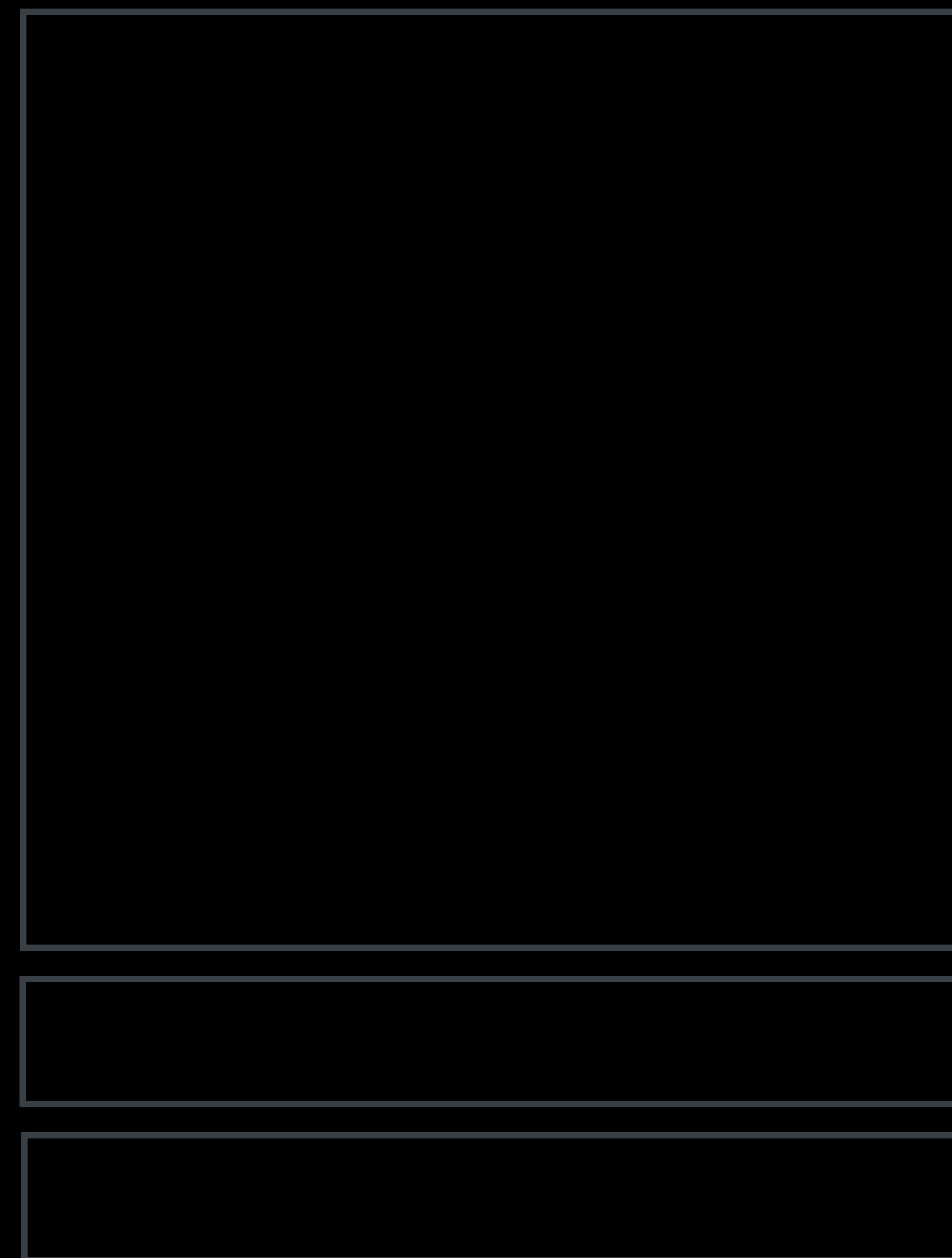
TVPosterView

NEW



TVPosterView

NEW



TVPosterView

NEW



A diagram illustrating the layout of a TV poster view. It consists of three vertically stacked rectangular components. The top component is a large square with a light gray gradient, labeled 'image'. Below it is a smaller, solid light gray rectangle labeled 'title'. The bottom component is another smaller, solid light gray rectangle labeled 'subtitle'.

image

title

subtitle

TVPosterView

NEW



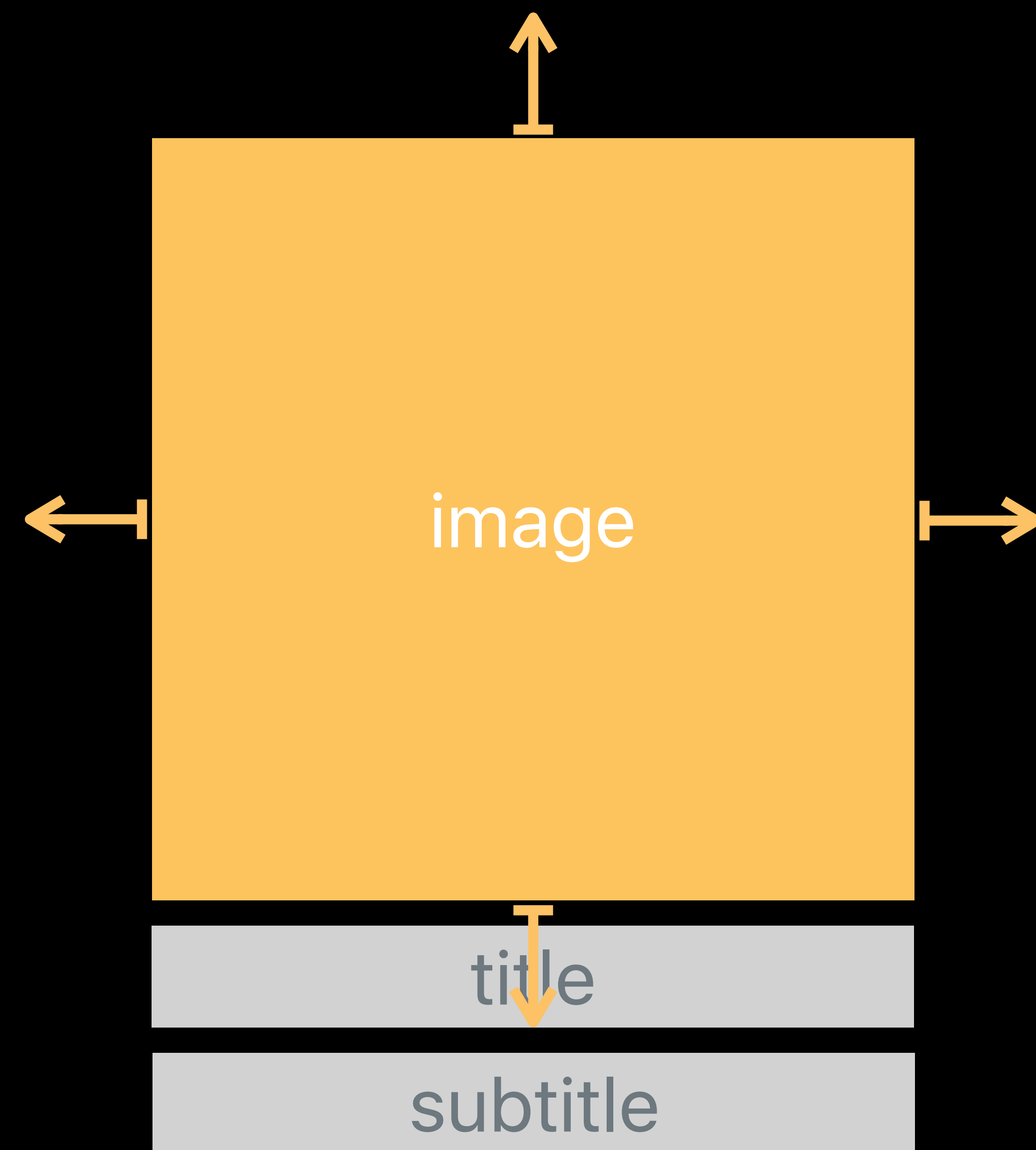
image

title

subtitle

TVPosterView

NEW



TVPosterView

NEW

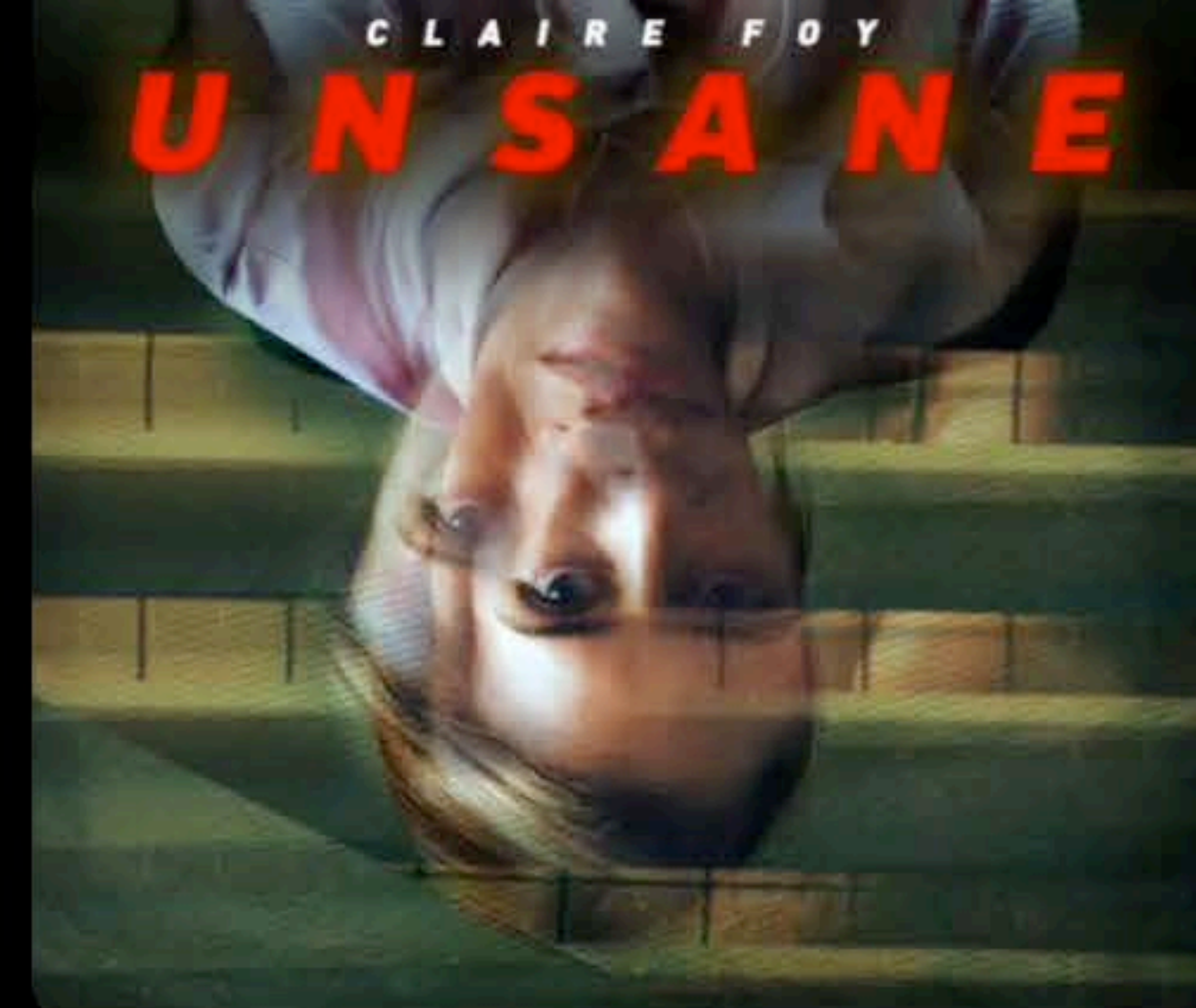


The diagram illustrates the layout of a TV poster view. It consists of three main vertical components: a large yellow rectangle at the top, a light gray rectangle below it, and another light gray rectangle at the bottom. The yellow rectangle is labeled 'image'. The first light gray rectangle is labeled 'title', and the second light gray rectangle is labeled 'subtitle'.

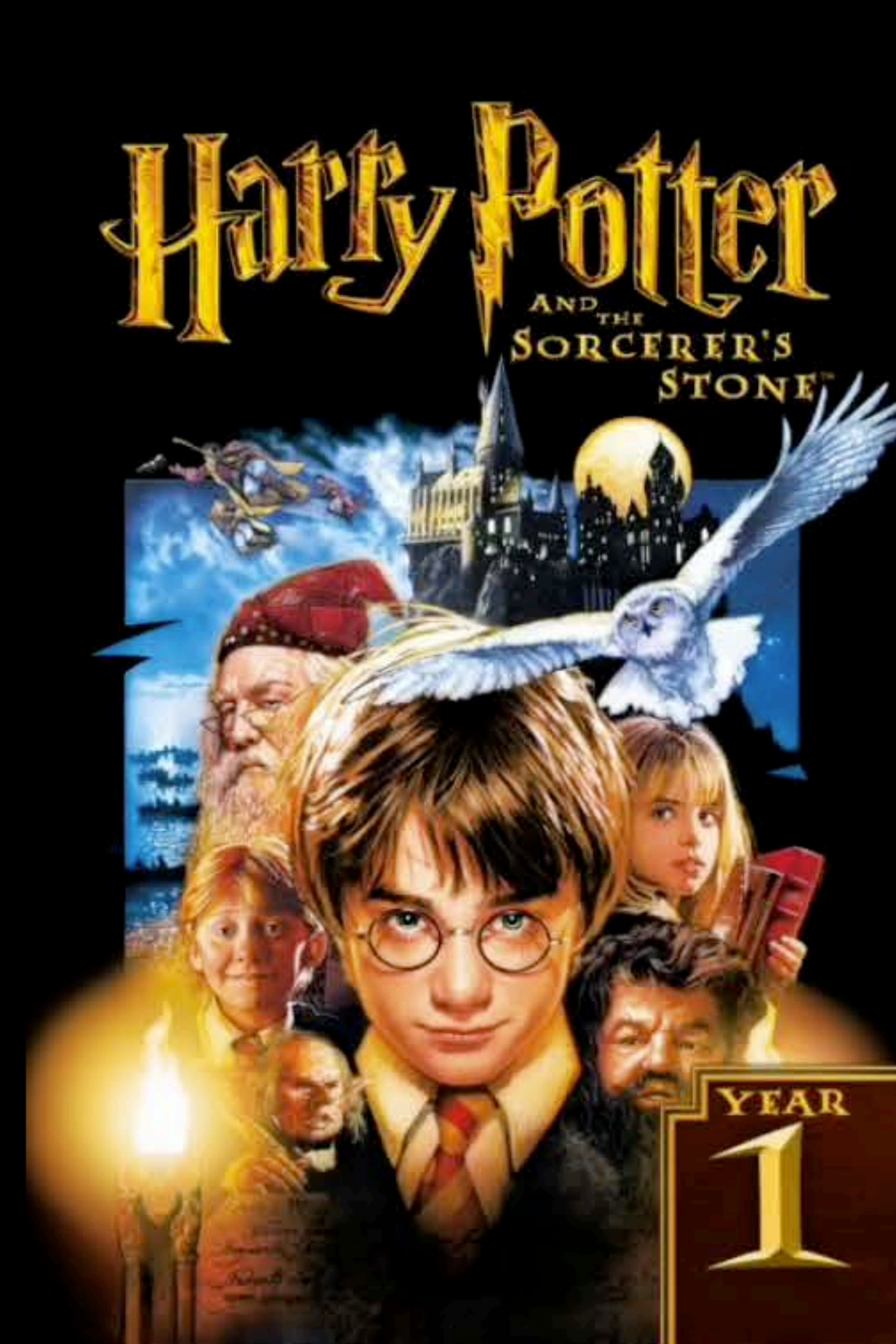
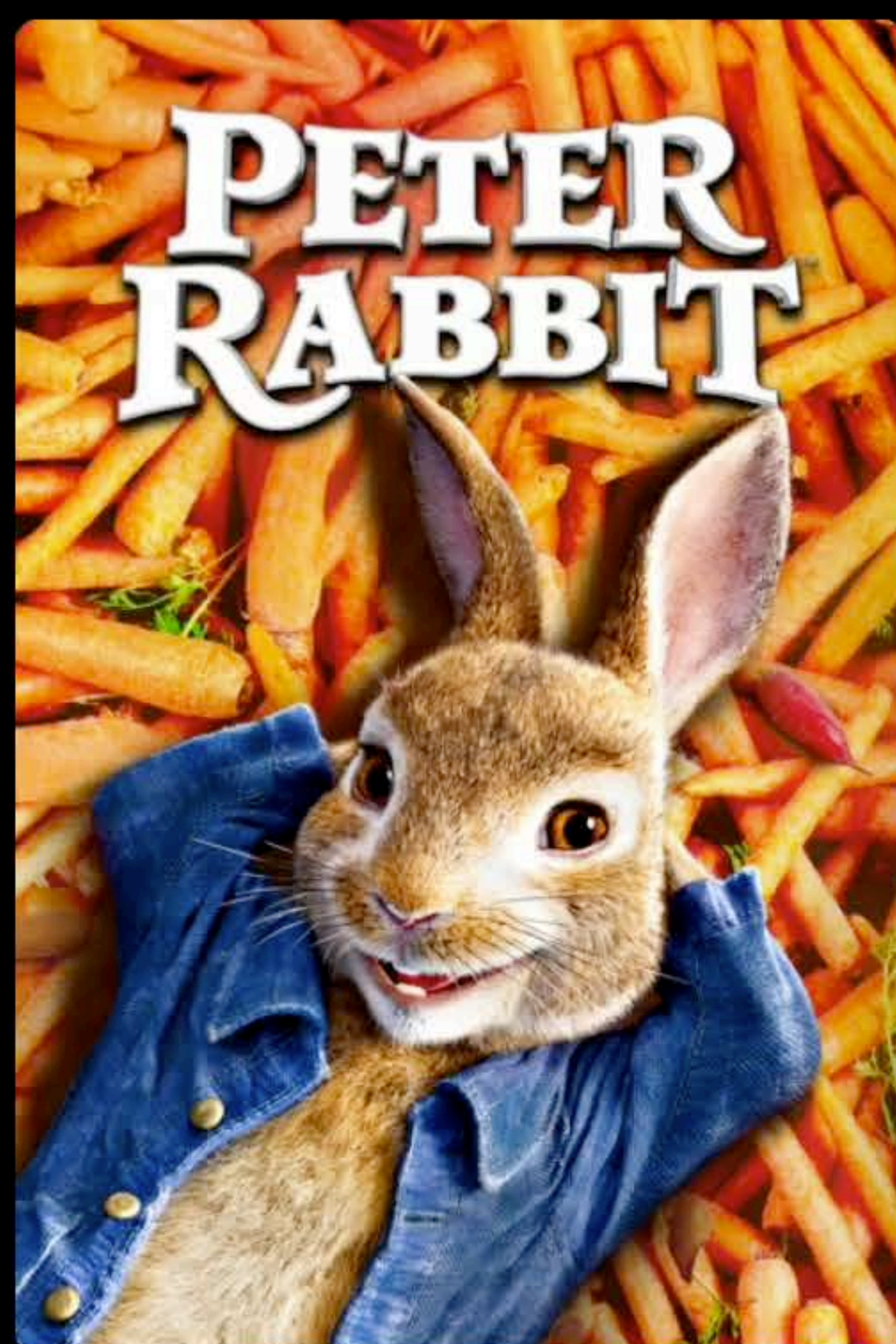
image

title

subtitle

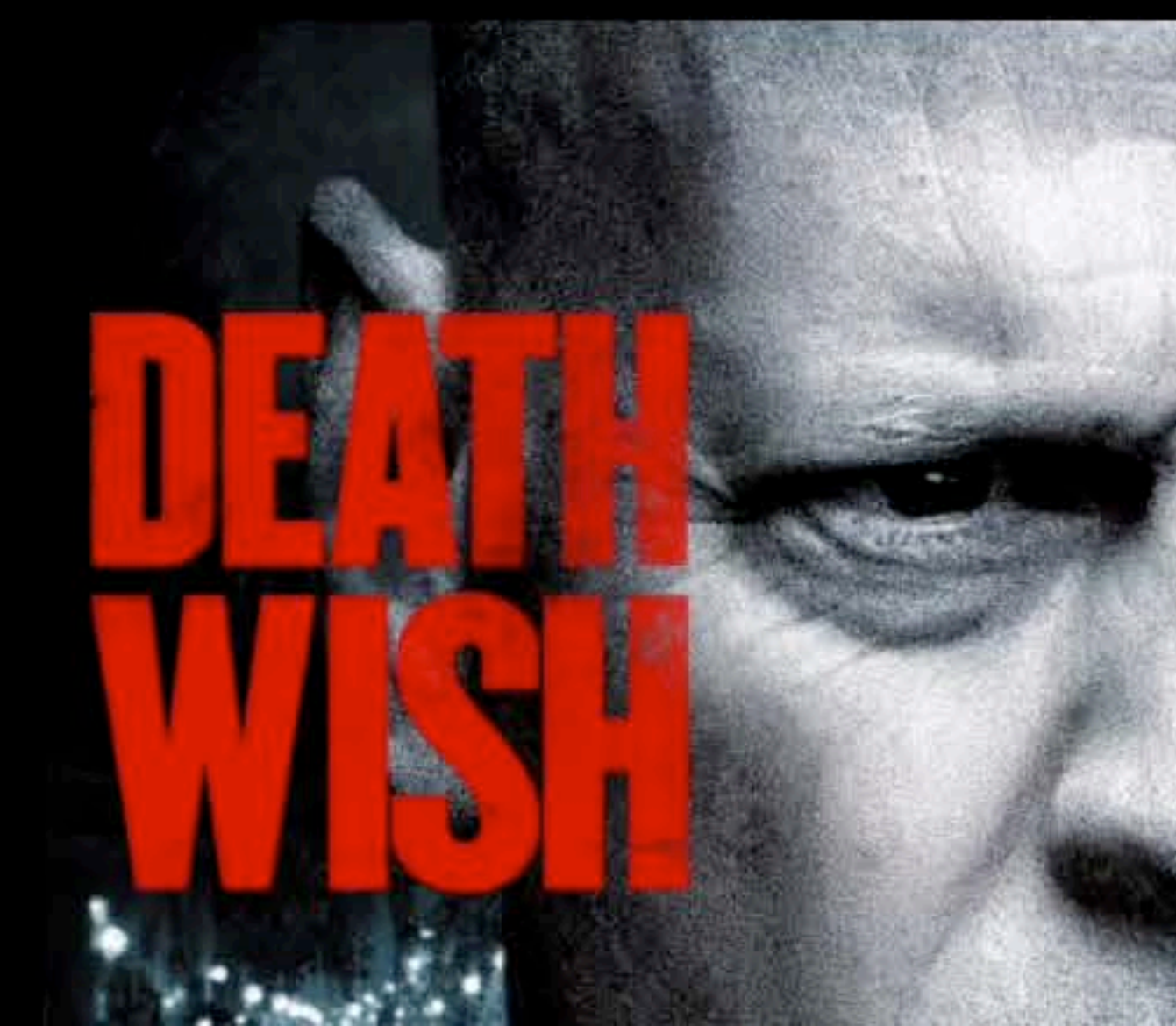


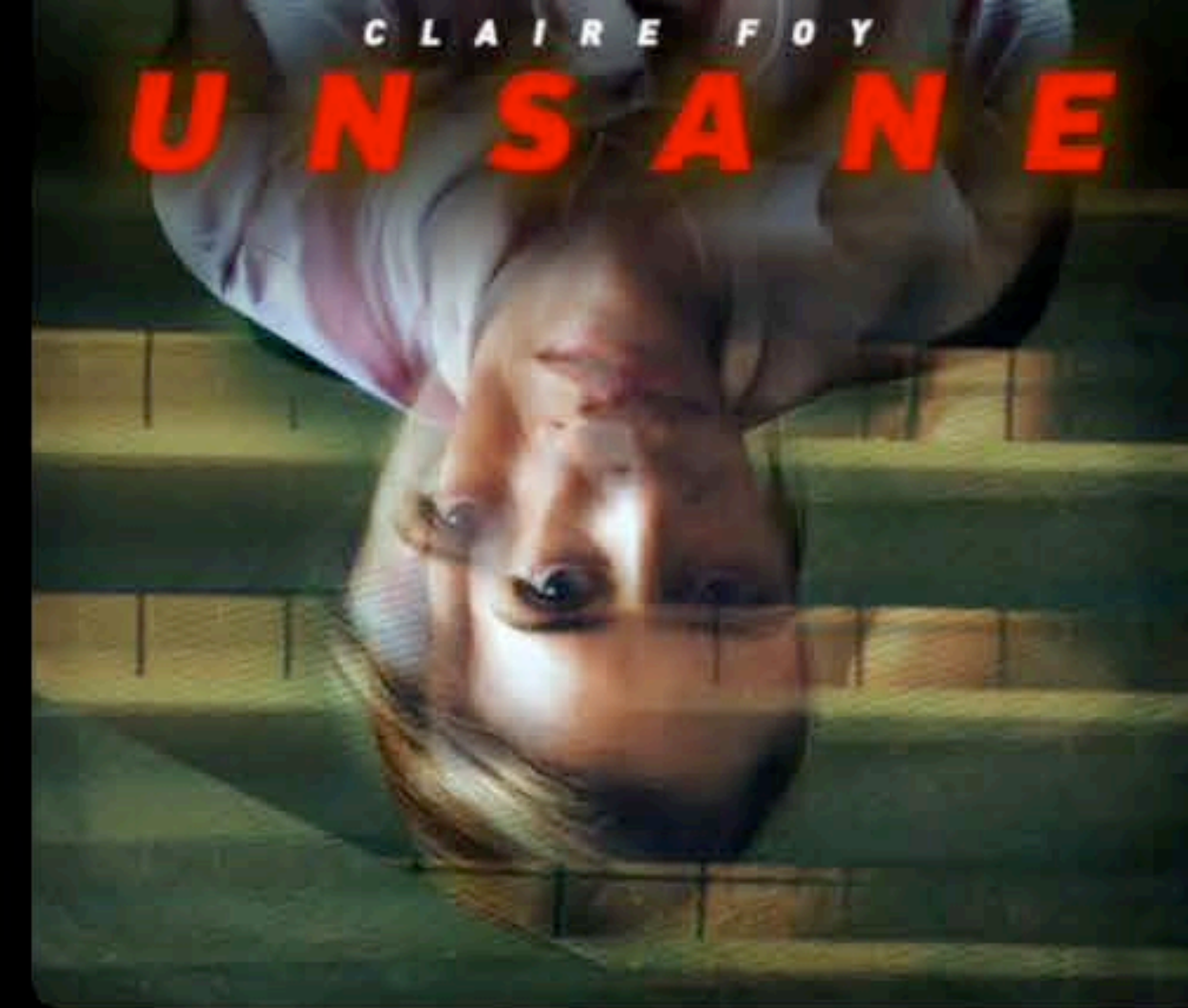
Kids & Family



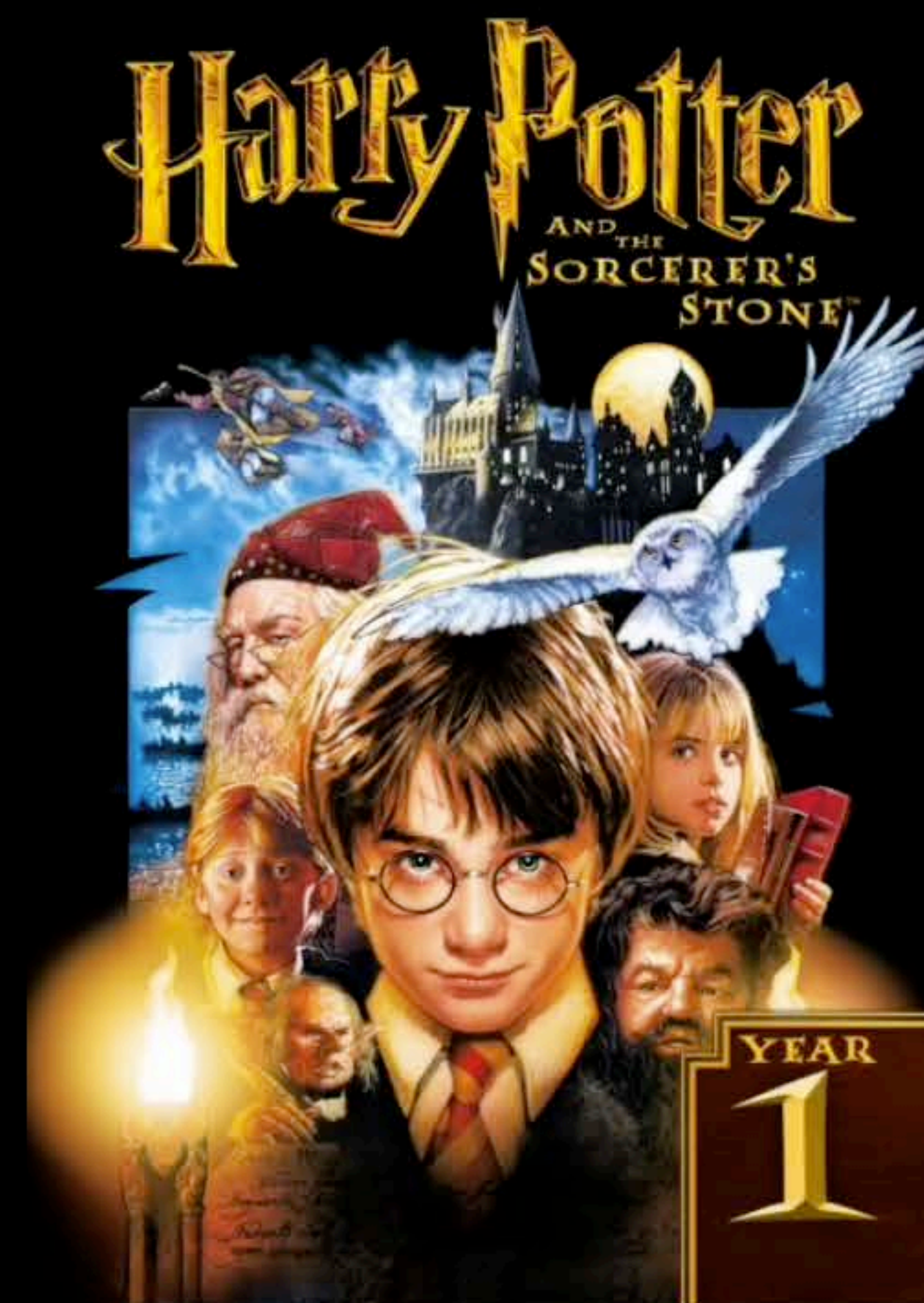
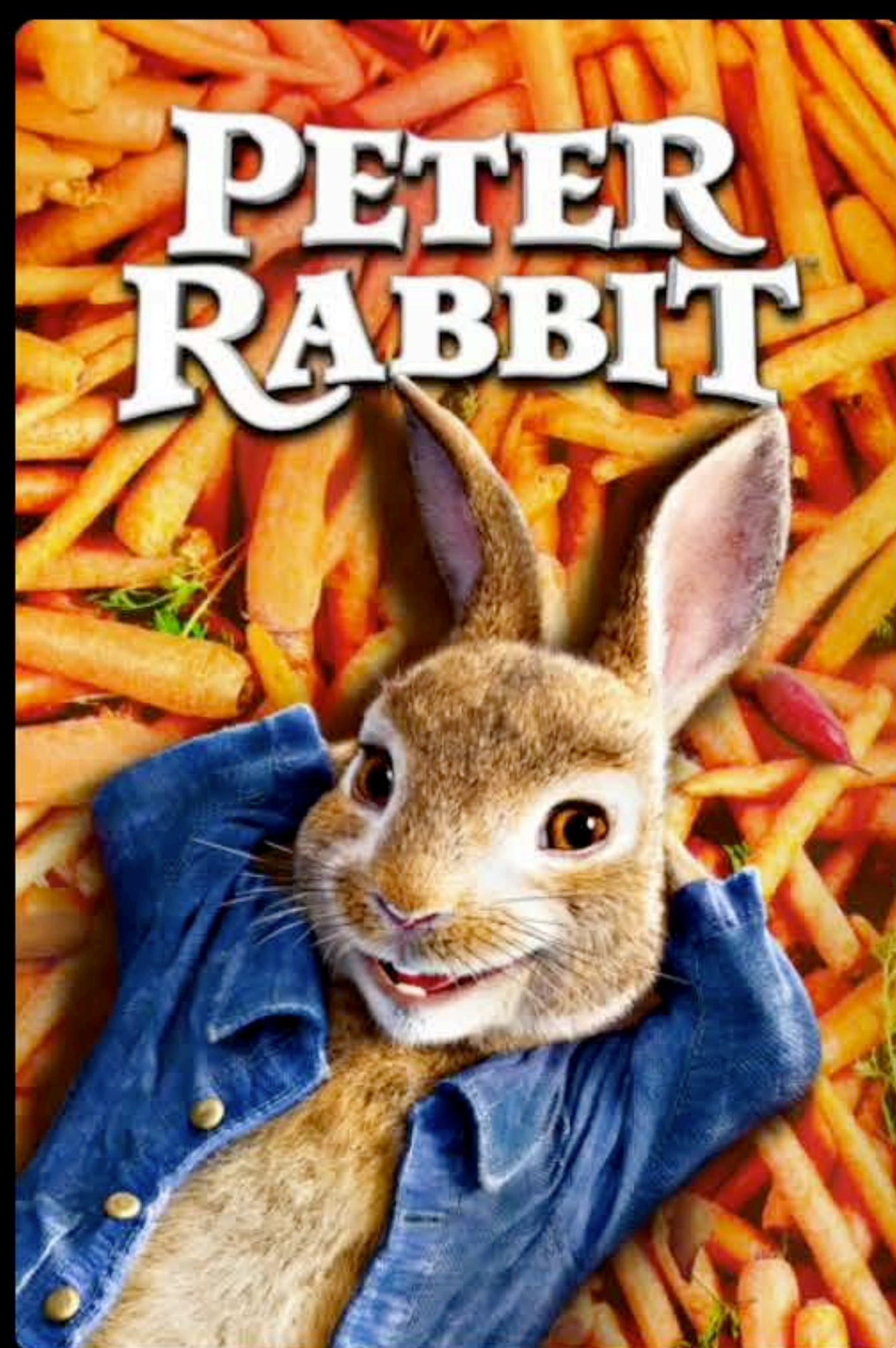
Ferdinand

Action & Adventure



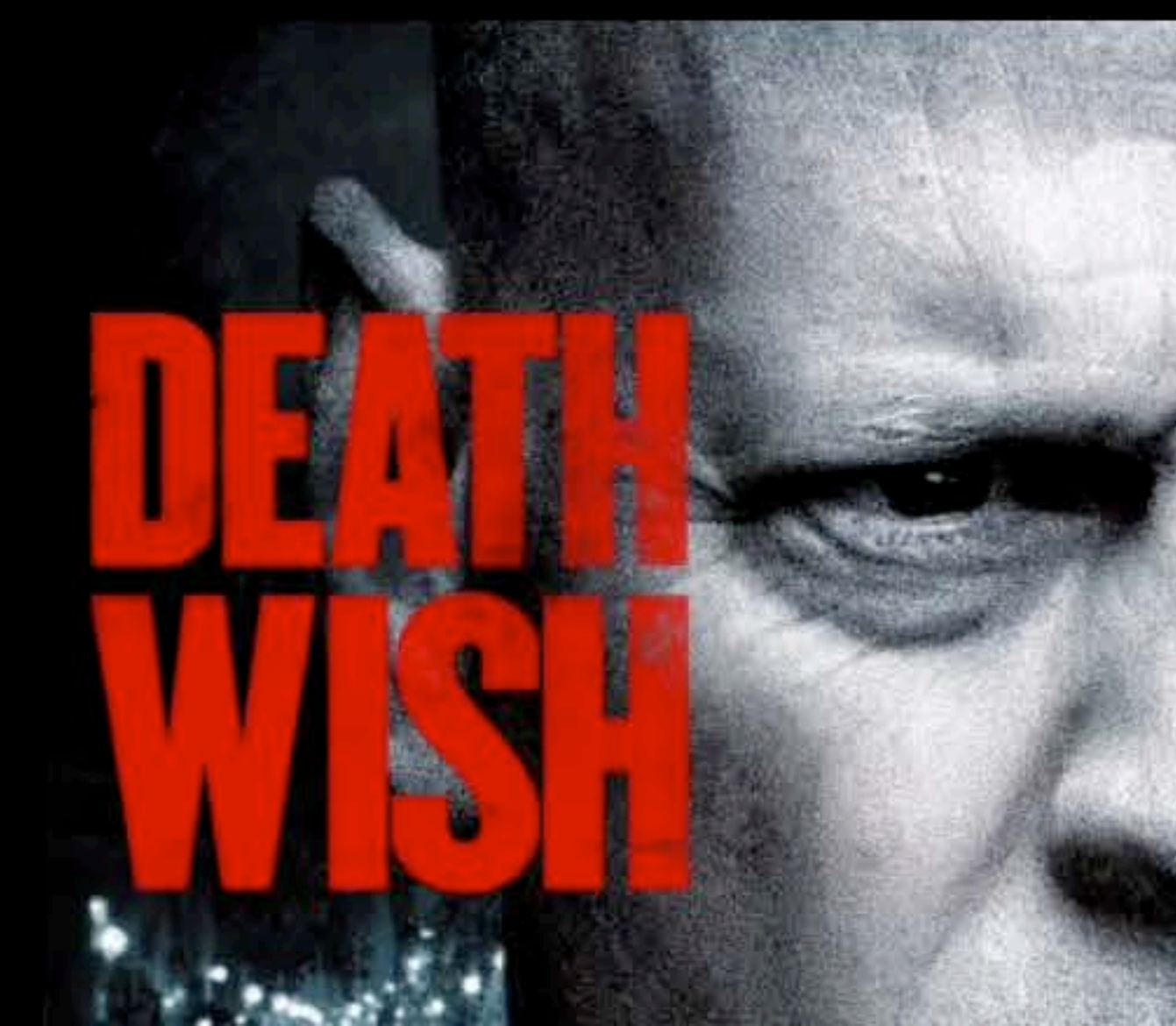


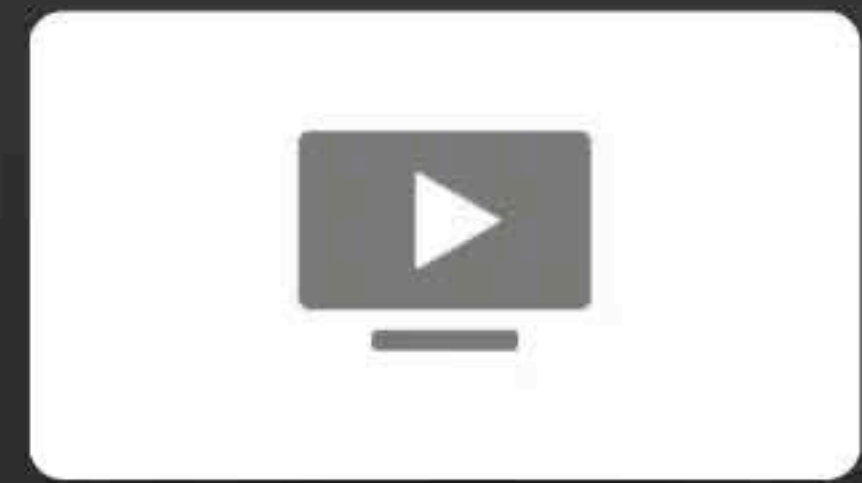
Kids & Family



Ferdinand

Action & Adventure





Preview

\$19.99

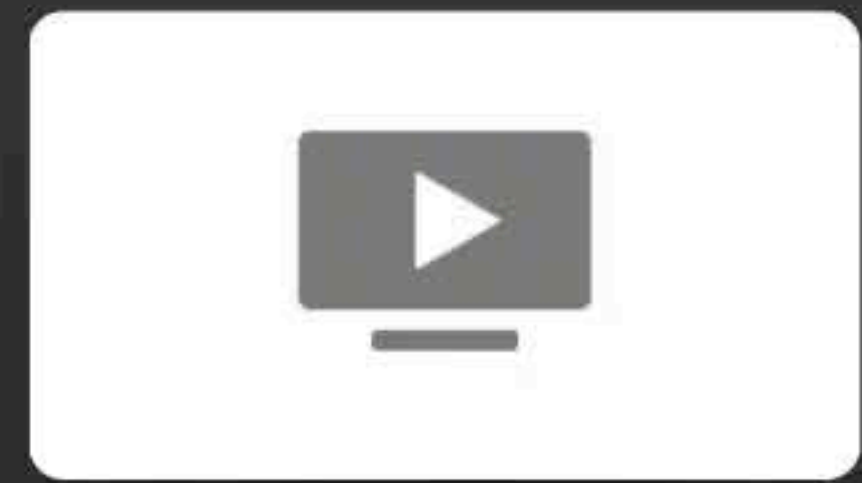
Buy
With iTunes Extras

\$5.99

Rent



Wish List



Preview

\$19.99

Buy
With iTunes Extras

\$5.99

Rent

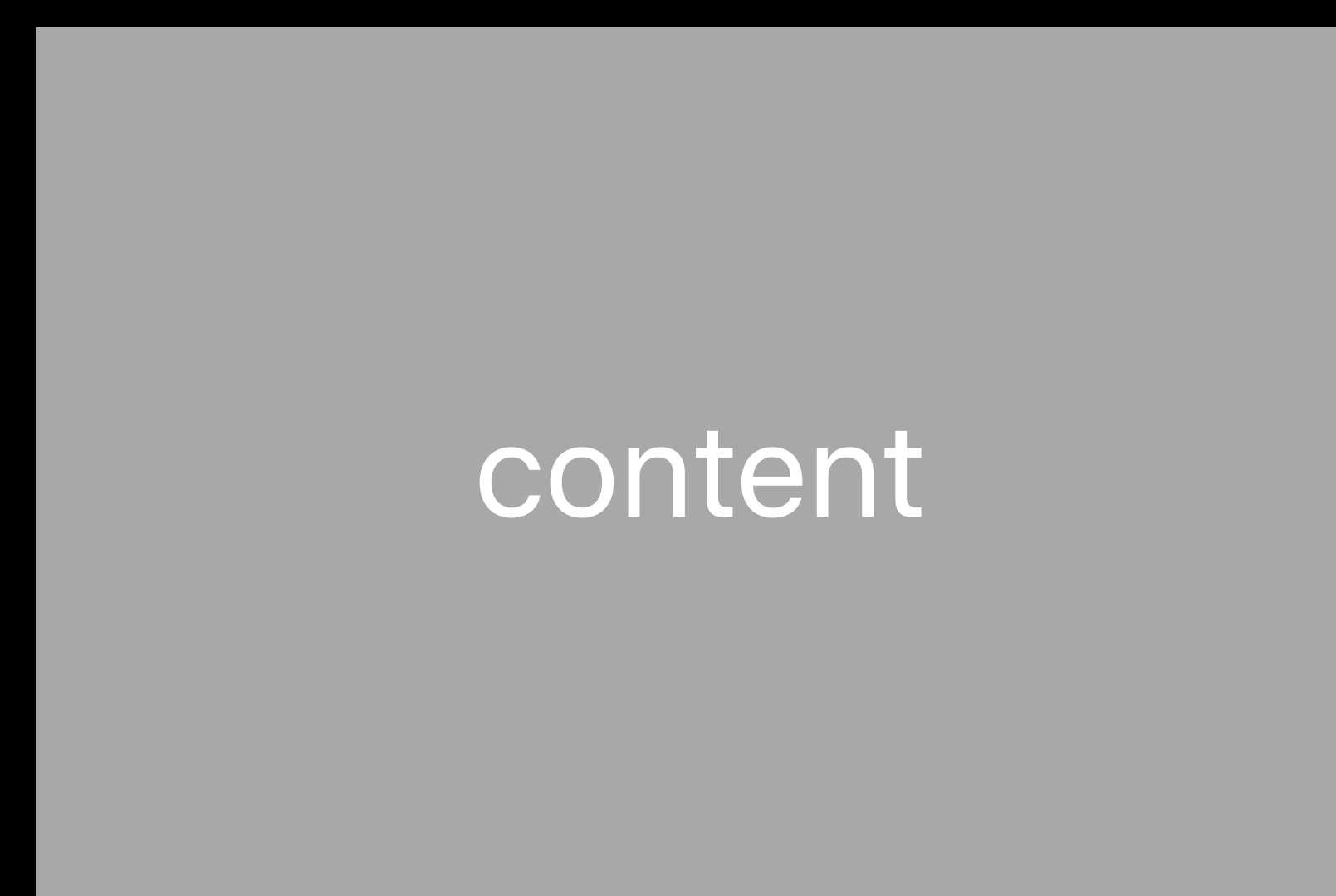


Wish List

TVCaptionButtonView

NEW

TVCaptionButtonView



TVCaptionButtonView

NEW

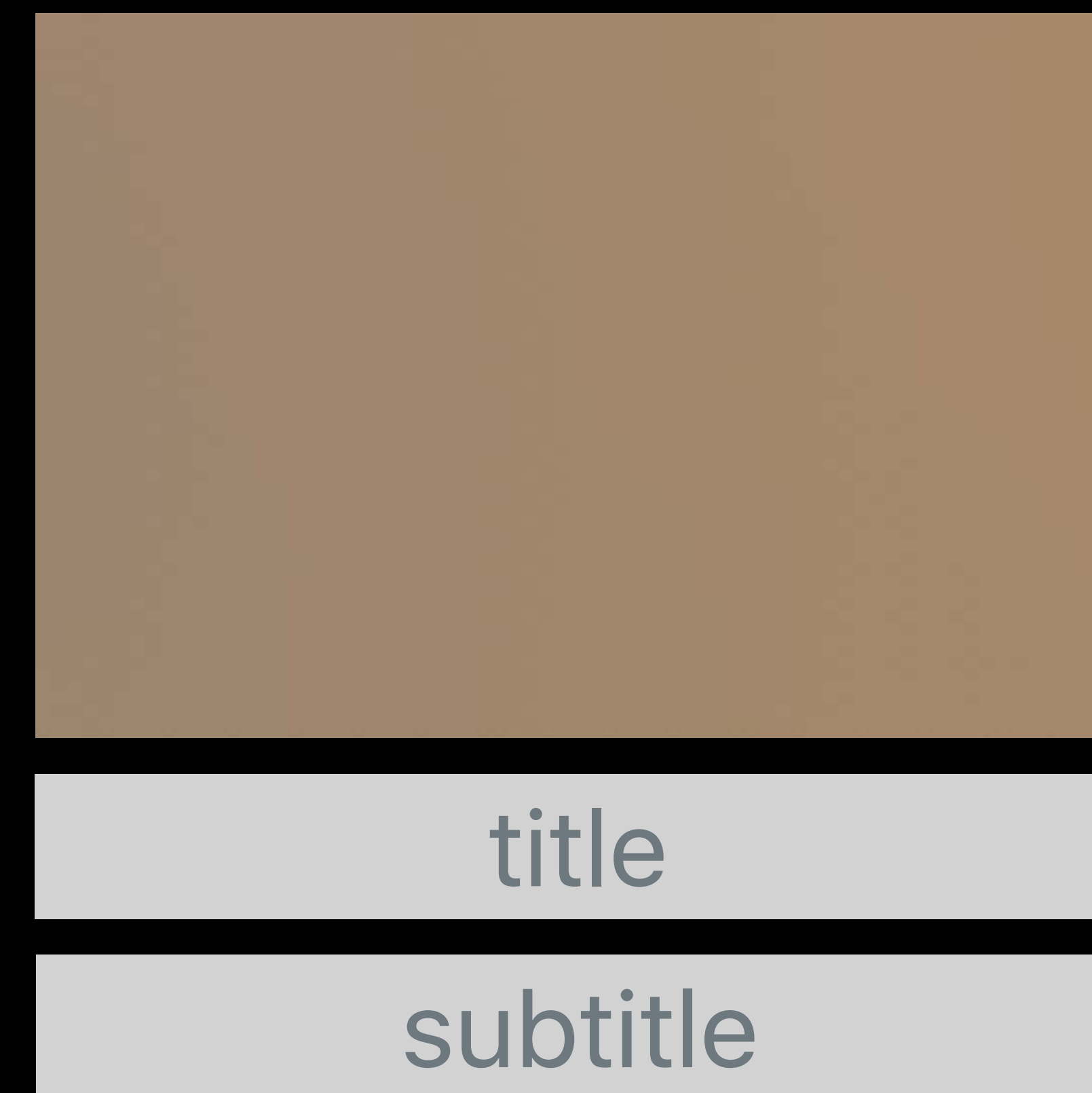
content

title

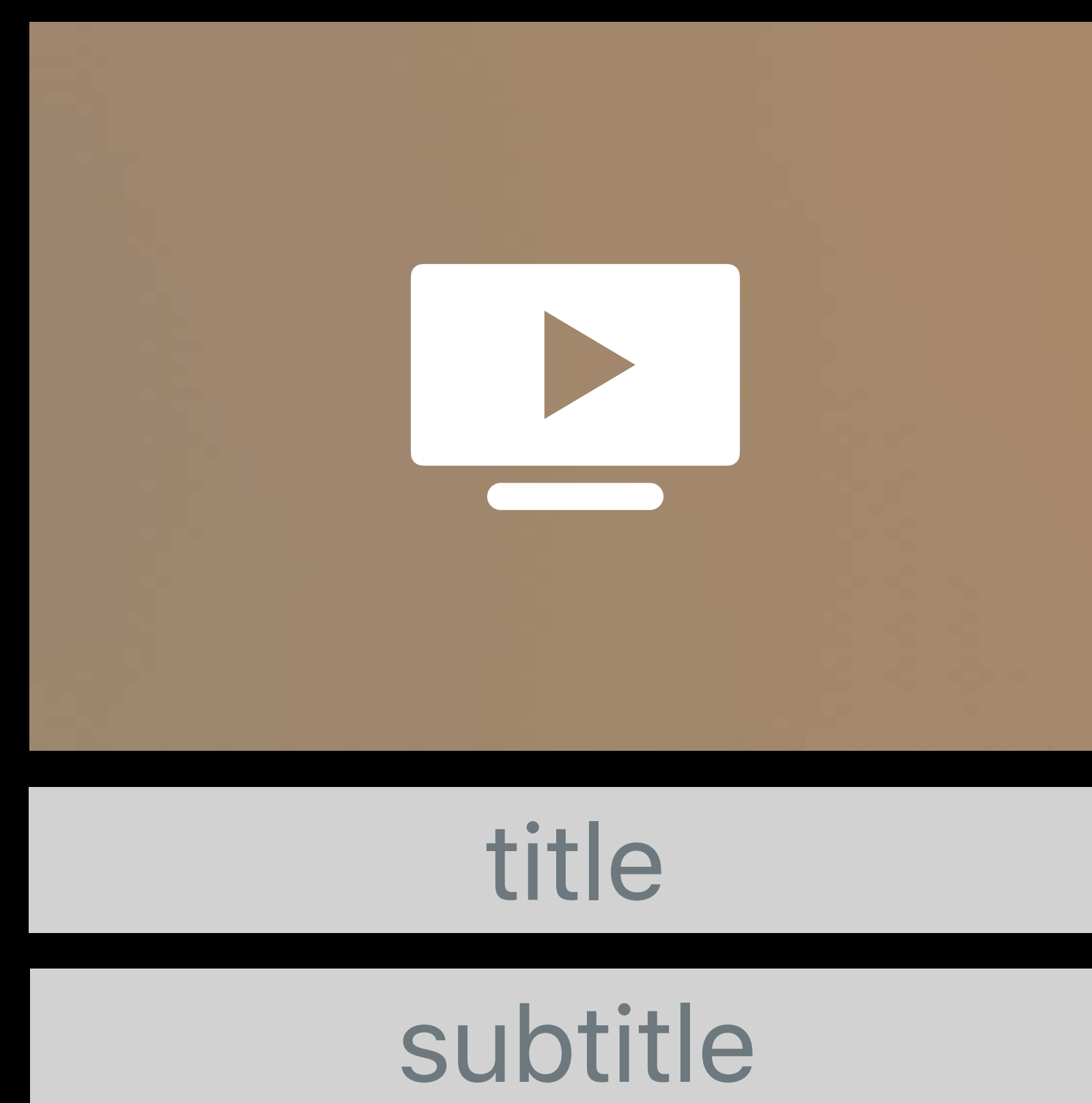
subtitle

TVCaptionButtonView

NEW



TVCaptionButtonView



TVCaptionButtonView

A UI component consisting of three stacked rectangular elements. The top element is a tan-colored rectangle with the text "\$9.99" in white. The middle element is a light gray rectangle with the text "title" in a dark gray font. The bottom element is a light gray rectangle with the text "subtitle" in a dark gray font.

\$9.99

title

subtitle

TVCaptionButtonView



\$9.99

title

subtitle

TVCaptionButtonView

NEW

\$9.99

title

subtitle

TVCaptionButtonView

NEW

\$9.99

title

subtitle

TVCaptionButtonView

NEW

\$9.99

title

subtitle

TVCaptionButtonView

NEW

\$9.99

title

subtitle

The Post

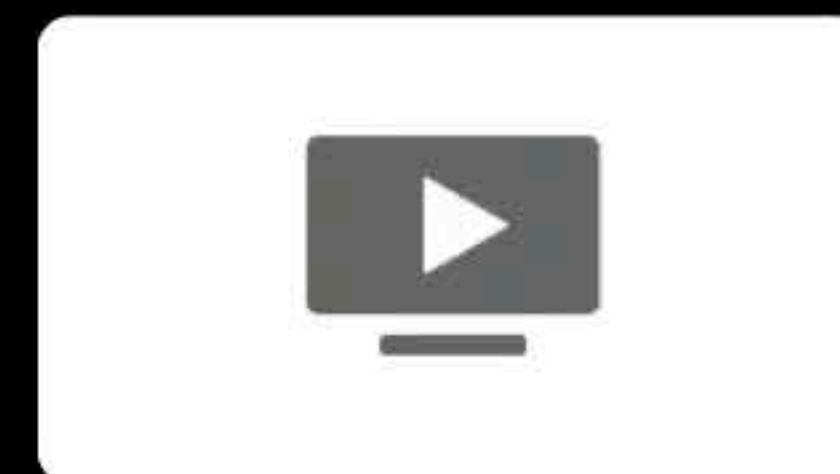
GENRE
Drama

PG-13 13+ 87% 1 hr 56 min 2018 4K HDR CC SDH AD

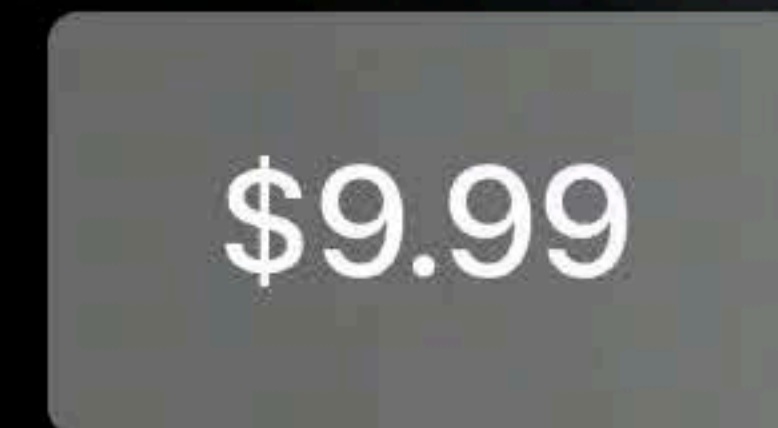
DIRECTOR
Steven Spielberg

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STARRING
Meryl Streep
Tom Hanks
Sarah Paulson
Bob Odenkirk
Tracy Letts

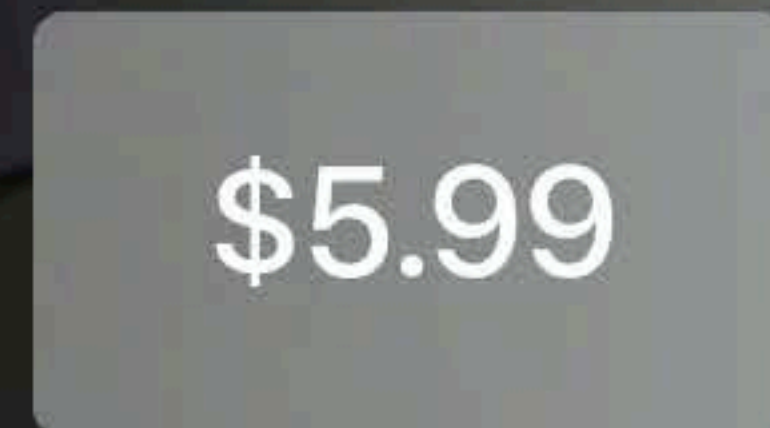


Preview



Buy

With iTunes Extras



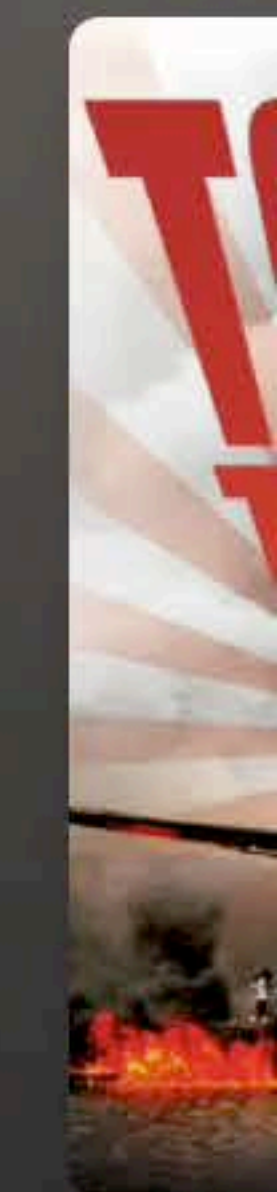
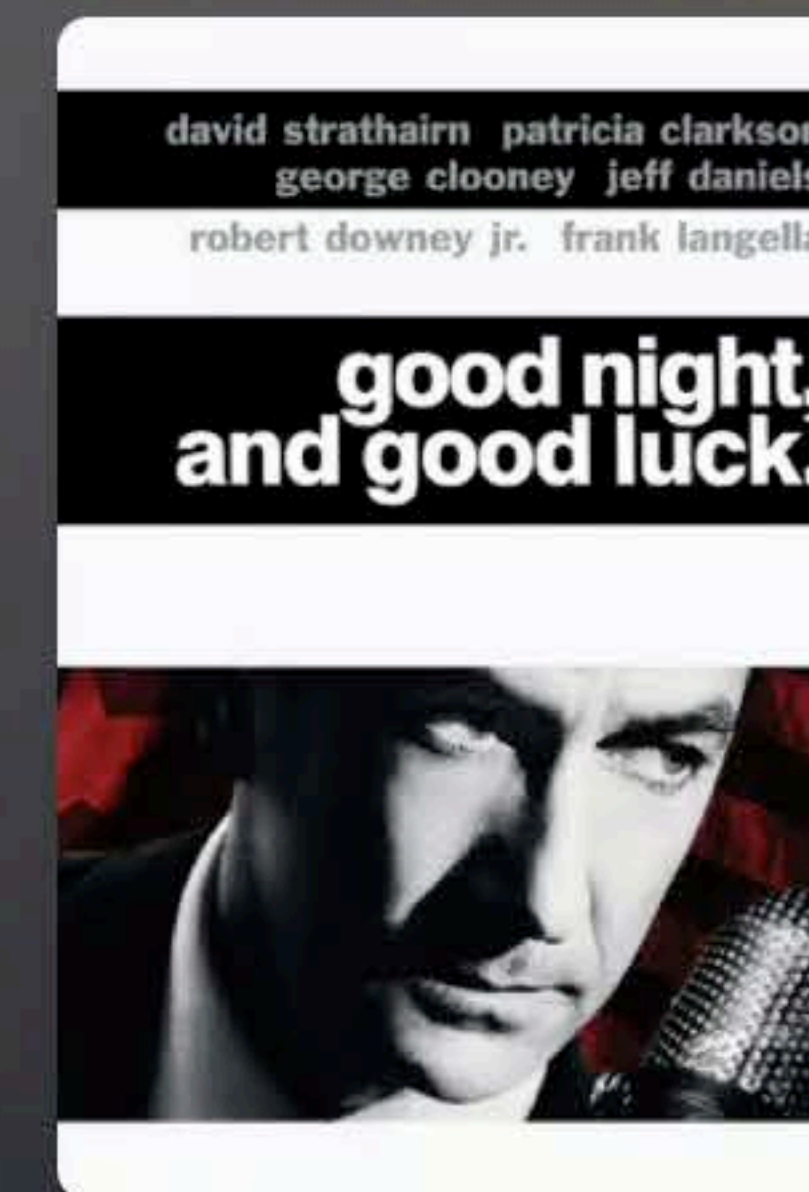
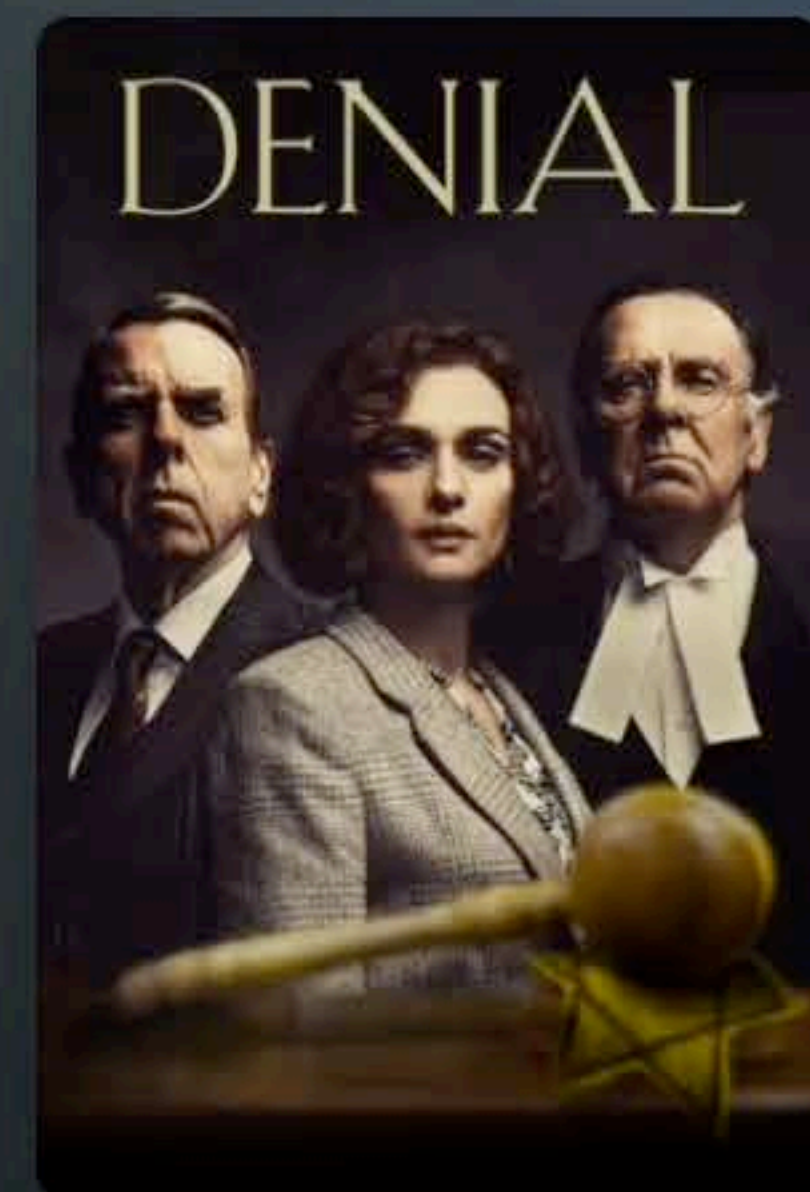
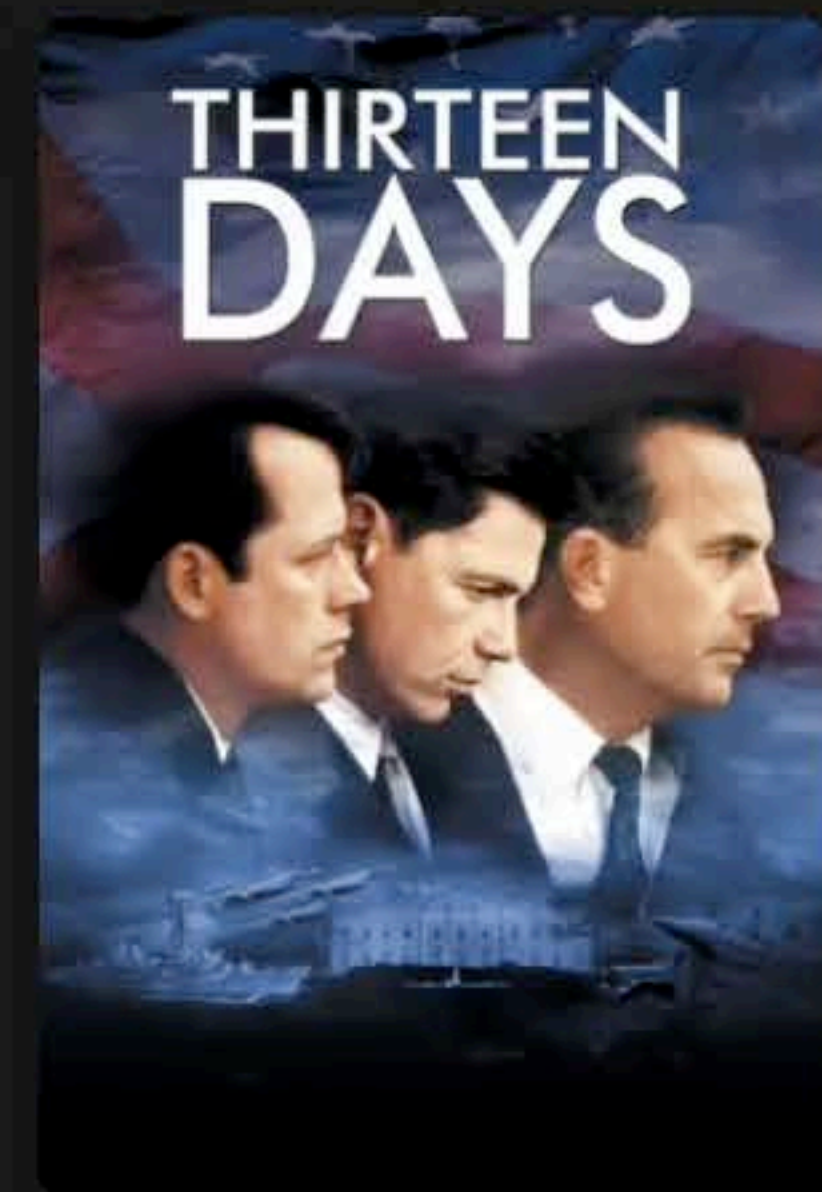
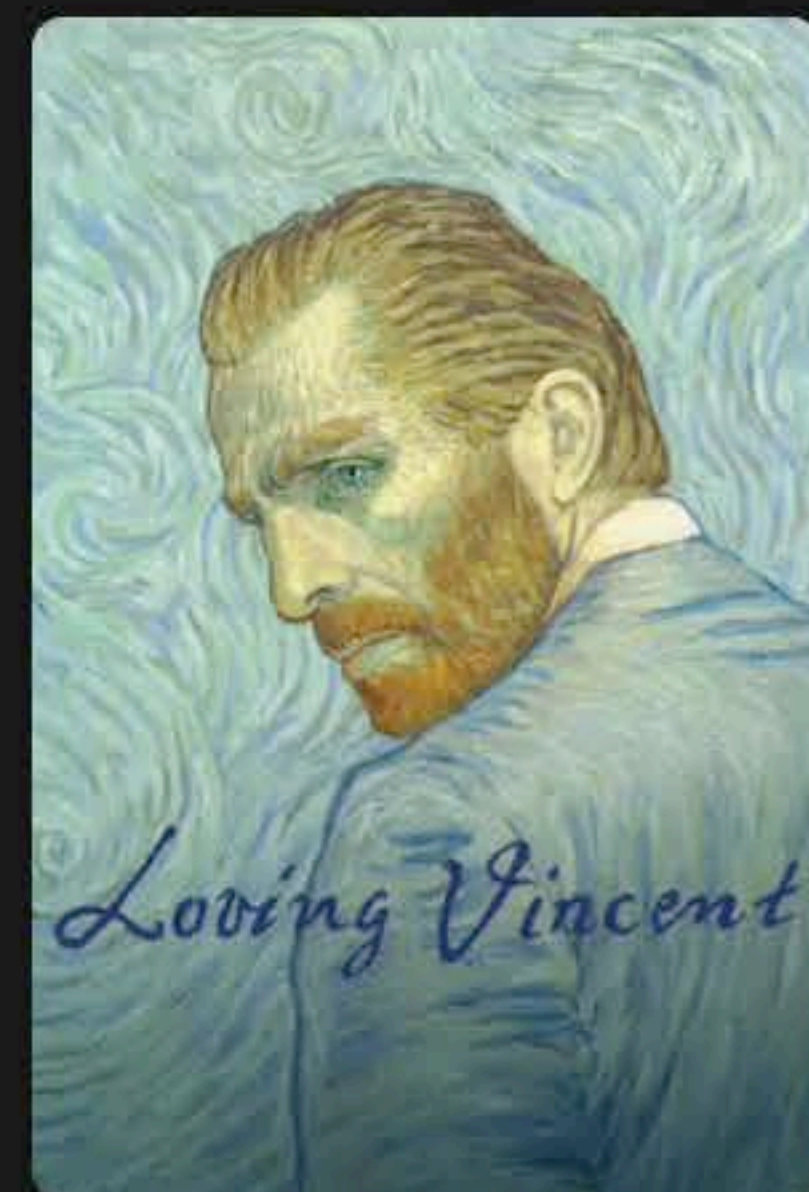
\$5.99

Rent



Wish List

Viewers Also Watched



The Post

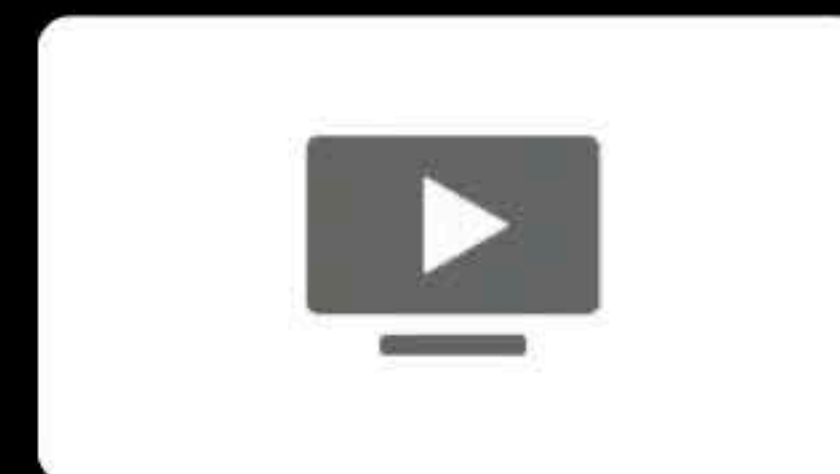
GENRE
Drama

PG-13 ✓13+ 🍌87% 1 hr 56 min 2018 **4K** **HDR** **CC** **SDH** **AD**

DIRECTOR
Steven Spielberg

Steven Spielberg directs Meryl Streep and Tom Hanks in **THE POST**, a thrilling drama about the unlikely partnership of Katharine Graham (Streep), the first female publisher of The Washington Post, and its driven editor Ben Bradlee (Hanks), as they race to catch up with The New York Times to... [MORE](#)

STARRING
Meryl Streep
Tom Hanks
Sarah Paulson
Bob Odenkirk
Tracy Letts



Preview



Buy

With iTunes Extras

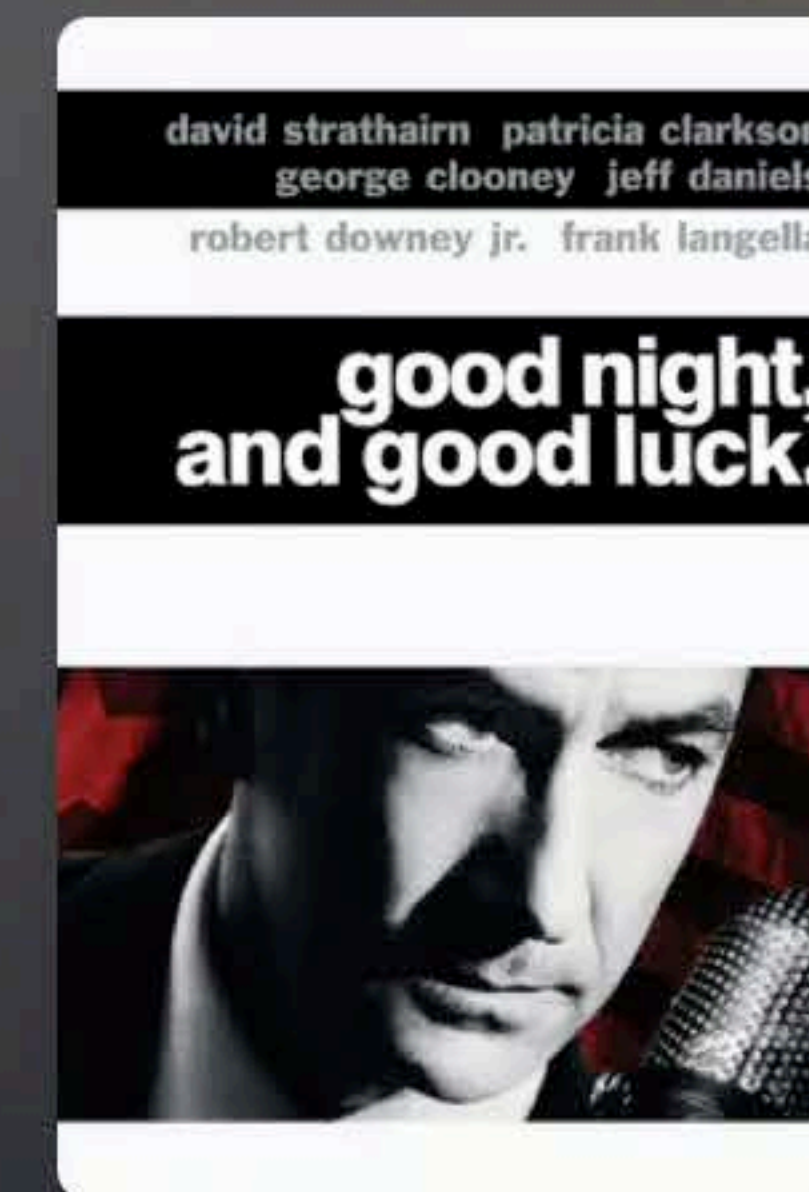
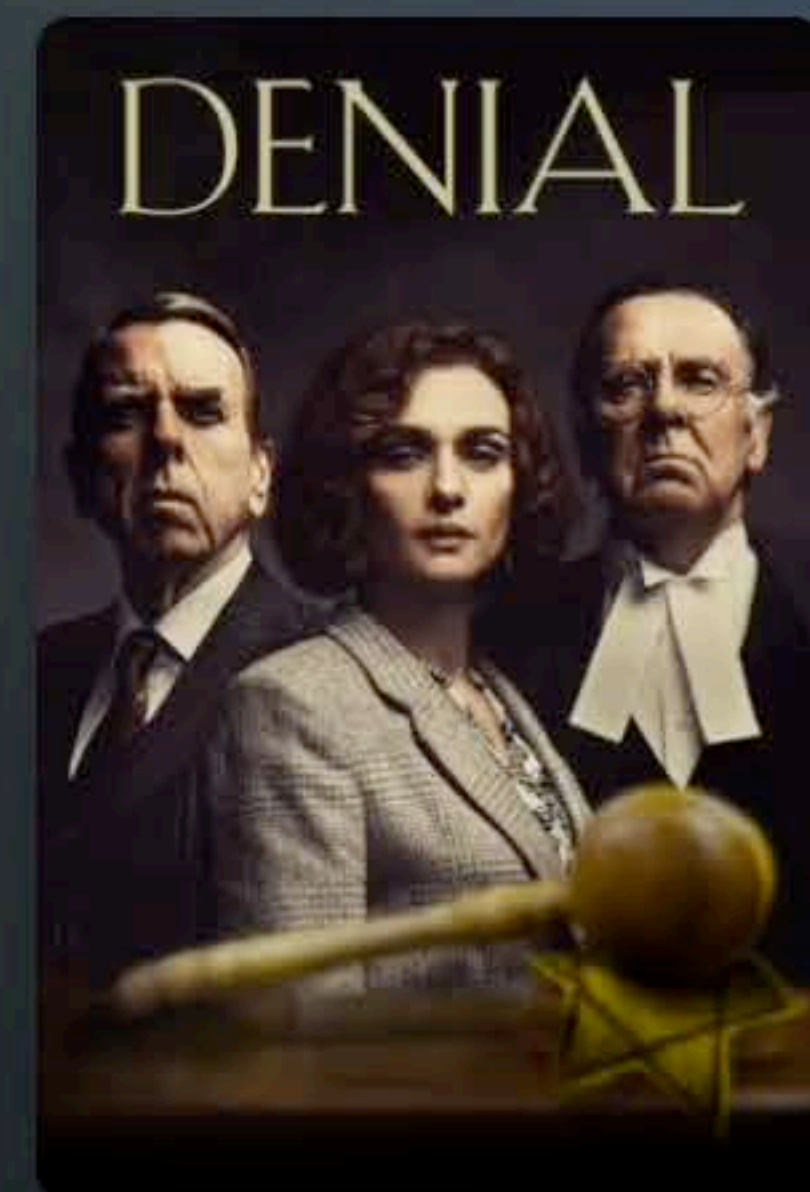
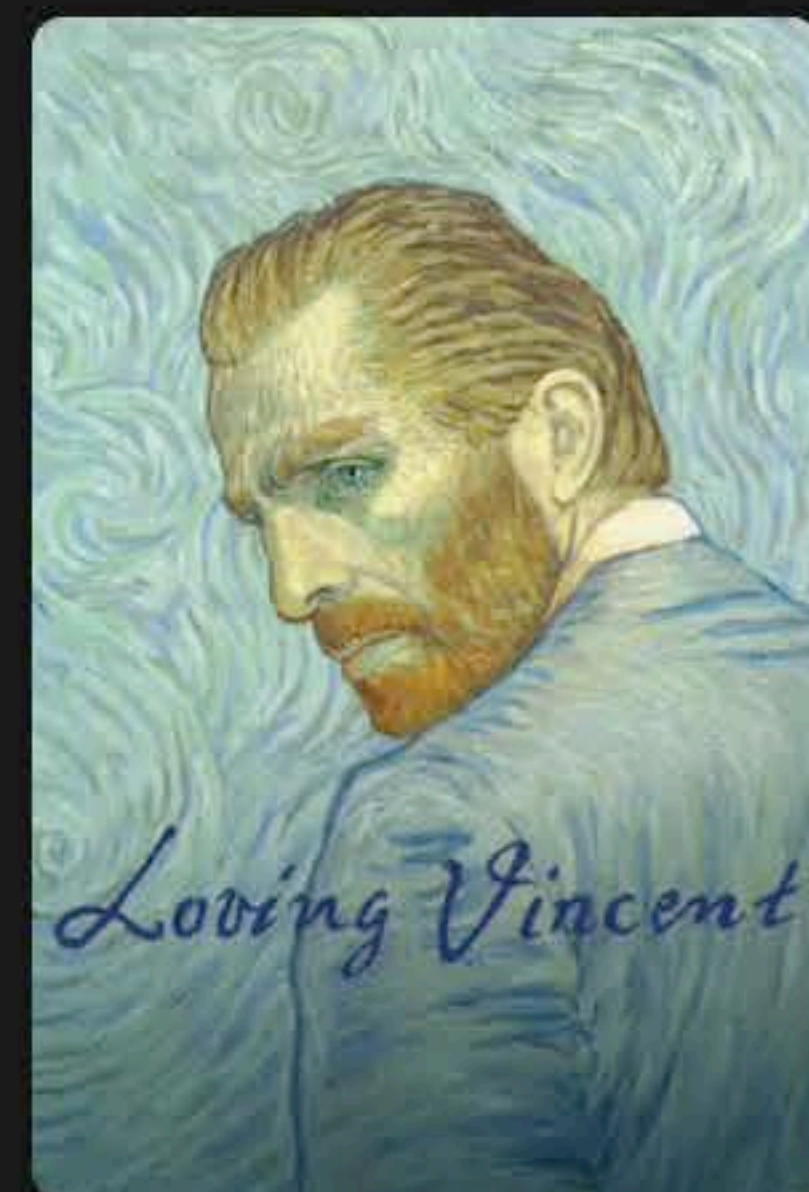


Rent



Wish List

Viewers Also Watched



Title
Subtitle



Title

SUBTITLE

Lorem ipsum dolor sit
amet, consectetur
adipiscing elit. Cras eget...

Title
Subtitle

Title
Subtitle



Title

SUBTITLE

Lorem ipsum dolor sit
amet, consectetur
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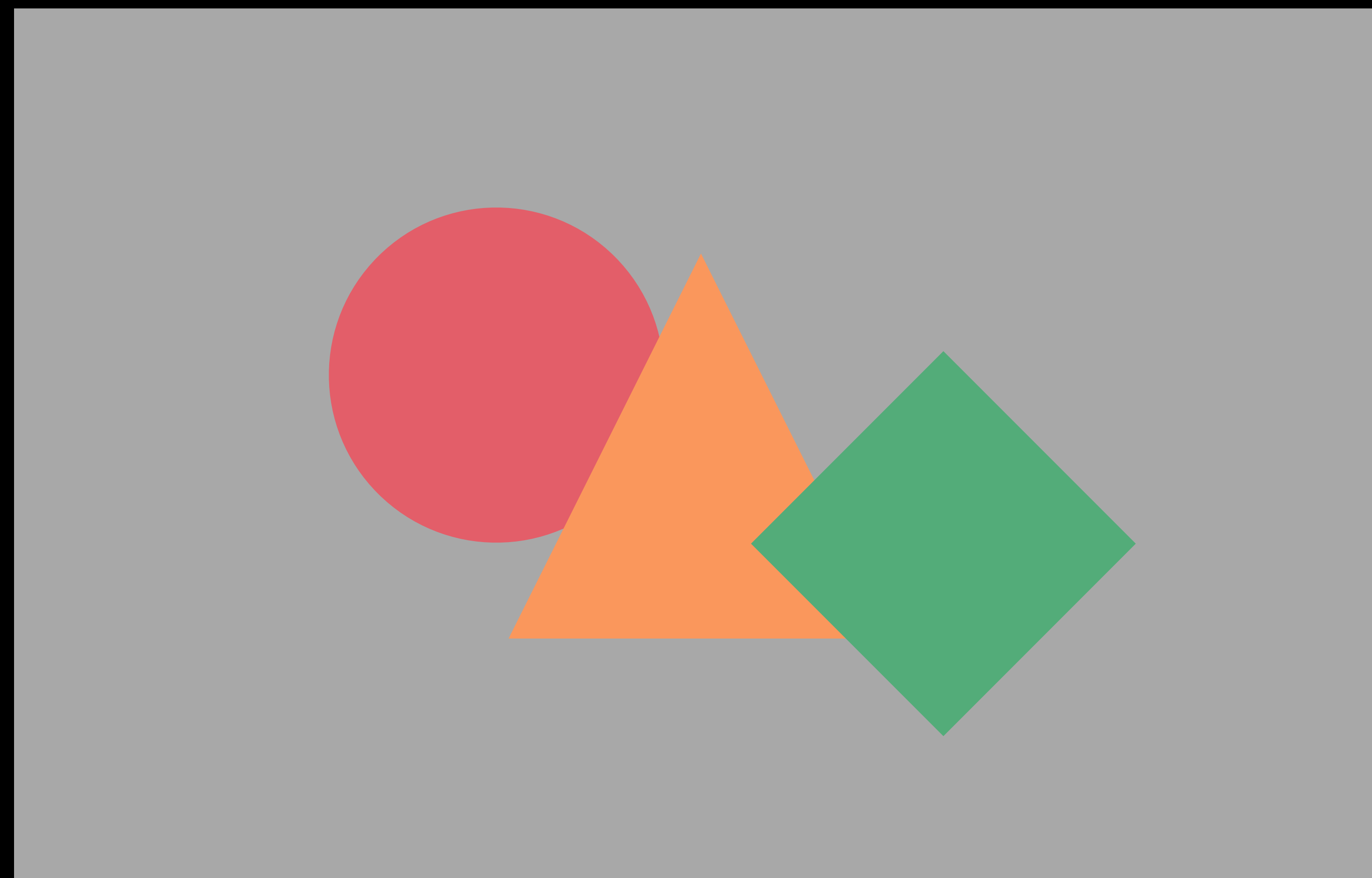
Title
Subtitle

TVCardView

NEW

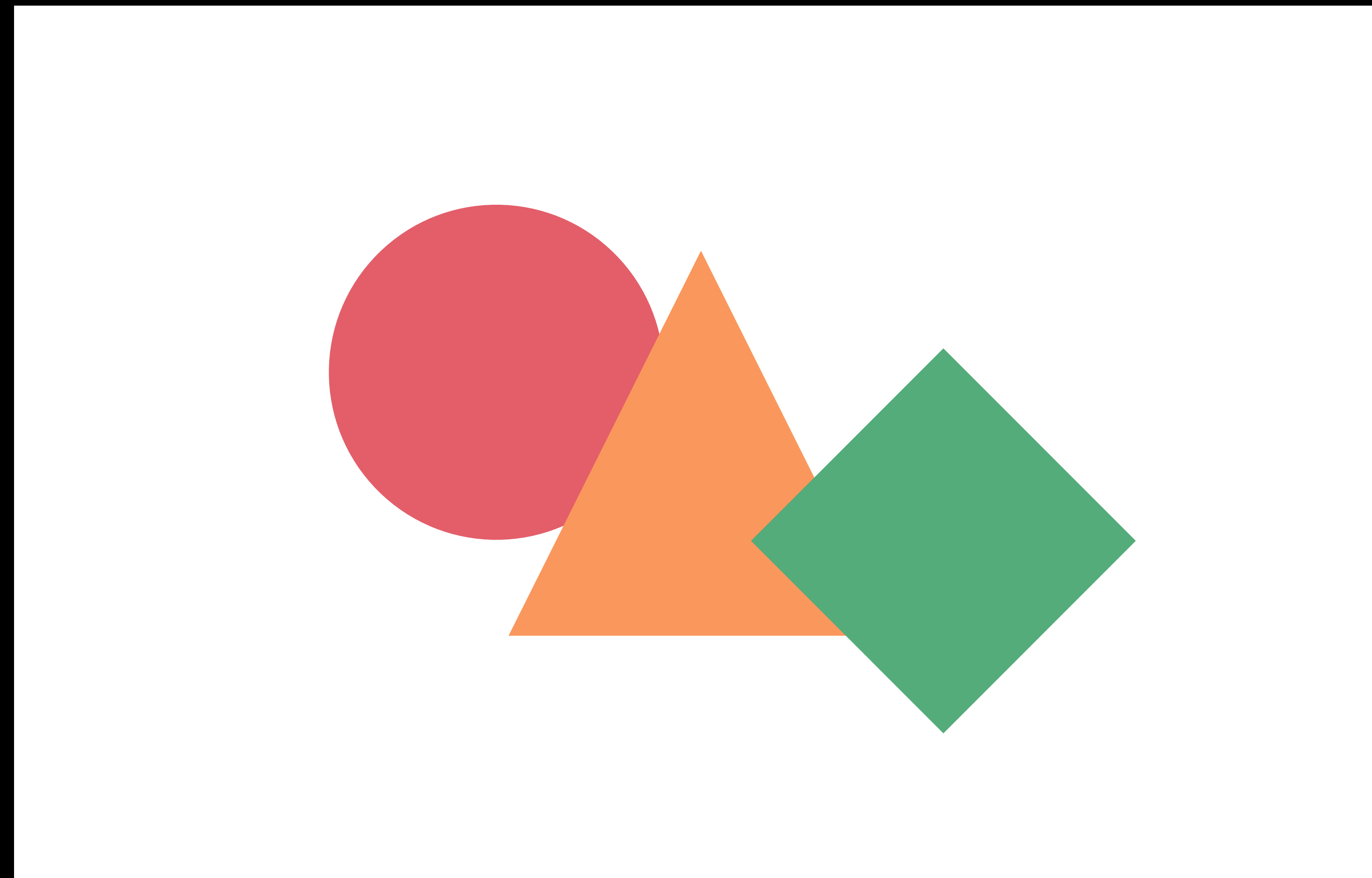
TVCardView

NEW



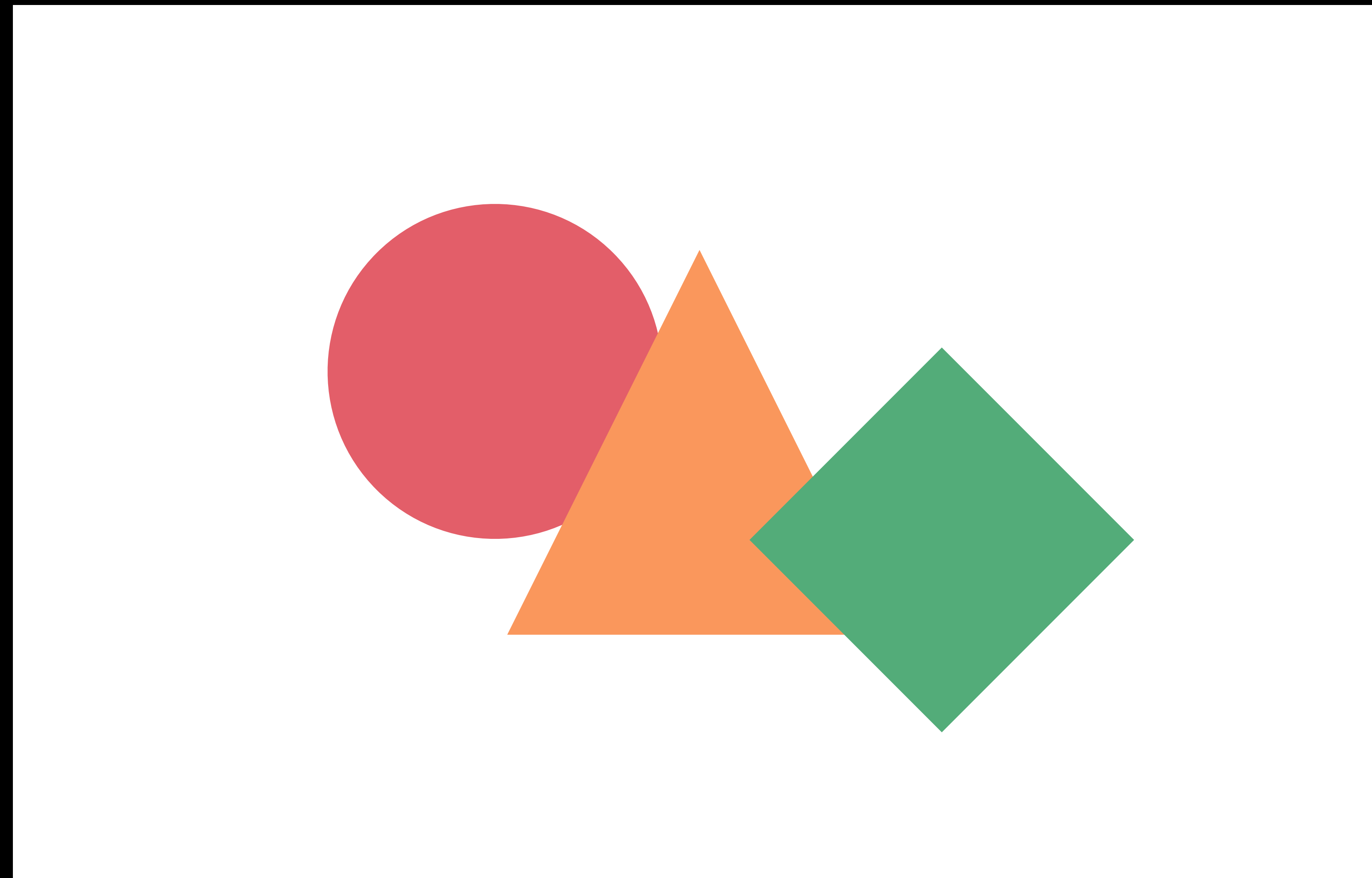
TVCardView

NEW



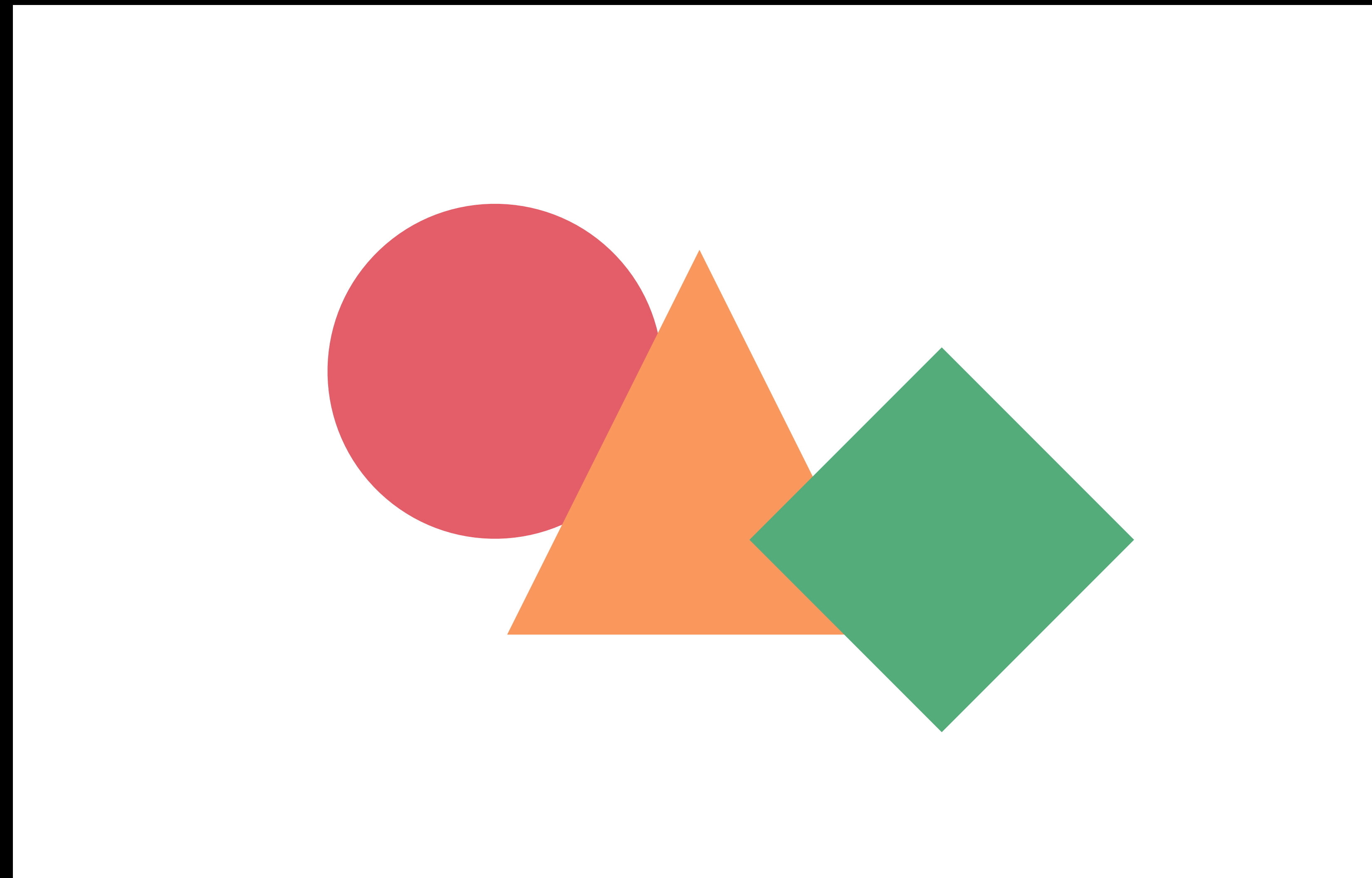
TVCardView

NEW



TVCardView

NEW





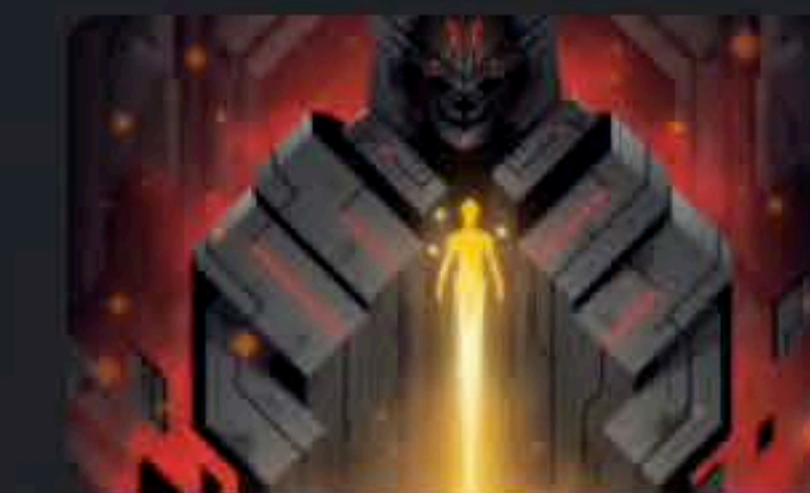
Hidden Folks Games

\$3.99



Mushroom Guardian Games

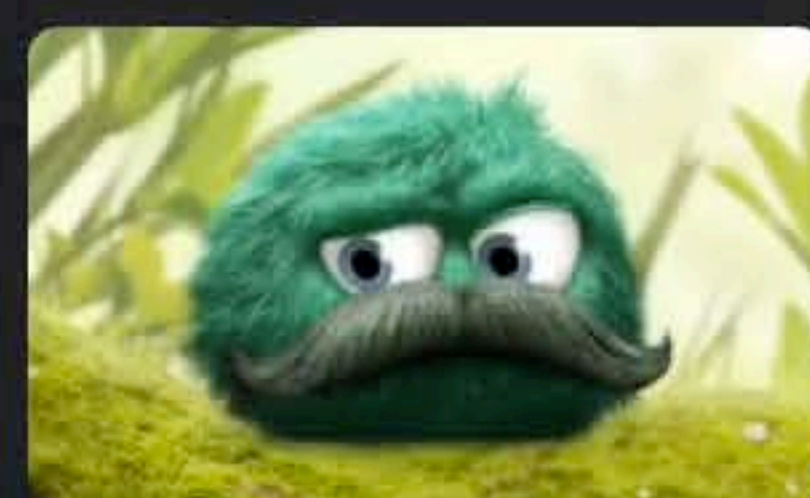
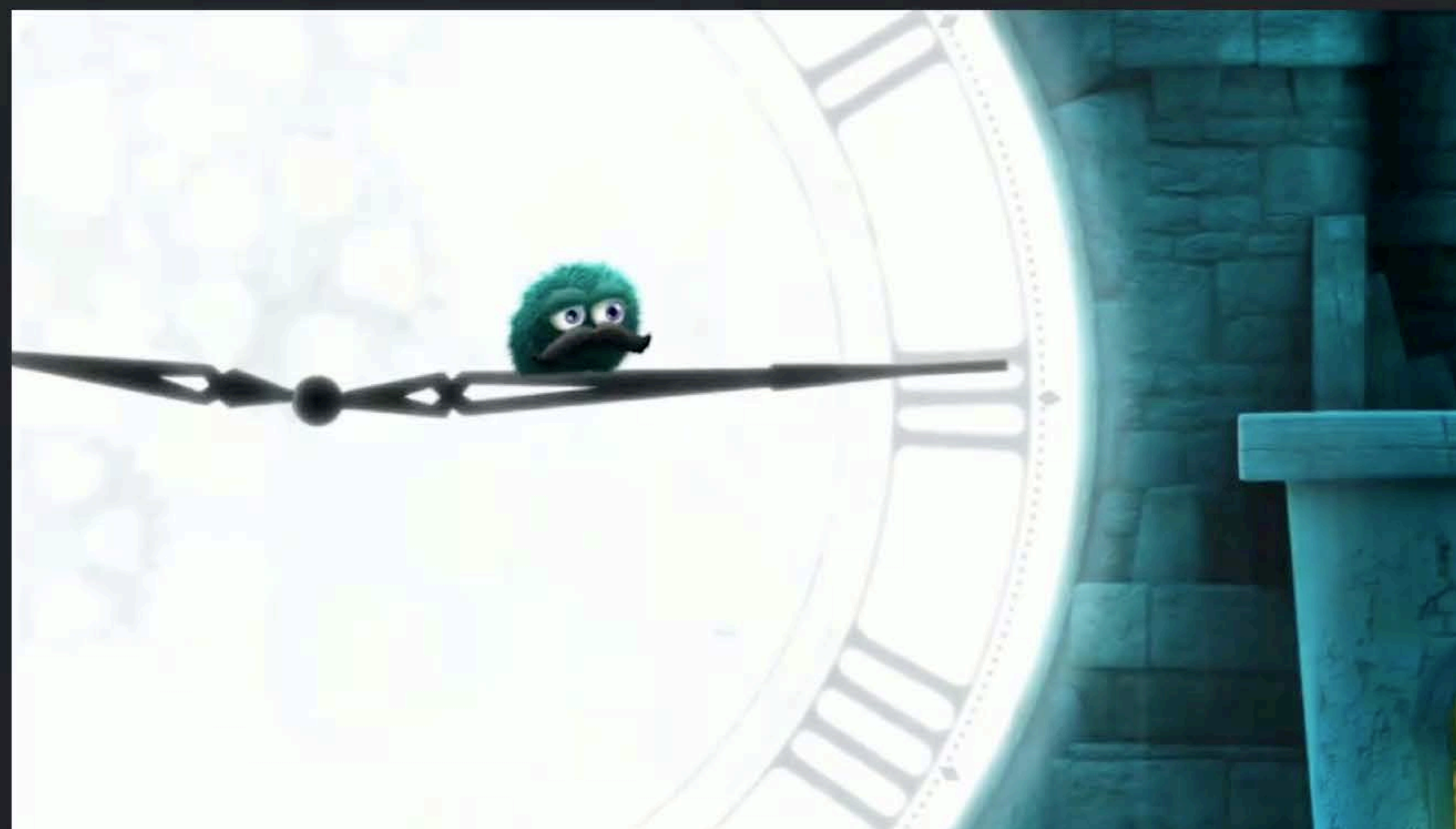
\$1.99



Hyperforma Games

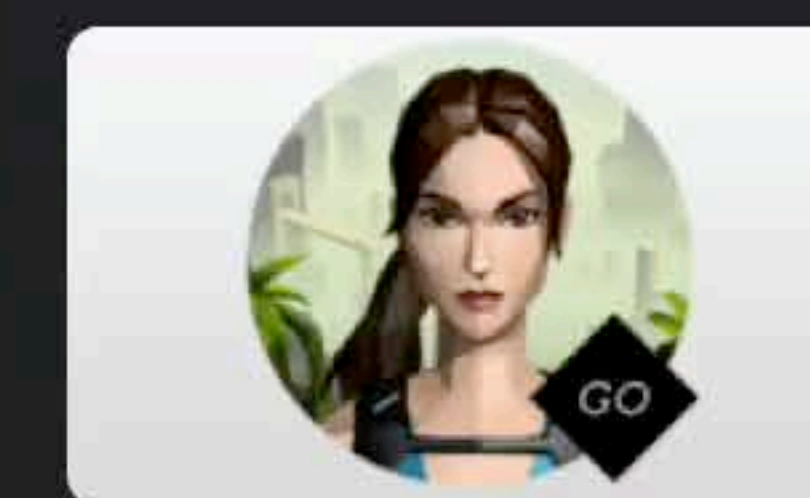
Editors' Choice

DARK ECHO

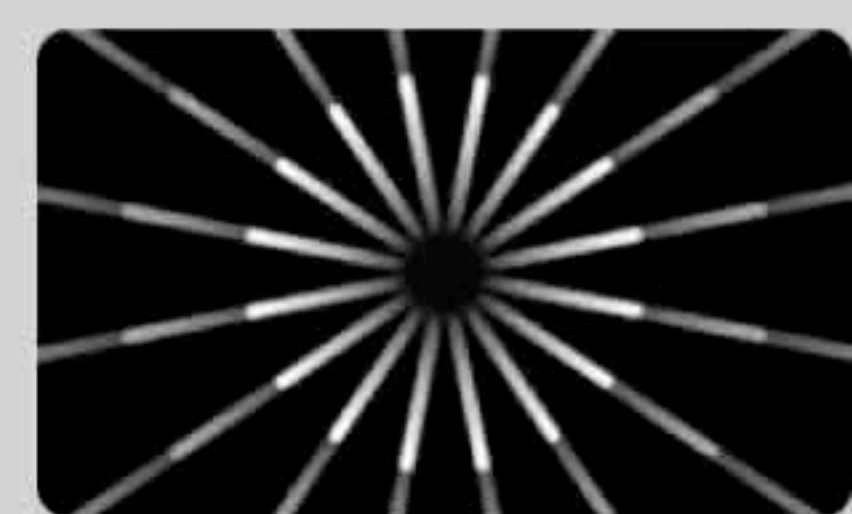


Leo's Fortune Games

\$4.99



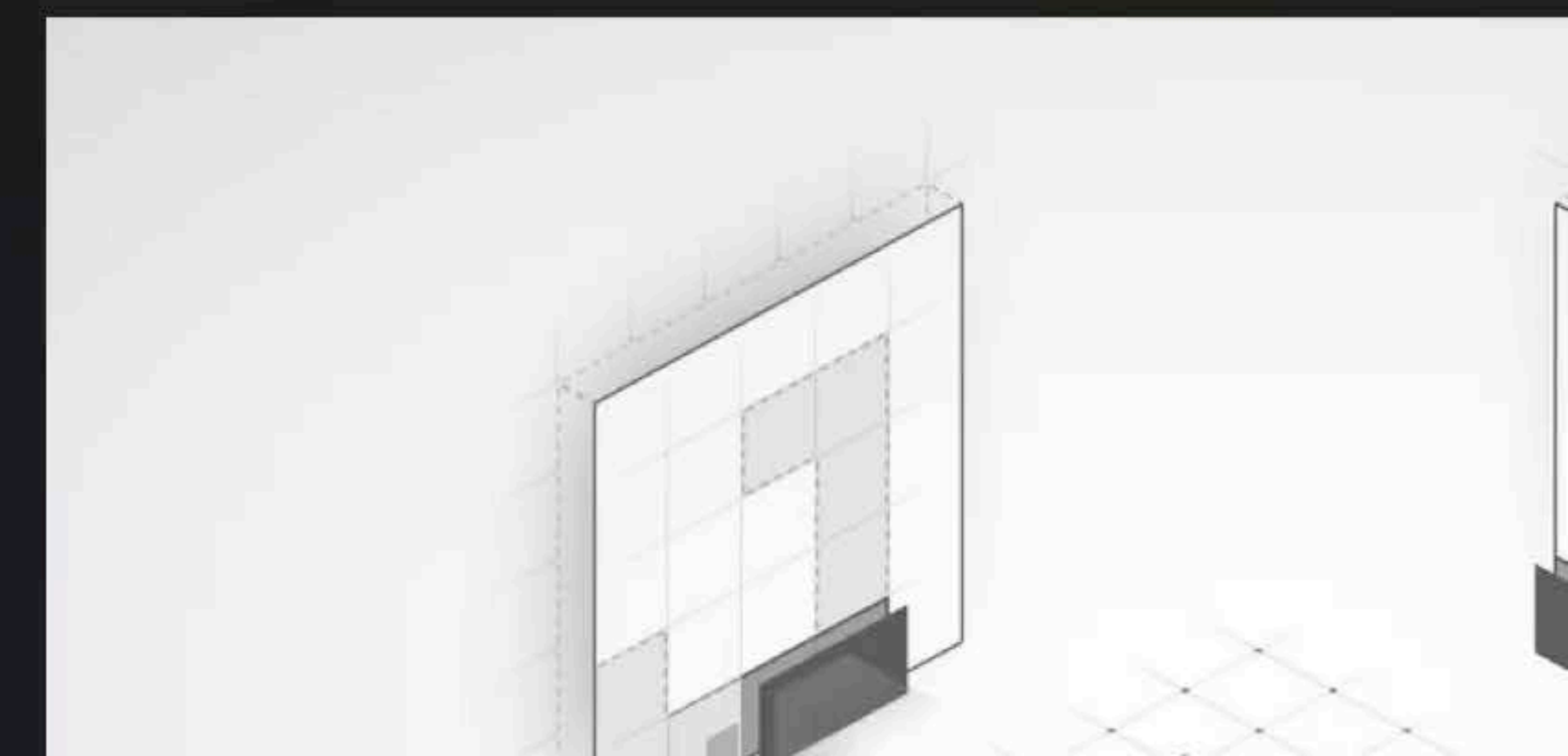
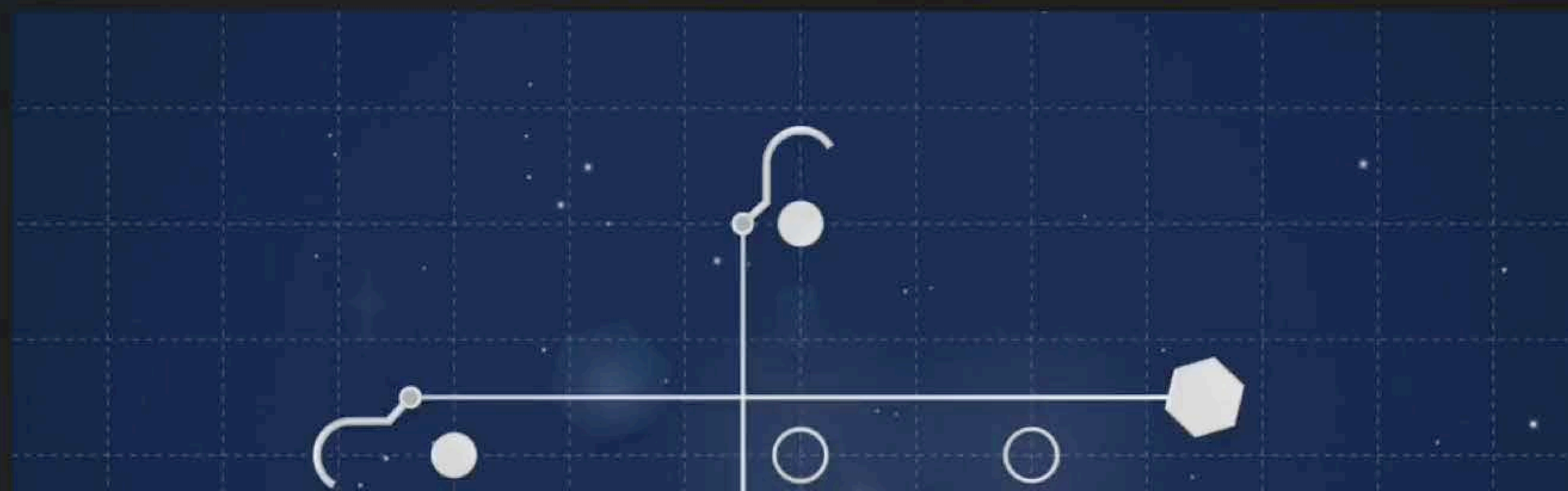
Lara Croft GO Games



Dark Echo Games

\$1.99

Feeling Puzzled?





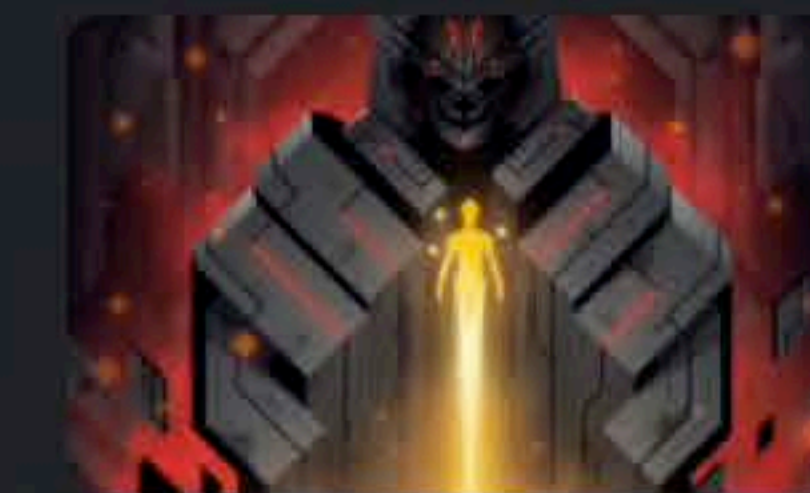
Hidden Folks
Games

\$3.99



Mushroom Guardian
Games

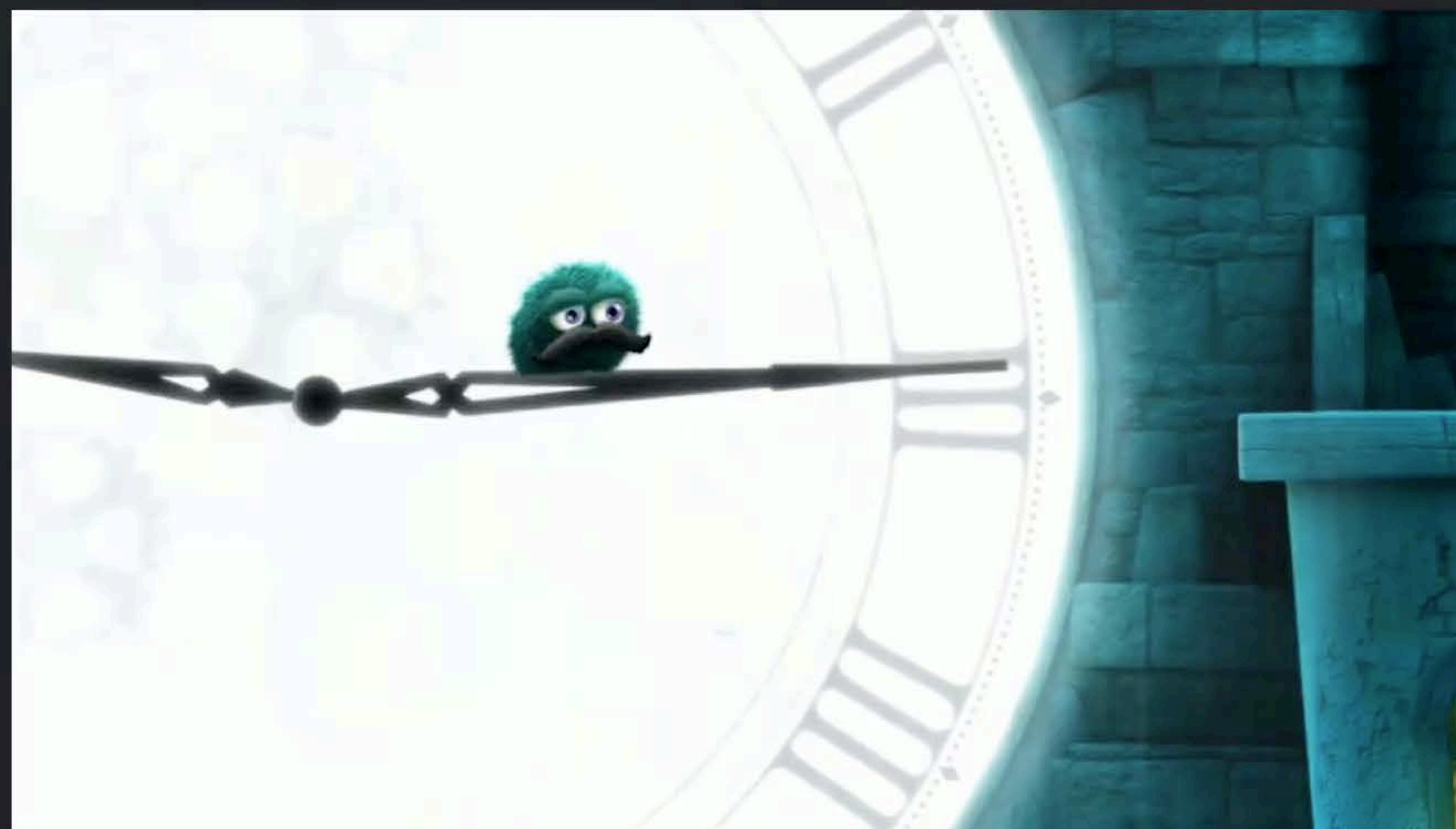
\$1.99



Hyperforma
Games

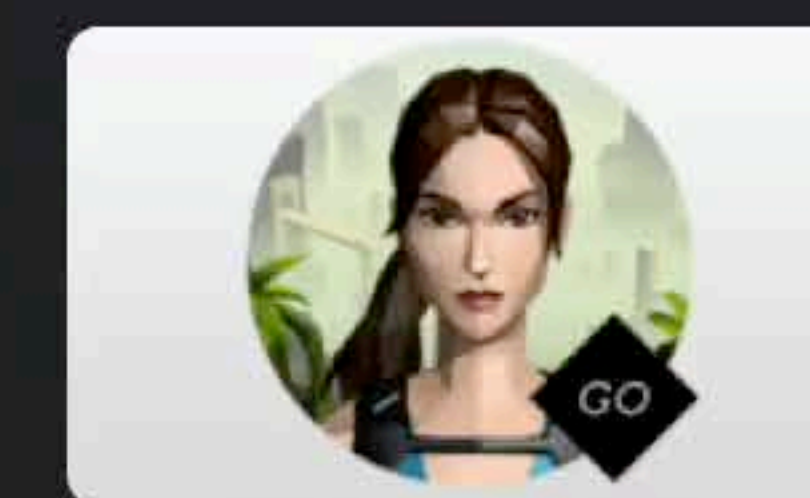
Editors' Choice

DARK ECHO



Leo's Fortune
Games

\$4.99



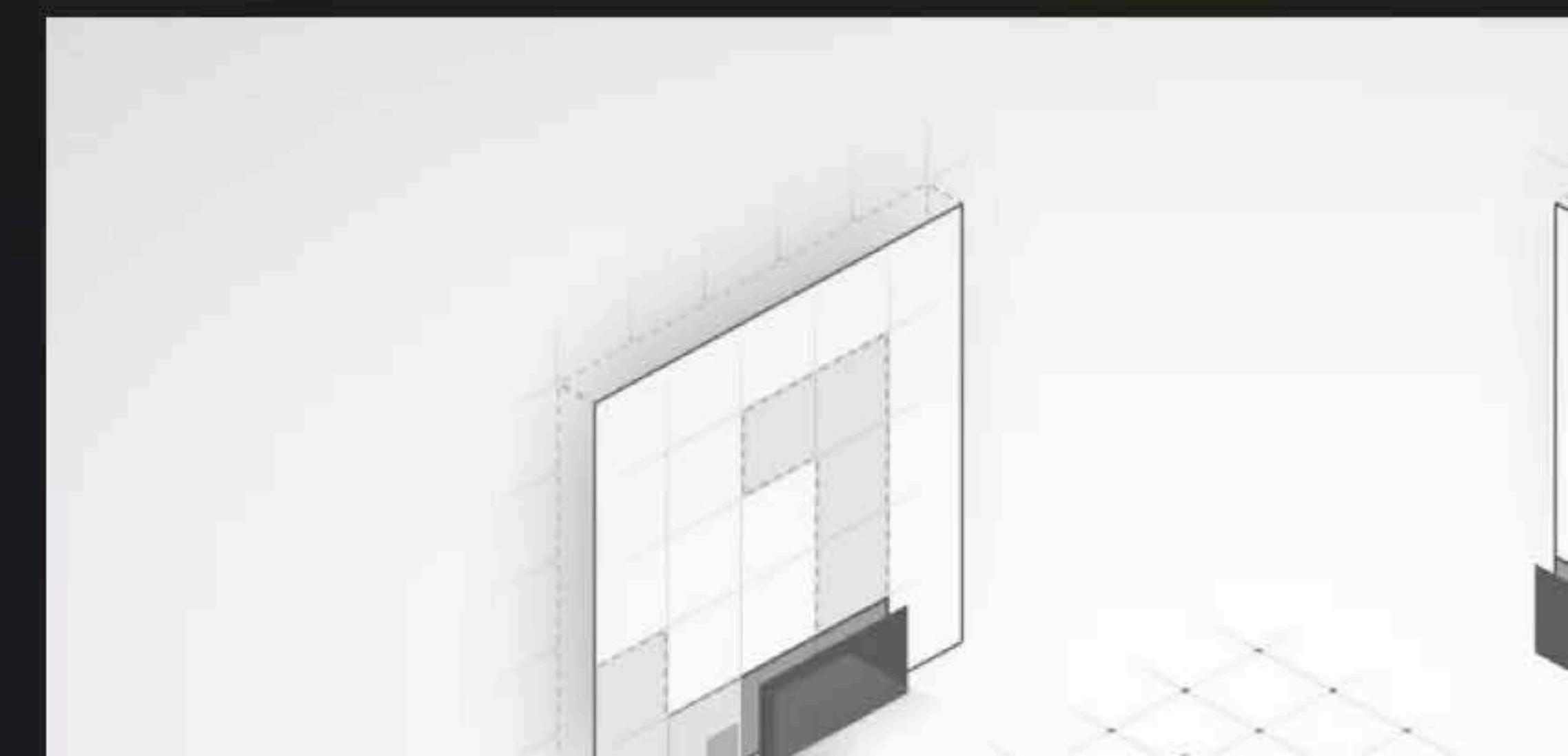
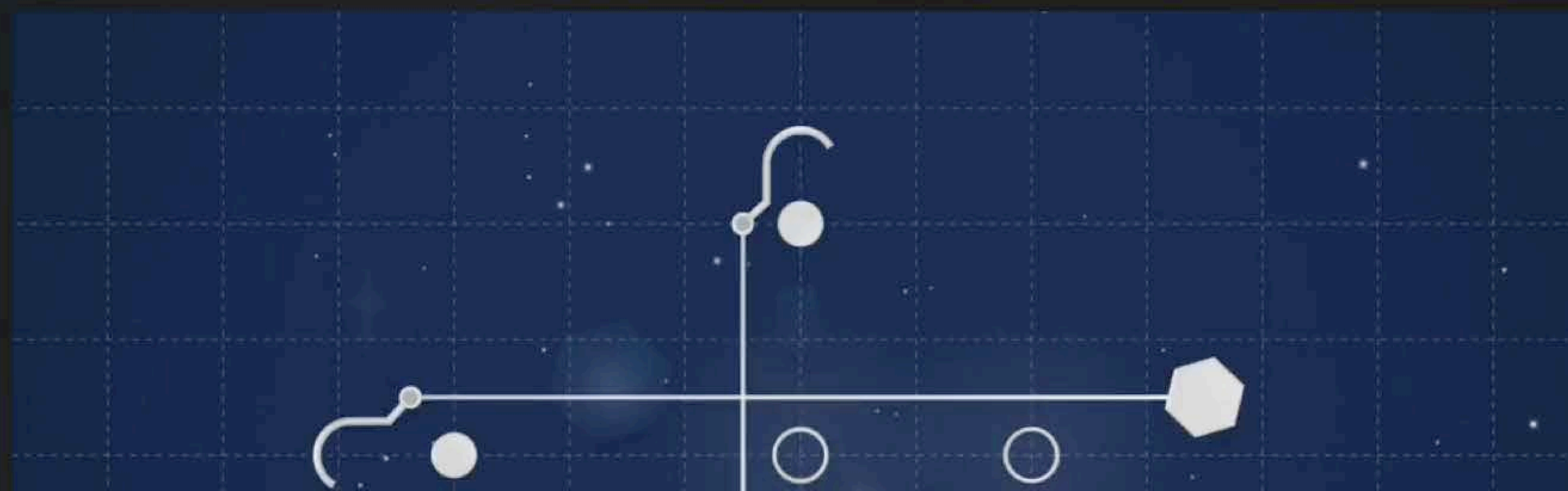
Lara Croft GO
Games



Dark Echo
Games

\$1.99

Feeling Puzzled?





Alicia Buchinski
ACTOR



Alvin Kwon
DIRECTOR



Cyrus Kimber
ACTOR



Dorothy Gooseff
ACTOR



Alicia Buchinski
ACTOR



Alvin Kwon
DIRECTOR



Cyrus Kimber
ACTOR



Dorothy Gooseff
ACTOR

TVMonogramView

NEW

TVMonogramView

NEW

content
image

TVMonogramView

NEW



The diagram illustrates the structure of the TVMonogramView. It features a central light gray circle labeled "content image". Below this circle are two stacked light gray rectangular bars. The top bar is labeled "title" and the bottom bar is labeled "subtitle".

content
image

title

subtitle

TVMonogramView

NEW



title

subtitle

TV MonogramView

NEW



title

subtitle

John Appleseed

TVMonogramView

NEW



JA

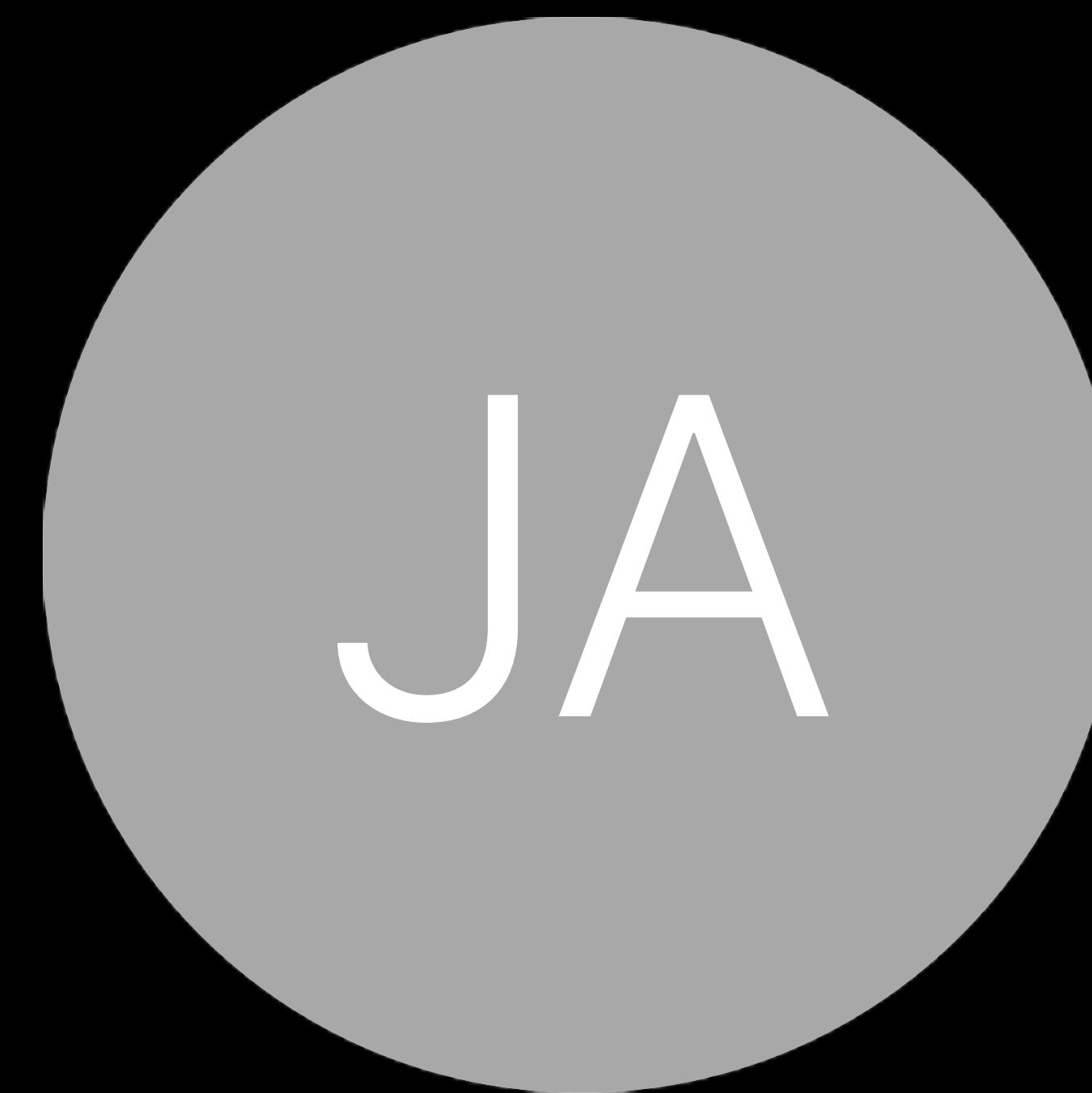
title

subtitle

John Appleseed

TV MonogramView

NEW



title

subtitle



TV MonogramView

NEW



title

subtitle



TVMonogramView

NEW



title

subtitle

TV MonogramView

NEW



title

subtitle

Cast & Crew



Alicia Buchinski
ACTOR



Alvin Kwon
DIRECTOR



Cyrus Kimber
ACTOR



Dorothy Gooseff
ACTOR



Eliza Izzarelli
ACTOR



Franklin Elfvin
ACTOR

Information

Studio	Lone Bird
Genre	Drama
Released	June 5, 2018
Run Time	1 hr 38 min
Format	Widescreen
Rated	PG-13 for prolonged sequences of action violence, and a brief rude gesture.

© 2018 Lone Bird

Languages

Primary	English (Dolby Digital Plus 7.1, Dolby Digital 5.1, Subtitles, CC, AD)
Additional	Arabic (Subtitles) Cantonese (Subtitles) Croatian (Subtitles) Korean (Subtitles) Danish (Subtitles) Dutch (Subtitles) Finnish (Subtitles)

Header

- SDH** Subtitles for the deaf and hard of hearing refer to subtitles in the original language with the addition of relevant nondialog information.
- AD** Audio description refers to a narration track describing what is happening on screen, to provide context for those who are blind or have low vision.

Cast & Crew



Alicia Buchinski
ACTOR



Alvin Kwon
DIRECTOR



Cyrus Kimber
ACTOR



Dorothy Gooseff
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NEW



Poster

Caption Button

Card

Monogram

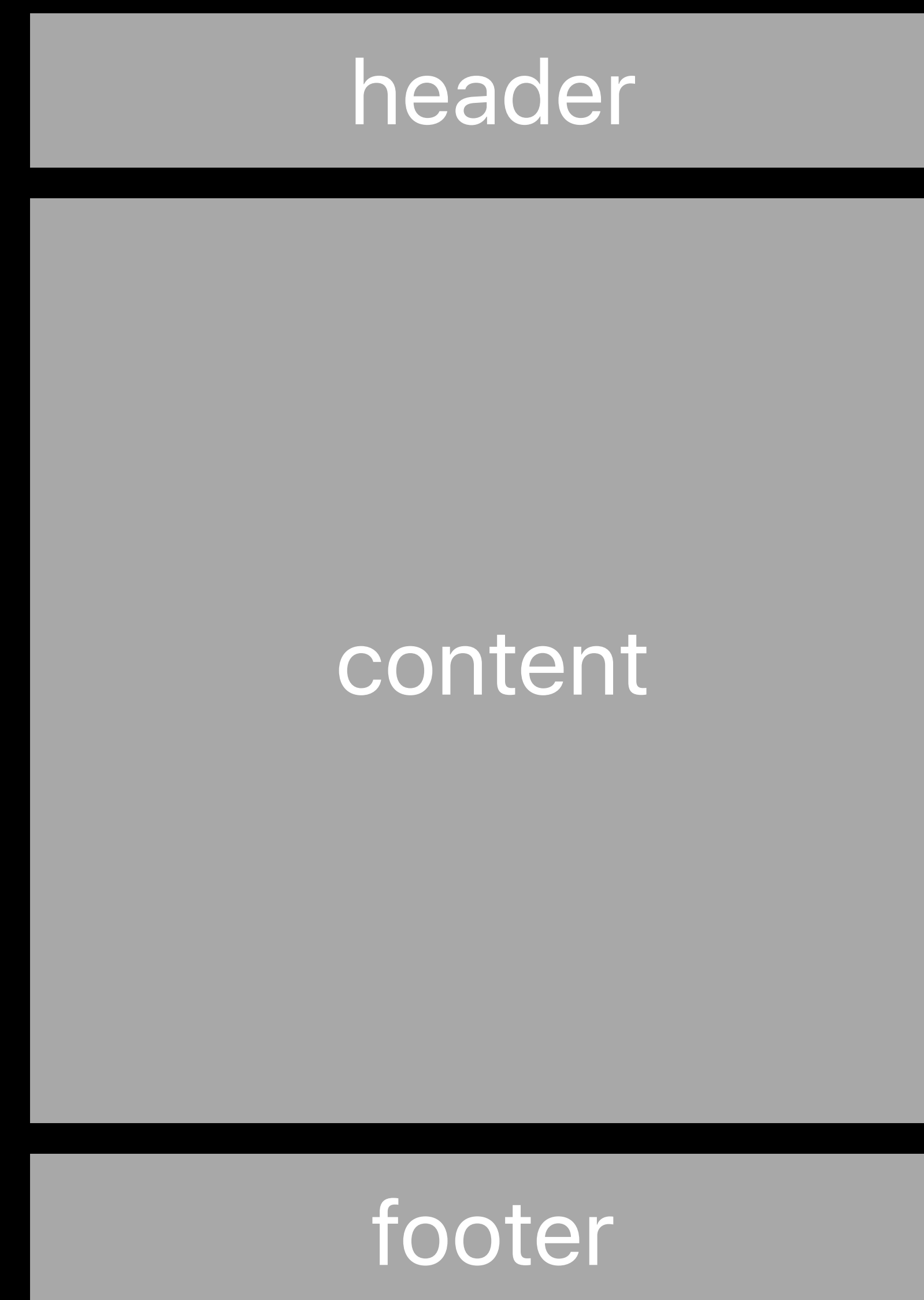
Common Theme

NEW

content

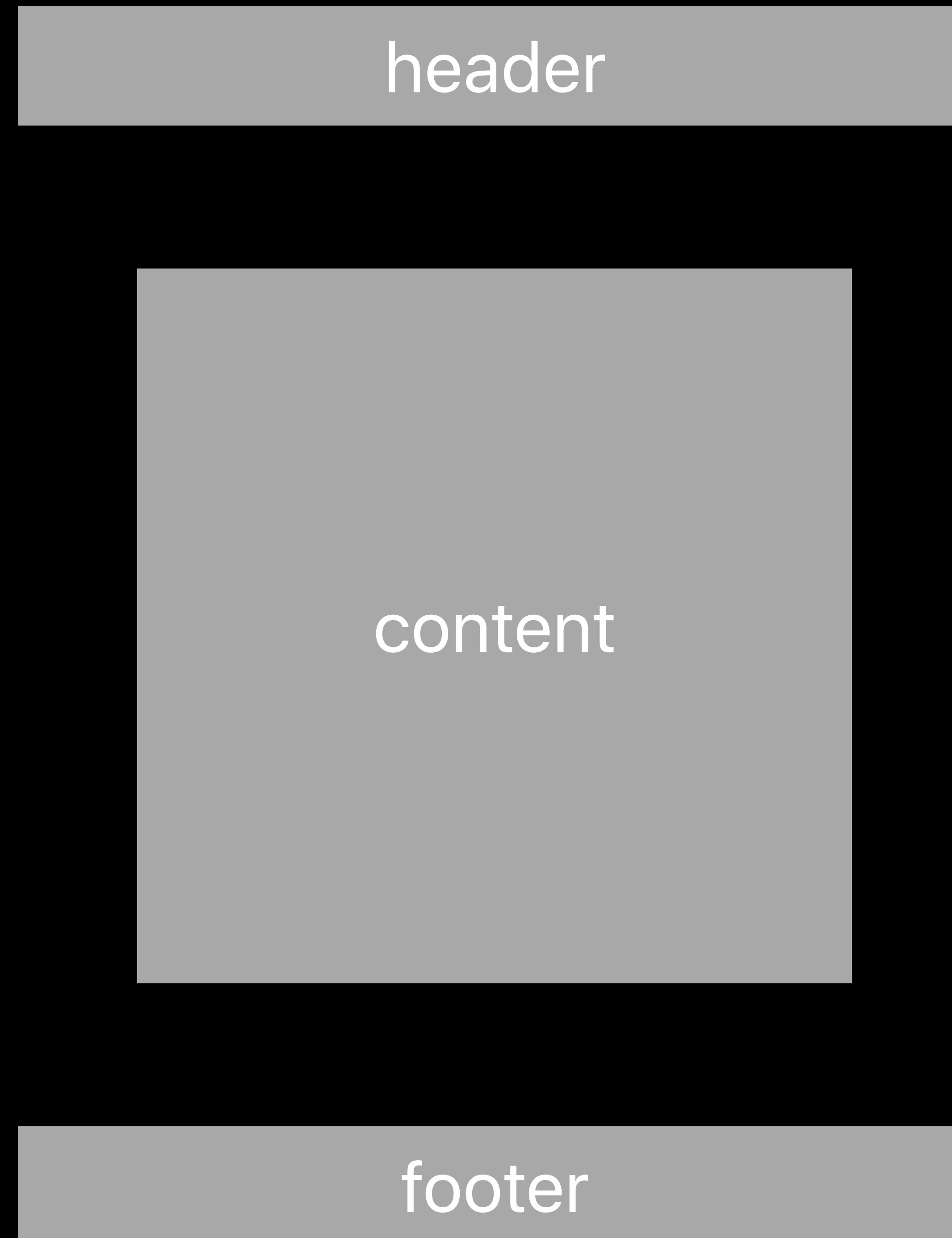
Common Theme

NEW



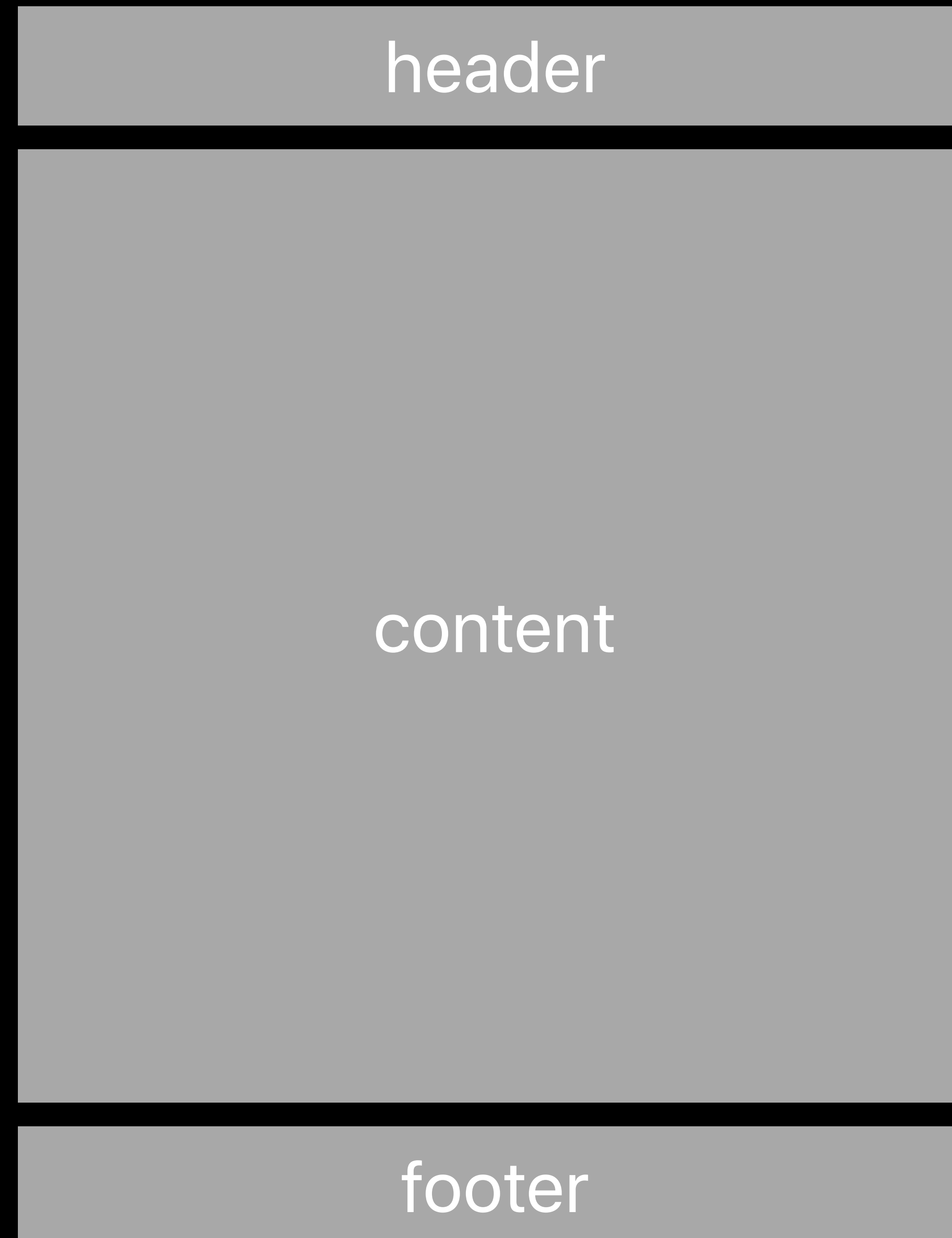
Common Theme

NEW



Common Theme

NEW





TVPosterView

TVCaptionButton

TVCardView

TVMonogramView



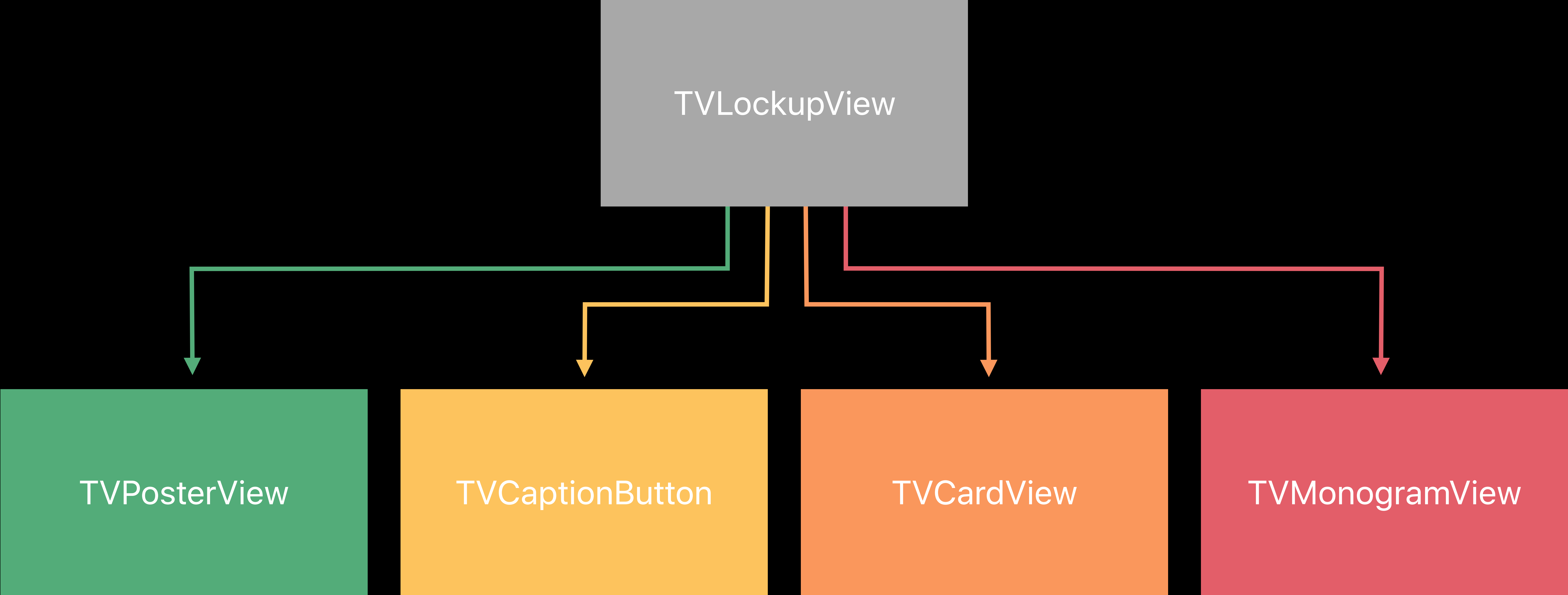
TVPosterView

TVCaptionButton

TVCardView

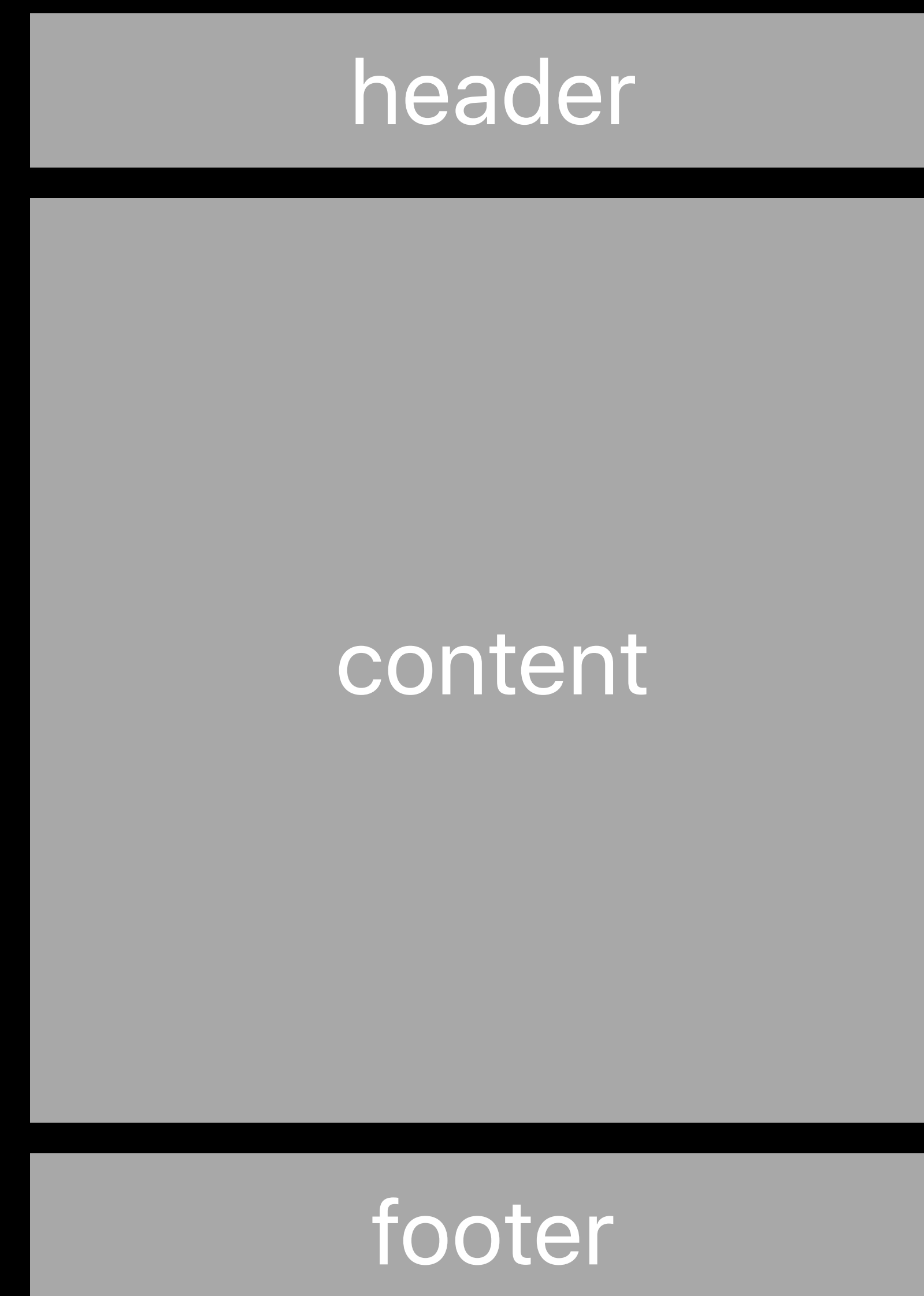
TVMonogramView

NEW



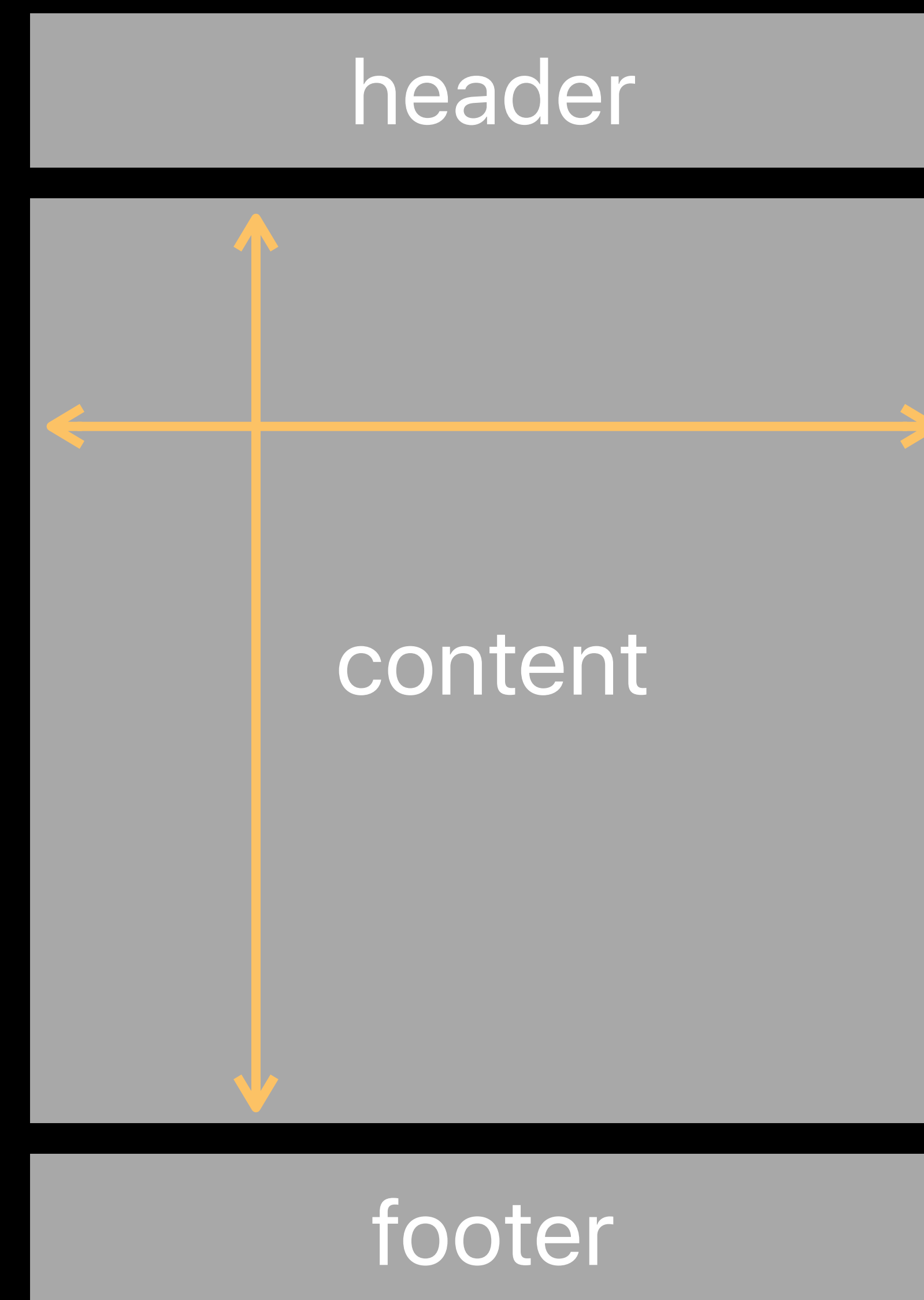
TVLockupView

NEW



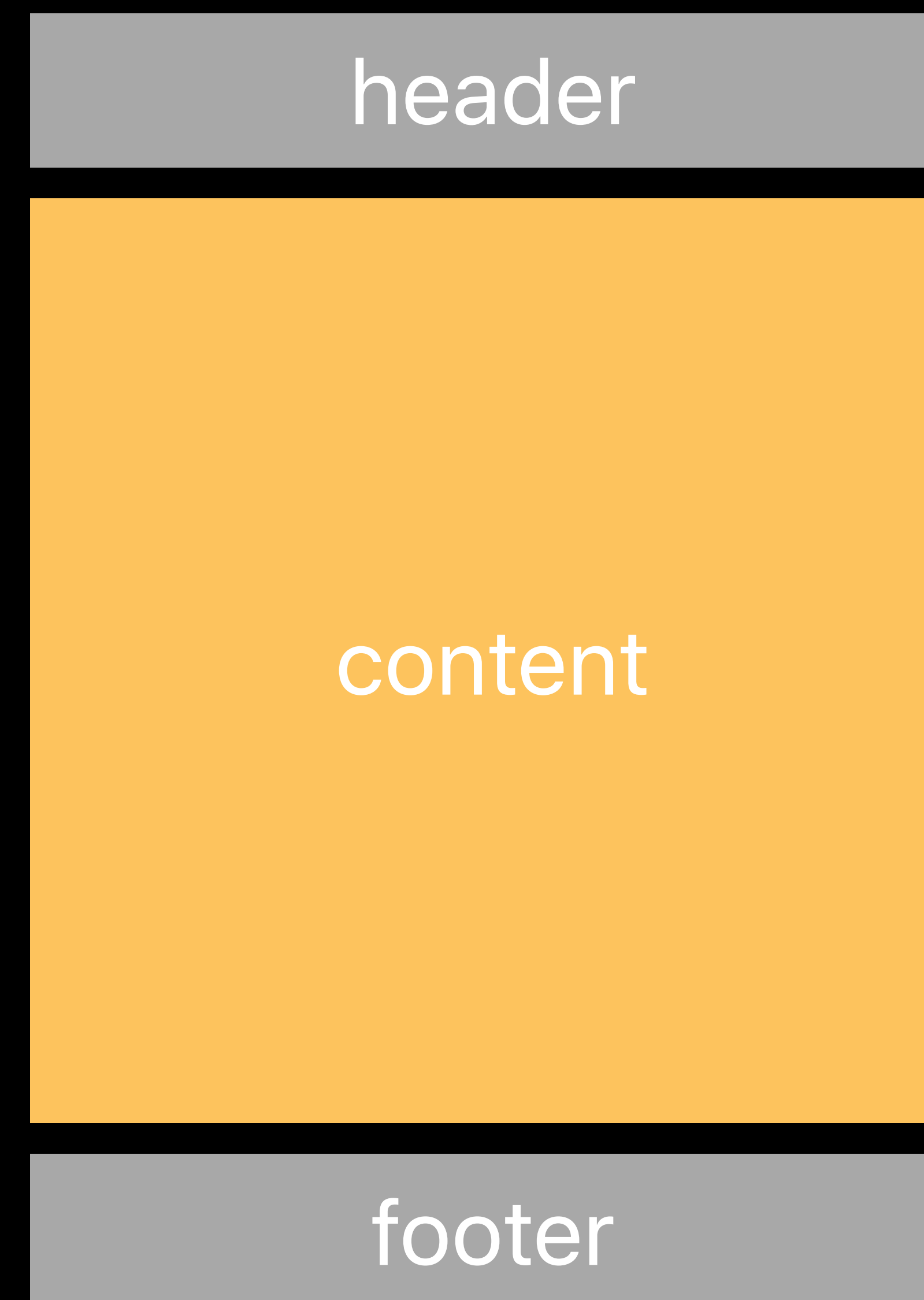
TVLockupView

NEW



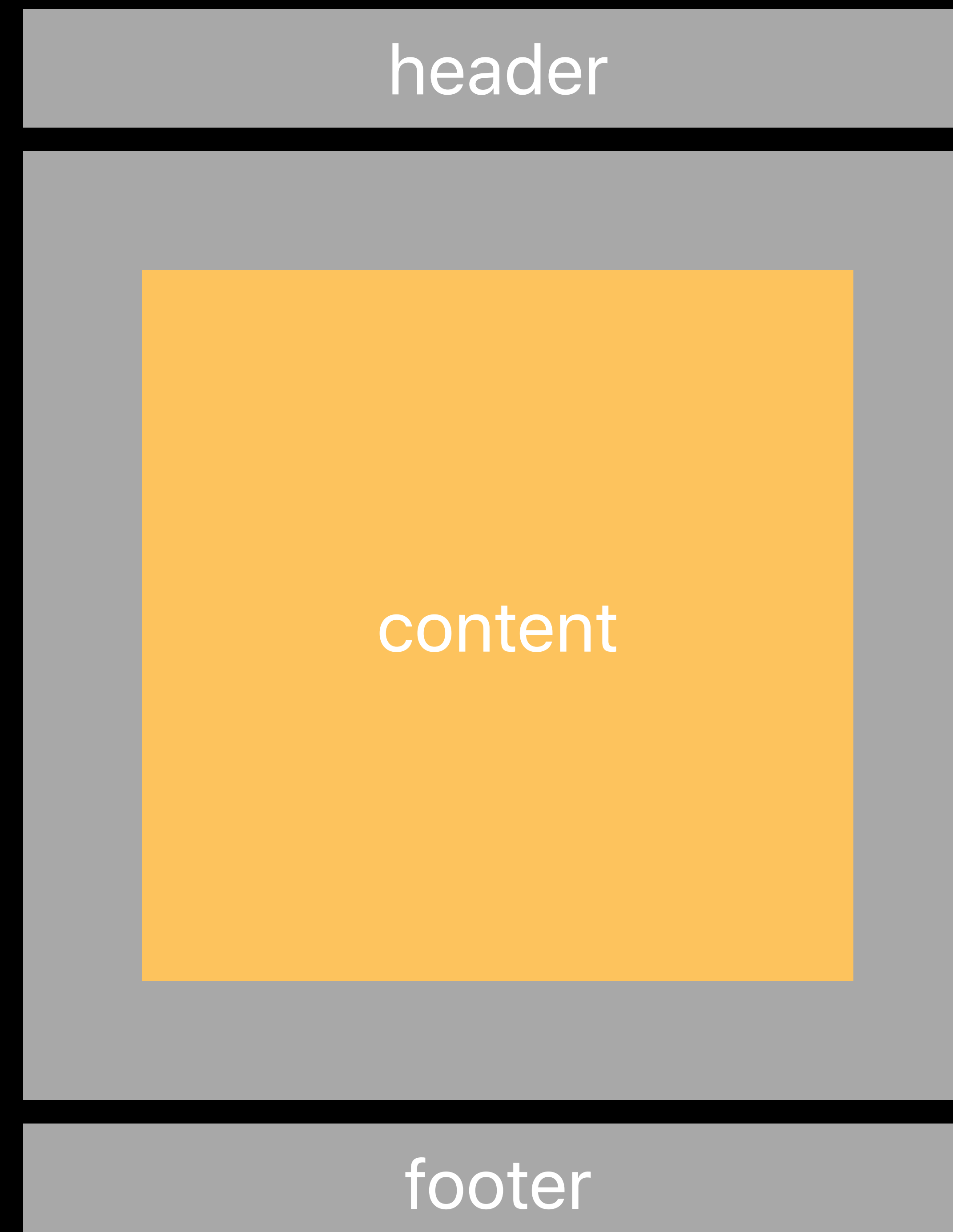
TVLockupView

NEW



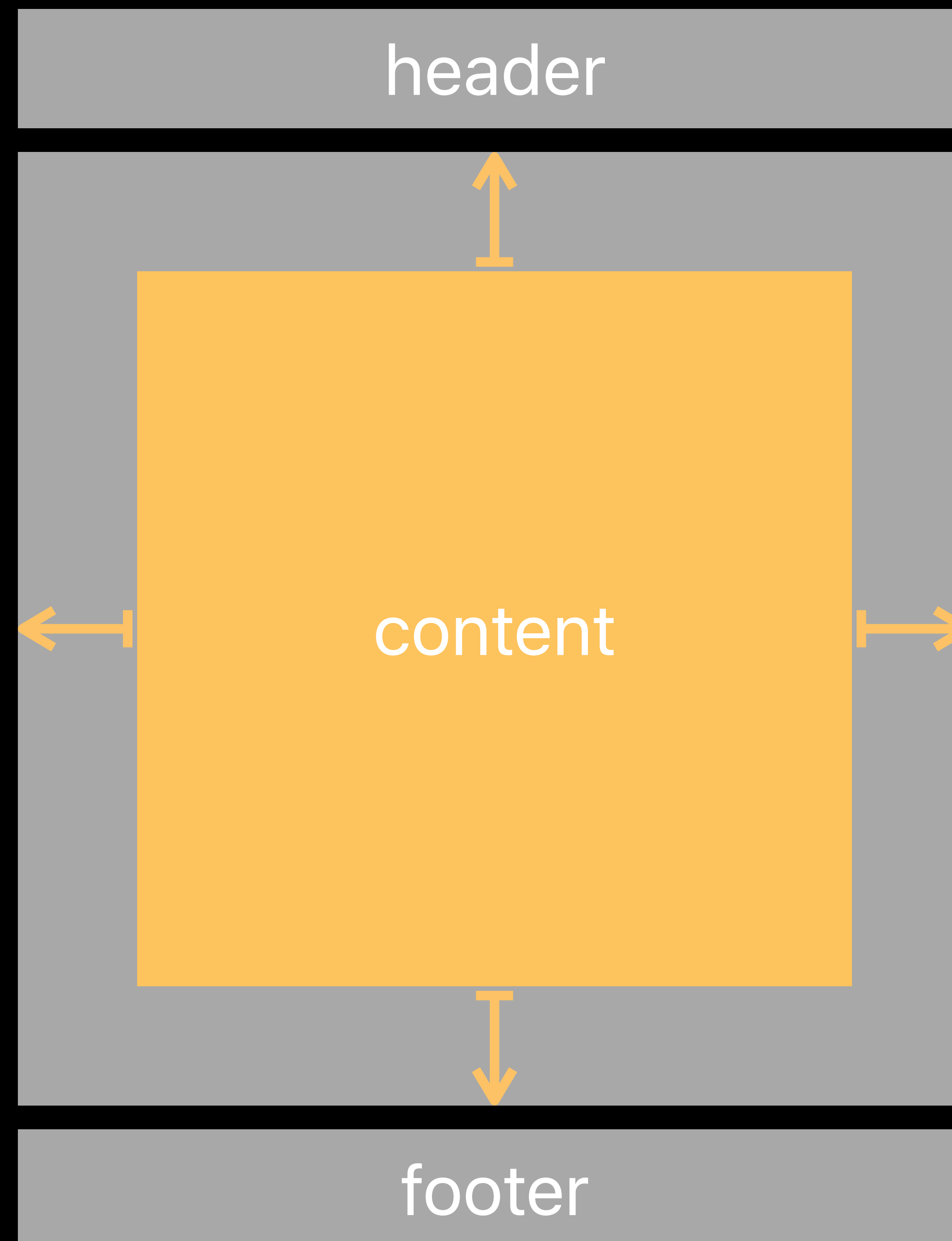
TVLockupView

NEW



TVLockupView

NEW



TVLockupView

Custom content



NEW

TVLockupView

Custom content



NEW

```
@available(tvOS 12.0, *)
public protocol TVLockupViewComponent : NSObjectProtocol {

    optional public func updateAppearance(forLockupViewState state: UIControl.State)
}
```

TVLockupView

Custom content



NEW

```
@available(tvOS 12.0, *)
public protocol TVLockupViewComponent : NSObjectProtocol {

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}
```

TVLockupView

NEW

TVLockupView



NEW

Your own widget that responds to focus

TVLockupView



NEW

Your own widget that responds to focus

Customize 4 special purpose subclasses

- TVPosterView
- TVCaptionButtonView
- TVCardView
- TVMonogramView

Set Passcode

Enter a four-digit passcode to set up restrictions for your Apple TV. You'll need to enter the passcode whenever you want to change the restrictions.

1 2 3 4 5 6 7 8 9 0 

Set Passcode

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1 2 3 4 5 6 7 8 9 0 

TVDigitEntryViewController

NEW

TVDigitEntryViewController

NEW

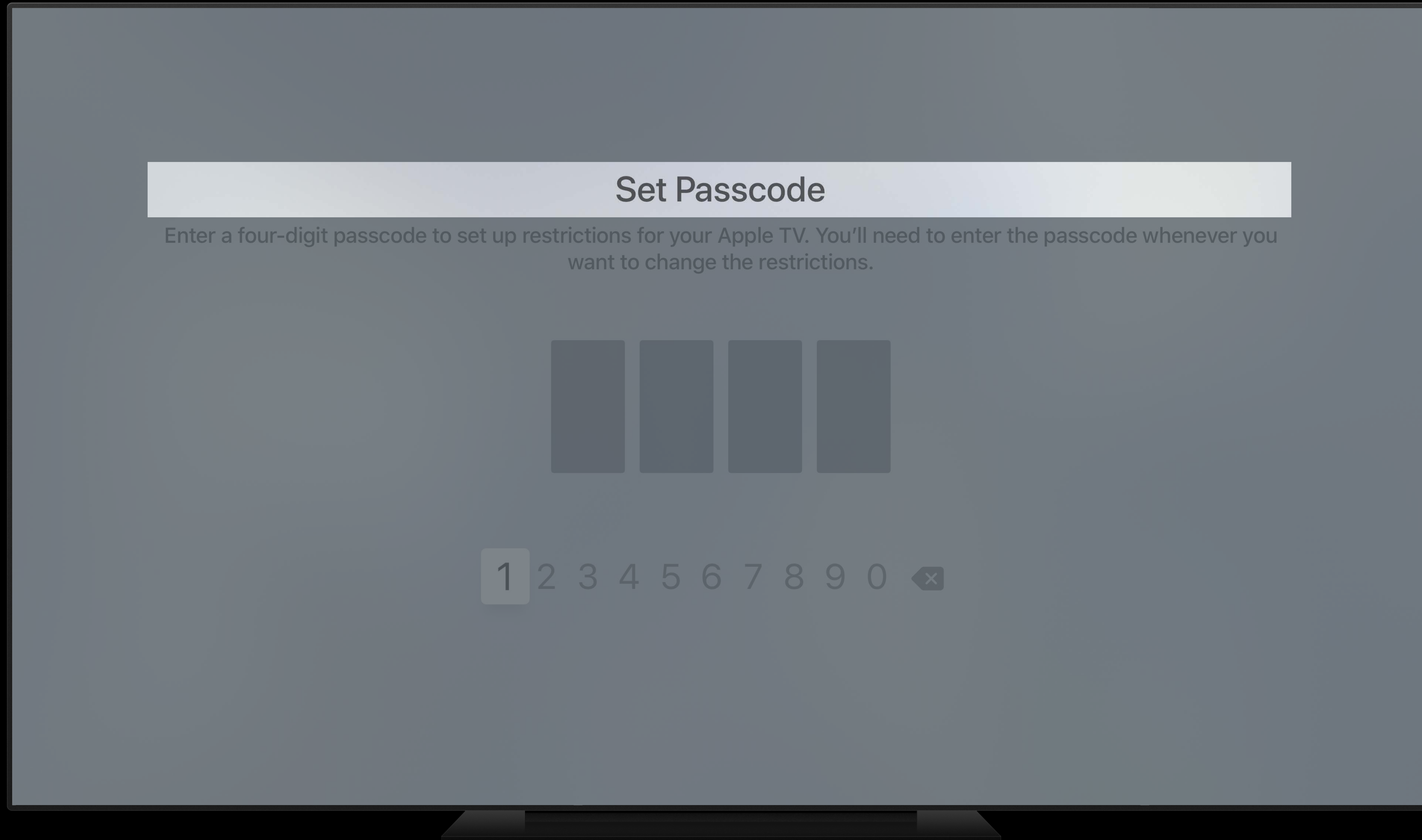
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1 2 3 4 5 6 7 8 9 0 

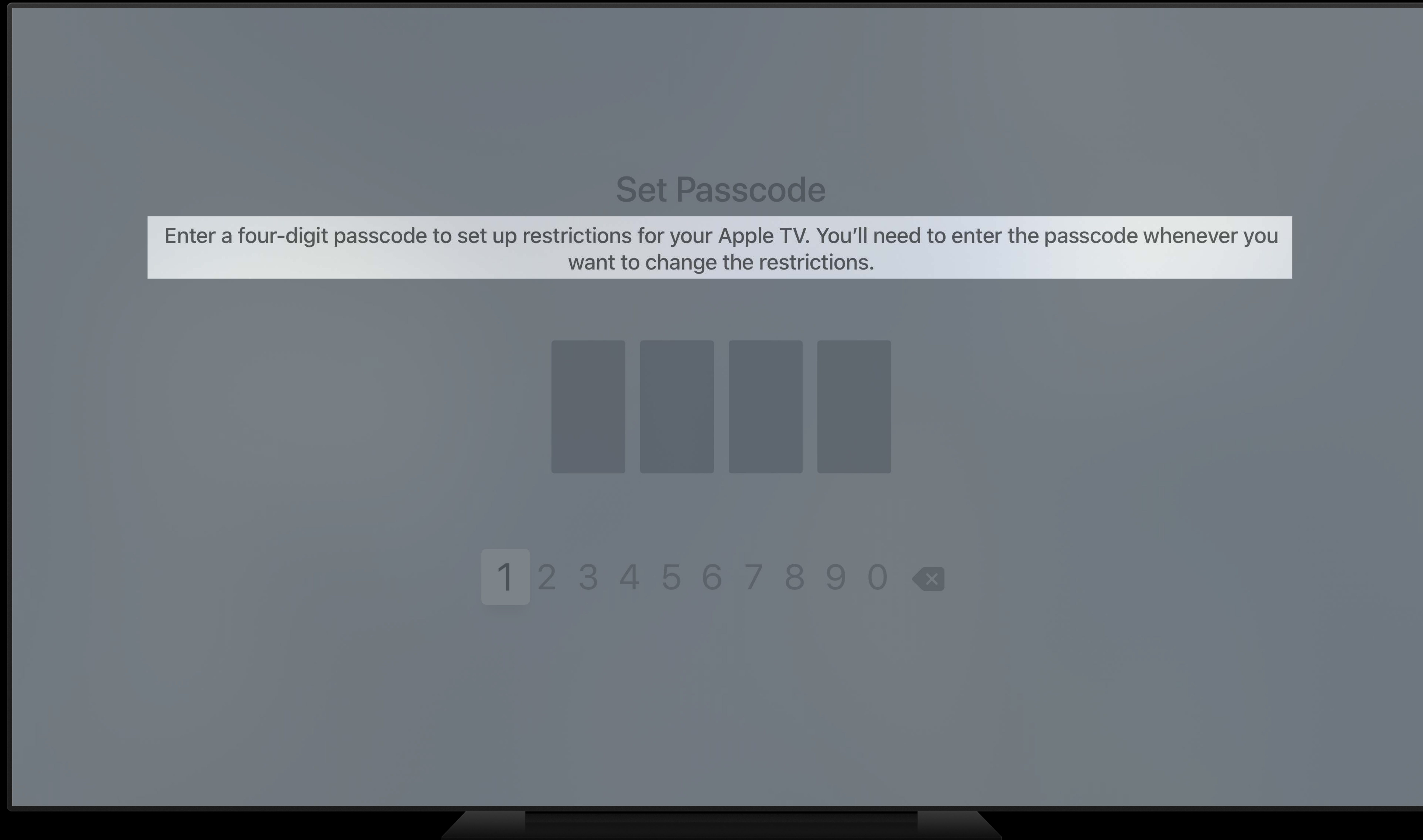
TVDigitEntryViewController

NEW



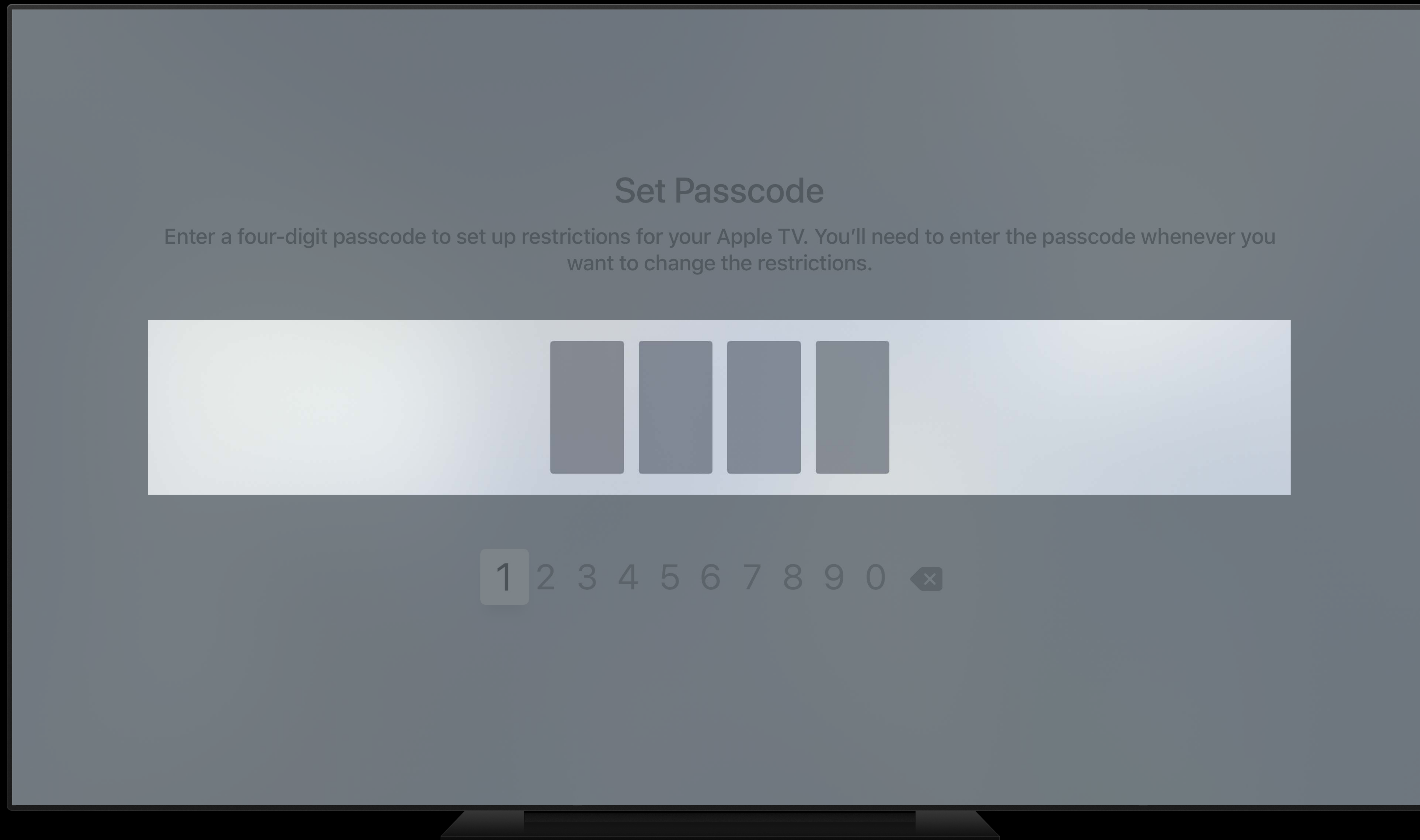
TVDigitEntryViewController

NEW



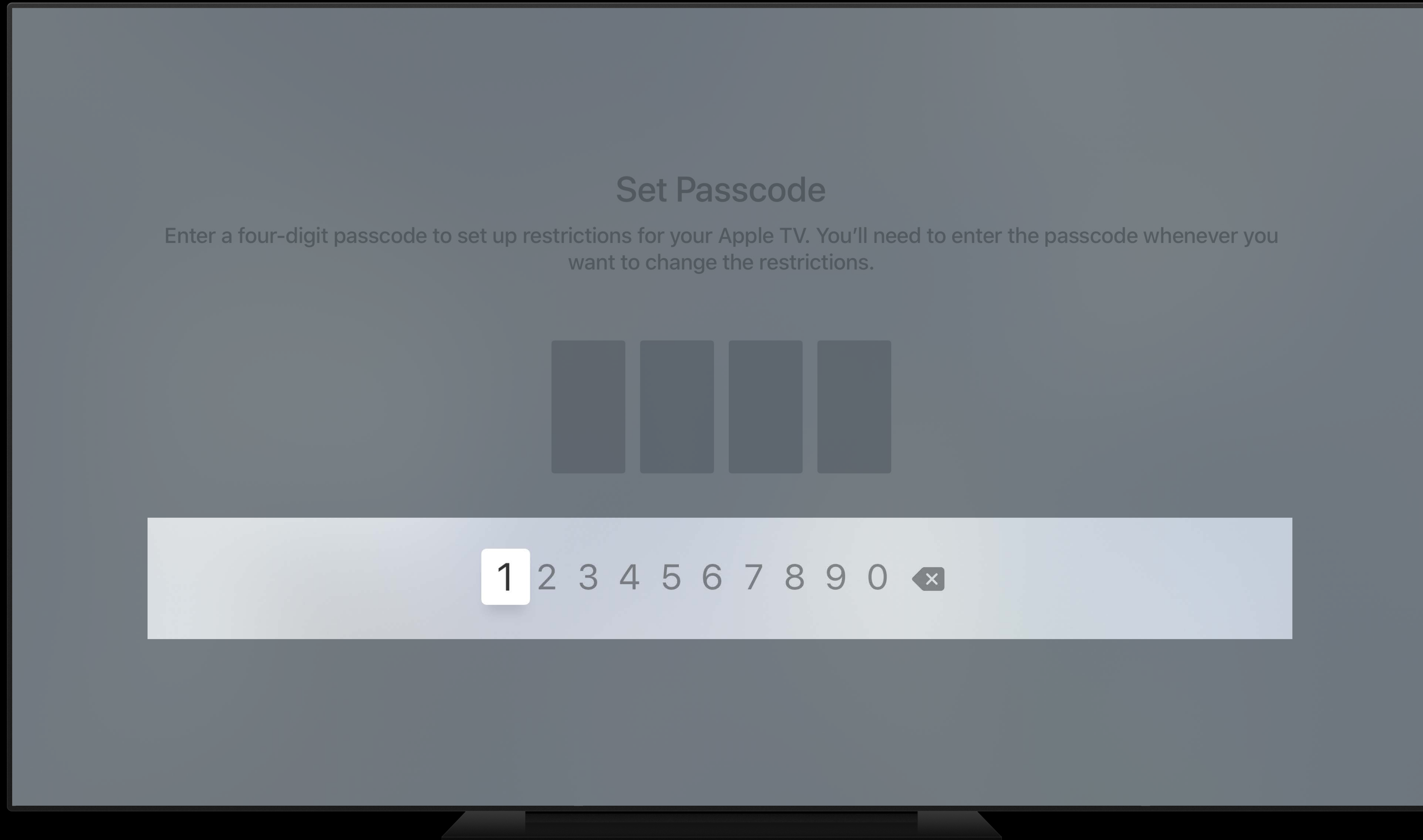
TVDigitEntryViewController

NEW



TVDigitEntryViewController

NEW



```
@available(tvOS 12.0, *)
open class TVDigitEntryViewController : UIViewController {

    open var entryCompletionHandler: (String) -> Swift.Void

    open var titleText: String?

    open var promptText: String?

    open var isSecureDigitEntry: Bool

    open var numberOfDigits: UInt

    open func clearEntry(animated: Bool)
}
```



NEW



NEW

```
@available(tvOS 12.0, *)
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Demo

Marshall Huss, tvOS Engineering

TVUIKit

NEW

TVUIKit



NEW

Easy adoption of common UI patterns

TVUIKit



NEW

Easy adoption of common UI patterns

Built-in support for localization and accessibility

TVUIKit

NEW

Easy adoption of common UI patterns

Built-in support for localization and accessibility

Developer Beta

Summary

Summary

Password AutoFill

Summary

Password AutoFill

Focus Engine enhancement

Summary

Password AutoFill

Focus Engine enhancement

TVUIKit

More Information

<https://developer.apple.com/wwdc2018/208>

tvOS Lab

Technology Lab 7

Wednesday 9:00AM

tvOS Lab

Technology Lab 7

Thursday 1:00PM

More Information

<https://developer.apple.com/wwdc2018/208>

Safari, WebKit, and Password AutoFill Lab

Technology Lab 3

Wednesday 2:00PM

Safari, WebKit, and Password AutoFill Lab

Technology Lab 4

Friday 2:45PM

 **WWDC18**