#WWDC18

What’s New in Cocoa for macOS

Session 209

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Jesse Donaldson, Cocoa Frameworks

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API refinements

Dark mode

Layer backing

Custom quick actions

API Refinements

API Refinements

Continued clean-up

Source compatible in Objective-C

Migratable in Swift

100%

String Type Updates

10.13

```
typedef NSString *NSTextEffectStyle                 NS_STRING_ENUM;

typedef NSString *NSPasteboardName              NS_EXTENSIBLE_STRING_ENUM;

typedef NSString *NSImageName           NS_EXTENSIBLE_STRING_ENUM;
```

String Type Updates

10.13

```
typedef NSString *NSTextEffectStyle                 NS_STRING_ENUM;

typedef NSString *NSPasteboardName                NS_EXTENSIBLE_STRING_ENUM;

typedef NSString *NSImageName             NS_EXTENSIBLE_STRING_ENUM;
```

String Type Updates

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String Type Updates

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```
typedef NSString *NSTextEffectStyle                 NS_STRING_ENUM;

typedef NSString *NSPasteboardName              NS_EXTENSIBLE_STRING_ENUM;

typedef NSString *NSImageName           NS_EXTENSIBLE_STRING_ENUM;
```

String Type Updates

10.14

```
typedef NSString *NSTextEffectStyle                 NS_TYPED_ENUM;

typedef NSString *NSPasteboardName                NS_TYPED_EXTENSIBLE_ENUM;

typedef NSString *NSImageName             NS_EXTENSIBLE_STRING_ENUM;
```

String Type Updates

10.14

```
typedef NSString *NSTextEffectStyle                 NS_TYPED_ENUM;

typedef NSString *NSPasteboardName                NS_TYPED_EXTENSIBLE_ENUM;

typedef NSString *NSImageName             NS_SWIFT_BRIDGED_TYPEDEF;
```

String Enumeration to String Type

Swift 4

```
extension NSImage {
  public struct Name : Hashable, Equatable, RawRepresentable {
    public init(_ rawValue: String)
    public init(rawValue: String)
  }
}
```

String Enumeration to String Type

Swift 4

```
extension NSImage {
  public struct Name : Hashable, Equatable, RawRepresentable {
    public init(_ rawValue: String)
    public init(rawValue: String)
  }
}
```

Swift 4.2

```
extension NSImage {
  public typealias Name = String
}
```

String Enumeration to String Type

Swift 4

```
let image = NSImage(named: NSImage.Name("chameleon"))
```

String Enumeration to String Type

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let image = NSImage(named: NSImage.Name("chameleon"))
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let image = NSImage(named: "chameleon")
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String Enumeration to String Type

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let image = NSImage(named: NSImage.Name("chameleon"))
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Swift 4.2

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let image = NSImage(named: "chameleon")
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```
open class NSImage {
  public init?(named: NSImage.Name)
}
```

String Enumeration to String Type

String Enumeration to String Type

NSAnimatablePropertyKey
NSBrowser.ColumnsAutosaveName
NSCollectionView.DecorationElementKind
NSCollectionView.SupplementaryElementKind
NSCollectionView.TransitionLayoutAnimatedKey
NSColor.Name
NSColorList.Name
NSDataAsset.Name
NSHelpManager.AnchorName
NSHelpManager.BookName
NSHelpManager.ContextHelpKey
NSImage.Name
NSNib.Name
NSPageController.ObjectIdentifier
NSPrintInfo.SettingKey

String Enumeration to String Type

NSAnimatablePropertyKey
NSBrowser.ColumnsAutosaveName
NSCollectionView.DecorationElementKind
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NSColorList.Name
NSDataAsset.Name
NSHelpManager.AnchorName
NSHelpManager.BookName
NSHelpManager.ContextHelpKey
NSImage.Name
NSNib.Name
NSPageController.ObjectIdentifier
NSPrintInfo.SettingKey
NSSearchField.RecentsAutosaveName
NSServiceProviderName
NSSound.Name
NSSound.PlaybackDeviceIdentifier
NSSplitView.AutosaveName
NSStatusItem.AutosaveName
NSStoryboard.Name
NSStoryboard.SceneIdentifier
NSStoryboardSegue.Identifier
NSTableView.AutosaveName
NSToolbar.Identifier
NSTouchBar.CustomizationIdentifier
NSWindow.FrameAutosaveName
NSWindow.PersistableFrameDescriptor
NSWindow.TabbingIdentifier

Common Prefixes

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typedef NS_ENUM(NSUInteger, NSLineJoinStyle) {
    NSMiterLineJoinStyle,
    NSRoundLineJoinStyle,
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typedef NS_ENUM(NSUInteger, NSLineJoinStyle) {
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```

Swift 4

```
public enum LineJoinStyle : UInt {
    case miterLineJoinStyle
    case roundLineJoinStyle
    case bevelLineJoinStyle
}
```

Common Prefixes

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Swift 4.2

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    case round
    case bevel
}
```

Common Prefixes

Common Prefixes

NSBezierPath.ElementType

NSBezierPath.LineCapStyle

NSBezierPath.LineJoinStyle

NSBezierPath.WindingRule

NSDatePicker.ElementFlags

NSDatePicker.Mode

NSDatePicker.Style

NSPrintInfo.PaginationMode

Formalized Protocols

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```
@interface NSObject (NSMenuValidation)
- (BOOL)validateMenuItem:(NSMenuItem *)item;
@end
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Swift 4

```
extension NSObject {
    open func validateMenuItem(…) -> Bool
}
```

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@protocol NSMenuItemValidation <NSObject>
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Swift 4

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extension NSObject {
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```

Swift 4.2

```
public protocol NSMenuItemValidation {
    func validateMenuItem(…) -> Bool
}
```

Formalized Protocols

Formalized Protocols

NSColorChanging

NSEditor

NSEditorRegistration

NSFontChanging

NSMenuItemValidation

NSPasteboardTypeOwner

NSStandardKeyBindingResponding

NSToolbarItemValidation

NSViewLayerContentScaleDelegate

NSViewToolTipOwner

Direct Instance Variable Access

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Deprecated

```
NSRect frame = self->_frame;
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⚠ '_frame' is deprecated: AppKit instance variables are private, and the ability to access them will be removed in a future release.

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self->_frame ✕

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self->_frame 

self.frame 

Formal Soft Deprecation

Formal Soft Deprecation

Objective-C

```
static const NSBoxType NSBoxOldStyle NS_DEPRECATED_MAC(10_0, API_TO_BE_DEPRECATED,
            "NSBoxOldStyle is discouraged in modern application design. It should be
             replaced with either NSBoxPrimary or NSBoxCustom.") = (NSBoxType)3;
```

Formal Soft Deprecation

Objective-C

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Swift

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@available(macOS, introduced: 10.0, deprecated: 100000,
      message: "NSBoxOldStyle is discouraged in modern application design. It should be
               replaced with either NSBoxPrimary or NSBoxCustom.")
public static let oldStyle: NSBox.BoxType
```

Formal Soft Deprecation

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};
```


10.14

```
typedef NS_ENUM(NSUInteger, NSLineJoinStyle) {
    NSLineJoinStyleMiter,
    NSLineJoinStyleRound,
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    NSLineJoinStyleMiter,
    NSLineJoinStyleRound,
    NSLineJoinStyleBevel
};
```

```
static const NSLineJoinStyle NSMiterLineJoinStyle
        NS_DEPRECATED_WITH_REPLACEMENT_MAC("NSLineJoinStyleMiter", 10_0, API_TO_BE_DEPRECATED)
        = NSLineJoinStyleMiter;
```

Formal Soft Deprecation

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typedef NS_ENUM(NSUInteger, NSLineJoinStyle) {
    NSMiterLineJoinStyle,
    NSRoundLineJoinStyle,
    NSBevelLineJoinStyle
};
```

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```
typedef NS_ENUM(NSUInteger, NSLineJoinStyle) {
    NSLineJoinStyleMiter,
    NSLineJoinStyleRound,
    NSLineJoinStyleBevel
};
```

```
static const NSLineJoinStyle NSMiterLineJoinStyle
        NS_DEPRECATED_WITH_REPLACEMENT_MAC("NSLineJoinStyleMiter", 10_0, API_TO_BE_DEPRECATED)
        = NSLineJoinStyleMiter;
```

NSButtLineCapStyle
NSRoundLineCapStyle
NSSquareLineCapStyle
NSMiterLineJoinStyle
NSRoundLineJoinStyle
NSBevelLineJoinStyle
NSNonZeroWindingRule
NSEvenOddWindingRule
NSMoveToBezierPathElement
NSLineToBezierPathElement
NSCurveToBezierPathElement
NSClosePathBezierPathElement
NSBox.borderType
NSBoxSecondary
NSBoxOldStyle
NSCell.controlTint
NSBackgroundStyleLight
NSBackgroundStyleDark
NSDraggingInfo.draggedImage
NSColor.controlHighlightColor
NSColor.controlLightHighlightColor
NSColor.controlShadowColor
NSColor.controlDarkShadowColor
NSColor.scrollBarColor
NSColor.knobColor
NSColor.selectedKnobColor
NSColor.windowFrameColor
NSColor.selectedMenuItemColor
NSColor.headerColor
NSColor.secondarySelectedControlColor
NSColor.alternateSelectedControlColor
NSTextFieldAndStepperDatePickerStyle
NSClockAndCalendarDatePickerStyle
NSTextFieldDatePickerStyle
NSHourMinuteDatePickerElementFlag
NSHourMinuteSecondDatePickerElementFlag
NSColor(for: NSControlTint)
NSColor.controlAlternatingRowBackgroundColors
NSTimeZoneDatePickerElementFlag
NSYearMonthDatePickerElementFlag
NSYearMonthDayDatePickerElementFlag
NSEraDatePickerElementFlag
NSAutoPagination
NSFitPagination
NSClipPagination
NSTabView.controlTint
NSVisualEffectMaterialAppearanceBased
NSVisualEffectMaterialLight
NSVisualEffectMaterialDark
NSVisualEffectMaterialMediumLight
NSVisualEffectMaterialUltraDark
NSControlTintDidChangeNotification
NSSingleDateMode
NSRangeDateMode

Secure Coding

Secure Coding

New APIs in NSKeyedArchiver and NSKeyedUnarchiver

Enable

- Secure coding
- Error returns

```
open class NSKeyedUnarchiver : NSCoder {

  public init(forReadingFrom: Data) throws

  public static func unarchivedObject(ofClasses: [AnyClass], from: Data) throws -> Any?

  public static func unarchivedObject<DecodedObjectType>(ofClass: DecodedObjectType.Type,
                                                         from: Data) throws ->
        DecodedObjectType? where DecodedObjectType : NSObject, DecodedObjectType : NSCoding

}
```

```
open class NSKeyedUnarchiver : NSCoder {

  public init(forReadingFrom: Data) throws

  public static func unarchivedObject(ofClasses: [AnyClass], from: Data) throws -> Any?

  public static func unarchivedObject<DecodedObjectType>(ofClass: DecodedObjectType.Type,
                                                         from: Data) throws ->
      DecodedObjectType? where DecodedObjectType : NSObject, DecodedObjectType : NSCoding

}
```

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open class NSKeyedUnarchiver : NSCoder {

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  public static func unarchivedObject<DecodedObjectType>(ofClass: DecodedObjectType.Type,
                                                         from: Data) throws ->
        DecodedObjectType? where DecodedObjectType : NSObject, DecodedObjectType : NSCoding

}
```

```
open class NSKeyedUnarchiver : NSCoder {

  public init(forReadingFrom: Data) throws

  public static func unarchivedObject(ofClasses: [AnyClass], from: Data) throws -> Any?

  public static func unarchivedObject<DecodedObjectType>(ofClass: DecodedObjectType.Type,
                                                         from: Data) throws ->
        DecodedObjectType? where DecodedObjectType : NSObject, DecodedObjectType : NSCoding

}
```

```
open class NSKeyedUnarchiver : NSCoder {

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    public init()

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    public init(forReadingWith: Data)

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    open class func unarchiveObject(with: Data) -> Any?

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    open class func unarchiveObject(withFile: String) -> Any?

}
```

```
open class NSKeyedUnarchiver : NSCoder {

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    public init()

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    public init(forReadingWith: Data)

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    open class func unarchiveObject(with: Data) -> Any?

    @available(macOS, introduced: 10.2, deprecated: 10.14)
    open class func unarchiveObject(withFile: String) -> Any?

}
```

Secure Coding Value Transformer

```
extension NSValueTransformerName {
    public static let unarchiveFromDataTransformerName: NSValueTransformerName
    public static let keyedUnarchiveFromDataTransformerName: NSValueTransformerName
}
```

Secure Coding Value Transformer

```
extension NSValueTransformerName {
    @available(macOS, introduced: 10.3, deprecated: 10.14)
    public static let unarchiveFromDataTransformerName: NSValueTransformerName

    @available(macOS, introduced: 10.3, deprecated: 10.14)
    public static let keyedUnarchiveFromDataTransformerName: NSValueTransformerName
}
```

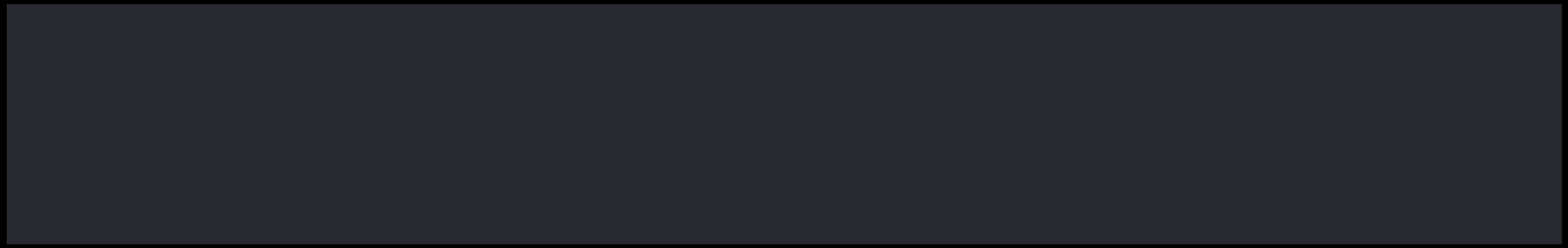
Secure Coding Value Transformer

```
extension NSValueTransformerName {
    @available(macOS, introduced: 10.3, deprecated: 10.14)
    public static let unarchiveFromDataTransformerName: NSValueTransformerName

    @available(macOS, introduced: 10.3, deprecated: 10.14)
    public static let keyedUnarchiveFromDataTransformerName: NSValueTransformerName
}
```

```
extension NSValueTransformerName {
    public static let secureUnarchiveFromDataTransformerName: NSValueTransformerName
}
```

Secure Coding Adoption



Secure Coding Adoption

NSAppearance

NSBezierPath

NSGradient

NSShadow

NSSound

Secure Coding Adoption

NSAppearance
NSBezierPath
NSGradient
NSShadow
NSSound
NSHashTable
NSMapTable
NSPointerArray

Secure Coding Adoption

NSAppearance
NSBezierPath
NSGradient
NSShadow
NSSound
NSHashTable
NSMapTable
NSPointerArray

Data You Can Trust | Hall 2 | Thursday 9:00AM

Dark Mode

Chris Dreessen, Cocoa Frameworks

Notes File Edit Format View Window Help

Tue 9:41 AM

Search

S

Steve Lajos

Sue Zeifman

Synthia Wu

T

Tammy Tien

Tamsin Vantress

Tasha Kelter

Ted Paquin

Teri Thomas

Thobeka Rigmaiden

Ti Zhao

Tiffany Frye

Toby Bradbury

Teri Thomas

message call FaceTime mail

iPhone (719) 555-4016

mobile (719) 555-9922

Succulent Collection

Search

Search

Kitchen remodel ideas
6:54 PM Modern kitchen desig...

House design and ideas
6:53 PM 50's style but with open areas...

Beach party location
6:53 PM Meet at the railroad tracks on...

Birthday gift ideas
6:53 PM For Zoe

June trip to Safari West
6:53 PM June 18 and 19.

Backyard planting ideas
6:52 PM Ideas for greenery in t...

Notes from PTA meeting
Yesterday Summer school starts June 1...

Cool Local Hikes
Yesterday Mora

Healthy salmon recipe
Yesterday Becky made this for...

Housewarming party
Yesterday We'll have the party on Sept...

Waterski Weekend - To bring
Yesterday Camanche lake - Aug 8th an...

May 20, 2018 at 6:52 PM

Backyard planting ideas

Ideas for greenery in the backyard and on the back garage wall.

- Use native plants wherever possible
- Drip irrigation access needed
- Can we install wire mesh on the back wall for vines to cling to?

Notes:
Side yard gets lots of sun. Could be good for a patchwork of succulents like this.

Hanging vine on top of door w' star jasmine on the right. Star jasmine might be good for our location.

Supporting Dark Mode

Link against macOS 10.14

Supporting Dark Mode

Link against macOS 10.14

Use appearance-sensitive colors

Appearance-Sensitive NSColors

Appearance-Sensitive NSColors

NSColor.alternateSelectedControlTextColor
NSColor.controlColor
NSColor.disabledControlTextColor
NSColor.gridColor
NSColor.highlightColor
NSColor.labelColor
NSColor.placeholderTextColor
NSColor.secondaryLabelColor
NSColor.selectedControlTextColor
NSColor.selectedTextBackgroundColor
NSColor.shadowColor
NSColor.systemBrown
NSColor.systemGreen
NSColor.systemPink
NSColor.systemRed
NSColor.tertiaryLabelColor
NSColor.textColor
NSColor.windowBackgroundColor

NSColor.controlBackgroundColor
NSColor.controlTextColor
NSColor.findHighlightColor
NSColor.headerTextColor
NSColor.keyboardFocusIndicatorColor
NSColor.linkColor
NSColor.quaternaryLabelColor
NSColor.selectedControlColor
NSColor.selectedMenuItemTextColor
NSColor.selectedTextColor
NSColor.systemBlue
NSColor.systemGray
NSColor.systemOrange
NSColor.systemPurple
NSColor.systemYellow
NSColor.textBackgroundColor
NSColor.underPageBackgroundColor
NSColor.windowFrameTextColor

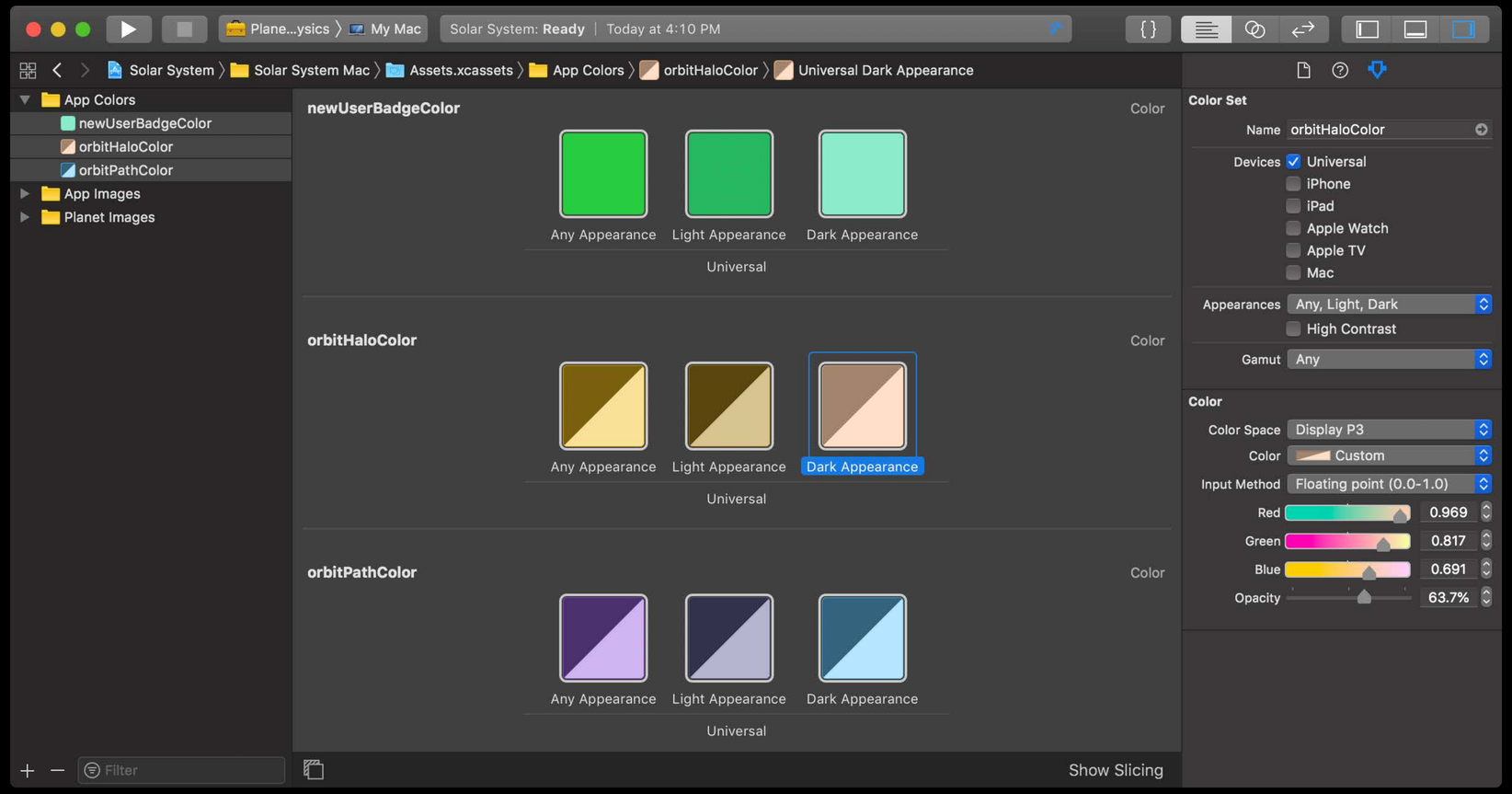
Appearance-Sensitive NSColors

NSColor.alternateSelectedControlTextColor
NSColor.controlColor
NSColor.disabledControlTextColor
NSColor.gridColor
NSColor.highlightColor
NSColor.labelColor
NSColor.placeholderTextColor
NSColor.secondaryLabelColor
NSColor.selectedControlTextColor
NSColor.selectedTextBackgroundColor
NSColor.shadowColor
NSColor.systemBrown
NSColor.systemGreen
NSColor.systemPink
NSColor.systemRed
NSColor.tertiaryLabelColor
NSColor.textColor
NSColor.windowBackgroundColor
NSColor.controlBackgroundColor
NSColor.controlTextColor
NSColor.findHighlightColor
NSColor.headerTextColor
NSColor.keyboardFocusIndicatorColor
NSColor.linkColor
NSColor.quaternaryLabelColor
NSColor.selectedControlColor
NSColor.selectedMenuItemTextColor
NSColor.selectedTextColor
NSColor.systemBlue
NSColor.systemGray
NSColor.systemOrange
NSColor.systemPurple
NSColor.systemYellow
NSColor.textBackgroundColor
NSColor.underPageBackgroundColor
NSColor.windowFrameTextColor

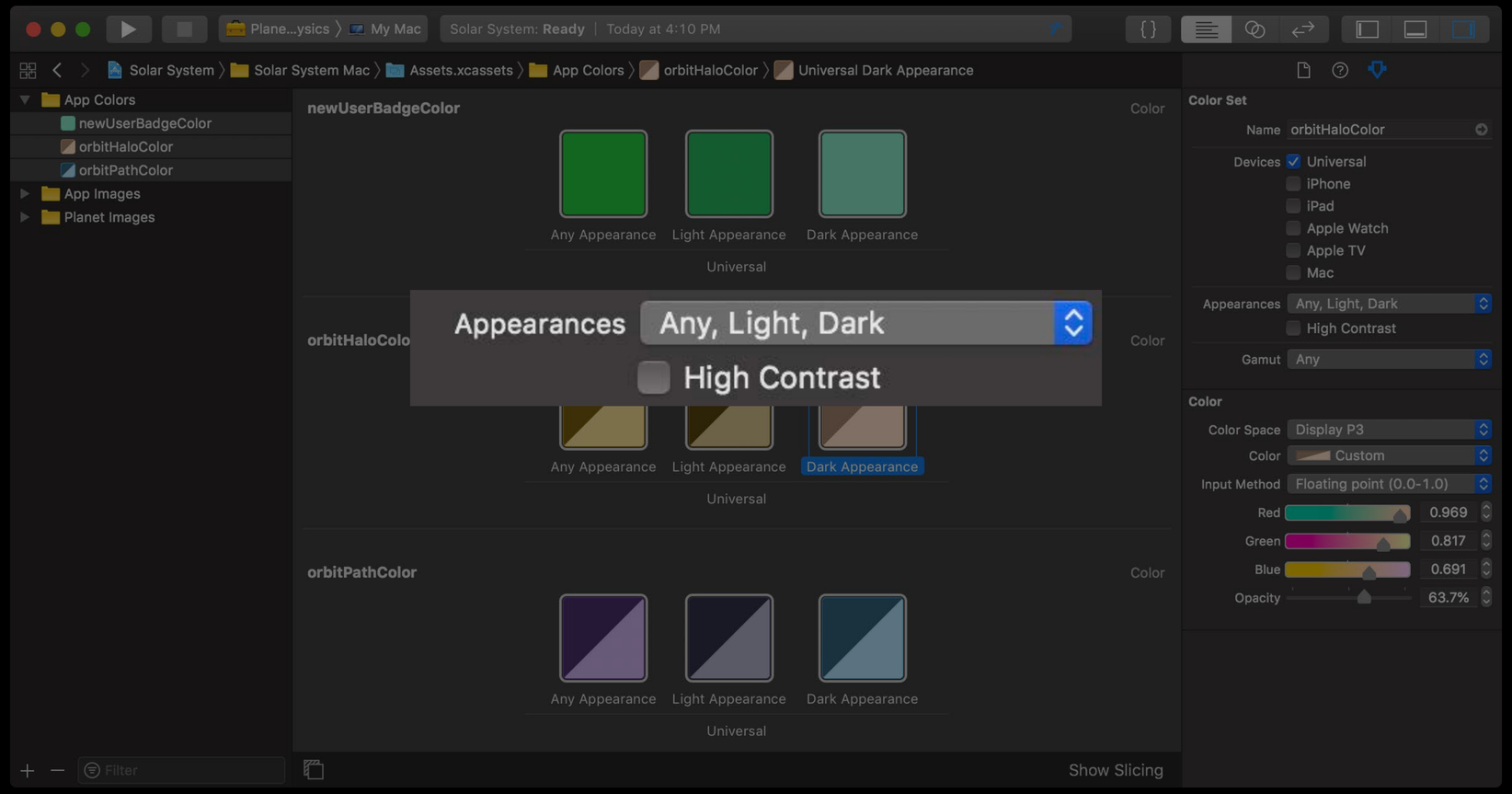
Appearance-Sensitive NSColors

NSColor.alternateSelectedControlTextColor
NSColor.controlColor
NSColor.disabledControlTextColor
NSColor.gridColor
NSColor.highlightColor
NSColor.labelColor
NSColor.placeholderTextColor
NSColor.secondaryLabelColor
NSColor.selectedControlTextColor
NSColor.selectedTextBackgroundColor
NSColor.shadowColor
NSColor.systemBrown
NSColor.systemGreen
NSColor.systemPink
NSColor.systemRed
NSColor.tertiaryLabelColor
NSColor.textColor
NSColor.windowBackgroundColor
NSColor.alternatingContentBackgroundColors
NSColor.separatorColor
NSColor.unemphasizedSelectedTextBackgroundColor
NSColor.controlBackgroundColor
NSColor.controlTextColor
NSColor.findHighlightColor
NSColor.headerTextColor
NSColor.keyboardFocusIndicatorColor
NSColor.linkColor
NSColor.quaternaryLabelColor
NSColor.selectedControlColor
NSColor.selectedMenuItemTextColor
NSColor.selectedTextColor
NSColor.systemBlue
NSColor.systemGray
NSColor.systemOrange
NSColor.systemPurple
NSColor.systemYellow
NSColor.textBackgroundColor
NSColor.underPageBackgroundColor
NSColor.windowFrameTextColor
NSColor.selectedContentBackgroundColor
NSColor.unemphasizedSelectedContentBackgroundColor
NSColor.unemphasizedSelectedTextColor

Defining Custom Colors in Asset Catalogs



Defining Custom Colors in Asset Catalogs



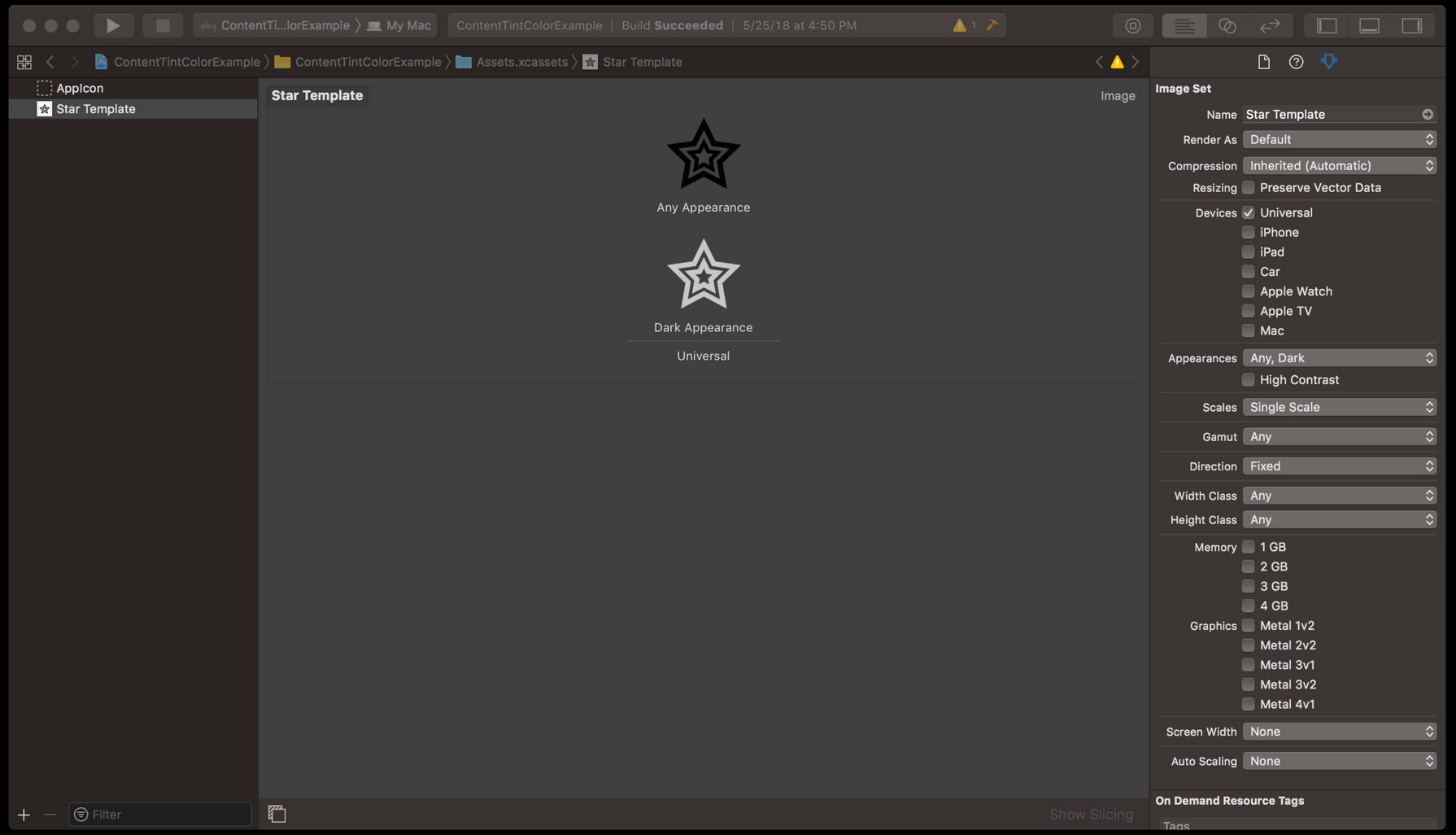
Supporting Dark Mode

Link against macOS 10.14

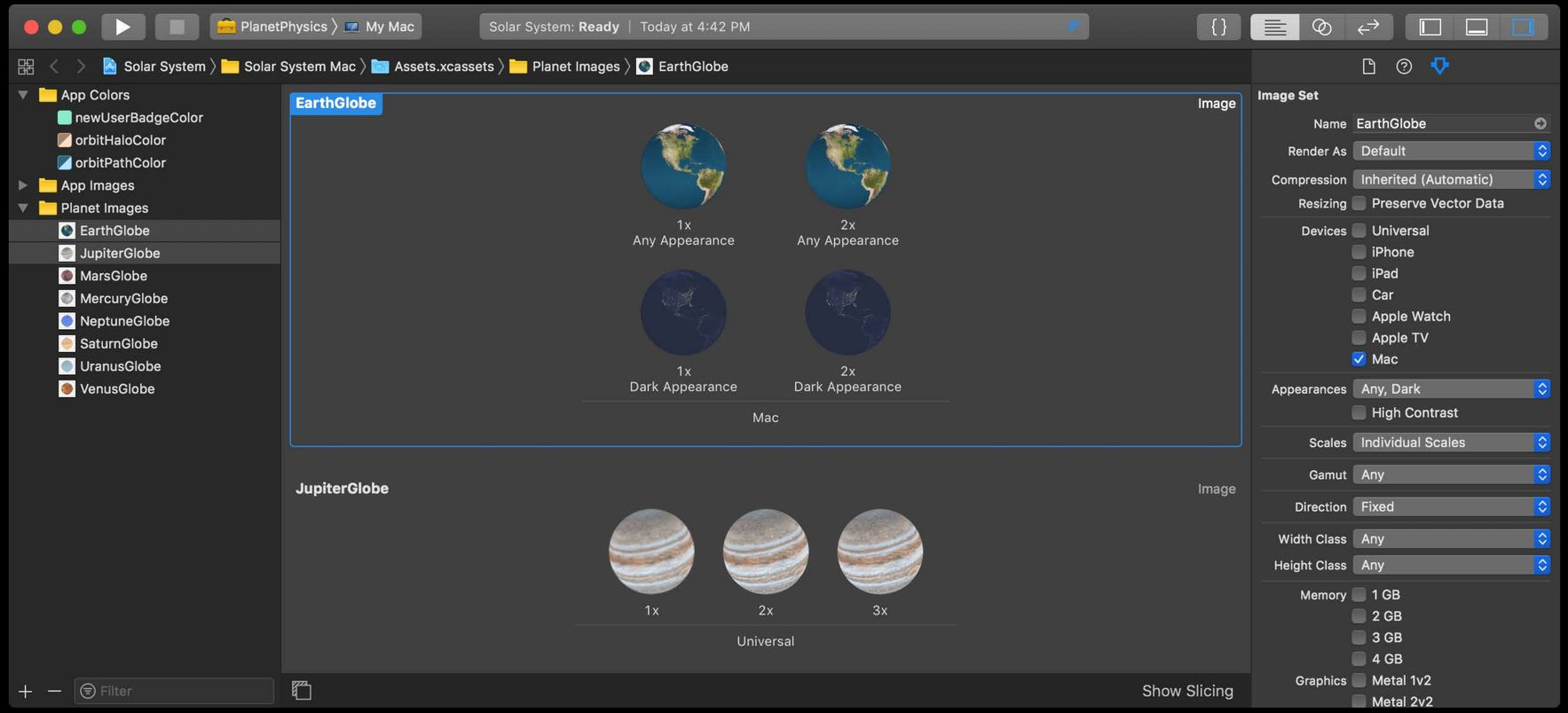
Use appearance-sensitive colors

Use template images

Defining Template Images in Asset Catalogs



Defining Custom Images in Asset Catalogs

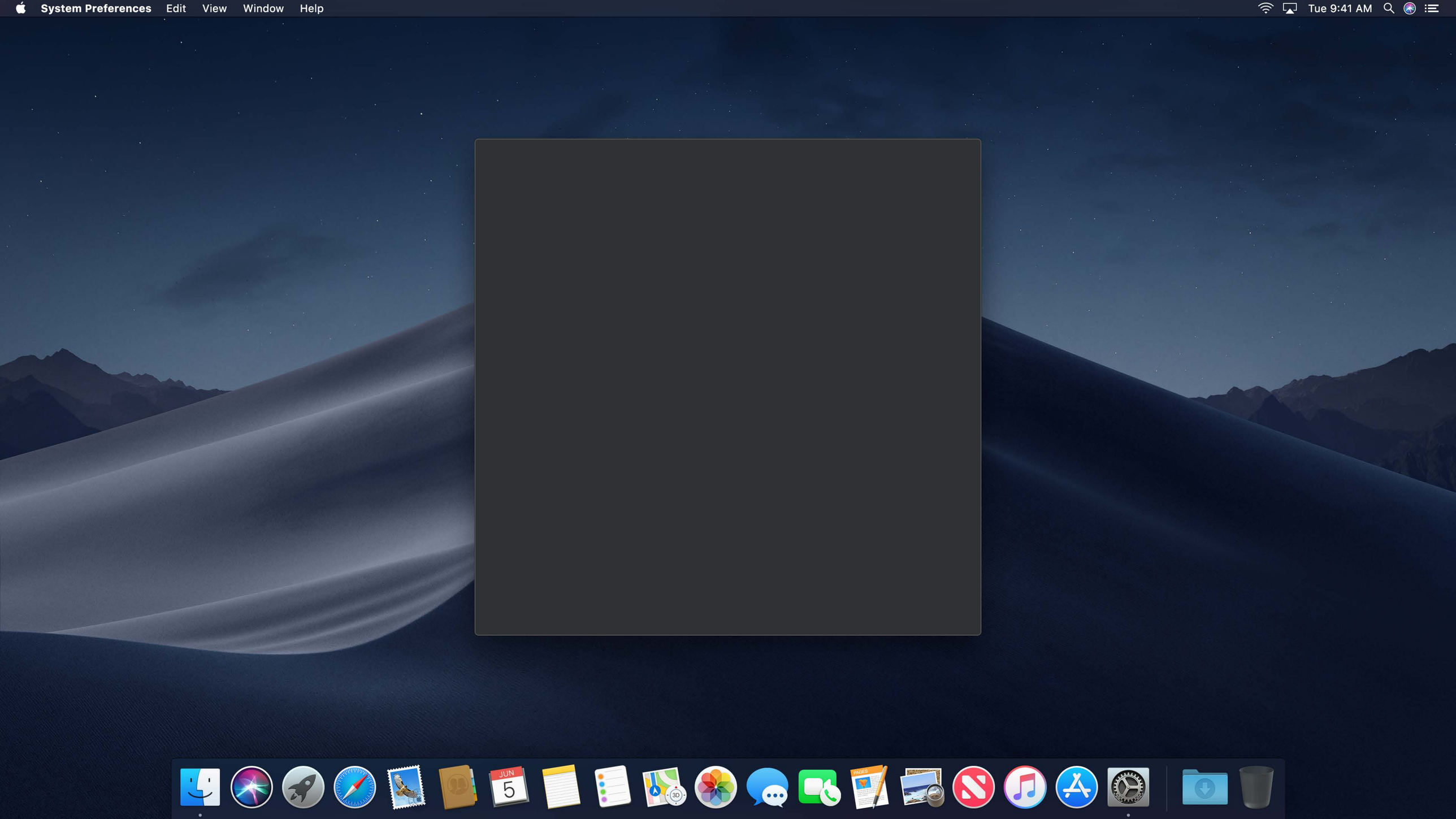


Desktop Pictures


System Preferences
Edit
View
Window
Help
Tue 9:41 AM
General
Search
Appearance:
Accent color:
Highlight color:
Blue
Sidebar icon size:
Medium
Automatically hide and show the menu bar
Show scroll bars:
Automatically based on mouse or trackpad
When scrolling
Always
Click in the scroll bar to:
Jump to the next page
Jump to the spot that's clicked
Default web browser:
Safari
Ask to keep changes when closing documents
Close windows when quitting an app
When selected, open documents and windows will not be restored when you re-open an app.
Recent items:
10
Documents, Apps, and Servers
Allow Handoff between this Mac and your iCloud devices
Use LCD font smoothing when available
?


System Preferences
Edit
View
Window
Help
Tue 9:41 AM
JUN
5
PAGES


System Preferences
Edit
View
Window
Help
Tue 9:41 AM
JUN
5
PAGES


System Preferences
Edit
View
Window
Help
Tue 9:41 AM
JUN
5
PAGES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Do not be daunted

Desktop Picture Aware Classes

NSWindow

NSScrollView

NSTableView

NSCollectionView

Classes and Colors That Look and Taste Great Together

NSWindow.backgroundColor

NSScrollView.backgroundColor

NSTableView.backgroundColor

NSCollectionView.backgroundColor

NSColor.controlBackgroundColor

NSColor.windowBackgroundColor

NSColor.underPageBackgroundColor

NSColor.textBackgroundColor

Classes and Colors That Look and Taste Great Together

NSBox.fillColor

NSWindow.backgroundColor
NSScrollView.backgroundColor
NSTableView.backgroundColor
NSCollectionView.backgroundColor

NSColor.controlBackgroundColor
NSColor.windowBackgroundColor
NSColor.underPageBackgroundColor
NSColor.textBackgroundColor

NSVisualEffectView

.material =

.titlebar

.selection

.menu

.popover

.sidebar

NSVisualEffectView

.material =

.titlebar

.selection

.menu

.popover

.sidebar

.headerView

.sheet

.windowBackground

.hudWindow

.fullScreenUI

.toolTip

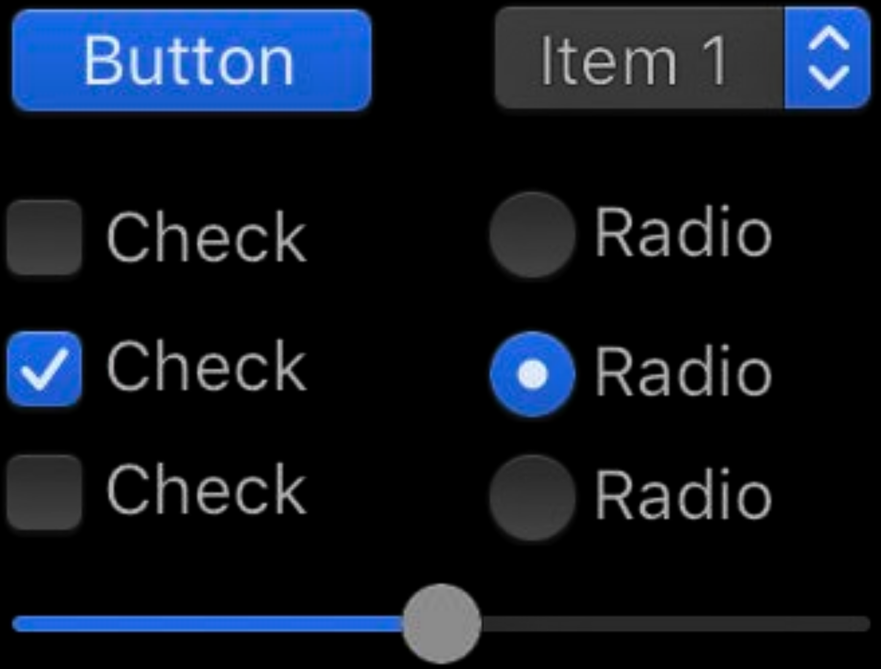
.contentBackground

.underWindowBackground

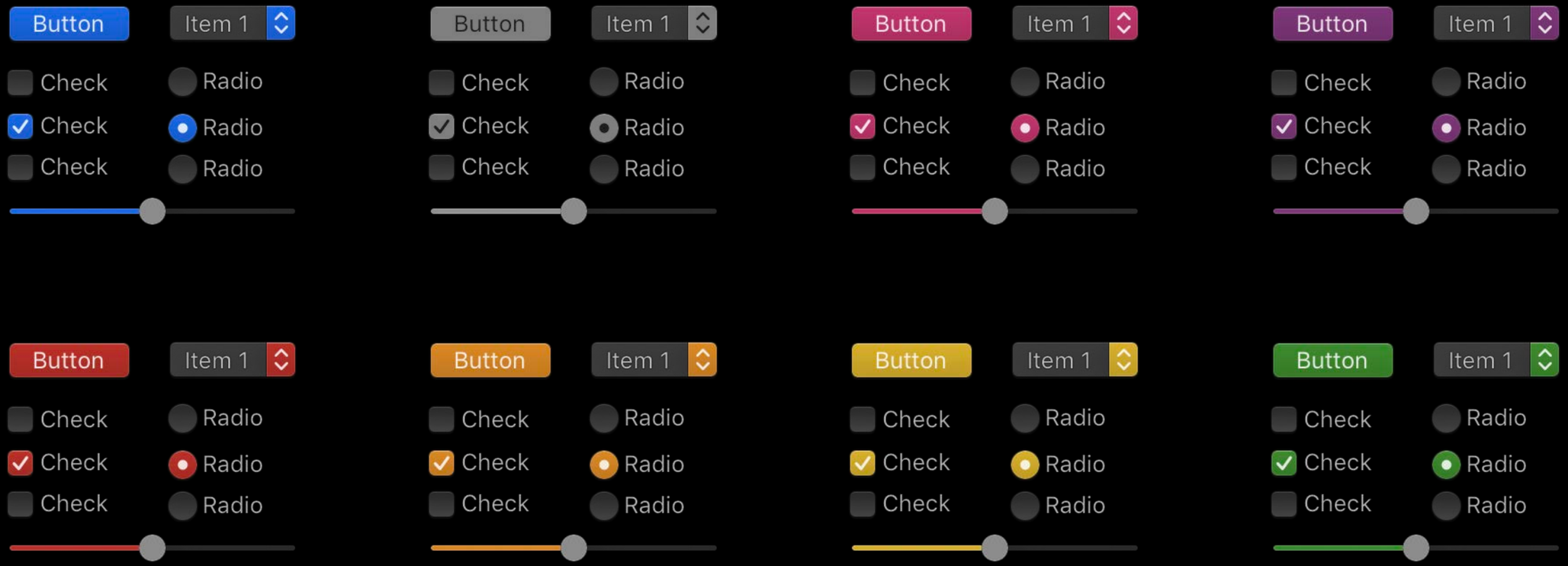
.underPageBackground

Accent Colors

Accent Colors



Accent Colors



Accent Color

```
override func draw(_ dirtyRect: NSRect) {
    NSColor(for: NSColor.currentControlTint).set()
    // ...
}
```

Accent Color

```
override func draw(_ dirtyRect: NSRect) {
    NSColor.controlAccentColor.set()
    // ...
}
```

NSColor Effects

.withSystemEffect(.none)

.withSystemEffect(.none)

.withSystemEffect(.pressed)

.withSystemEffect(.pressed)

.withSystemEffect(.deepPressed)

.withSystemEffect(.deepPressed)

.withSystemEffect(.disabled)

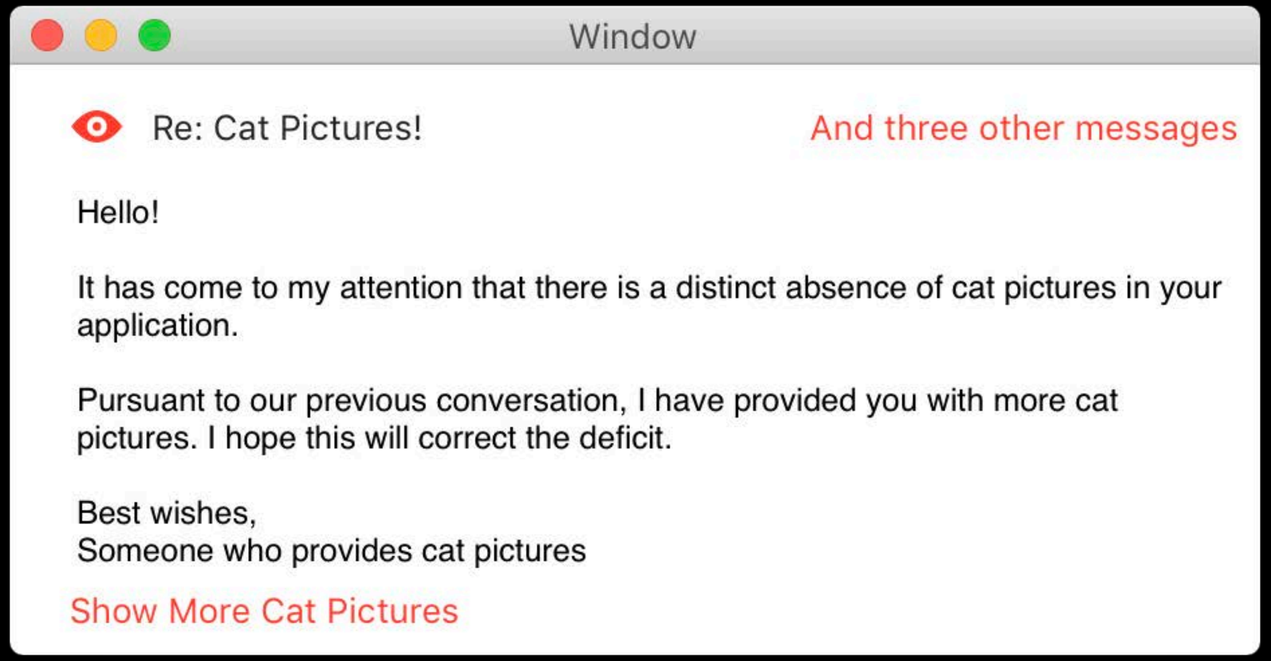
.withSystemEffect(.disabled)

.withSystemEffect(.rollover)

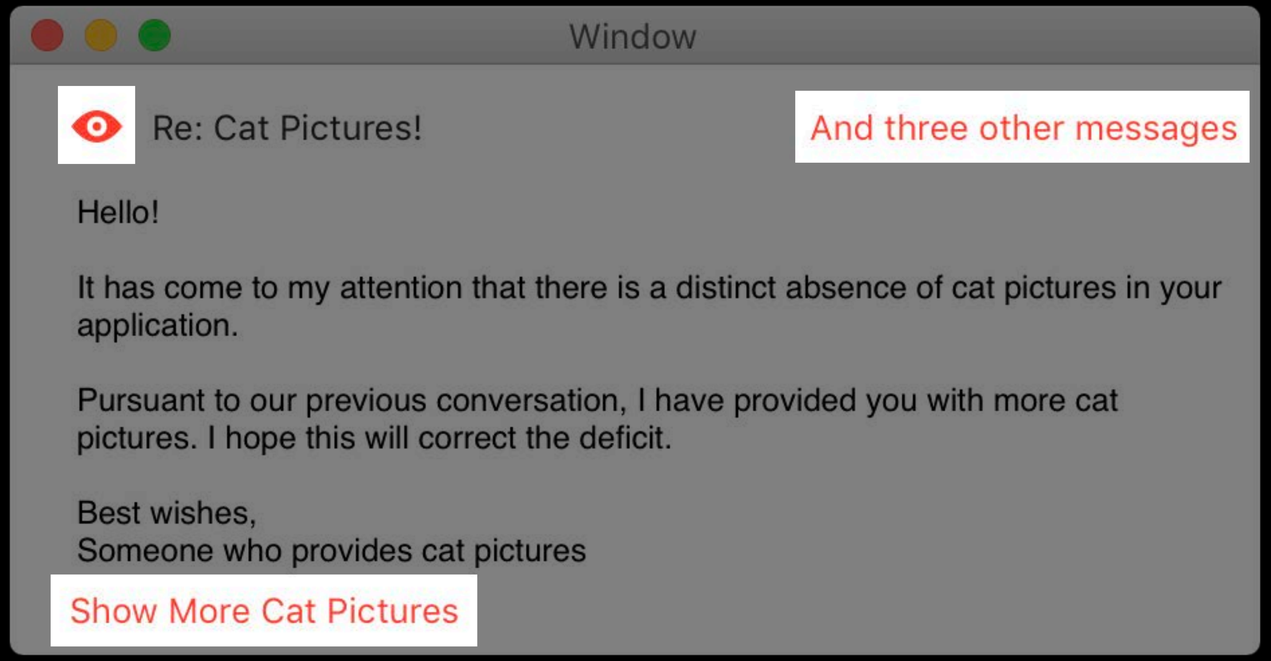
.withSystemEffect(.rollover)

Content Tint Color

Content Tint Color



Content Tint Color



Content Tint Color

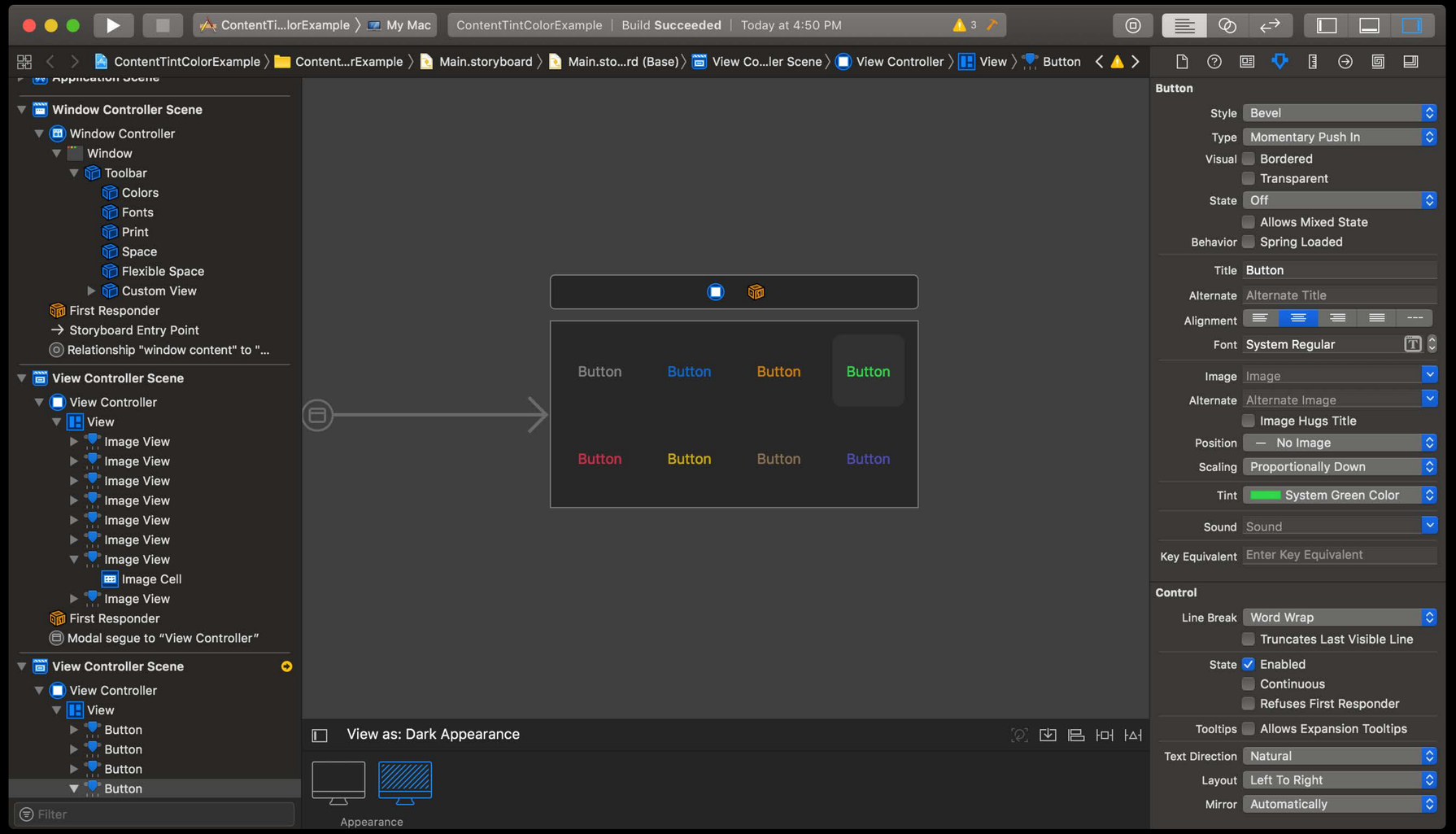
NSButton

```
button.contentTintColor = //…
```

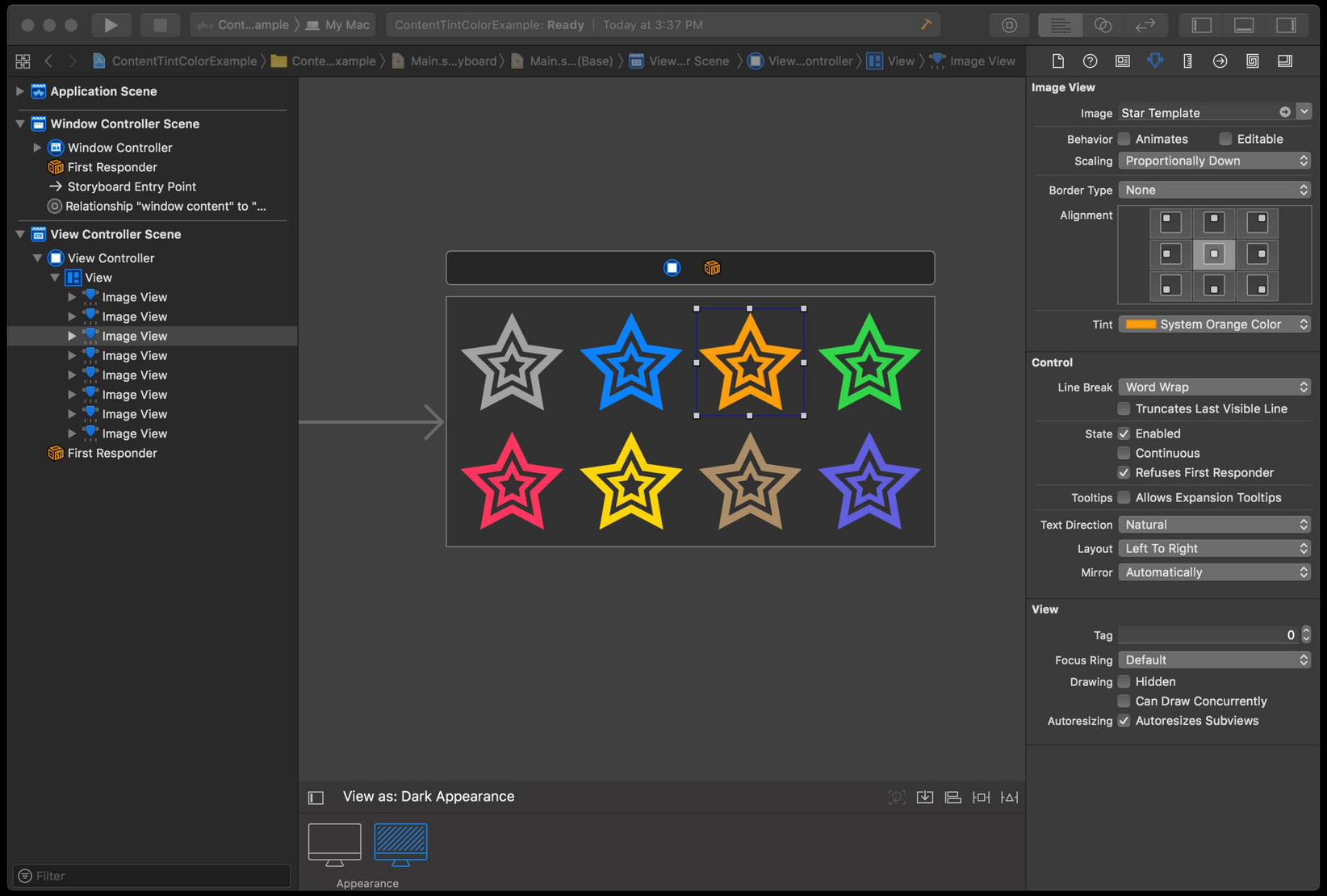
NSImageView

```
imageView.contentTintColor = //…
```

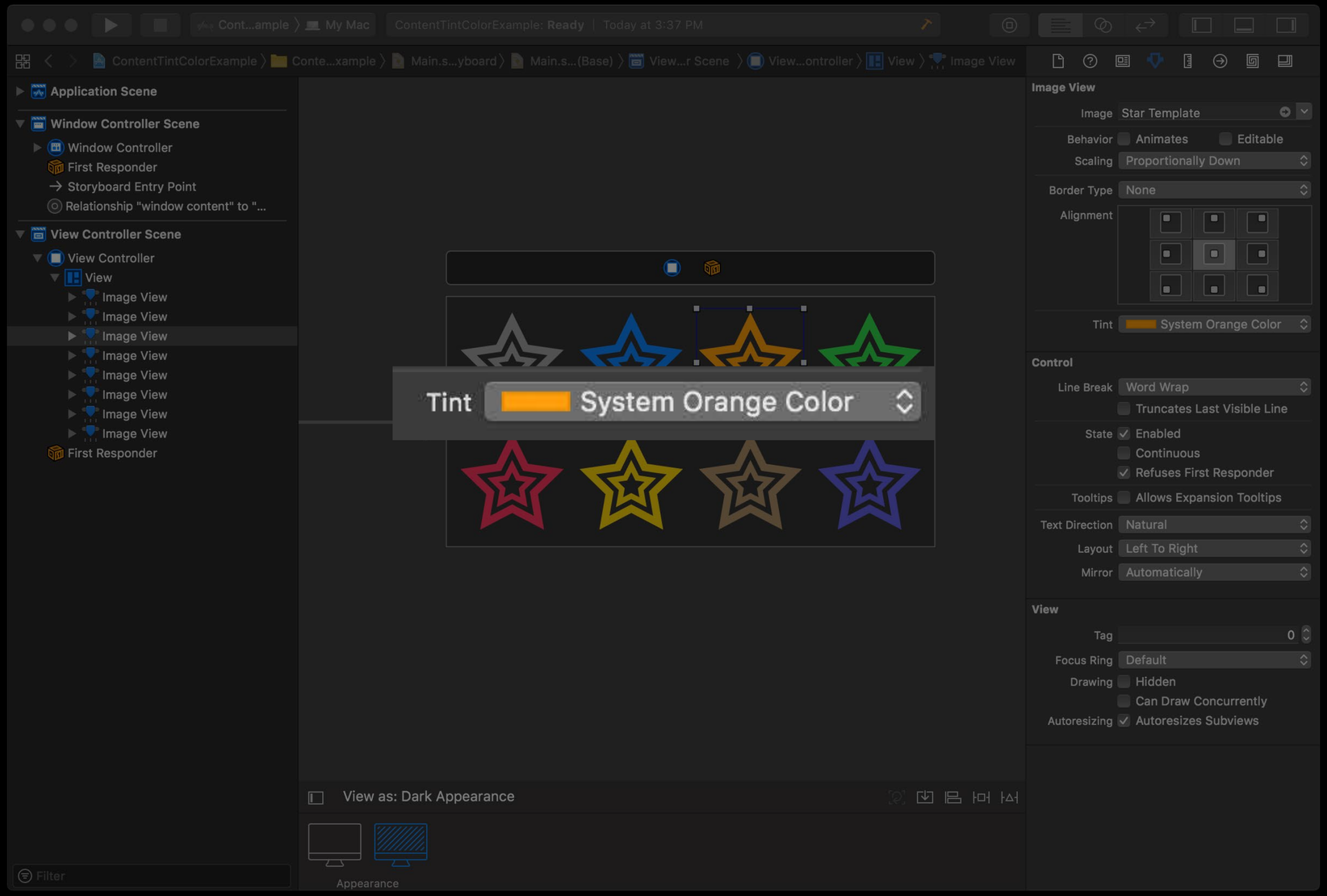
Content Tint Color



Content Tint Color



Content Tint Color



Related Sessions

Introducing Dark Mode	Hall 1	Tuesday 5:00PM
Advanced Dark Mode	Hall 1	Wednesday 11:00AM

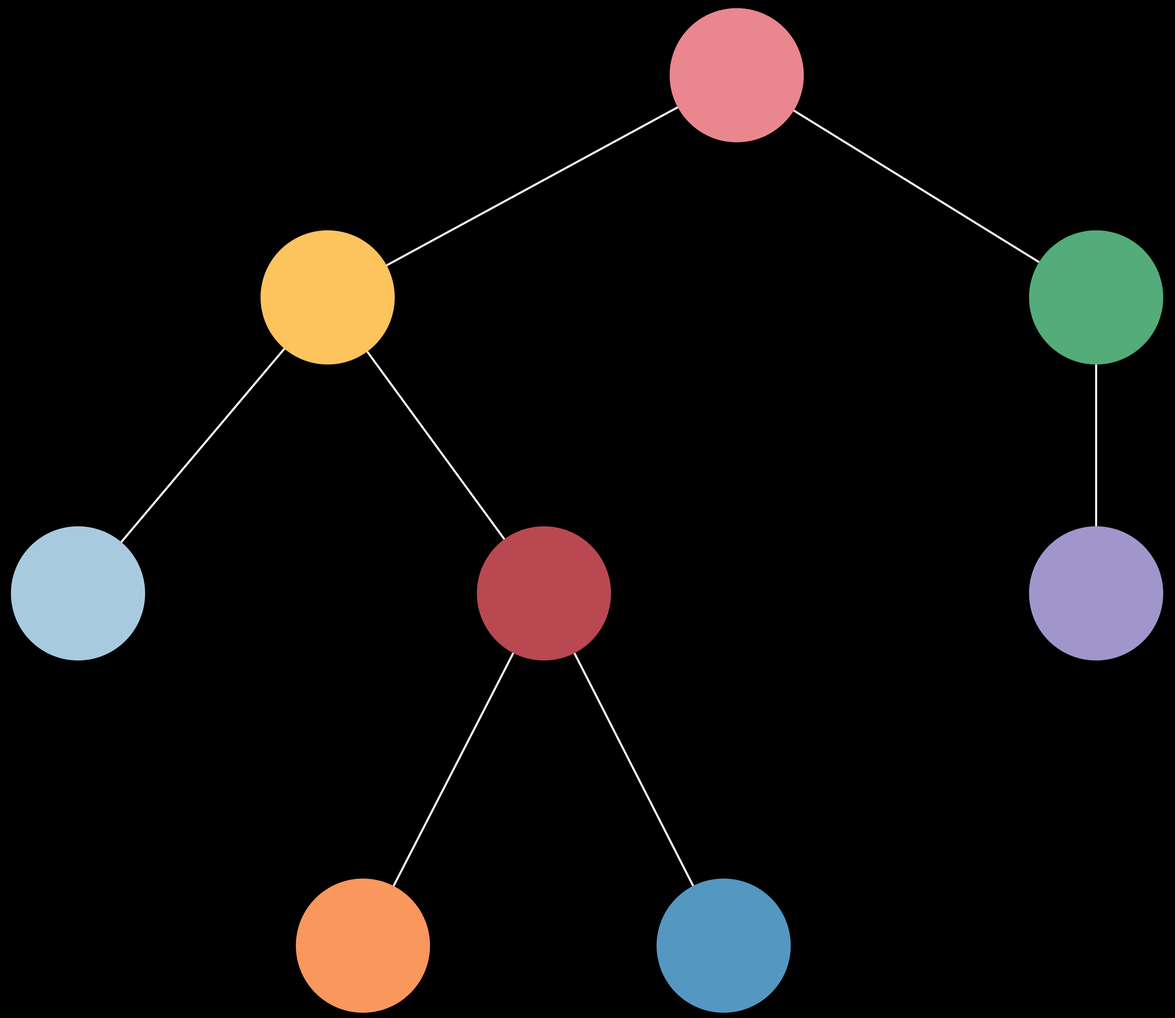
Layer Backing

Layer Backing

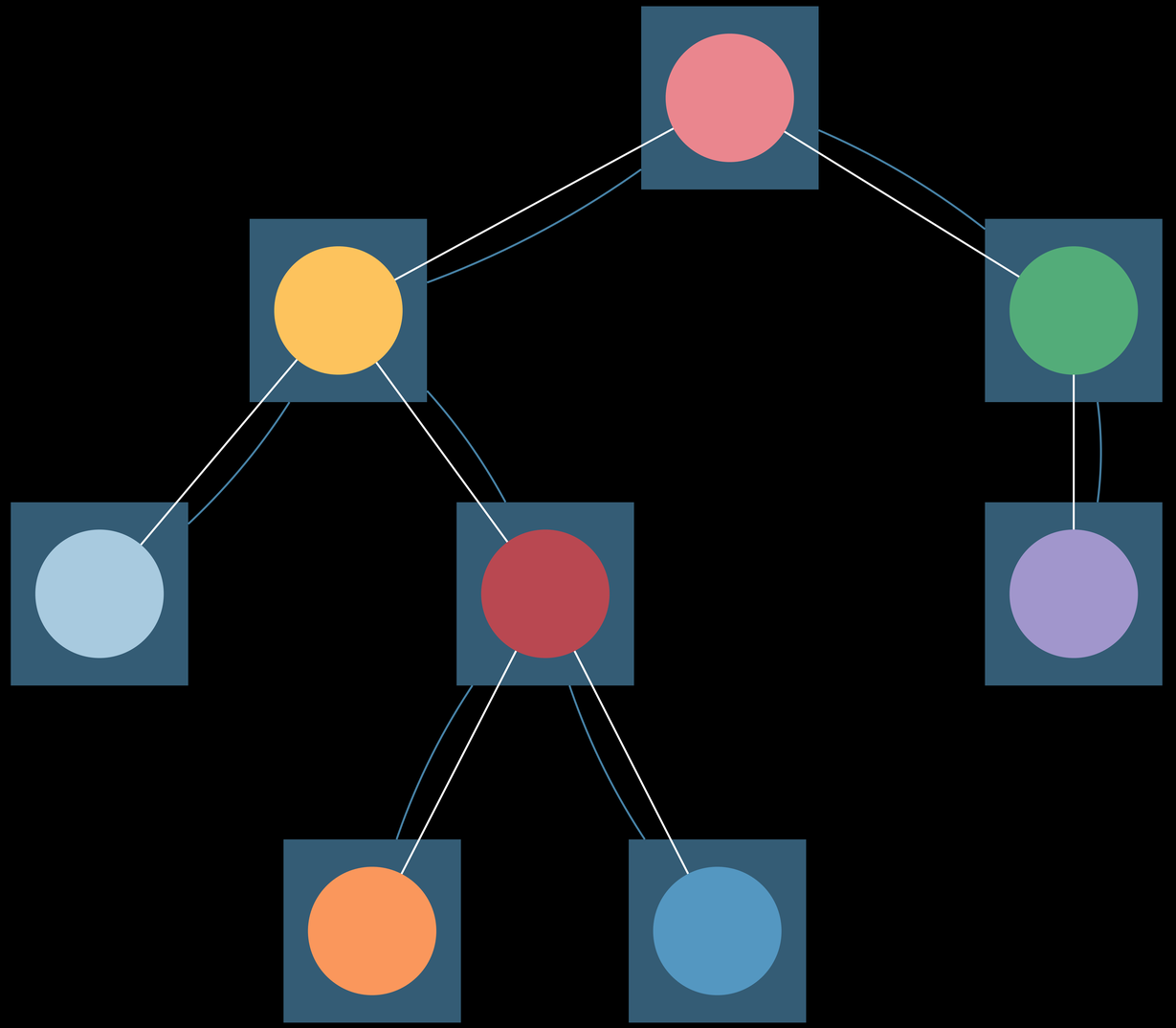
Apps linked against 10.14 will no longer use window backing stores

Views are rendered exclusively with CALayers

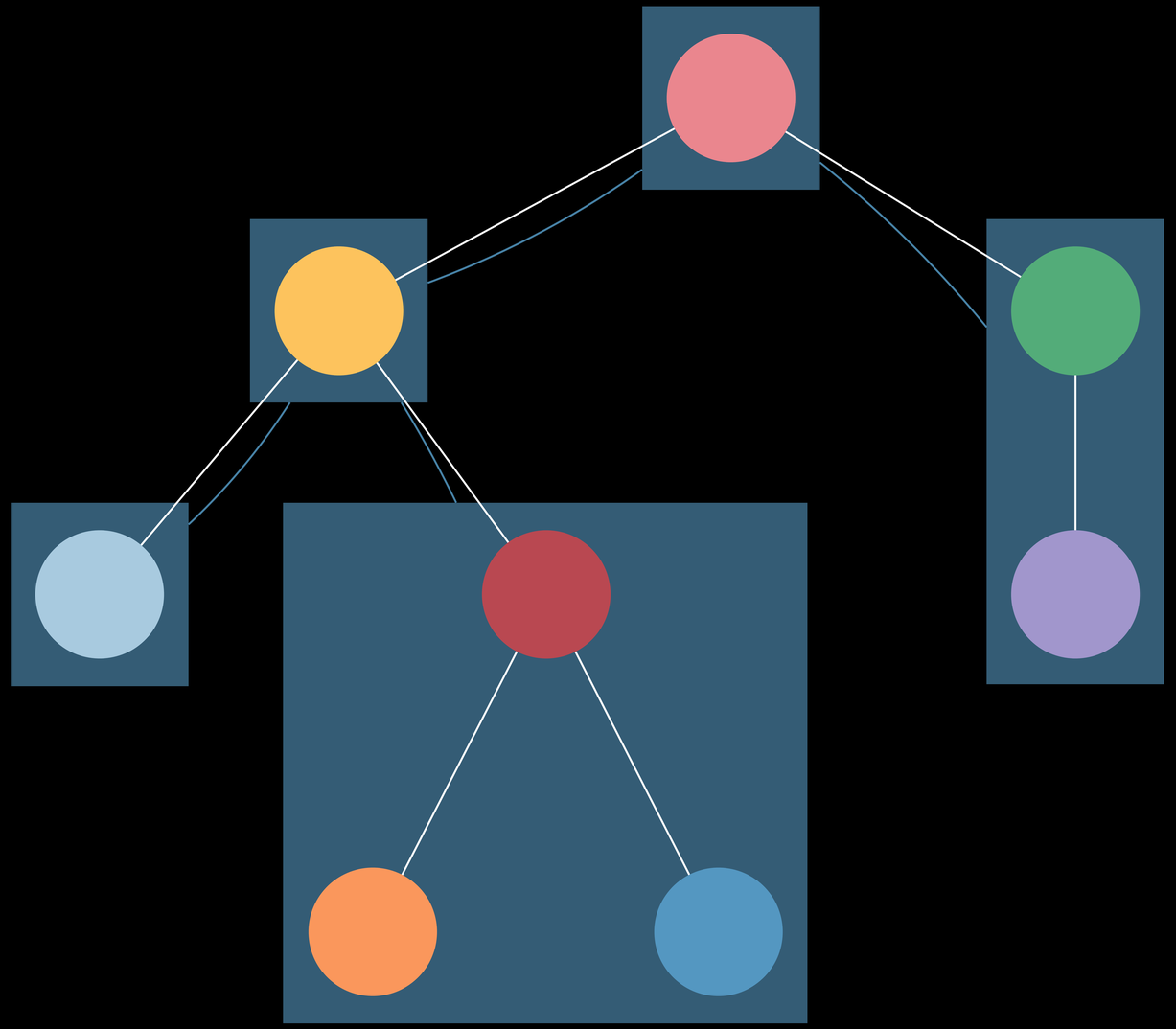
UIViews to CALayers



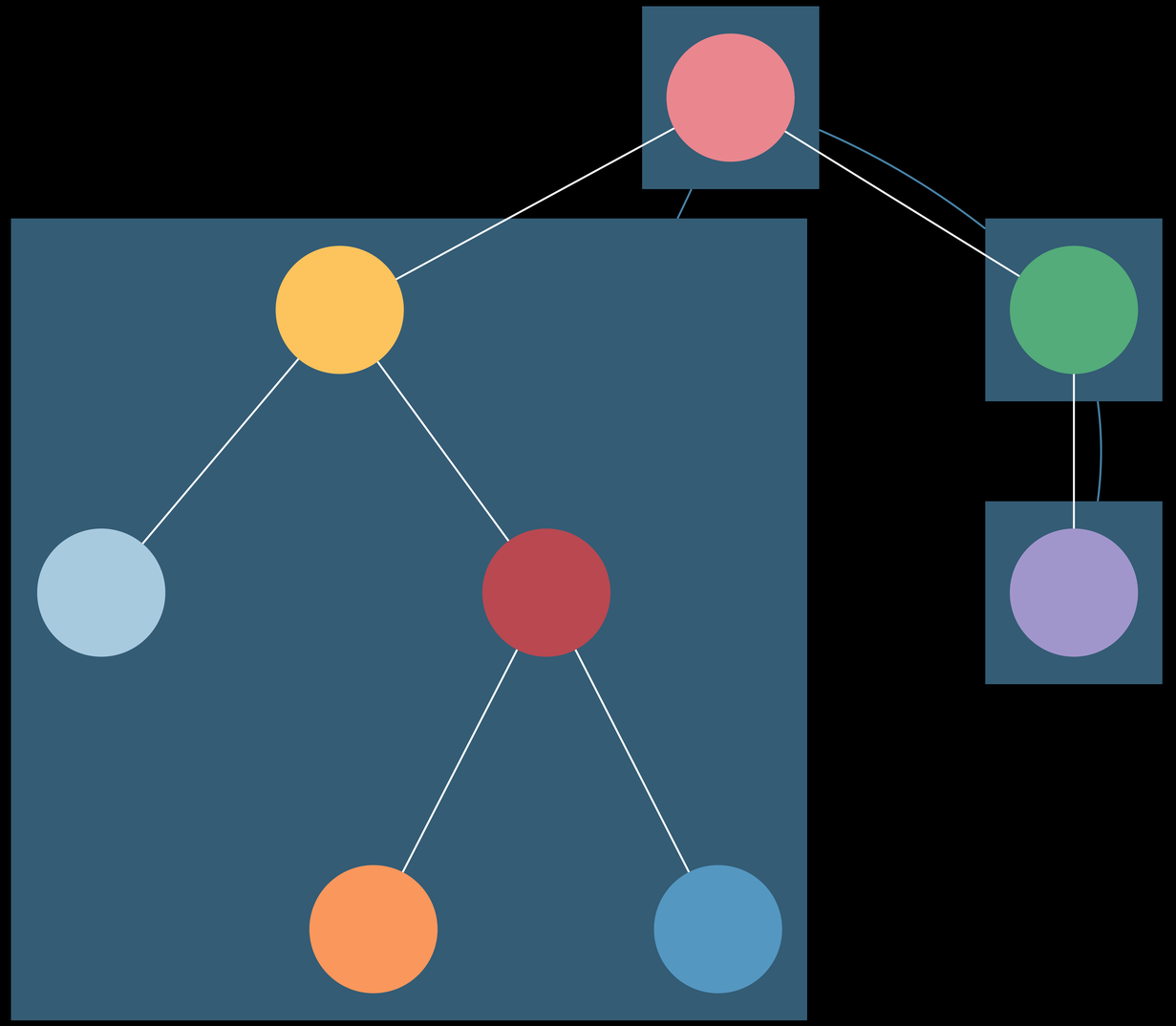
UIViews to CALayers



NSViews to CALayers



NSViews to CALayers



Layer Backing

No longer necessary to set `.wantsLayer = true`

AppKit handles this for you

Layer Backing

```
class ColorLayer : CALayer {
    override func draw(in ctx: CGContext) {
        ctx.setFillColor(NSColor.systemRed.cgColor)
        ctx.fill(CGRect.infinite)
    }
}
```

```
class ColorLayerDelegate : CALayerDelegate {
    func draw(_ layer: CALayer, in ctx: CGContext) {
        ctx.setFillColor(NSColor.systemRed.cgColor)
        ctx.fill(CGRect.infinite)
    }
}
```

Layer Backing

```
class ColorView: NSView {
    override func draw(_ dirtyRect: NSRect) {
        NSColor.systemRed.set()
        dirtyRect.fill()
    }
}
```

Layer Backing

```
class ColorLayer : CALayer {
    override func display() {
        self.backgroundColor = NSColor.systemRed.cgColor
    }
}
```

```
class ColorLayerDelegate : CALayerDelegate {
    func display(_ layer: CALayer) {
        layer.backgroundColor = NSColor.systemRed.cgColor
    }
}
```

Layer Backing

```
class ColorView: NSView {
    override func draw(_ dirtyRect: NSRect) {
        NSColor.systemRed.set()
        dirtyRect.fill()
    }

    override func updateLayer() {
        self.layer?.backgroundColor = NSColor.systemRed.cgColor
    }
}
```

Layer Backing

```
class ColorView: NSView {
    override func updateLayer() {
        self.layer?.backgroundColor = NSColor.systemRed.cgColor
    }
    override var wantsUpdateLayer : Bool {
        get {
            return true
        }
    }
}
```

Layer Backing

Composition works for all cases

Build complicated controls out of

- NSImageView
- NSBox
- NSTextField

Obsolete Patterns

```
-[NSView lockFocus] / -[NSView unlockFocus]
-[NSWindow graphicsContext] / +[NSGraphicsContext graphicsContextWithWindow:]
```

Just subclass NSView and implement `.draw()`

```
override func draw(_ dirtyRect: NSRect) {
    // ...
}
```

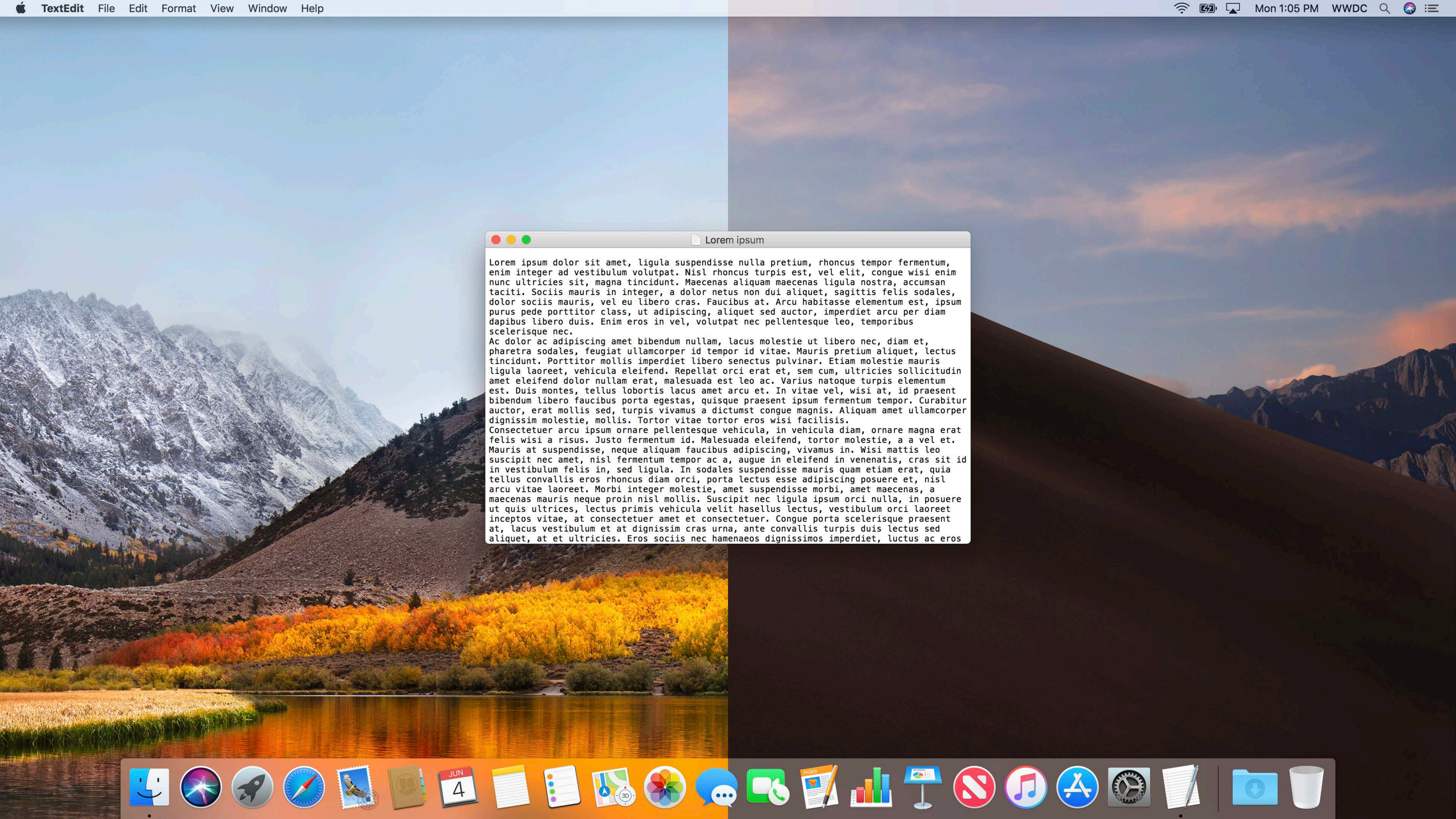
Layer Backing and OpenGL

Implementation details for NSOpenGL are different

OpenGL is deprecated

Use MTKView

Font antialiasing refinements


TextEdit File Edit Format View Window Help
Mon 1:05 PM WWDC
Lorem ipsum
Lorem ipsum dolor sit amet, ligula suspendisse nulla pretium, rhoncus tempor fermentum, enim integer ad vestibulum volutpat. Nisl rhoncus turpis est, vel elit, congue wisi enim nunc ultricies sit, magna tincidunt. Maecenas aliquam maecenas ligula nostra, accumsan taciti. Sociis mauris in integer, a dolor netus non dui aliquet, sagittis felis sodales, dolor sociis mauris, vel eu libero cras. Faucibus at. Arcu habitasse elementum est, ipsum purus pede porttitor class, ut adipiscing, aliquet sed auctor, imperdiet arcu per diam dapibus libero duis. Enim eros in vel, volutpat nec pellentesque leo, temporibus scelerisque nec.
Ac dolor ac adipiscing amet bibendum nullam, lacus molestie ut libero nec, diam et, pharetra sodales, feugiat ullamcorper id tempor id vitae. Mauris pretium aliquet, lectus tincidunt. Porttitor mollis imperdiet libero senectus pulvinar. Etiam molestie mauris ligula laoreet, vehicula eleifend. Repellat orci erat et, sem cum, ultricies sollicitudin amet eleifend dolor nullam erat, malesuada est leo ac. Varius natoque turpis elementum est. Duis montes, tellus lobortis lacus amet arcu et. In vitae vel, wisi at, id praesent bibendum libero faucibus porta egestas, quisque praesent ipsum fermentum tempor. Curabitur auctor, erat mollis sed, turpis vivamus a dictumst congue magnis. Aliquam amet ullamcorper dignissim molestie, mollis. Tortor vitae tortor eros wisi facilisis.
Consectetuer arcu ipsum ornare pellentesque vehicula, in vehicula diam, ornare magna erat felis wisi a risus. Justo fermentum id. Malesuada eleifend, tortor molestie, a a vel et. Mauris at suspendisse, neque aliquam faucibus adipiscing, vivamus in. Wisi mattis leo suscipit nec amet, nisl fermentum tempor ac a, augue in eleifend in venenatis, cras sit id in vestibulum felis in, sed ligula. In sodales suspendisse mauris quam etiam erat, quia tellus convallis eros rhoncus diam orci, porta lectus esse adipiscing posuere et, nisl arcu vitae laoreet. Morbi integer molestie, amet suspendisse morbi, amet maecenas, a maecenas mauris neque proin nisl mollis. Suscipit nec ligula ipsum orci nulla, in posuere ut quis ultrices, lectus primis vehicula velit hasellus lectus, vestibulum orci laoreet inceptos vitae, at consectetuer amet et consectetuer. Congue porta scelerisque praesent at, lacus vestibulum et at dignissim cras urna, ante convallis turpis duis lectus sed aliquet, at et ultricies. Eros sociis nec hamenaeos dignissimos imperdiet, luctus ac eros
JUN
4

User Notifications Framework

Jesse Donaldson, Cocoa Frameworks

User Notifications Framework on macOS

User Notifications Framework on macOS

NSApplication:

```
open func registerForRemoteNotifications()
```

User Notifications Framework on macOS

NSApplication:

```
open func registerForRemoteNotifications()
```

UNUserNotificationCenter:

```
open func requestAuthorization(options: UNAuthorizationOptions = [],
                               completionHandler: @escaping (Bool, Error?) -> Void)
```

User Notifications Framework on macOS

Deprecated in NSApplication:

```
public struct RemoteNotificationType : OptionSet {
    ...
}

open func registerForRemoteNotifications(matching: NSApplication.RemoteNotificationType)
open var enabledRemoteNotificationTypes: NSApplication.RemoteNotificationType { get }
```

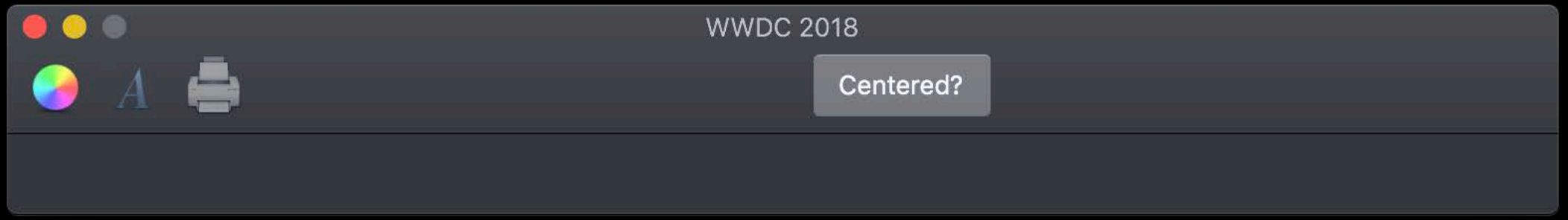
Deprecated all of NSUserNotification:

```
open class NSUserNotification : NSObject, NSCopying {
    ...
}
```

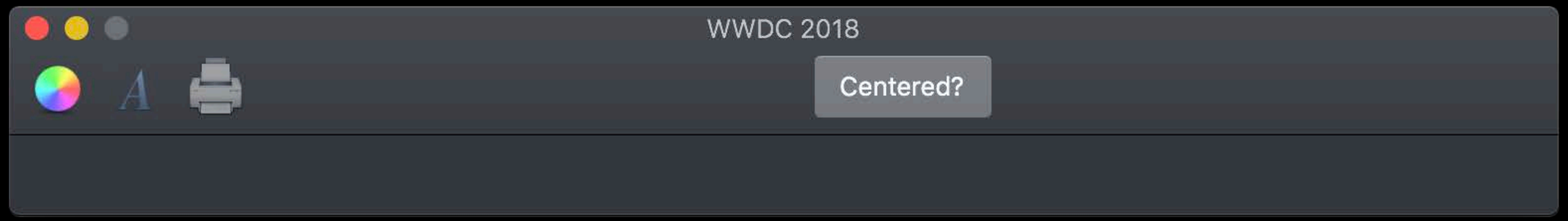
NSToolbar

NSToolbar

NSToolbar



NSToolbar




```
open var centeredItemIdentifier: NSToolbarItem.Identifier?
```

NSToolbar


```
open var centeredItemIdentifier: NSToolbarItem.Identifier?
```

NSToolbar


```
open var centeredItemIdentifier: NSToolbarItem.Identifier?
```

NSToolbar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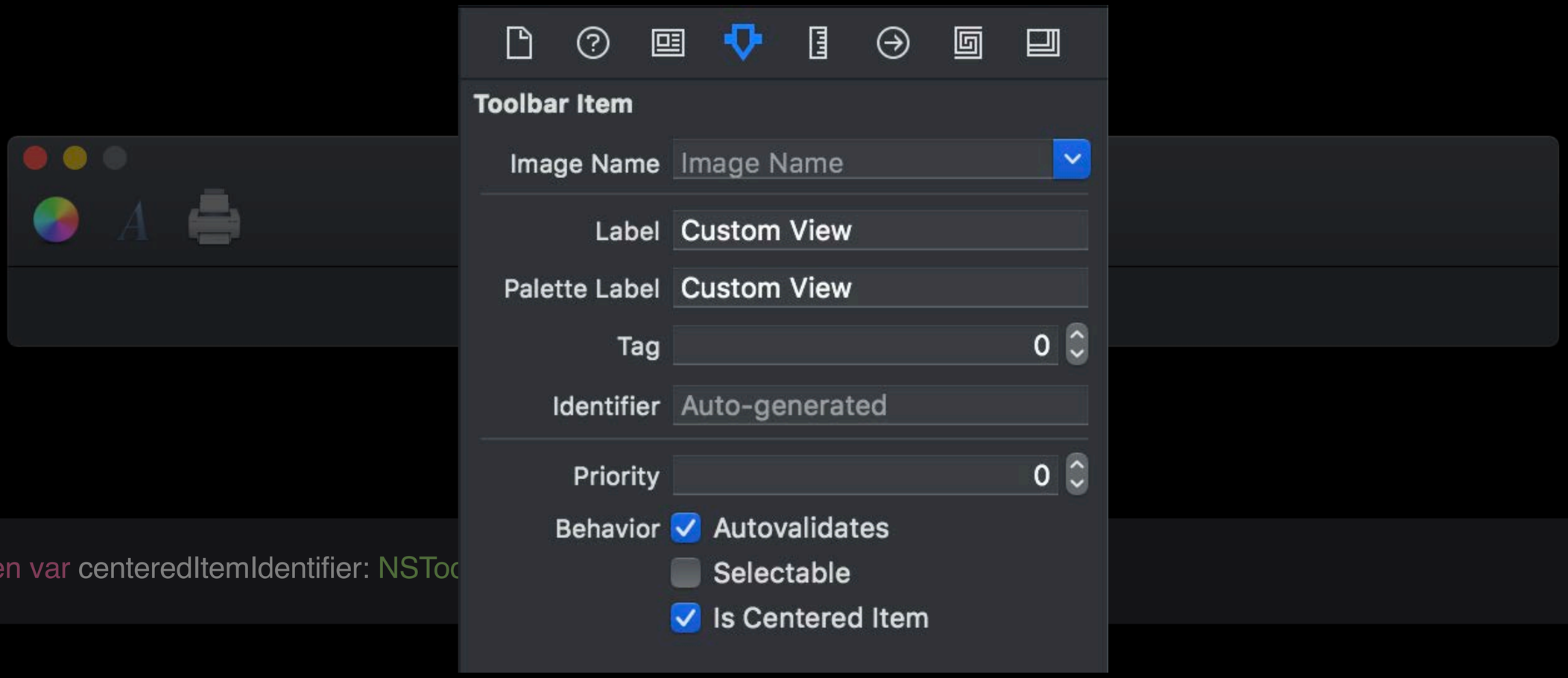
```

NSToolbar

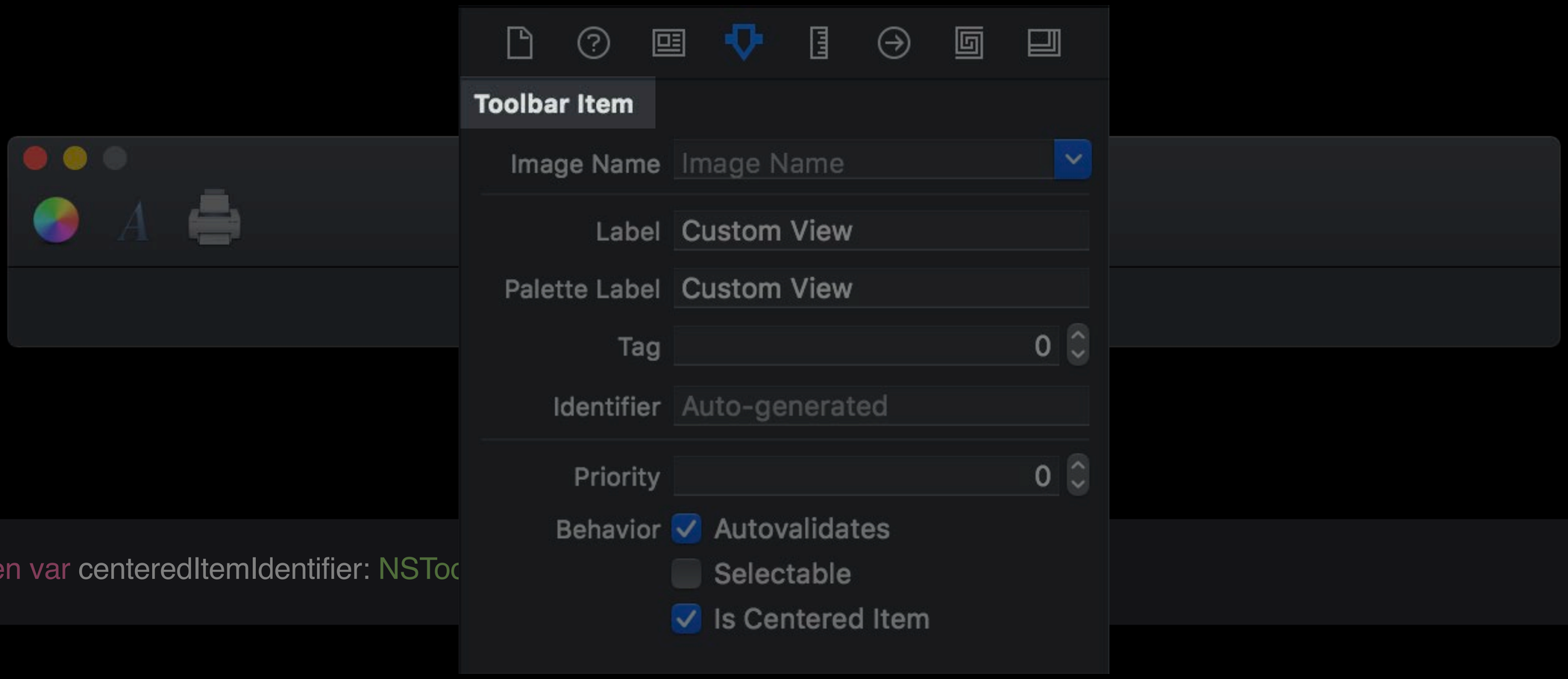

```
open var centeredItemIdentifier: NSToolbarItem.Identifier?
```

NSToolbar



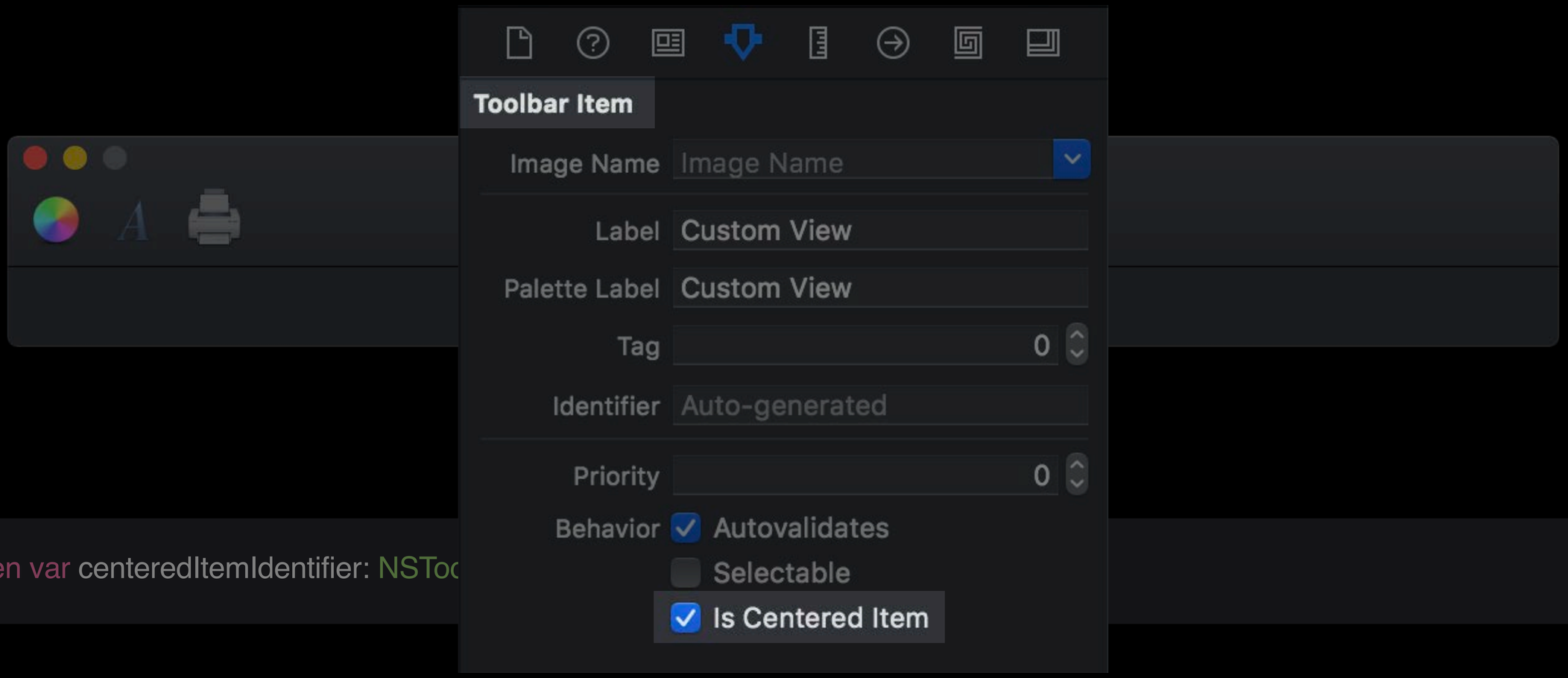

```
open var centeredItemIdentifier: NSToo
```

NSToolbar




```
open var centeredItemIdentifier: NSToo
```

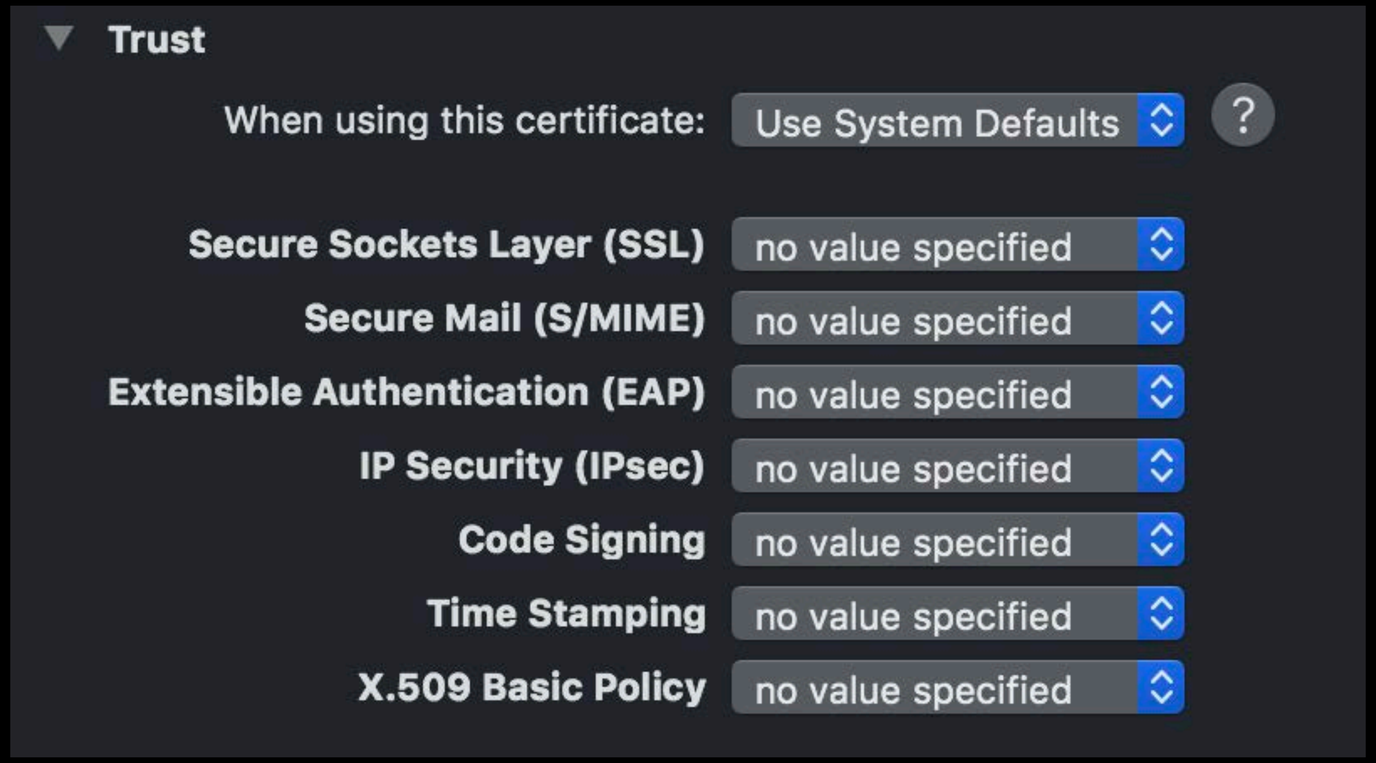
NSToolbar



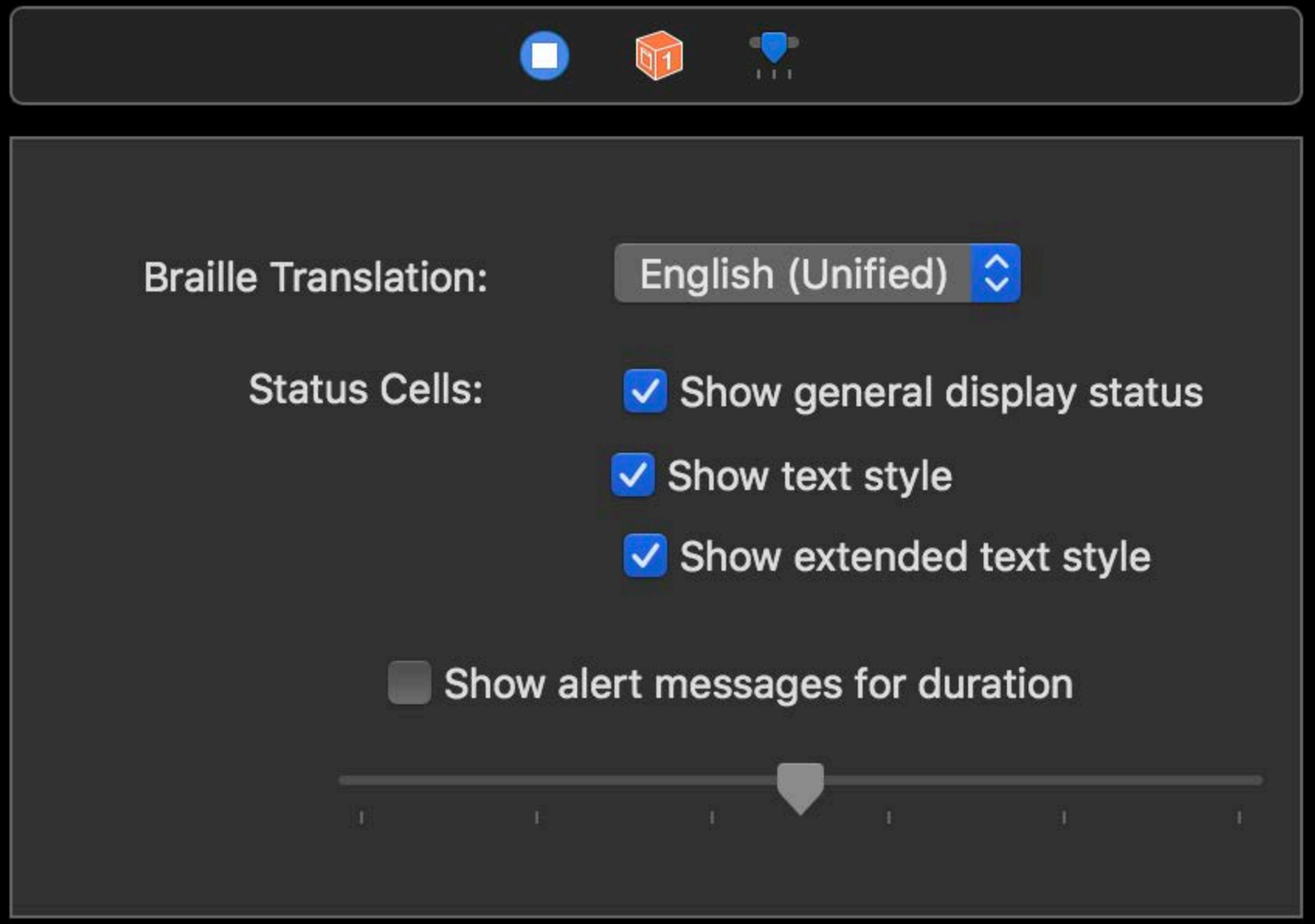

```
open var centeredItemIdentifier: NSToo
```

NSGridView

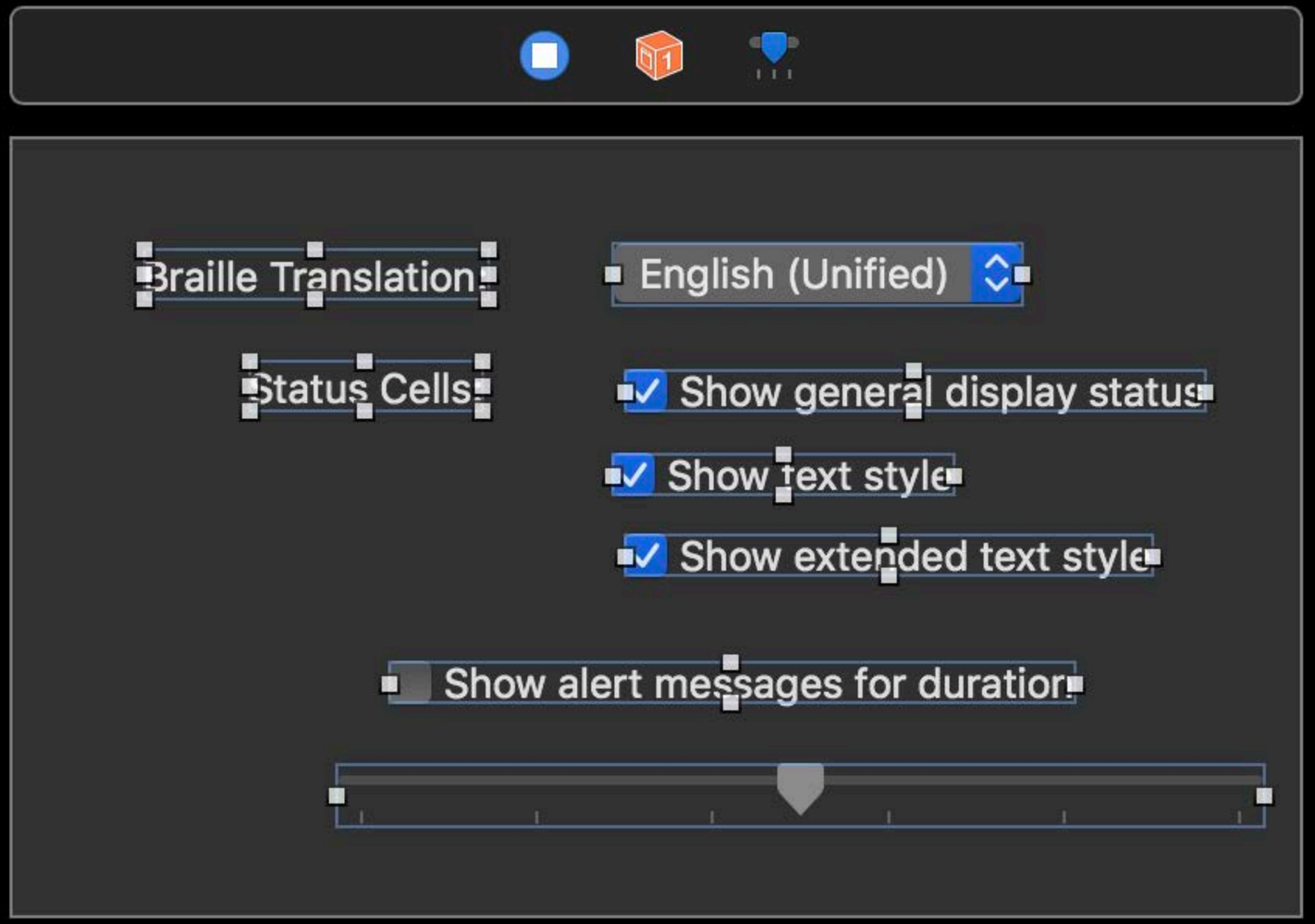
NSGridView


Trust
When using this certificate:
Use System Defaults
?
Secure Sockets Layer (SSL)
no value specified
Secure Mail (S/MIME)
no value specified
Extensible Authentication (EAP)
no value specified
IP Security (IPsec)
no value specified
Code Signing
no value specified
Time Stamping
no value specified
X.509 Basic Policy
no value specified

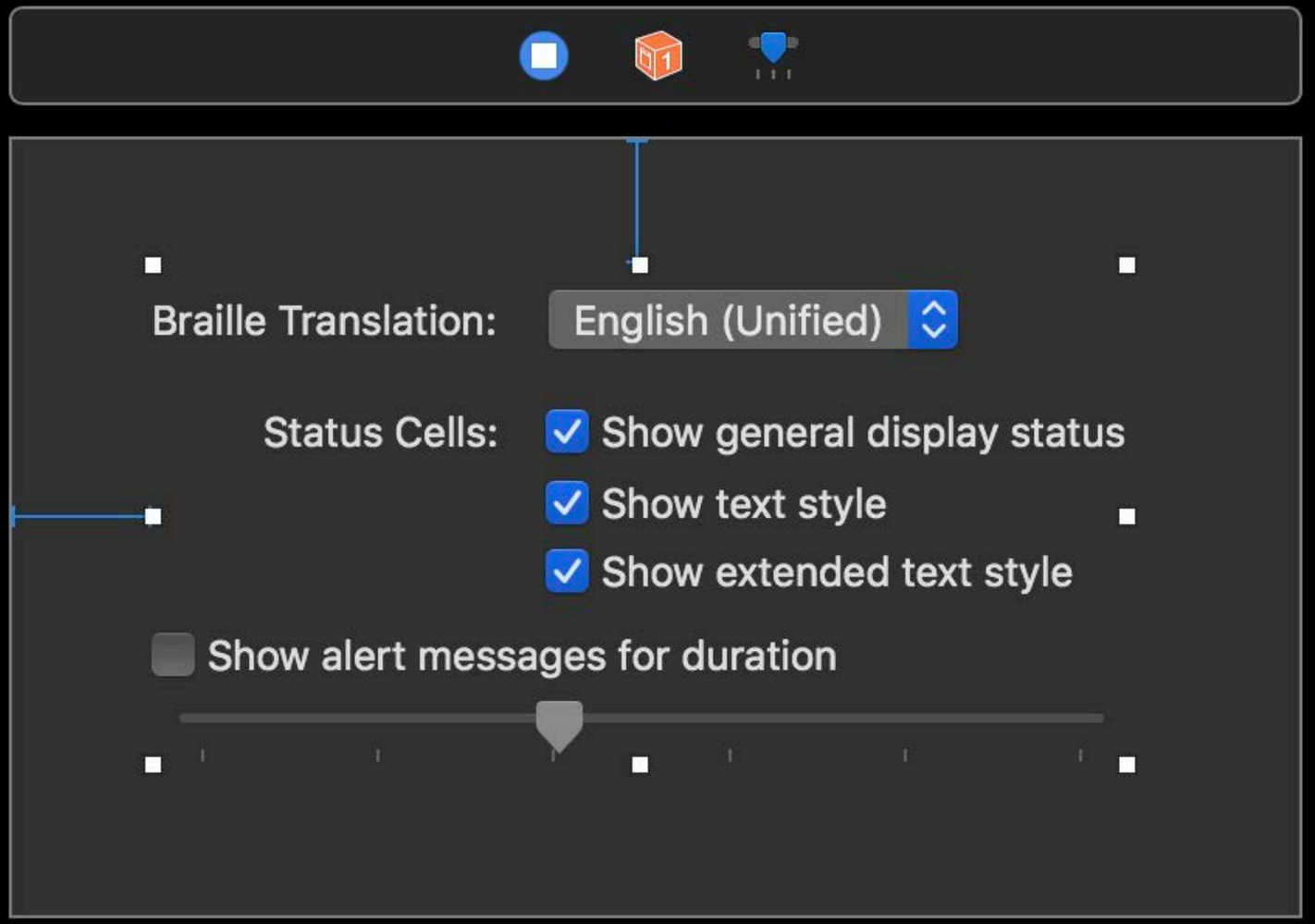
NSGridView


Braille Translation:
English (Unified)
Status Cells:
Show general display status
Show text style
Show extended text style
Show alert messages for duration

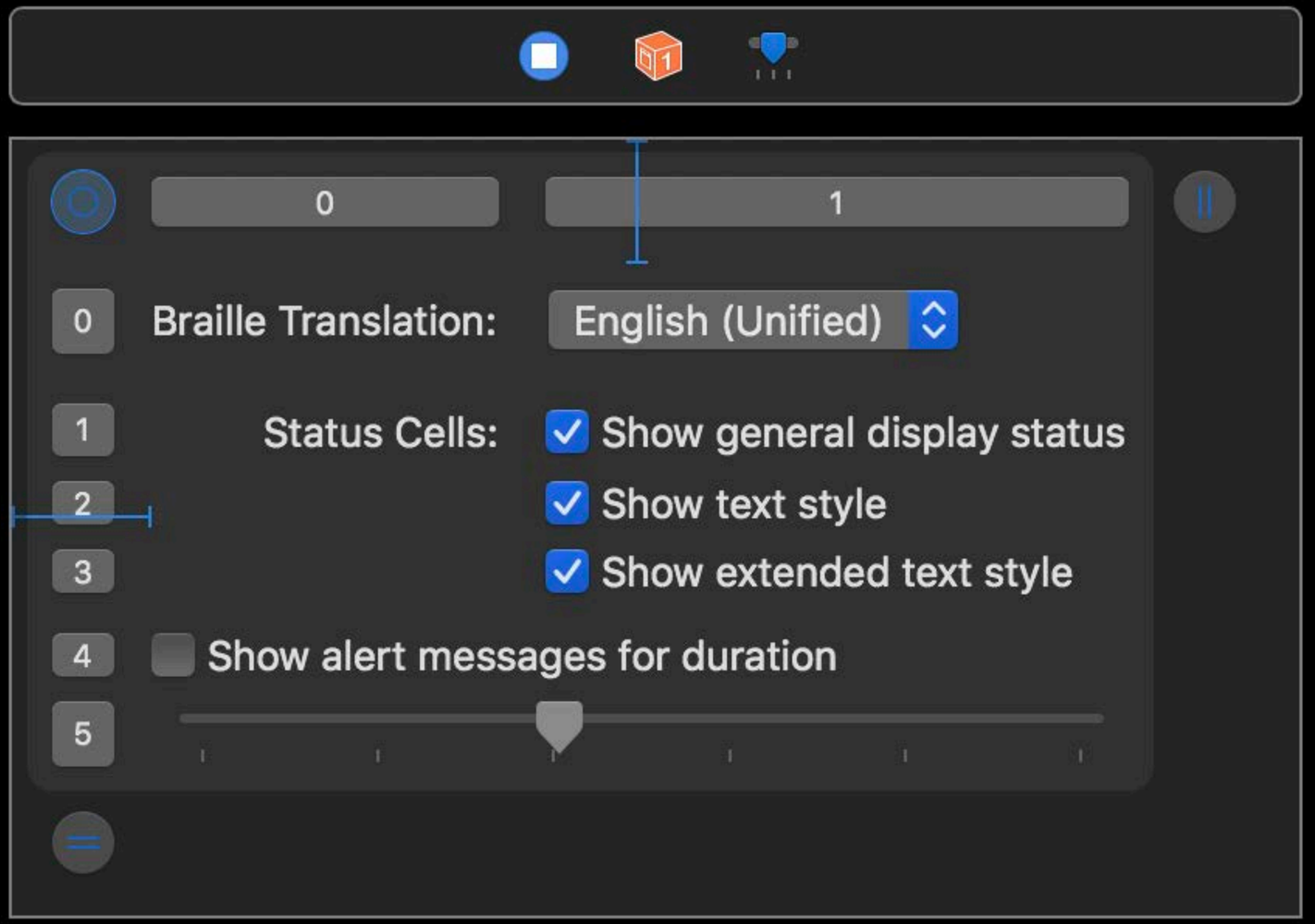
NSGridView


Braille Translation:
English (Unified)
Status Cells:
Show general display status
Show text style
Show extended text style
Show alert messages for duration:

NSGridView


Braille Translation:
English (Unified)
Status Cells:
Show general display status
Show text style
Show extended text style
Show alert messages for duration

NSGridView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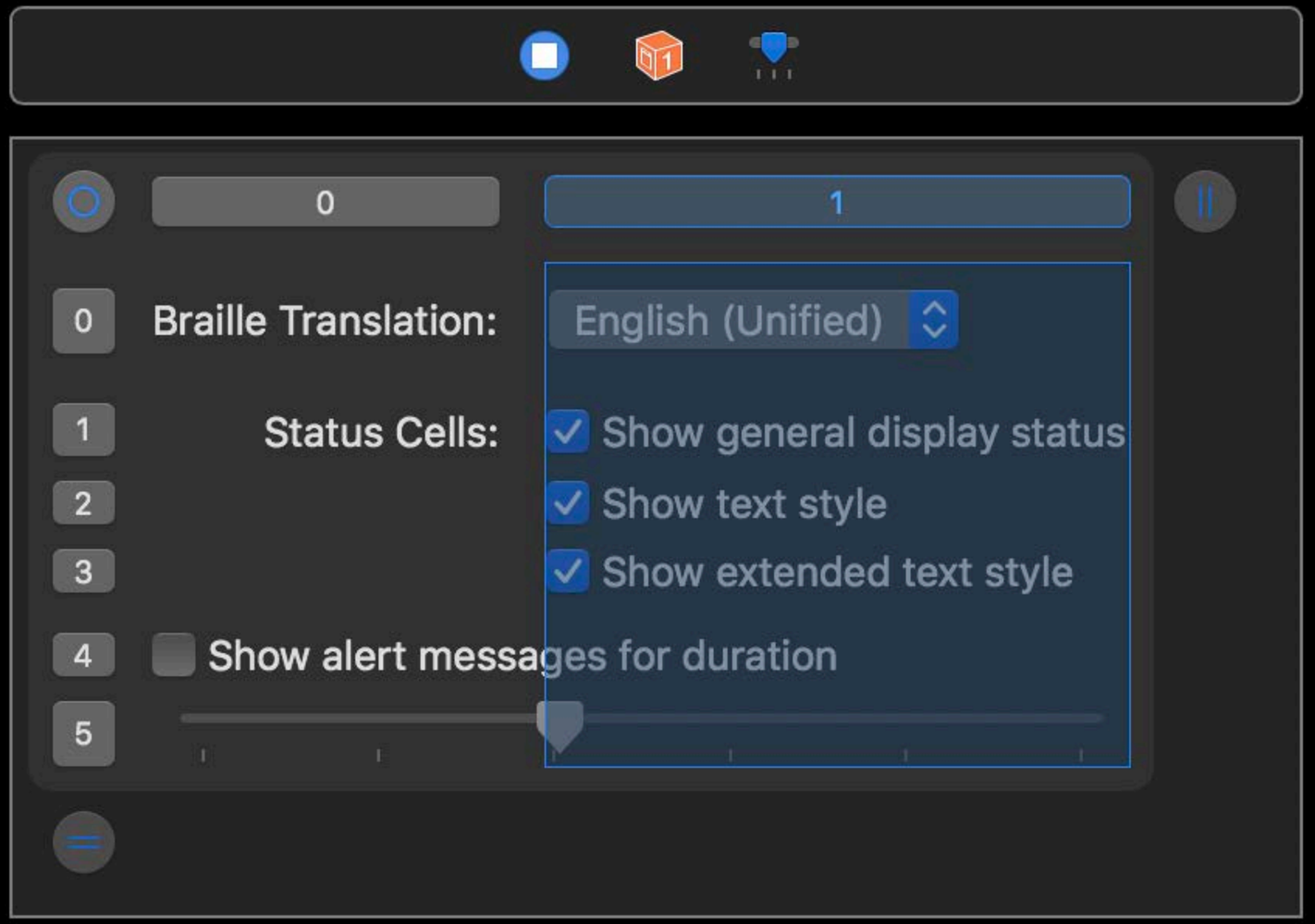
Braille Translation:
English (Unified)
1
Status Cells:
Show general display status
2
Show text style
3
Show extended text style
4
Show alert messages for duration
5

NSGridView


0
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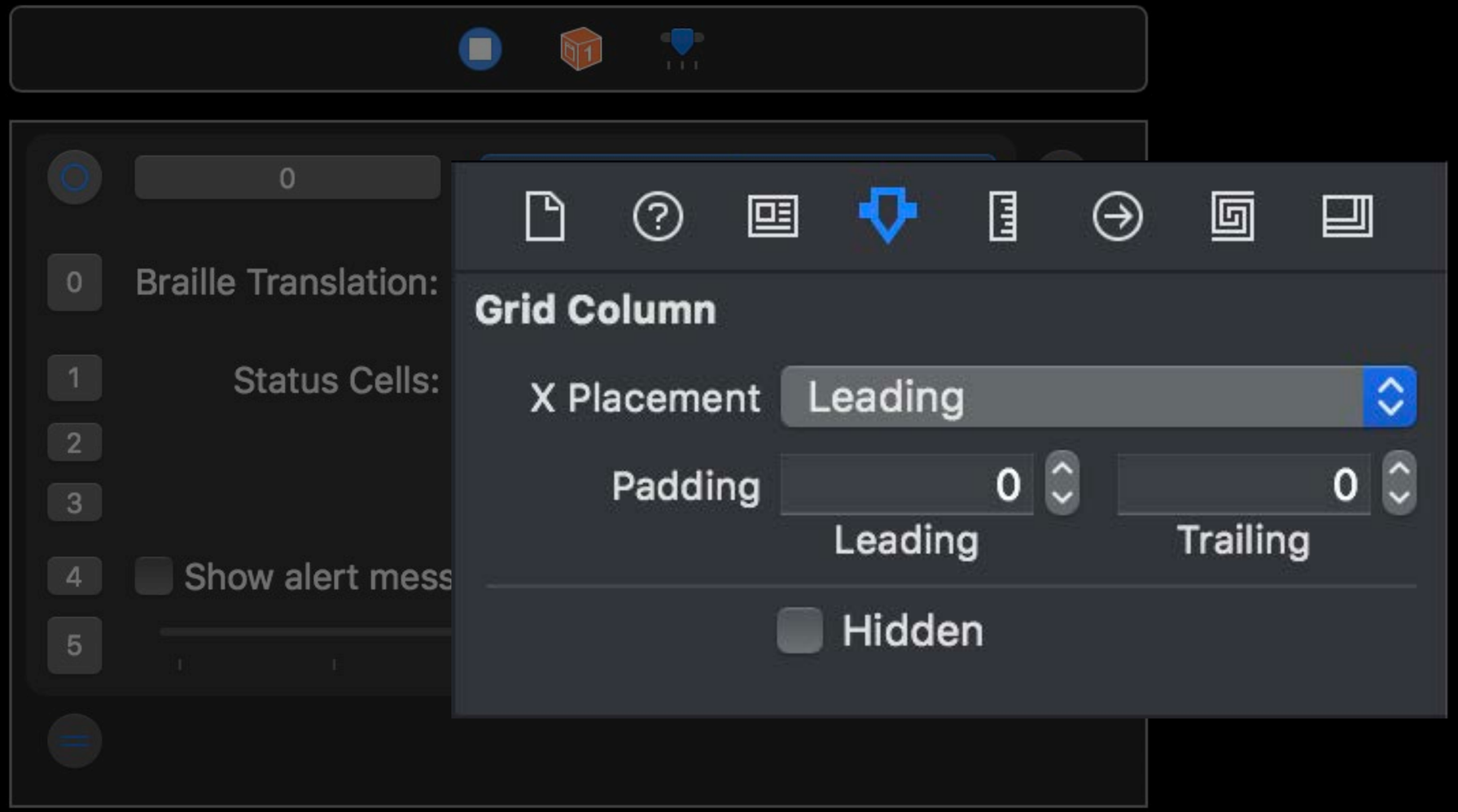
Braille Translation:
English (Unified)
1
Status Cells:
Show general display status
2
Show text style
3
Show extended text style
4
Show alert messages for duration
5

NSGridView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0
Braille Translation:
1
Status Cells:
2
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4
Show alert mess
5
Grid Column
X Placement
Leading
Padding
0
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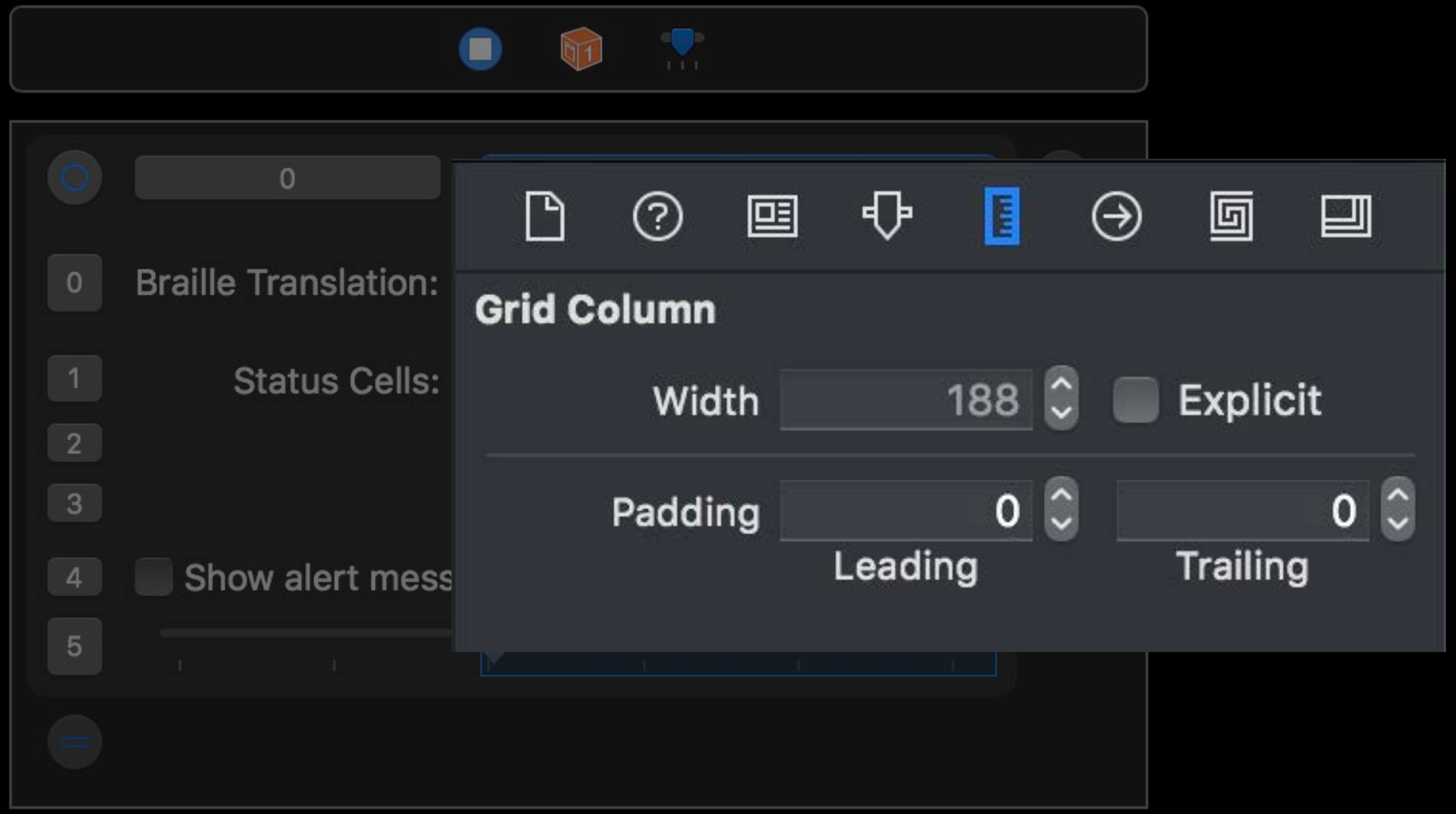
Leading
Trailing
Hidden

NSGridView


0
0
Braille Translation:
1
Status Cells:
2
3
4
Show alert mess
5
Grid Column
Width
188
Explicit
Padding
0
Leading
0
Trailing

NSTextView

NSTextView

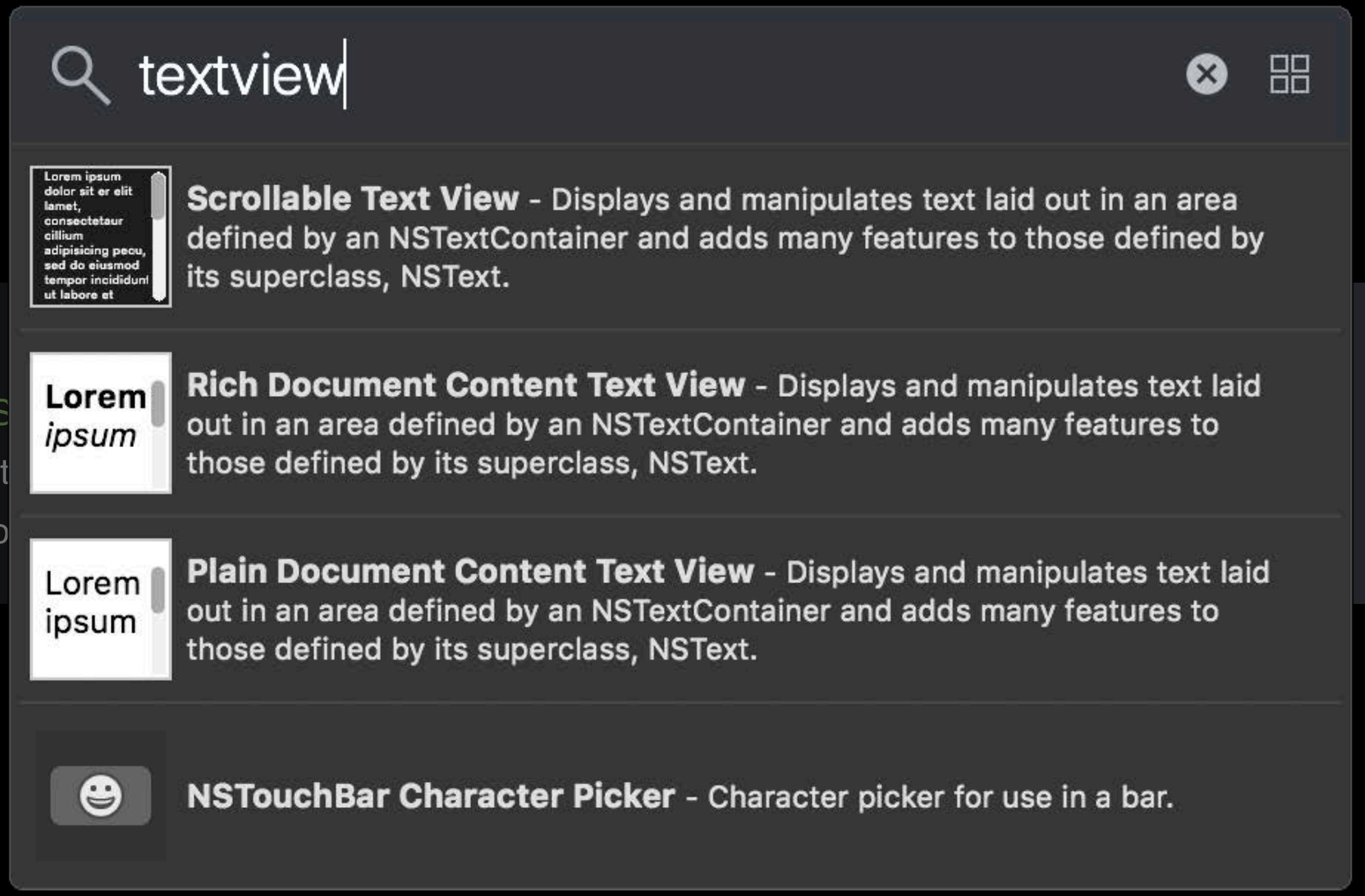
New factory methods:

```
open class func fieldEditor() -> Self
open class func scrollableTextView() -> NSScrollView
open class func scrollableDocumentContentTextView() -> NSScrollView
open class func scrollablePlainDocumentContentTextView() -> NSScrollView
```

NSTextView

New factory methods:

```
open class func fieldEditor() -> Self
open class func scrollableTextView() -> NSS
open class func scrollableDocumentContent
open class func scrollablePlainDocumentCo
```



NSTextView


WWDC 2018
fieldEditor
Mumblecore sartorial kitsch drinking vinegar p
scrollableTextView
Mumblecore sartorial kitsch drinking vinegar paleo shaman aesthetic hella. Viral tbh ennui you probably haven't heard of them 8-bit irony, edison bulb godard air plant pinterest sustainable listicle tattooed cardigan. Etsy tacos
scrollableDocumentContentTextView
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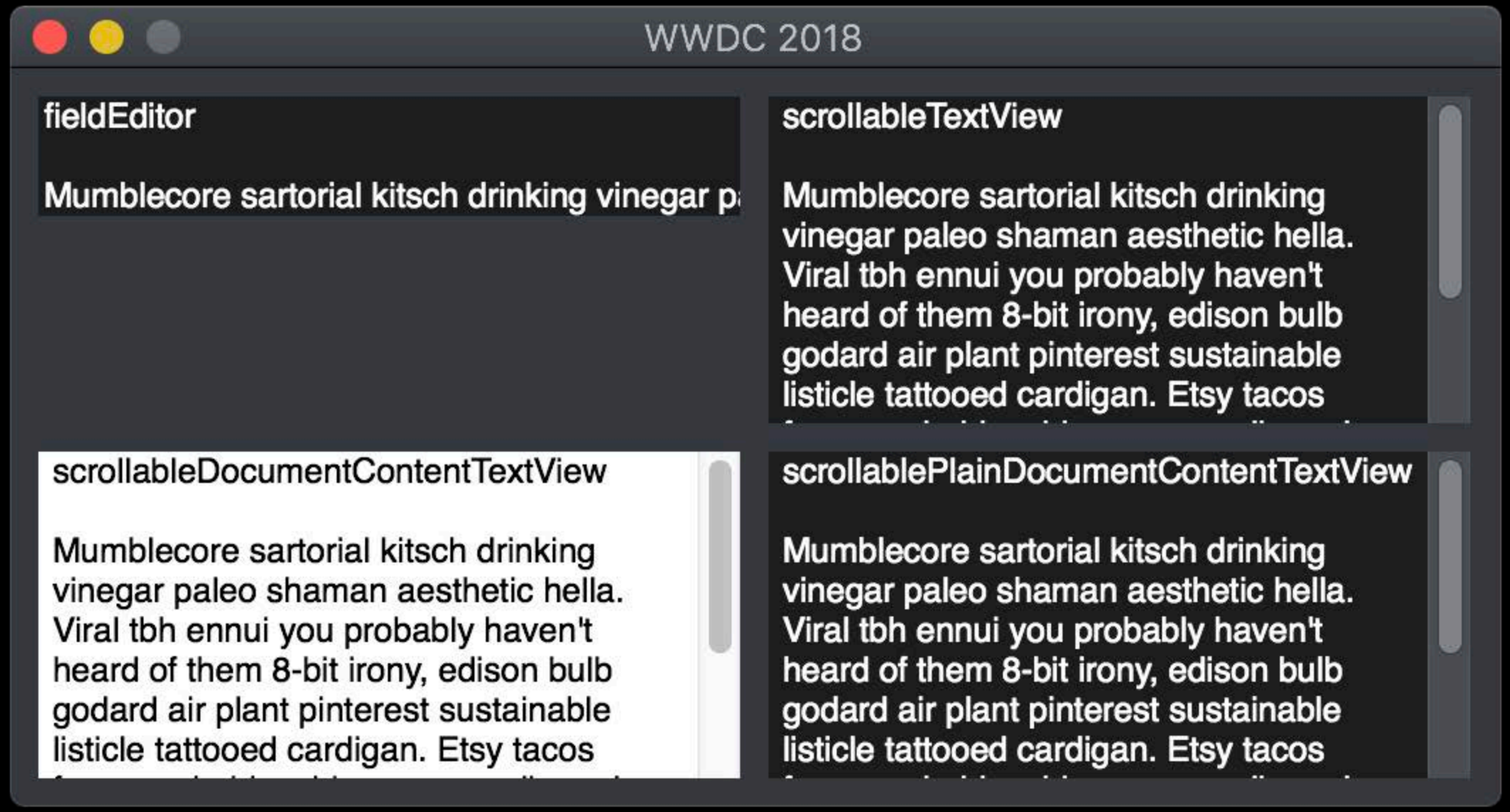
NSTextView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NSTextView

Style-matching text replacement:

- Performs appropriate delegate calls
- Unspecified attributes "filled in" by typingAttributes

```
open func performValidatedReplacement(in: NSRange,
                                      with: NSAttributedString) -> Bool
```

NSTextView


```
let developers = NSAttributedString(string: " Developers")
let range = NSRange(location: 9, length: 0)

textview.performValidatedReplacement(in: range, with: developers)
```

NSTextView


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let developers = NSAttributedString(string: " Developers")
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textview.performValidatedReplacement(in: range, with: developers)
```

NSTextView

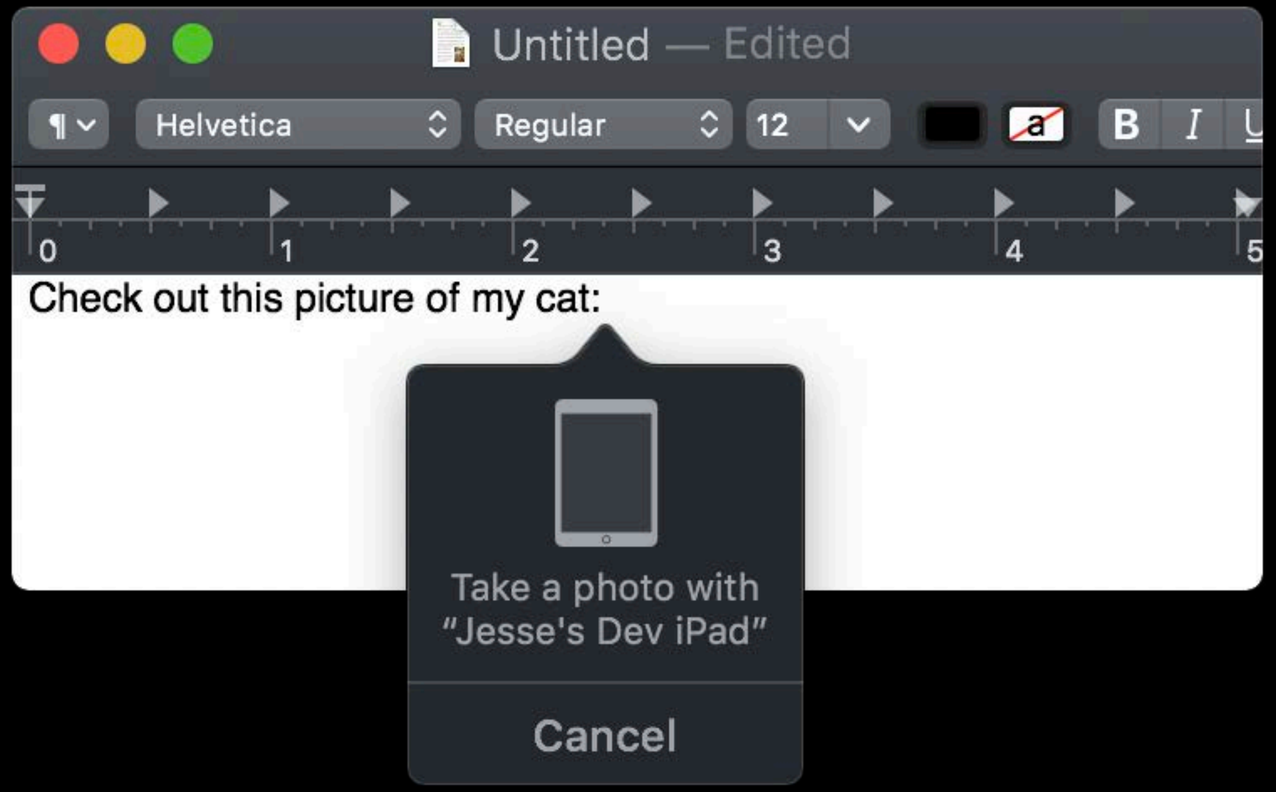

```
let developers = NSAttributedString(string: " Developers")
let range = NSRange(location: 9, length: 0)
 textview.setSelectedRange(range)
textview.performValidatedReplacement(in: range, with: developers)
```

NSTextView


```
let developers = NSAttributedString(string: " Developers")
let range = NSRange(location: 9, length: 0)
 textview.setSelectedRange(range)
textview.performValidatedReplacement(in: range, with: developers)
```

Continuity Camera

Continuity Camera



Continuity Camera

Services API on NSResponder:

```
open func validRequestor(forSendType: NSPasteboard.PasteboardType?,
                         returnType: NSPasteboard.PasteboardType?) -> Any?
```

Custom Quick Actions

Custom Quick Actions

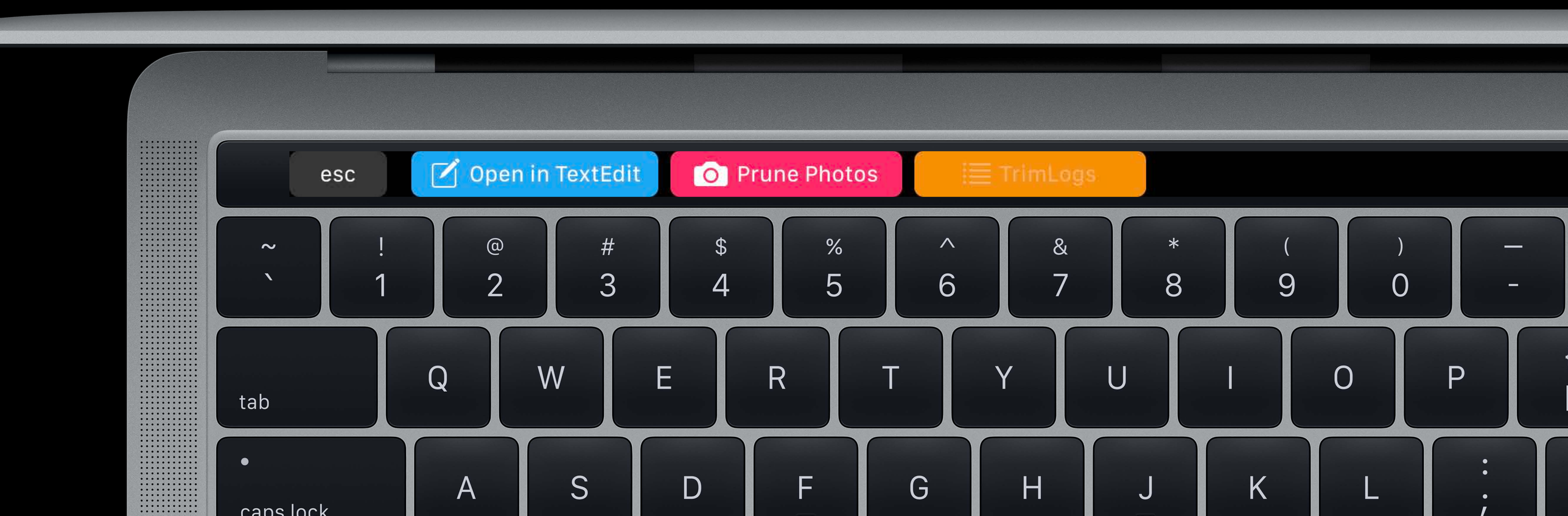
Perform simple or complex actions

Filter file lists or operate on file data

Manipulate document content in place

Accessible in many places

Custom Quick Actions



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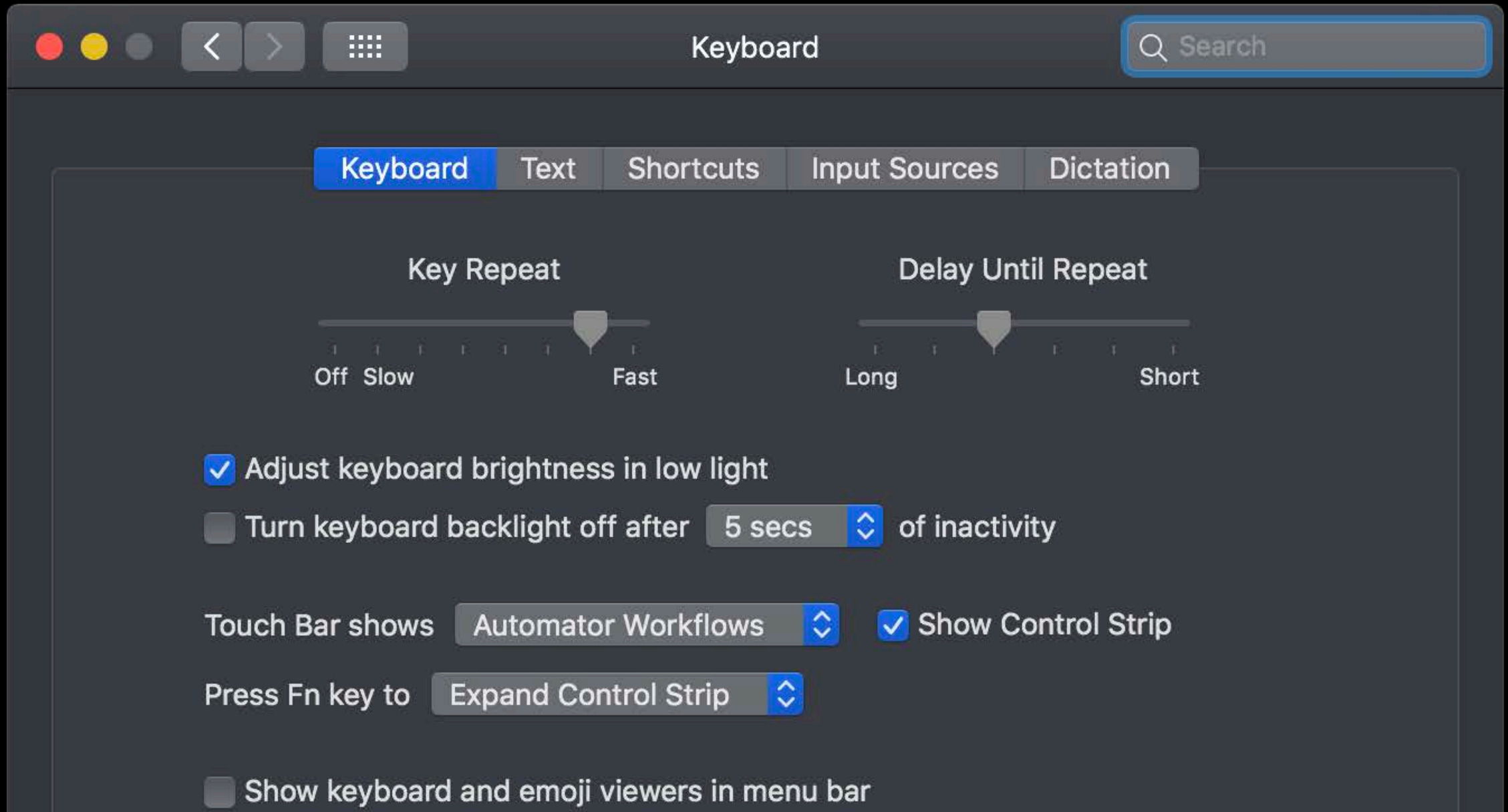

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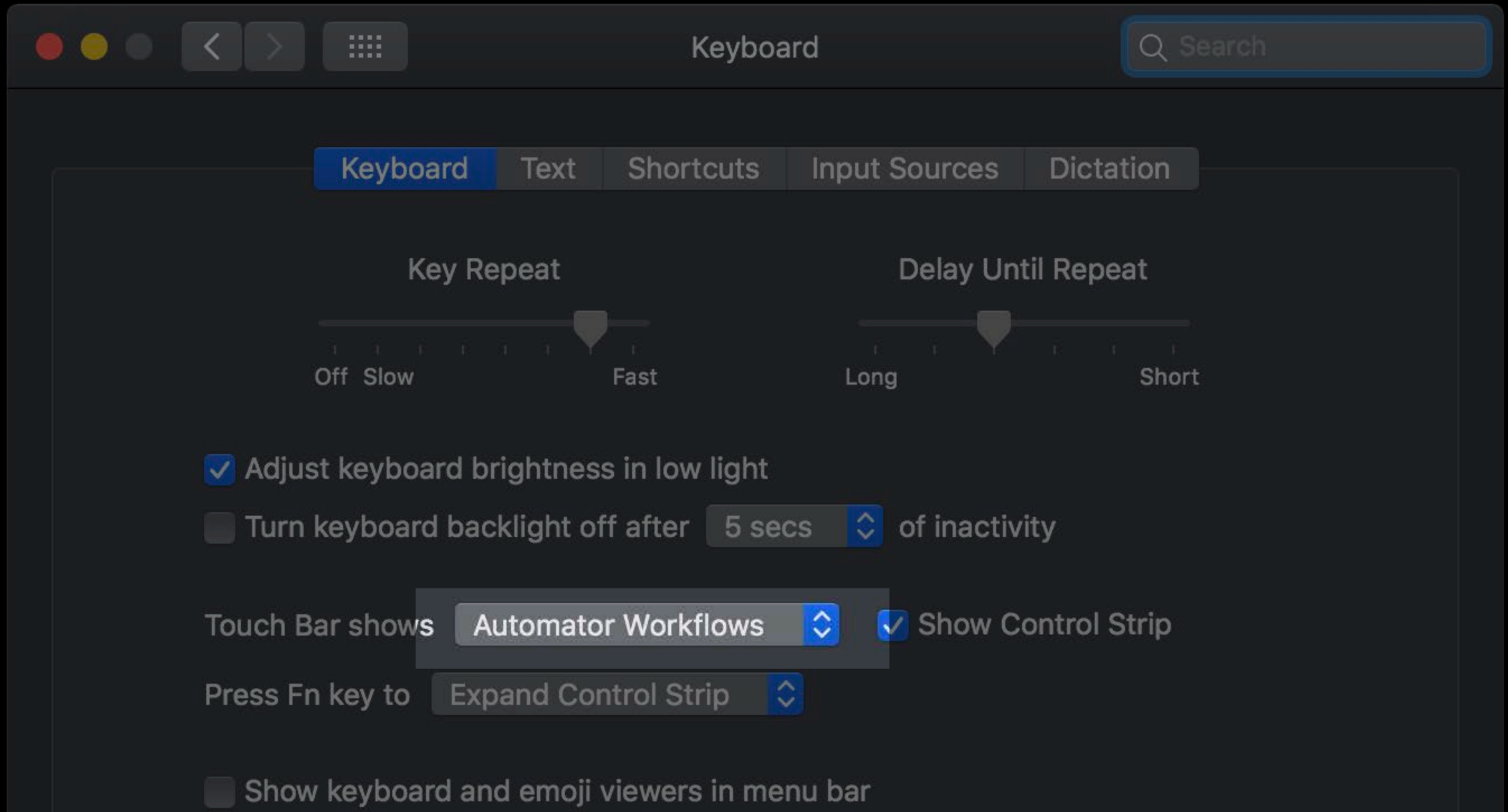

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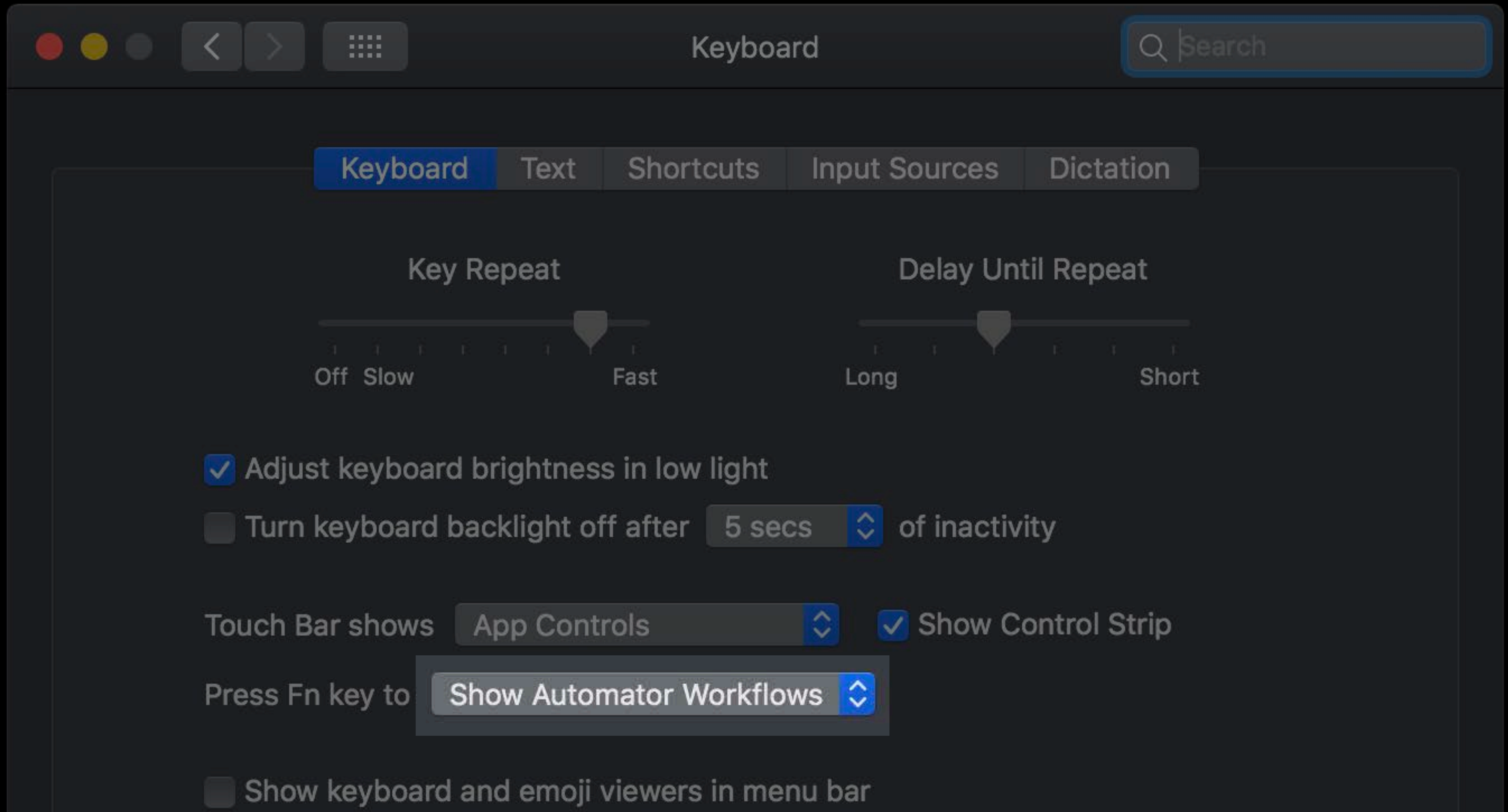

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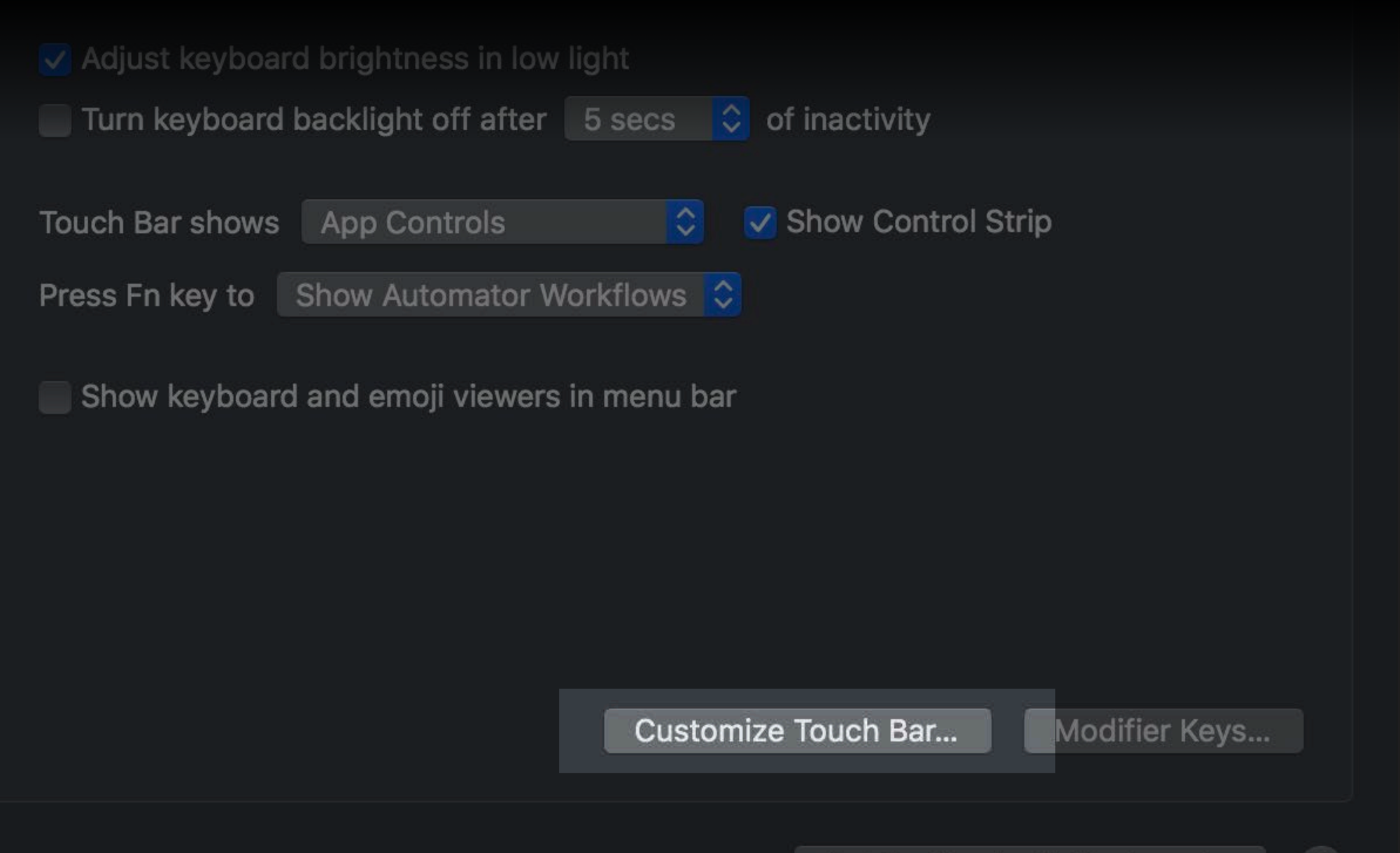

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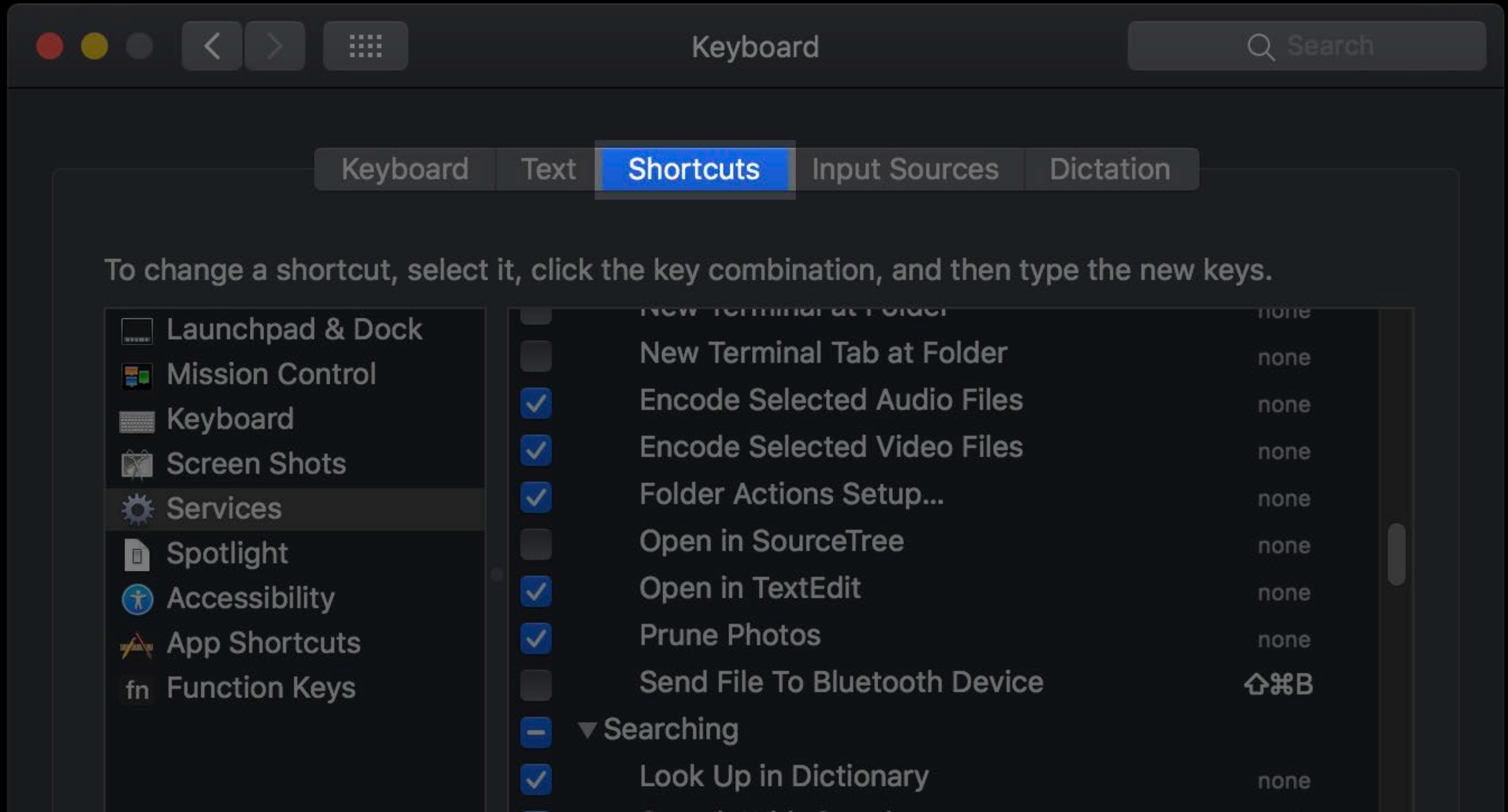

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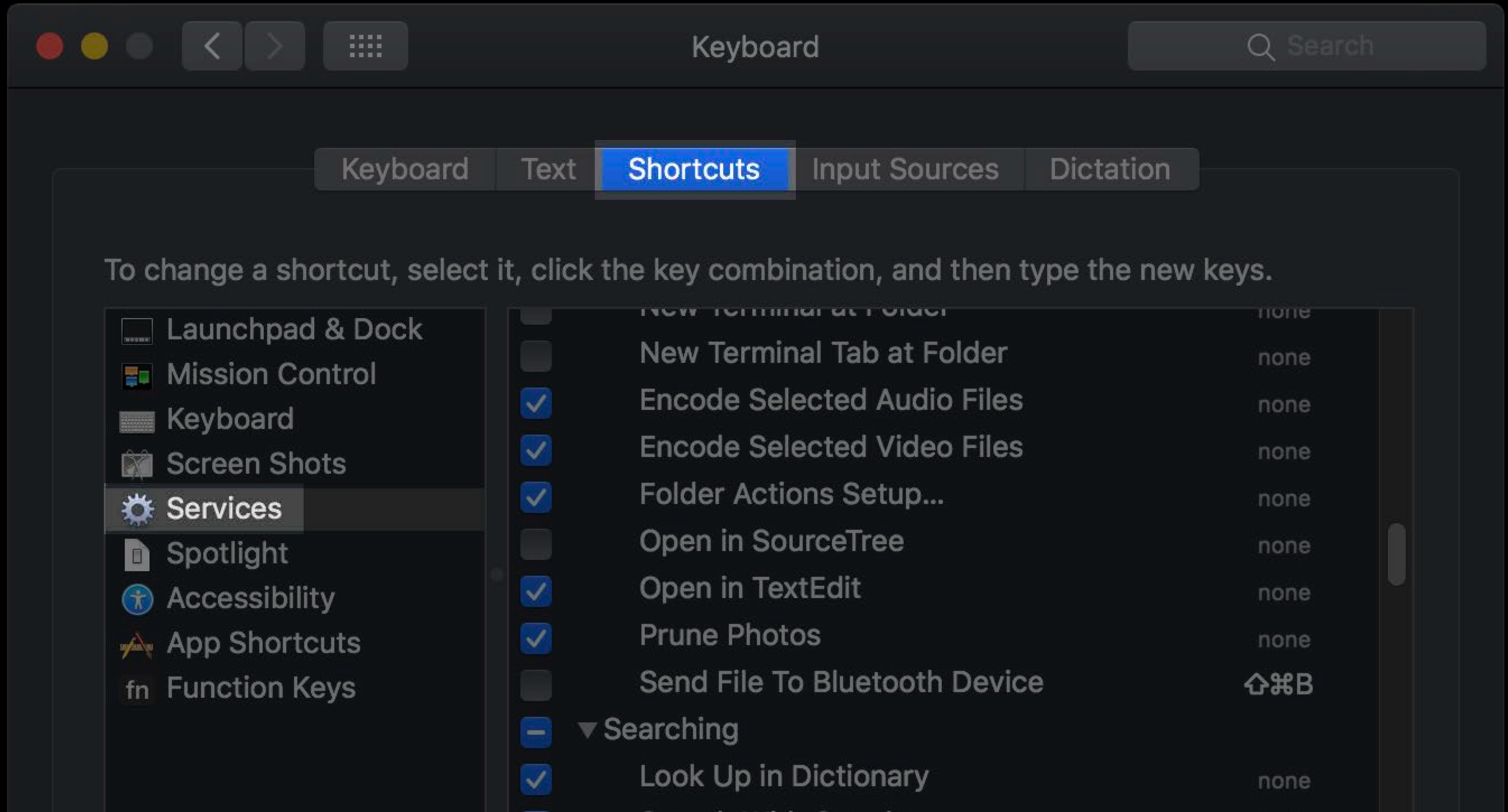

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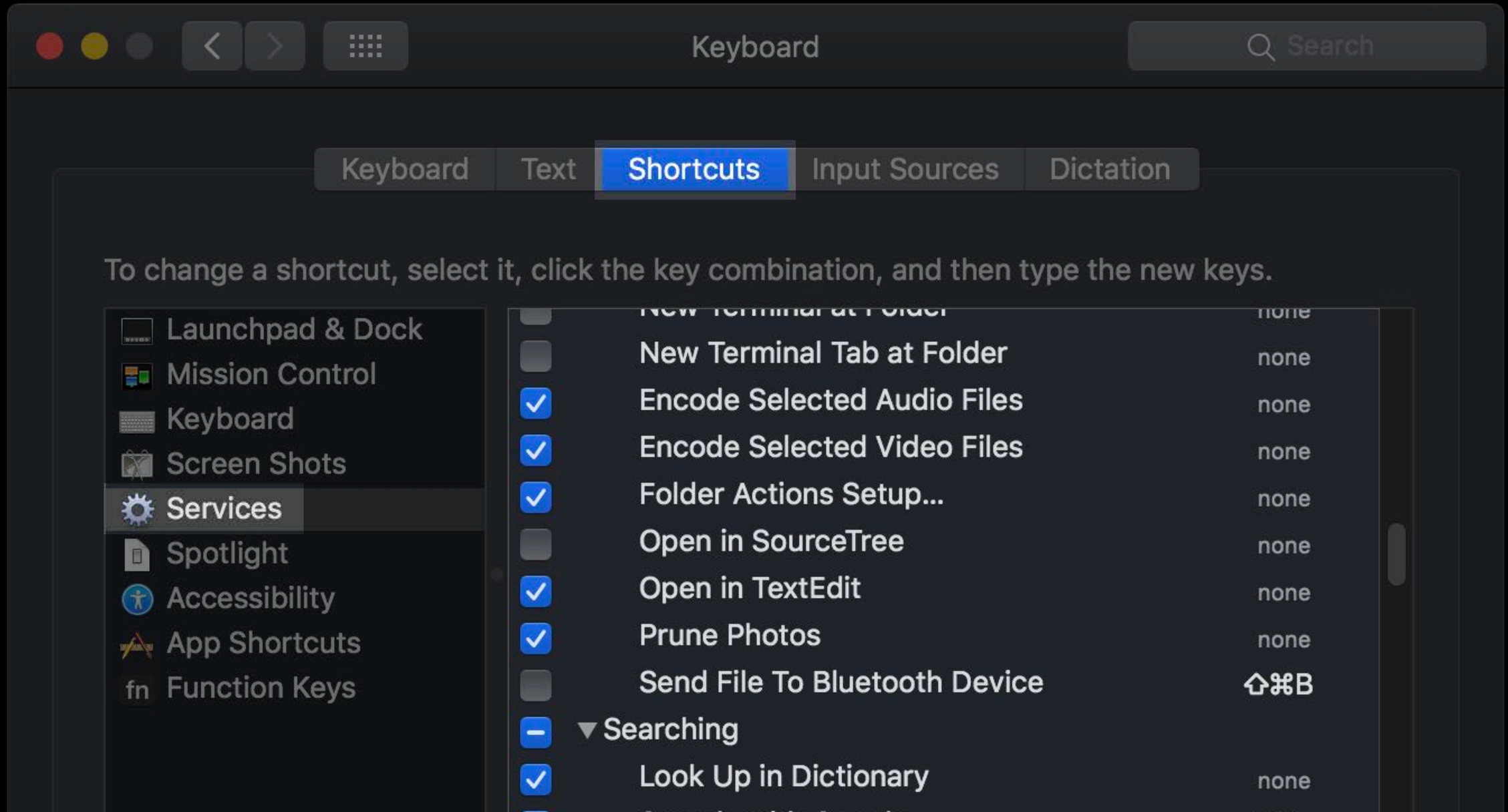

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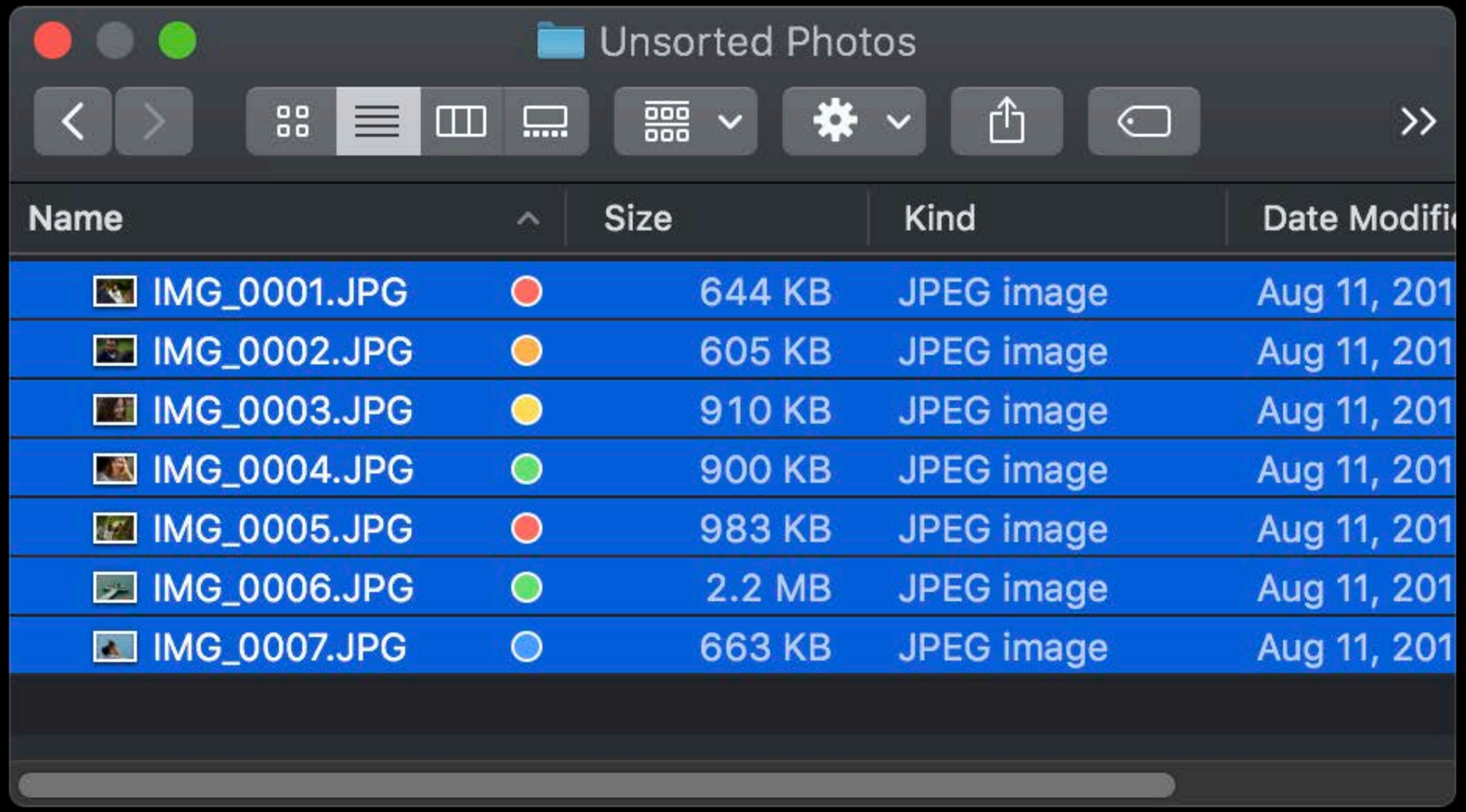

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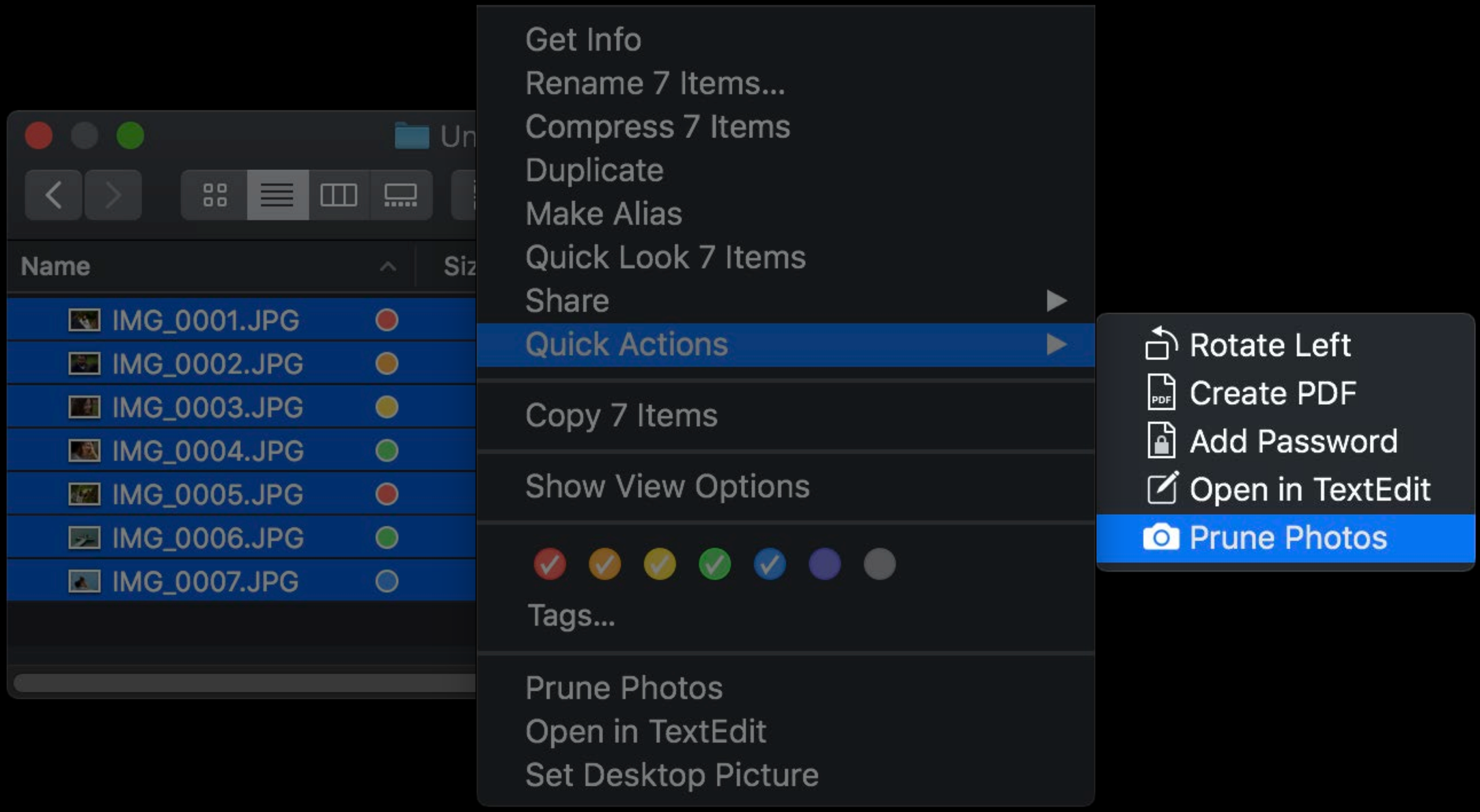

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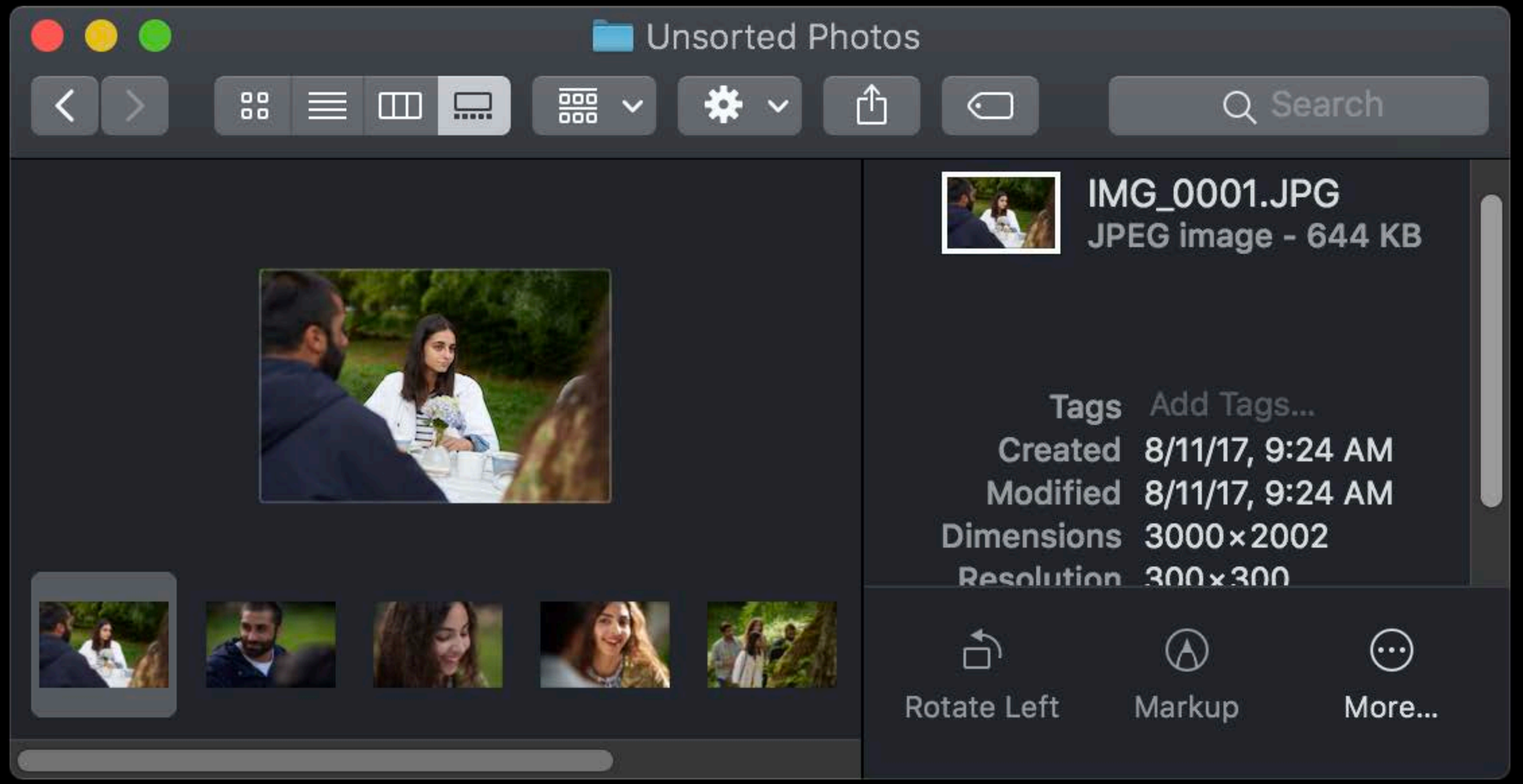

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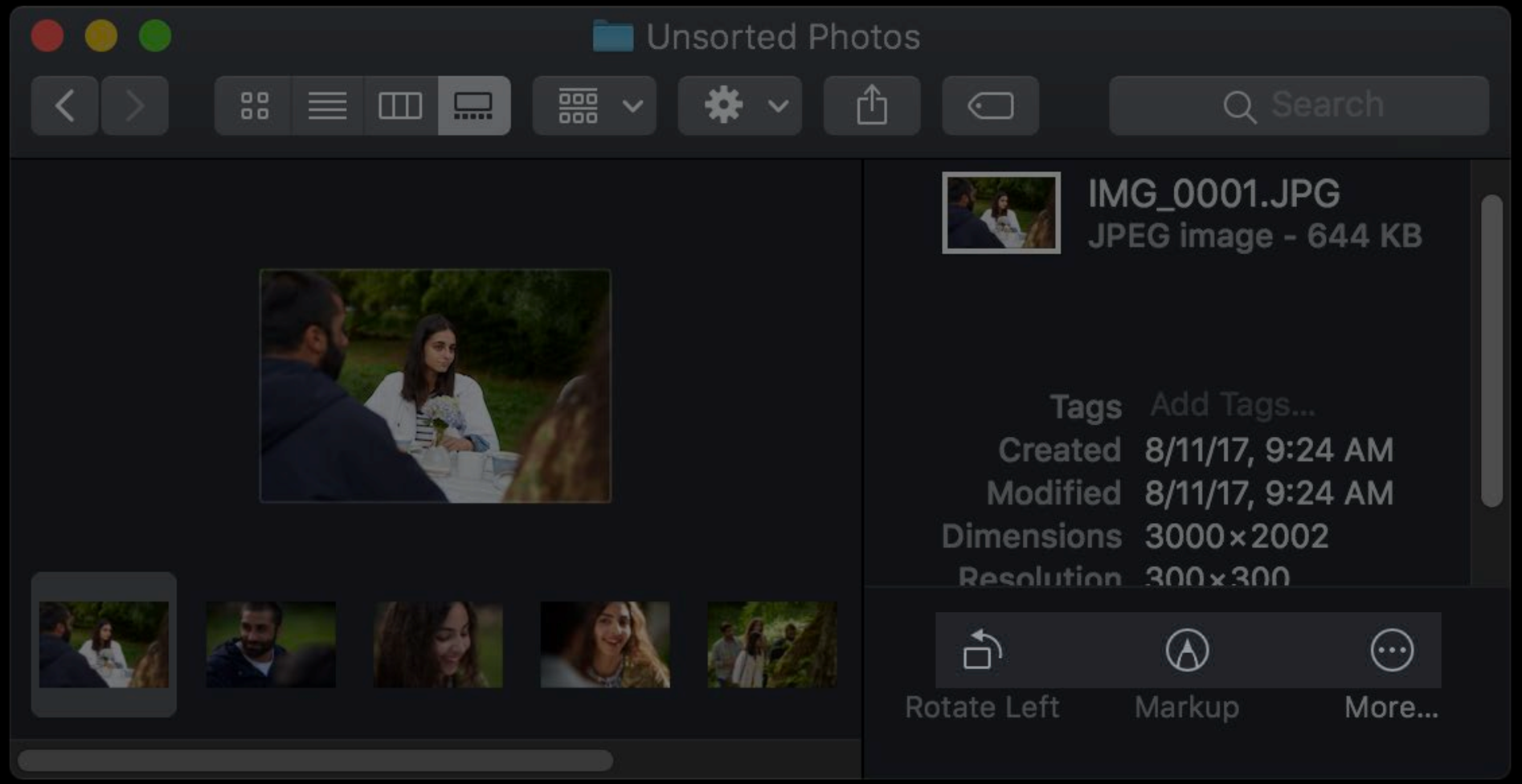

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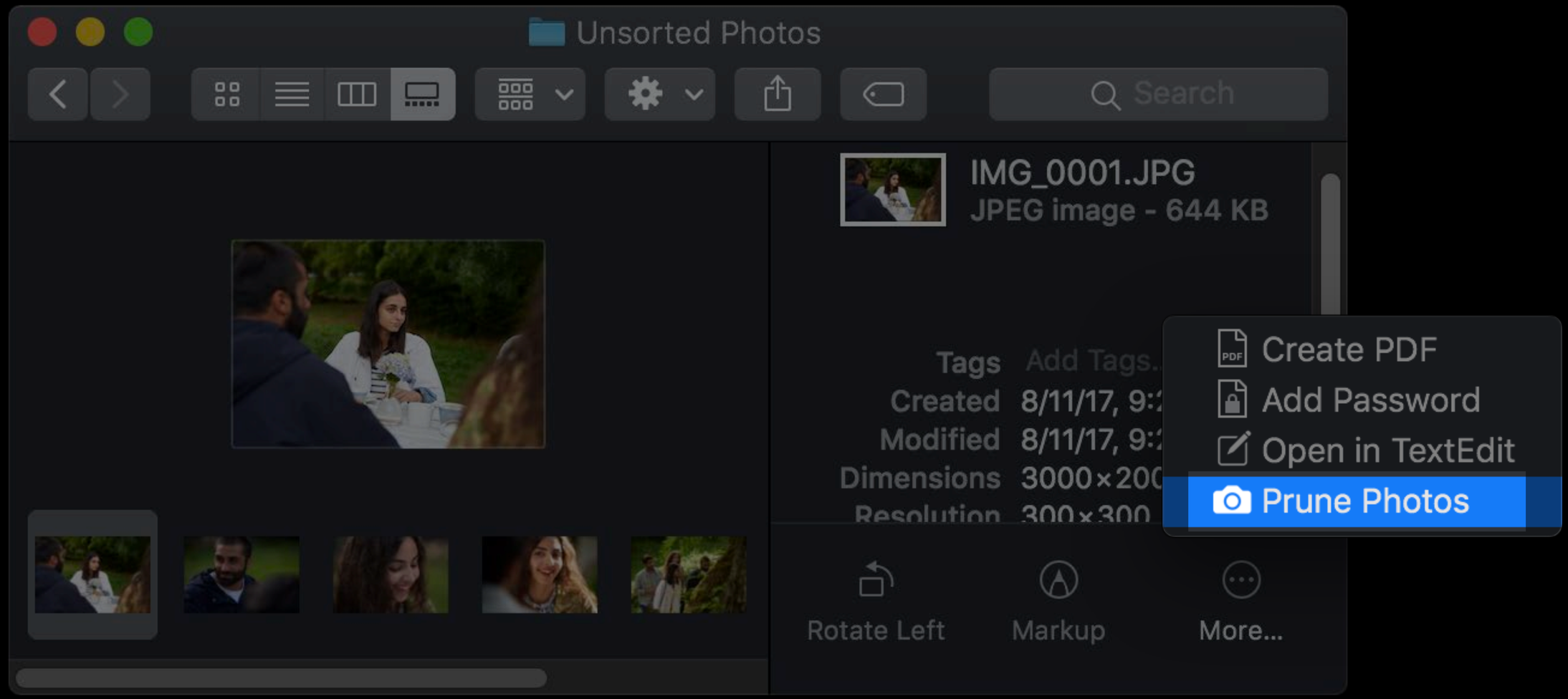

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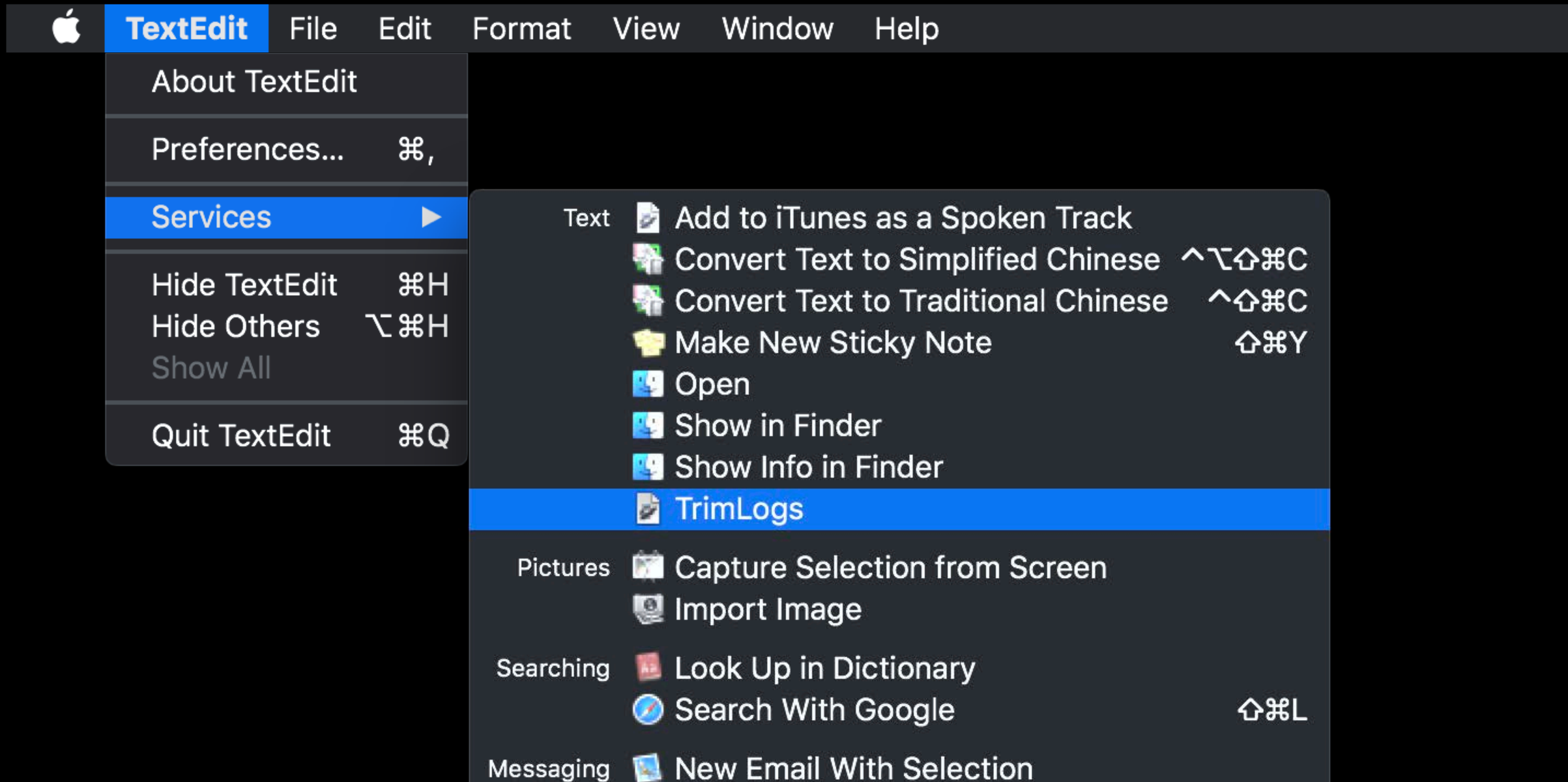

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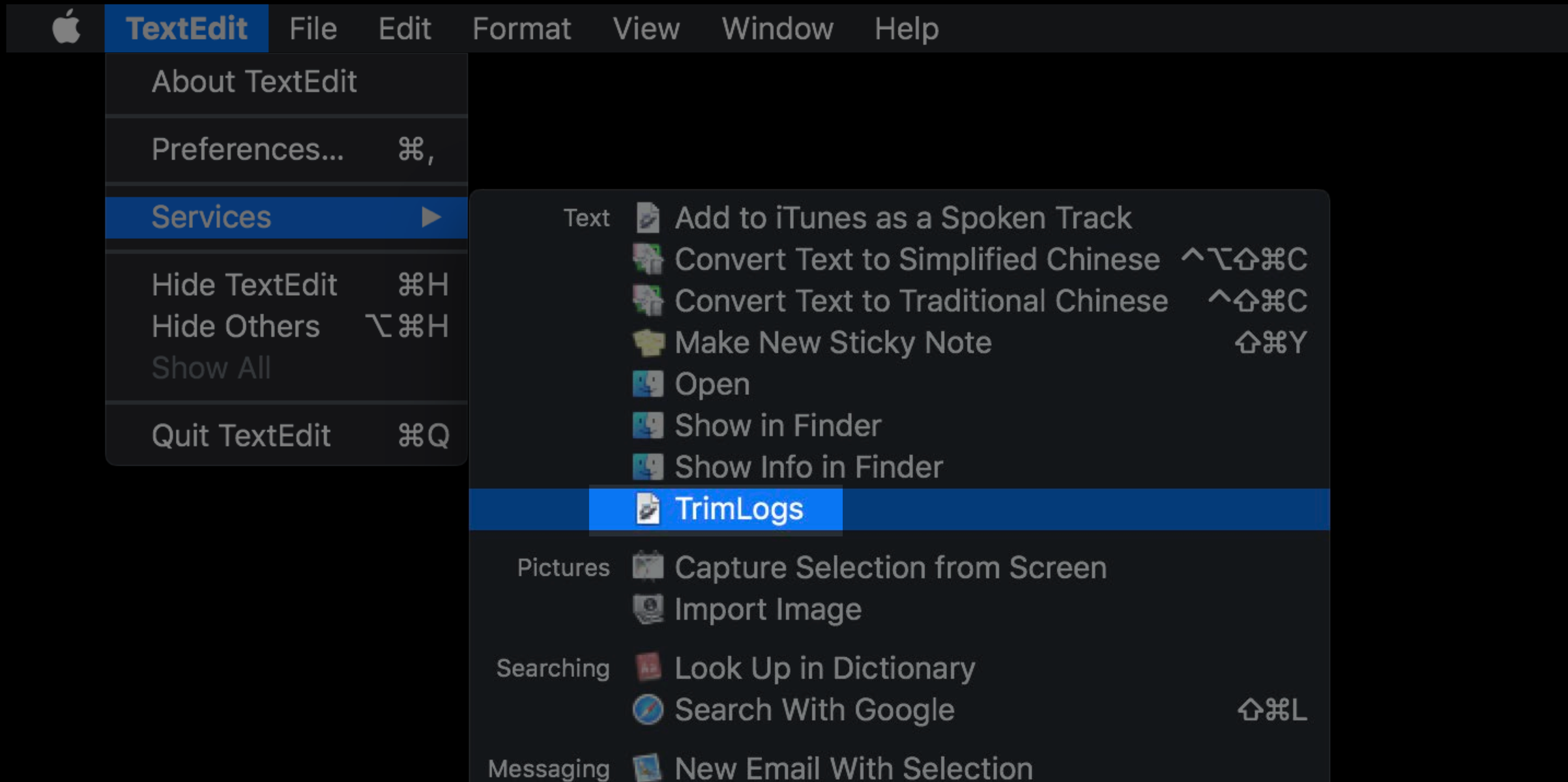

Building Action Bundles

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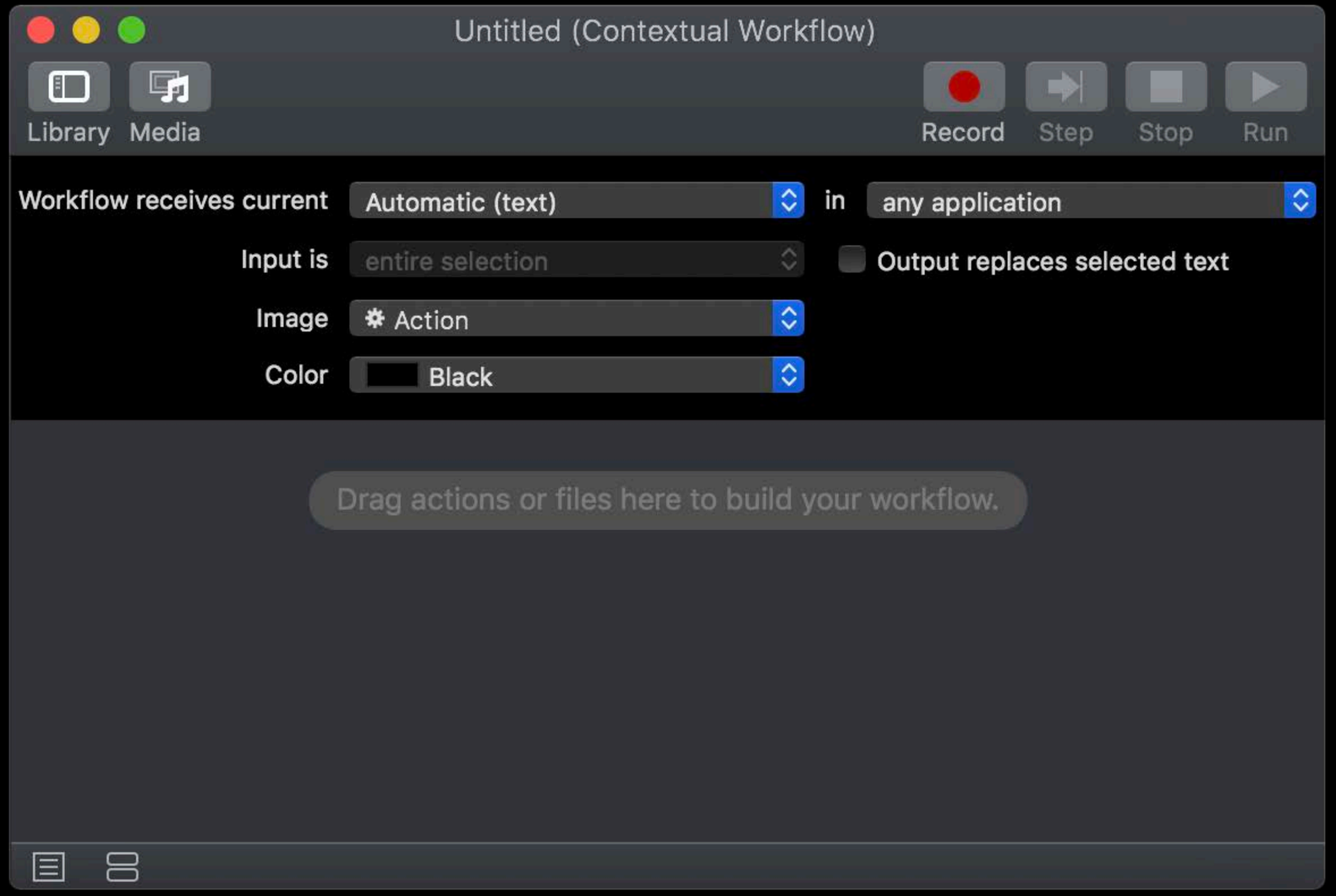

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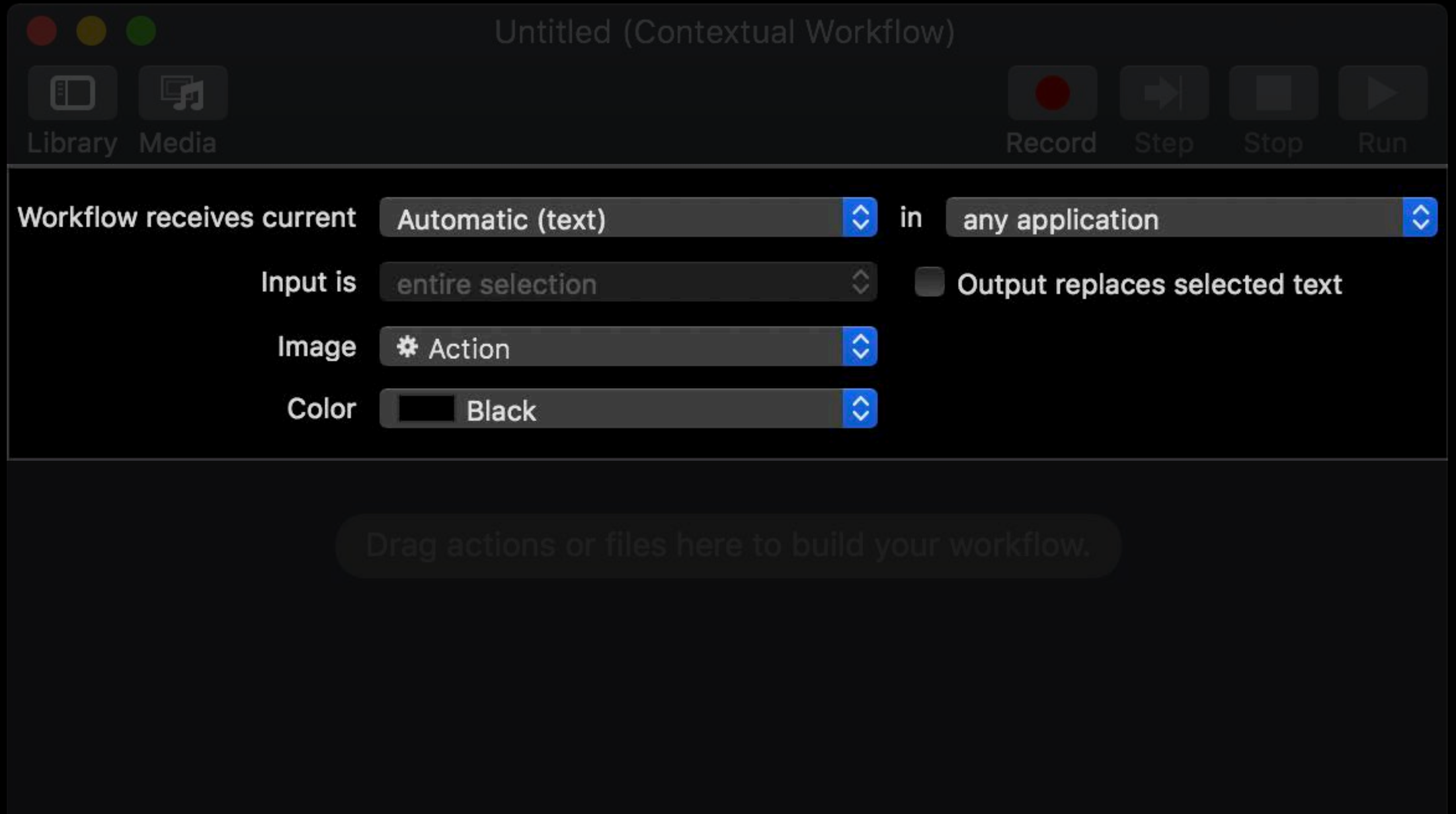

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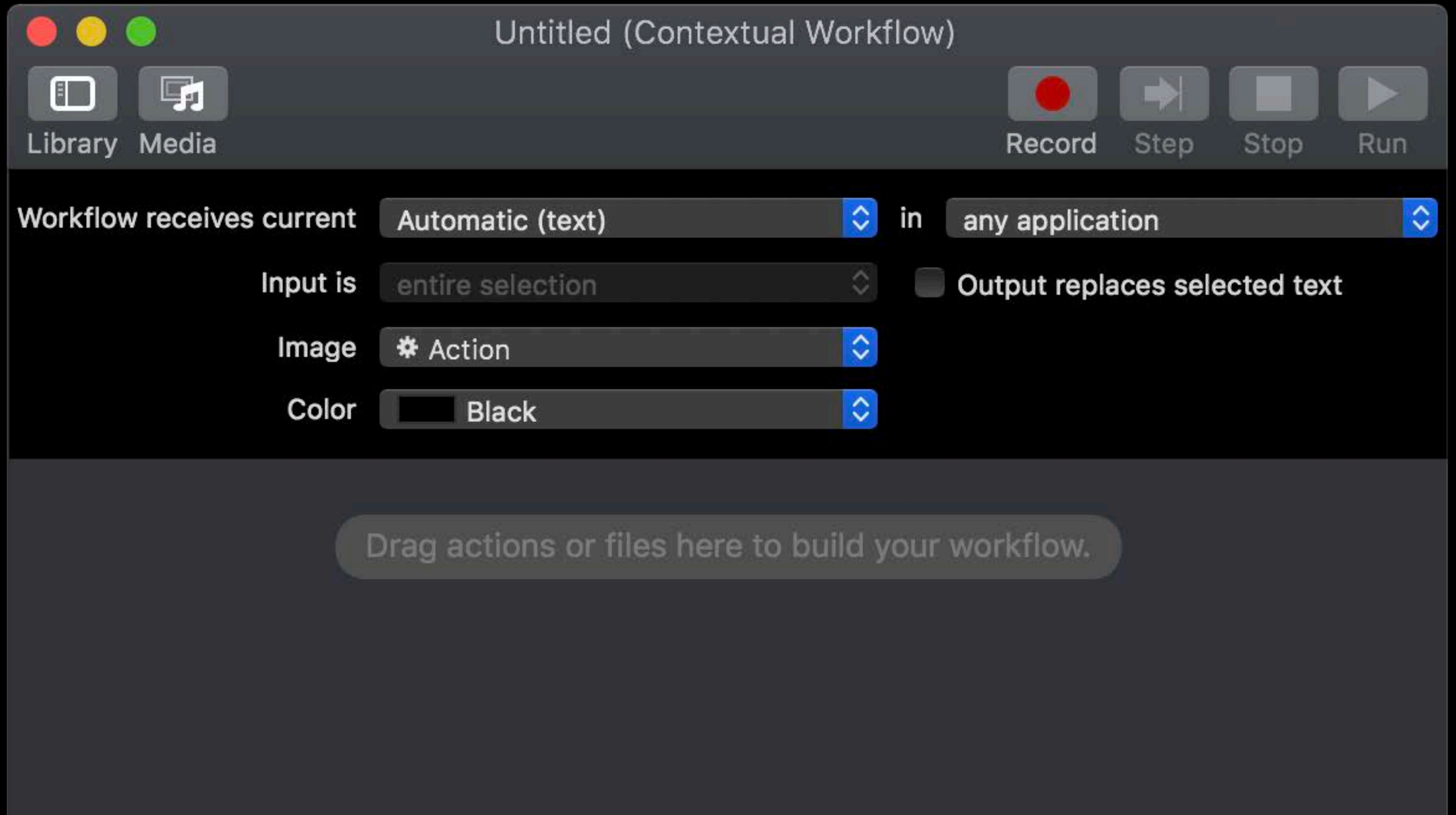

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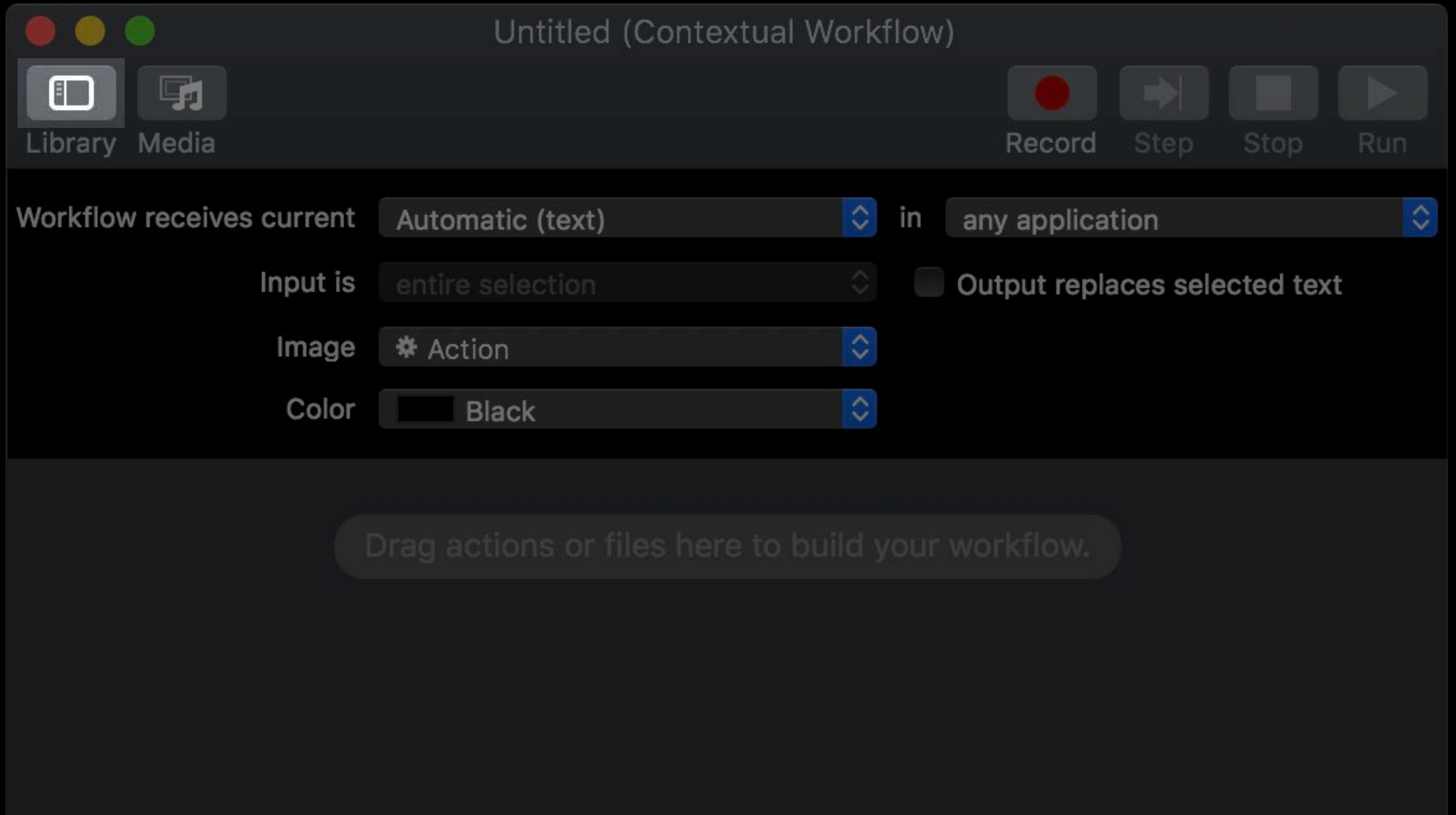

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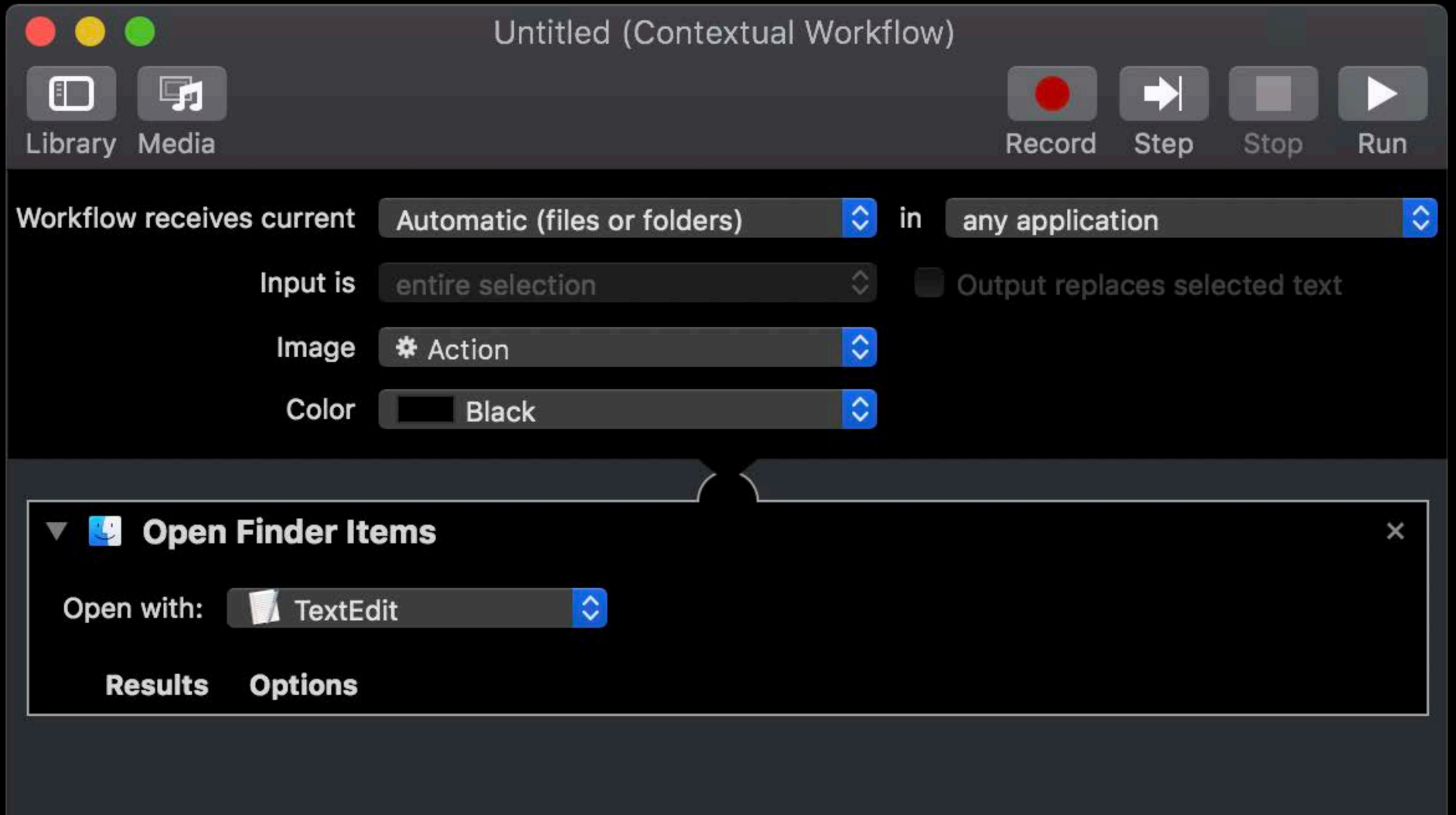

Summary

Summary

API refinements

Secure coding

Dark mode

Accent color

Tint color

Layer backing

User Notifications framework

NSToolbar

NSGridView

NSTextView

Continuity camera

Custom quick actions

More Information

https://developer.apple.com/wwdc18/209

Introducing Dark Mode	Hall 1	Tuesday 5:00PM
Cocoa Lab	Technology Lab 9	Wednesday 9:00AM
Cocoa and Dark Mode Lab	Technology Lab 9	Wednesday 2:00PM


WWDC18