

Advanced HTML & CSS Techniques for Developing Webkit Mobile Applications

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Senior Developer, Magnani Caruso Dutton
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Who I Am?

Who I Am?

- Senior Developer, Magnani Caruso Dutton

Who I Am?

- Senior Developer, Magnani Caruso Dutton
- Discover Financial Services, AT&T, London 2012

Who I Am?

- Senior Developer, Magnani Caruso Dutton
- Discover Financial Services, AT&T, London 2012
- Full Time Web Developer

Who I Am?

- Senior Developer, Magnani Caruso Dutton
- Discover Financial Services, AT&T, London 2012
- Full Time Web Developer
- Part Time Cocoa Developer

iPhone, Pre, Android?

iPhone, Pre, Android?

- iPhone, iPod touch?

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- iPhone, iPod touch?
 - More than 45,000,000 sold

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- iPhone, iPod touch?
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- Palm Pre?

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...but...

WebKit

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- WebKit browser engine across all three platforms

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- Build for one -- test for all

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- Some differences

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- Progressive enhancement

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 - Somethings will work
 - Others won't

WebKit

- WebKit browser engine across all three platforms
- Build for one -- test for all
- Some differences
- Progressive enhancement
 - Somethings will work
 - Others won't
 - The user doesn't miss out

Webkit Background

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- Actively developed, open source browser engine

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- Dave Hyatt (<http://surfingsafari.com>),
Safari & Webkit Architect

Webkit Background

- Actively developed, open source browser engine
- Dave Hyatt (<http://surfingsafari.com>),
Safari & Webkit Architect
- Began implementing CSS extensions that are
working drafts for the W3C

Let's begin...

“Web Application” Basics

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- Two forms:

“Web Application” Basics

- Two forms:
 - Web Application

“Web Application” Basics

- Two forms:
 - Web Application
 - the original, non-native answer to the SDK

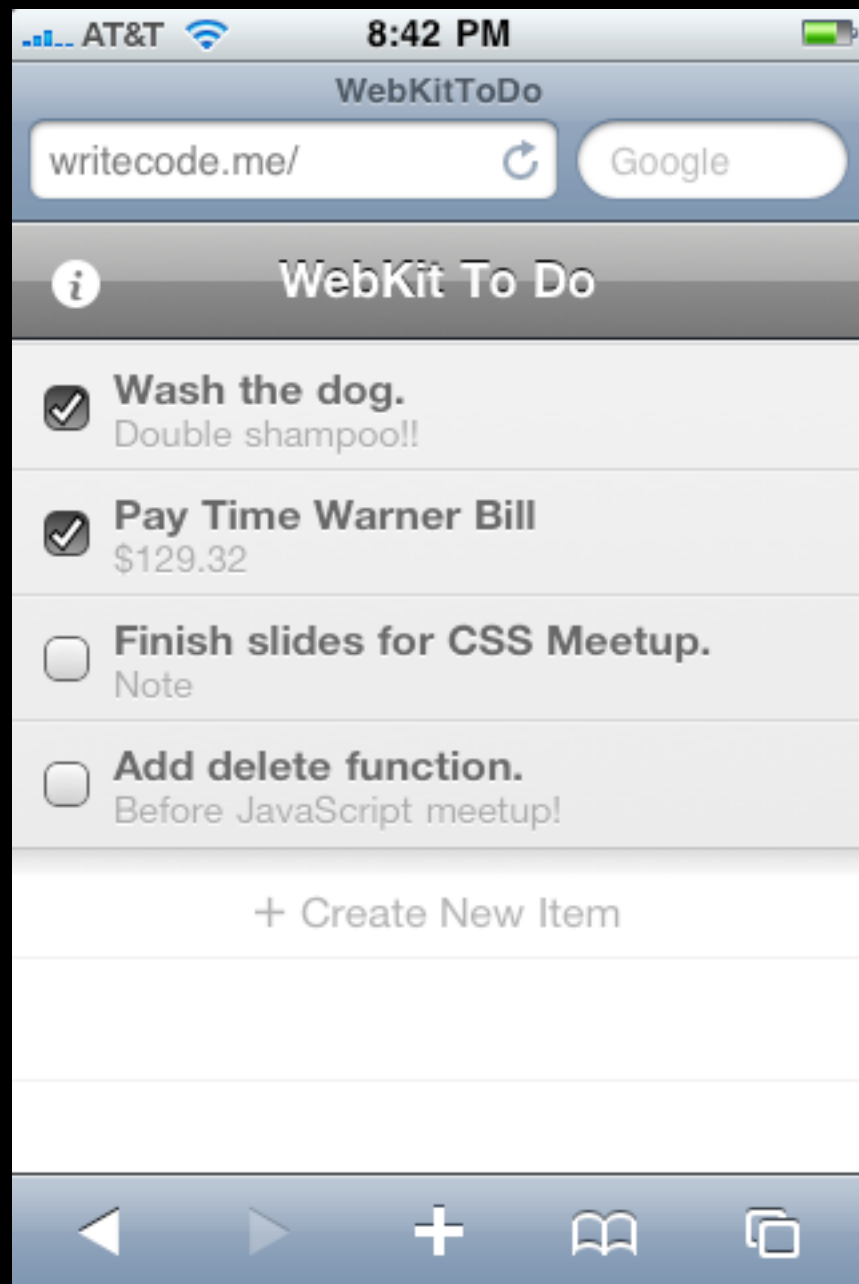
“Web Application” Basics

- Two forms:
 - Web Application
 - the original, non-native answer to the SDK
 - Web-based App

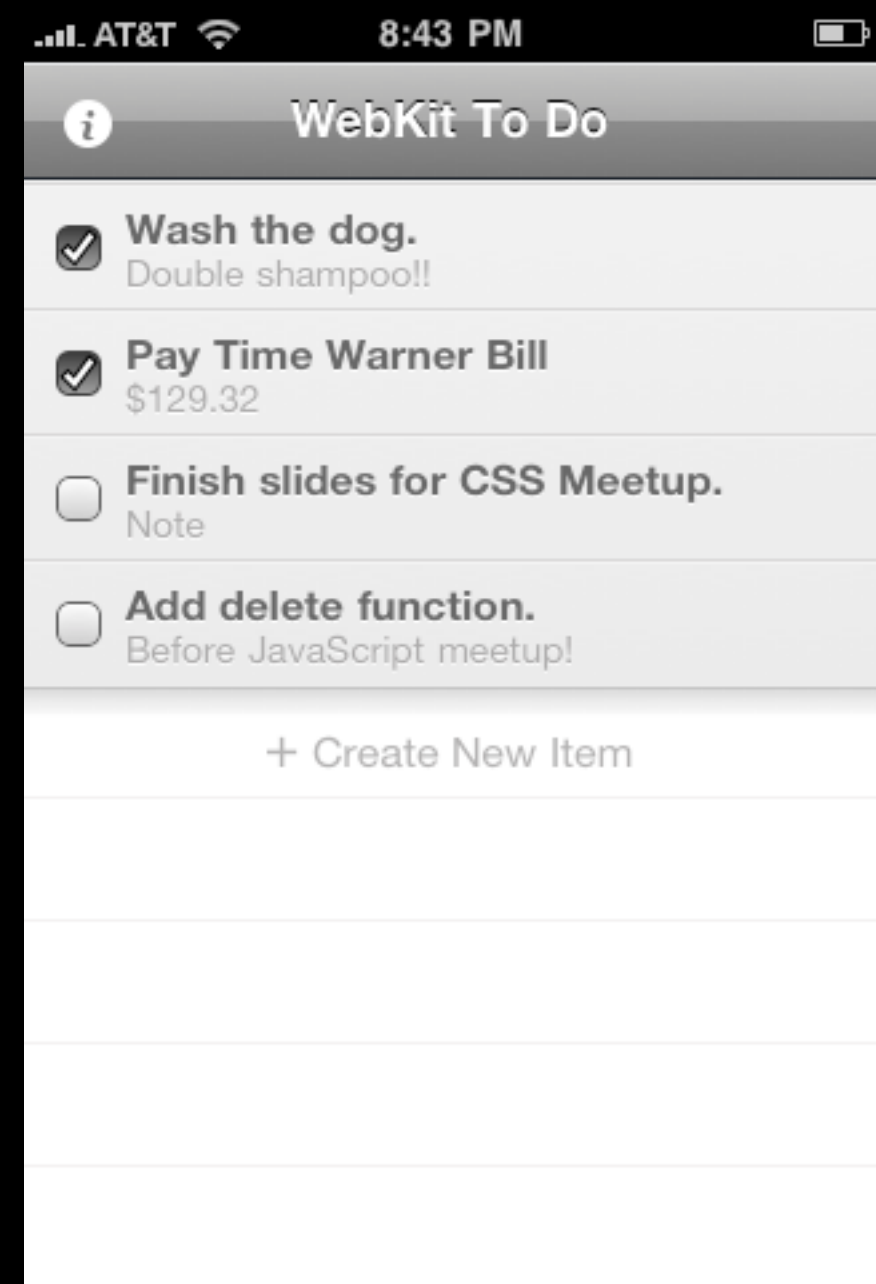
“Web Application” Basics

- Two forms:
 - Web Application
 - the original, non-native answer to the SDK
 - Web-based App
 - going to flickr.com and getting a customized view

“Web Application” Basics



Web-based App



Web App

“Web Application” Basics

“Web Application” Basics

- Form is determined by user and developer

“Web Application” Basics

- Form is determined by user and developer
- User must choose to “Save to Home Screen”

“Web Application” Basics

- Form is determined by user and developer
- User must choose to “Save to Home Screen”
- Developer uses HTML meta tags to customize the application for the iPhone

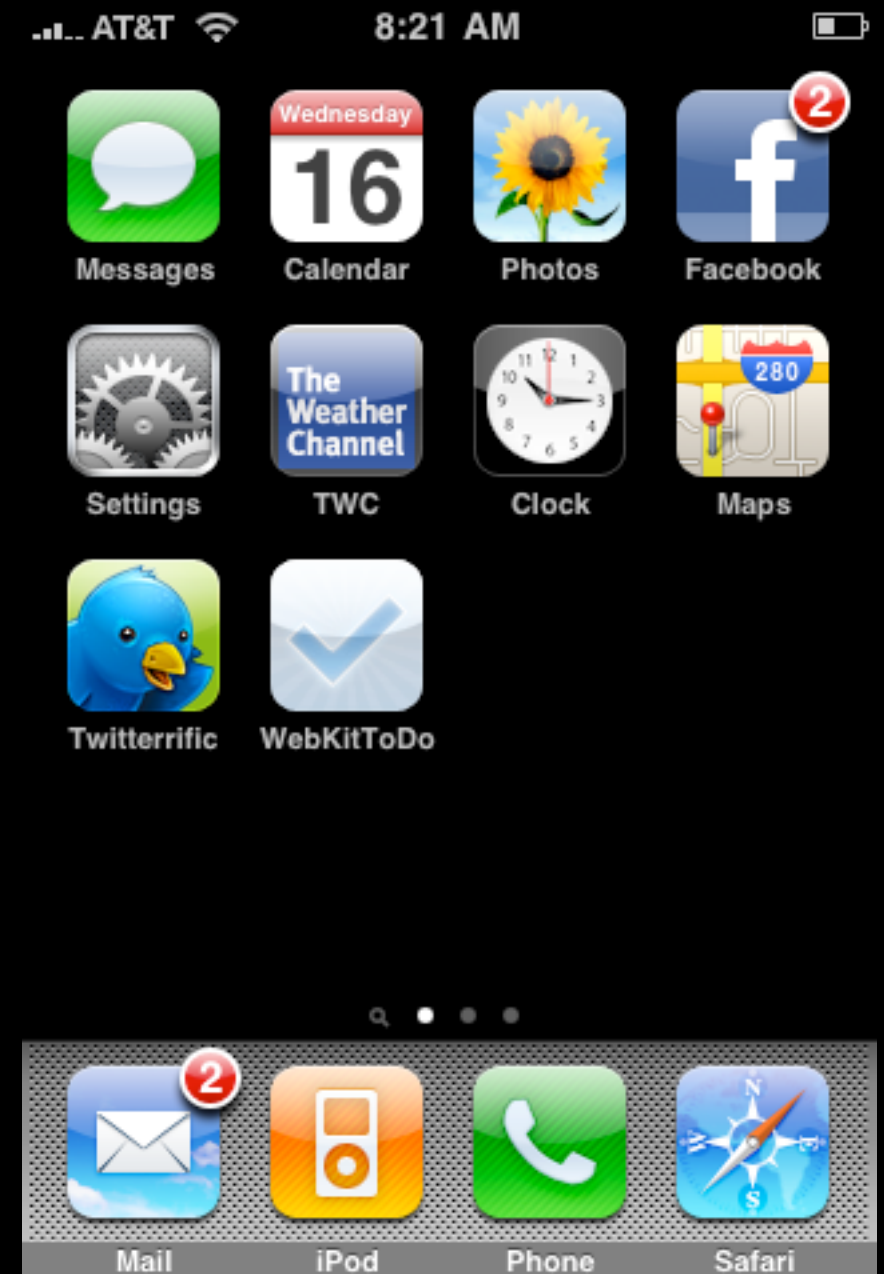
HTML

HTML

```
<link rel="apple-touch-icon" href="/custom_icon.png">
```

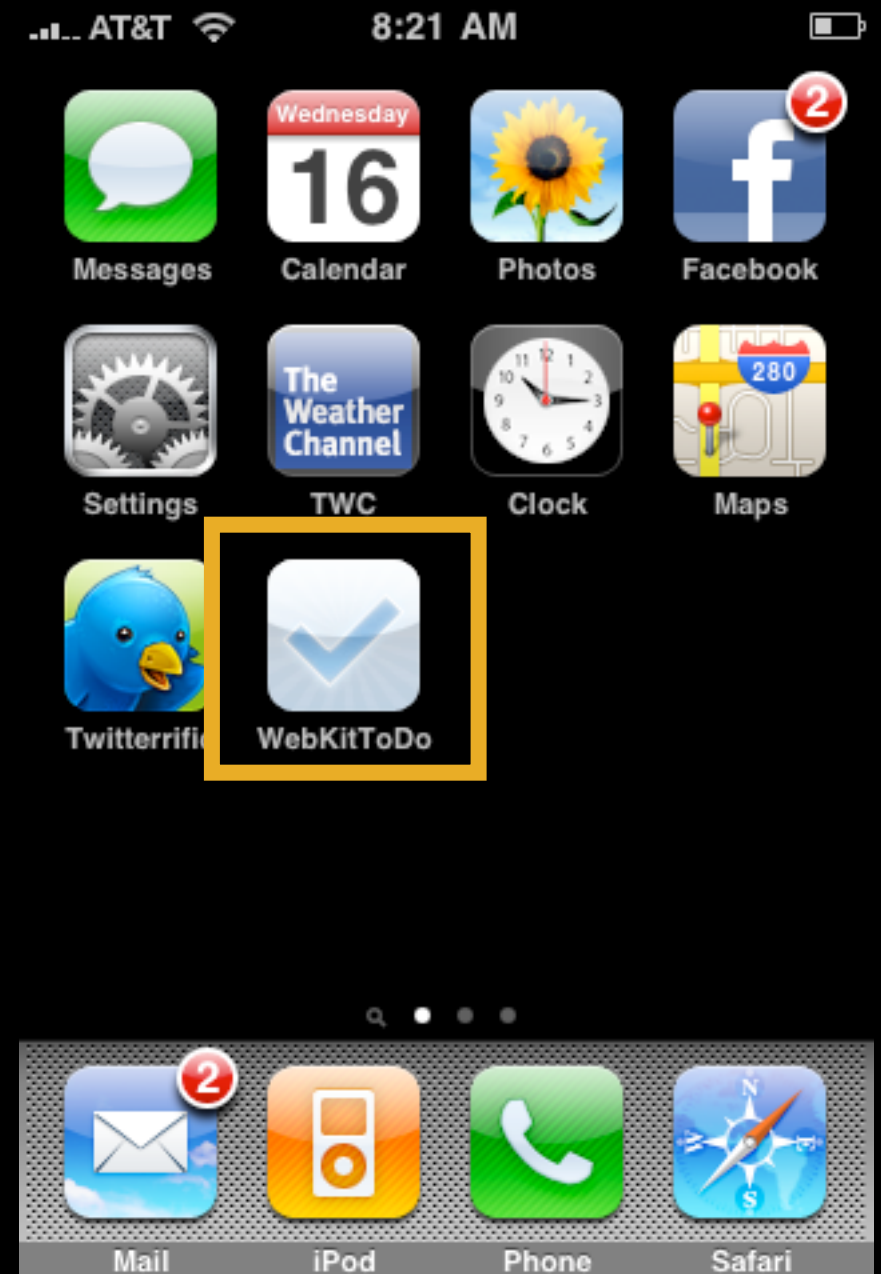
HTML

```
<link rel="apple-touch-icon" href="/custom_icon.png">
```



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<link rel="apple-touch-icon" href="/custom_icon.png">
```



HTML

```
<link rel="apple-touch-icon" href="/custom_icon.png">
```

```
<link rel="apple-touch-startup-image" href="/startup.png">
```

HTML

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<link rel="apple-touch-icon" href="/custom_icon.png">
```

```
<link rel="apple-touch-startup-image" href="/startup.png">
```

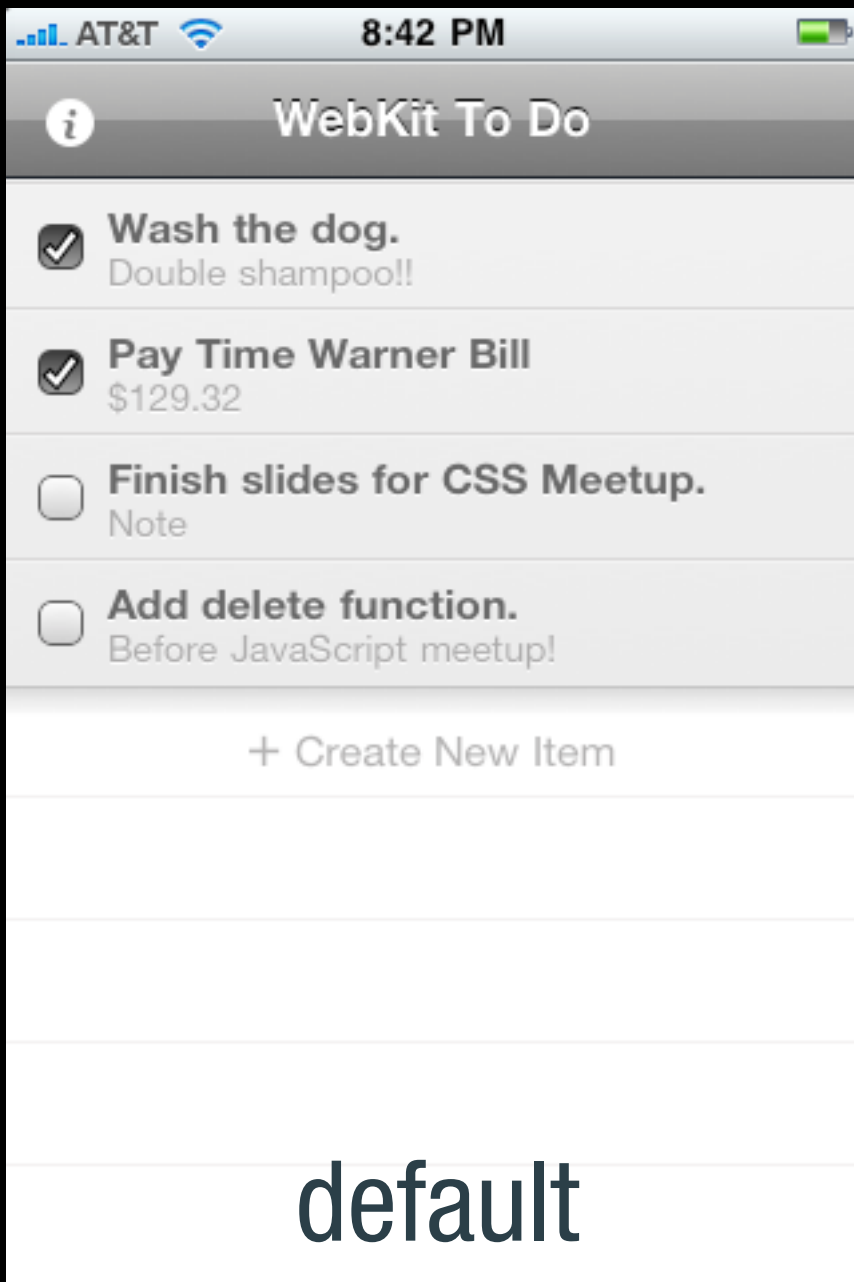
```
<meta name="apple-mobile-web-app-status-bar-style" content="black">
```

HTML

```
<meta name="apple-mobile-web-app-status-bar-style"  
      content=" [default|black|black-translucent]">
```

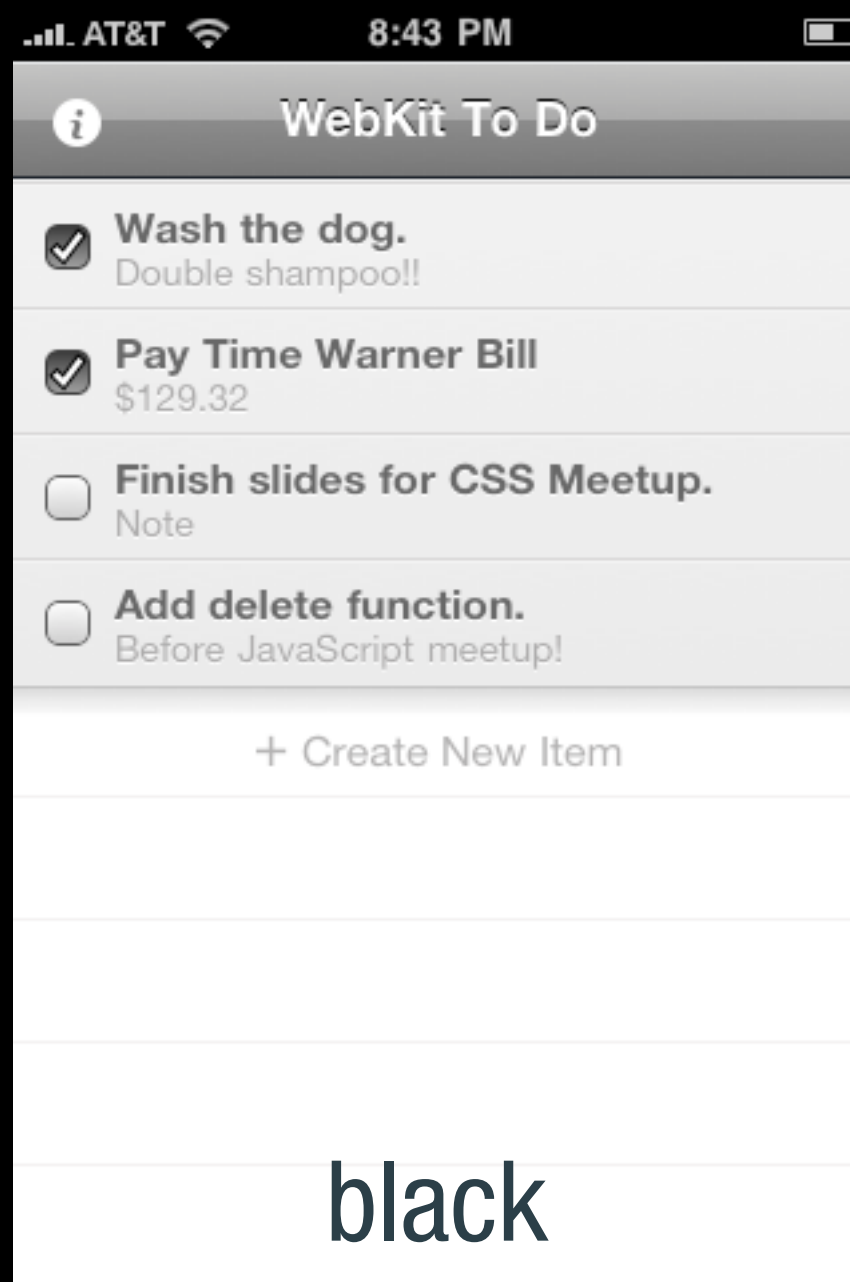
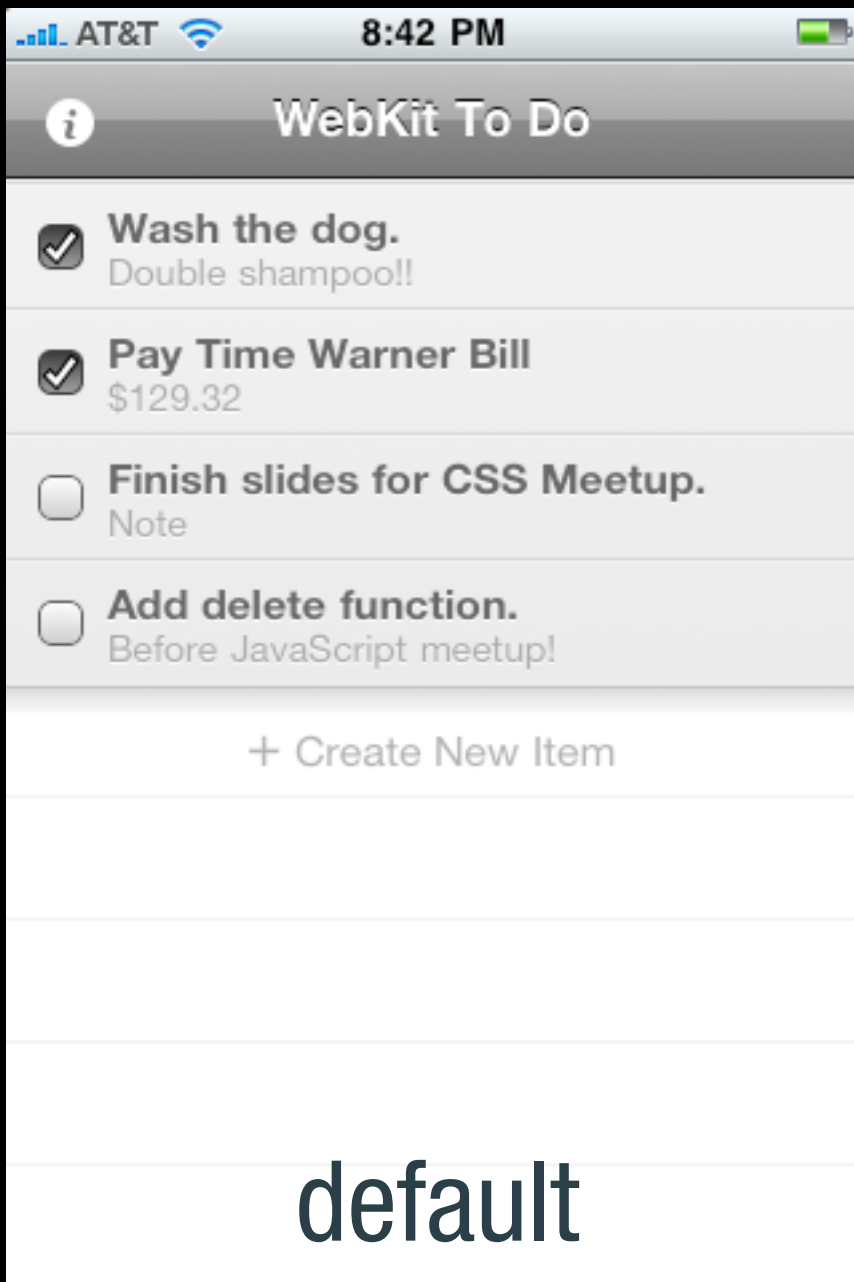
HTML

```
<meta name="apple-mobile-web-app-status-bar-style"
      content="default|black|black-translucent">
```



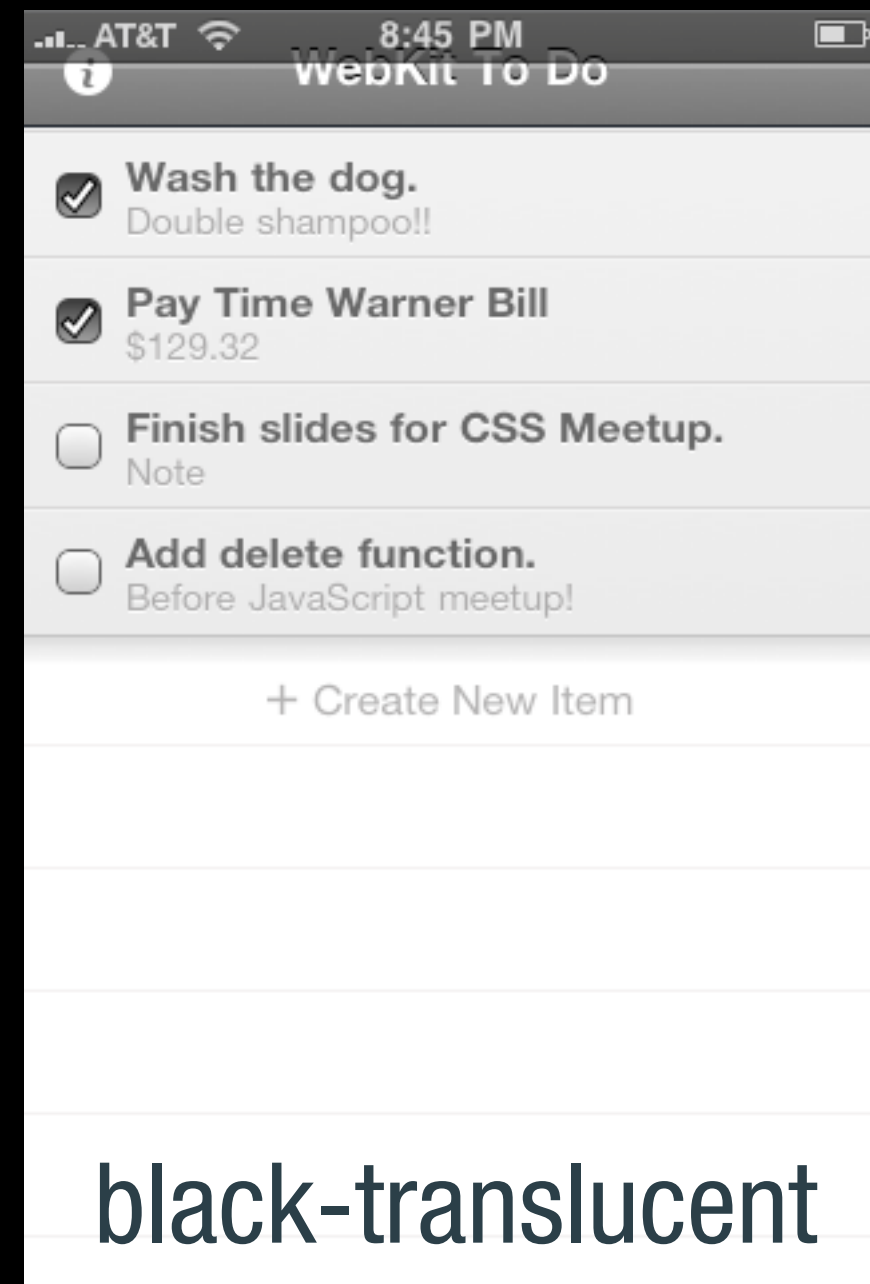
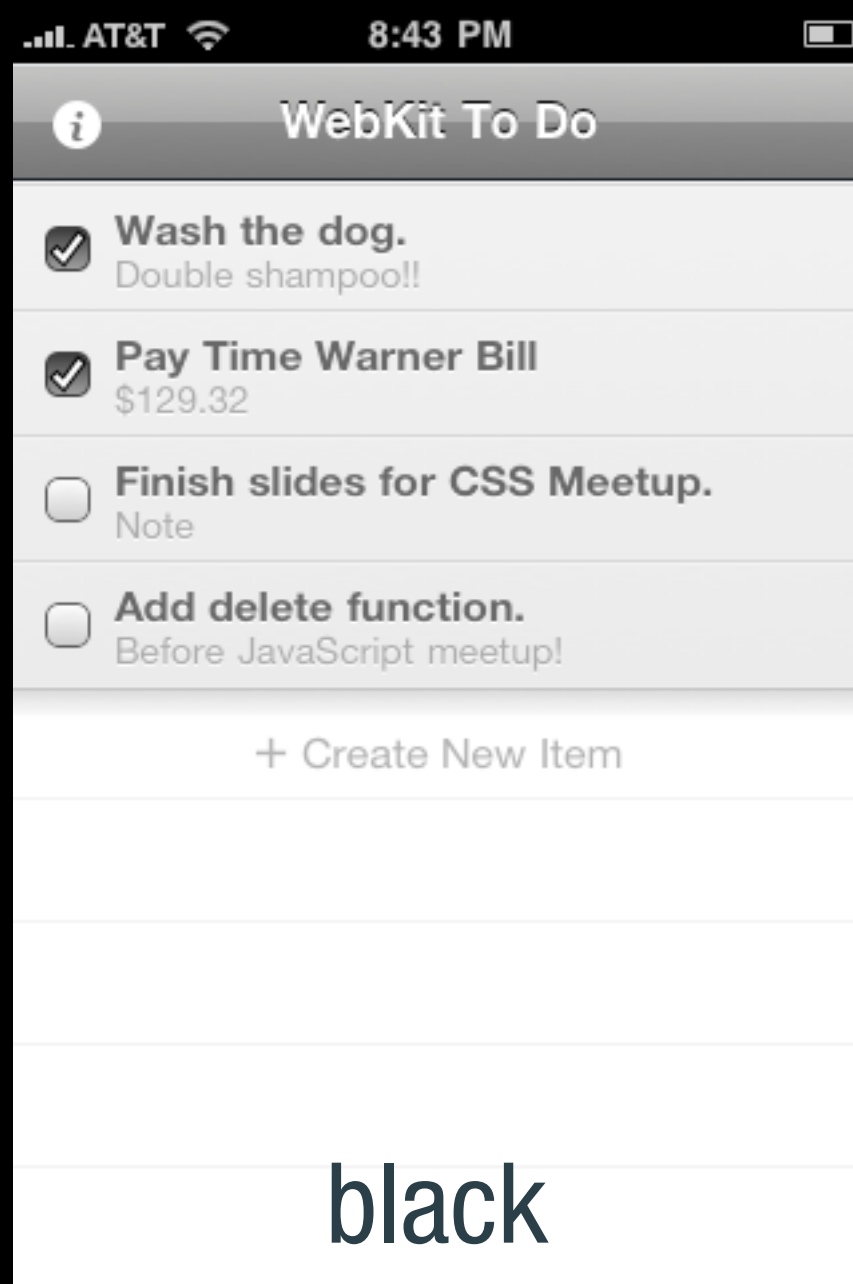
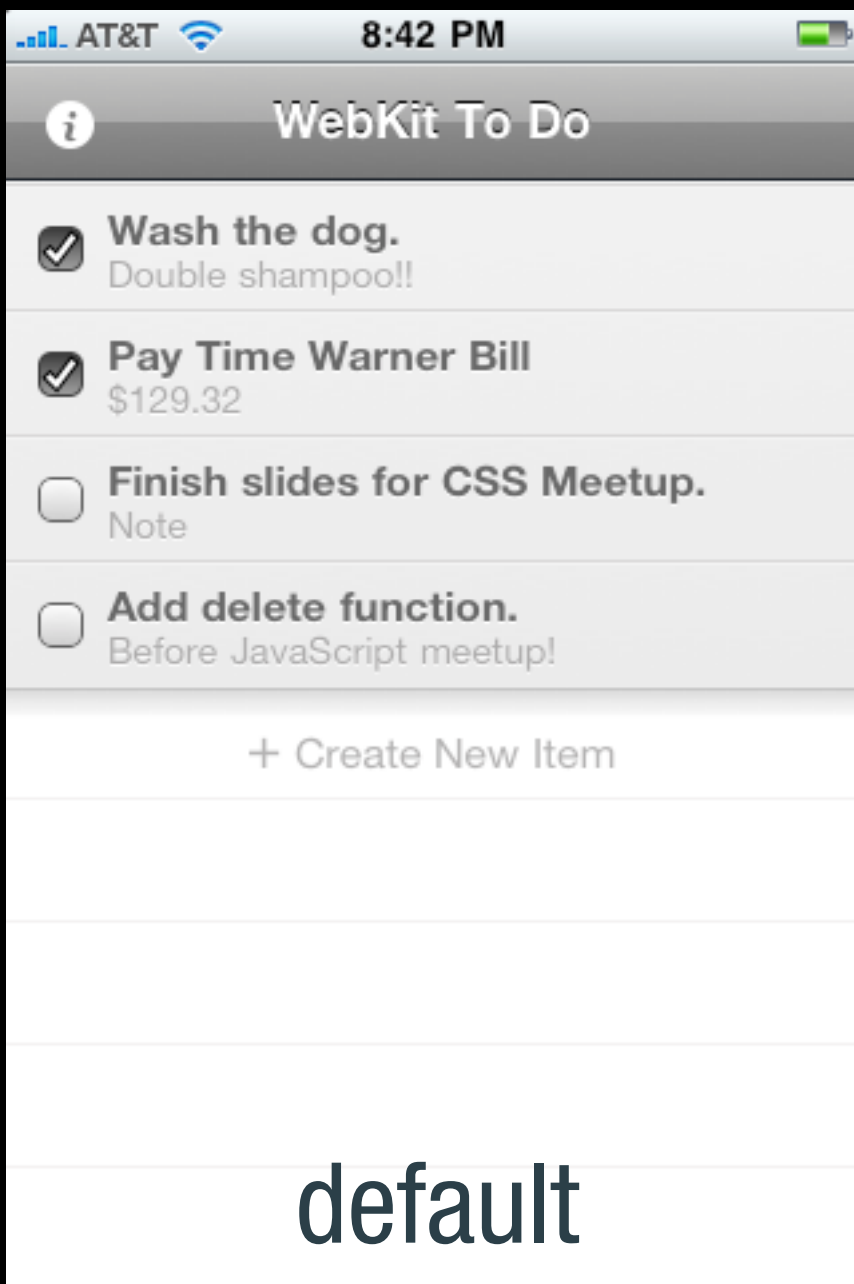
HTML

```
<meta name="apple-mobile-web-app-status-bar-style"
content=" [default|black|black-translucent]">
```



HTML

```
<meta name="apple-mobile-web-app-status-bar-style"
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```



HTML

```
<link rel="apple-touch-icon" href="/custom_icon.png">
```

```
<link rel="apple-touch-startup-image" href="/startup.png">
```

```
<meta name="apple-mobile-web-app-status-bar-style" content="black">
```

```
<meta name="viewport" content="initial-scale = 2.3, user-scalable = no">
```

HTML

```
<meta name="viewport" content="width = [200 to 10,000 || device-width]">
```

```
<meta name="viewport" content="height = [223 to 10,000 || device-height]">
```

```
<meta name="viewport" content="minimum-scale = [0.01 to 10.0]">
```

```
<meta name="viewport" content="maximum-scale = [0.01 to 10.0]">
```

```
<meta name="viewport"  
      content="initial-scale = [minimum-scale to maximum-scale]">
```

```
<meta name="viewport" content="user-scalable = [yes||no]">
```

All options can be combined via commas

HTML

```
<link rel="apple-touch-icon" href="/custom_icon.png">
```

```
<link rel="apple-touch-startup-image" href="/startup.png">
```

```
<meta name="apple-mobile-web-app-status-bar-style" content="black">
```

```
<meta name="viewport" content="initial-scale = 2.3, user-scalable = no">
```

```
<meta name="apple-mobile-web-app-capable" content="yes">
```

HTML

```
<link rel="apple-touch-icon" href="/custom_icon.png">
```

```
<link rel="apple-touch-startup-image" href="/startup.png">
```

```
<meta name="apple-mobile-web-app-status-bar-style" content="black">
```

```
<meta name="viewport" content="initial-scale = 2.3, user-scalable = no">
```

```
<meta name="apple-mobile-web-app-capable" content="yes">
```

```
<meta name="format-detection" content="telephone=no">
```

...which brings us
to the CSS...

WebKit CSS Support

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- WebKit's CSS support is spectacular.

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- Large subset of CSS 2.1 Specification

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 - (most written using -webkit-rule notation)

WebKit CSS Support

- WebKit's CSS support is spectacular.
- Large subset of CSS 2.1 Specification
- Portions of CSS 3 Specification
 - (most written using -webkit-rule notation)
- 200+ rules

border	opacity	counter-reset	-webkit-appearance
border-bottom	position	list-style	-webkit-nspace-mode
border-bottom-color	right	list-style-image	-webkit-rtl-ordering
border-bottom-style	top	list-style-position	-webkit-user-drag
border-bottom-width	unicode-bidi	list-style-type	-webkit-user-modify
border-color	vertical-align	orphans	-webkit-user-select
border-left	width	page-break-after	border-collapse
border-left-color	z-index	page-break-before	border-spacing
border-left-style	zoom	page-break-inside	caption-side
border-left-width	clip	widows	empty-cells
border-right	overflow	background	table-layout
border-right-color	overflow-x	background-attachment	-webkit-border-horizontal-spacing
border-right-style	overflow-y	background-color	-webkit-border-vertical-spacing
border-right-width	resize	background-image	-webkit-column-break-after
border-style	visibility	background-position	-webkit-column-break-before
border-top	-webkit-animation	background-position-x	-webkit-column-break-inside
border-top-color	-webkit-animation-delay	background-position-y	-webkit-column-count
border-top-style	-webkit-animation-direction	background-repeat	-webkit-column-gap
border-top-width	-webkit-animation-duration	color	-webkit-column-rule
border-width	-webkit-animation-iteration-count	-webkit-background-clip	-webkit-column-rule-color
margin-bottom	-webkit-animation-name	-webkit-background-composite	-webkit-column-rule-style
margin-left	-webkit-animation-play-state	-webkit-background-origin	-webkit-column-rule-width
margin-right	-webkit-animation-timing-function	font	-webkit-column-width
margin-top	-webkit-backface-visibility	font-family	-webkit-columns
padding-bottom	-webkit-box-reflect	font-size	cursor
padding-left	-webkit-mask	font-style	outline
padding-right	-webkit-mask-attachment	font-variant	outline-color
padding-top	-webkit-mask-box-image	font-weight	outline-offset
-webkit-border-bottom-left-radius	-webkit-mask-clip	src	outline-style
-webkit-border-bottom-right-radius	-webkit-mask-composite	unicode-range	outline-width
-webkit-border-image	-webkit-mask-image	letter-spacing	pointer-events
-webkit-border-radius	-webkit-mask-origin	text-align	-webkit-box-align
-webkit-border-top-left-radius	-webkit-mask-position	text-decoration	-webkit-box-direction
-webkit-border-top-right-radius	-webkit-mask-position-x	text-indent	-webkit-box-flex
-webkit-box-sizing	-webkit-mask-position-y	text-overflow	-webkit-box-flex-group
-webkit-box-shadow	-webkit-mask-repeat	text-shadow	-webkit-box-lines
-webkit-margin-bottom-collapse	-webkit-mask-size	text-transform	-webkit-box-ordinal-group
-webkit-margin-collapse	-webkit-mask-visibility	white-space	-webkit-box-orient
-webkit-margin-start	-webkit-perspective	word-break	-webkit-box-pack
-webkit-margin-top-collapse	-webkit-perspective-origin	word-spacing	-webkit-touch-callout
-webkit-padding-start	-webkit-transform	word-wrap	-webkit-dashboard-region
bottom	-webkit-transform-origin	-webkit-marquee	-webkit-tap-highlight-color
clear	-webkit-transform-origin-x	-webkit-marquee-direction	
direction	-webkit-transform-origin-y	-webkit-marquee-increment	
display	-webkit-transform-origin-z	-webkit-marquee-repetition	
float	-webkit-transform-style	-webkit-marquee-speed	
height	-webkit-transition	-webkit-marquee-style	
left	-webkit-transition-delay	-webkit-text-fill-color	
line-height	-webkit-transition-duration	-webkit-text-security	
max-height	-webkit-transition-property	-webkit-text-size-adjust	
max-width	-webkit-transition-timing-function	-webkit-text-stroke	
min-height	content	-webkit-text-stroke-color	
min-width	counter-increment	-webkit-text-stroke-width	
		-webkit-line-break	

- webkit-border-radius
- webkit-box-shadow
 - webkit-gradient
 - webkit-mask
- webkit-transition
- webkit-transform
- webkit-animation

- webkit-border-radius
- webkit-box-shadow
 - webkit-gradient
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- webkit-transform
- webkit-animation

-webkit-border-radius

-webkit-border-radius

- Rounds the corners of a box

-webkit-border-radius

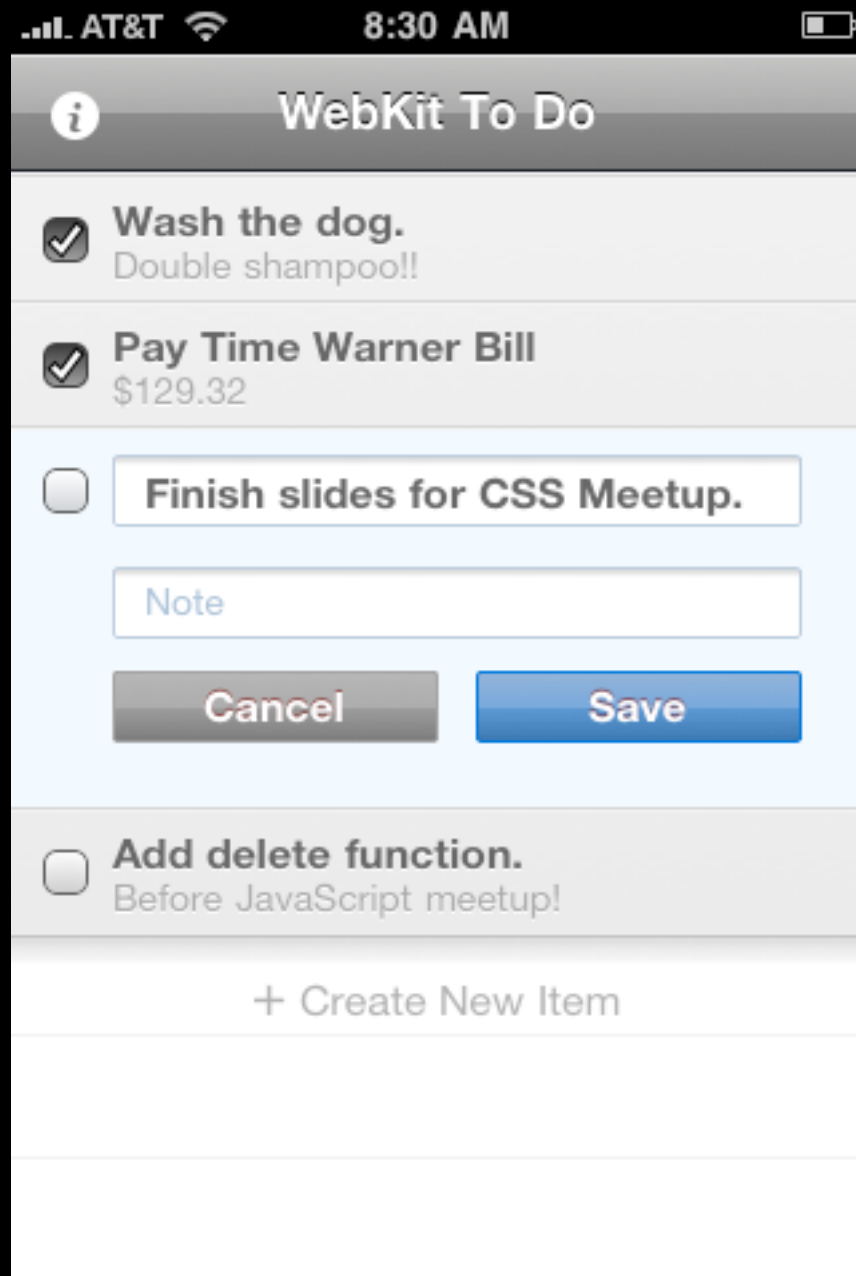
-webkit-border-radius

```
-webkit-border-radius: radius;  
-webkit-border-radius: horizontal_radius  
vertical_radius;
```

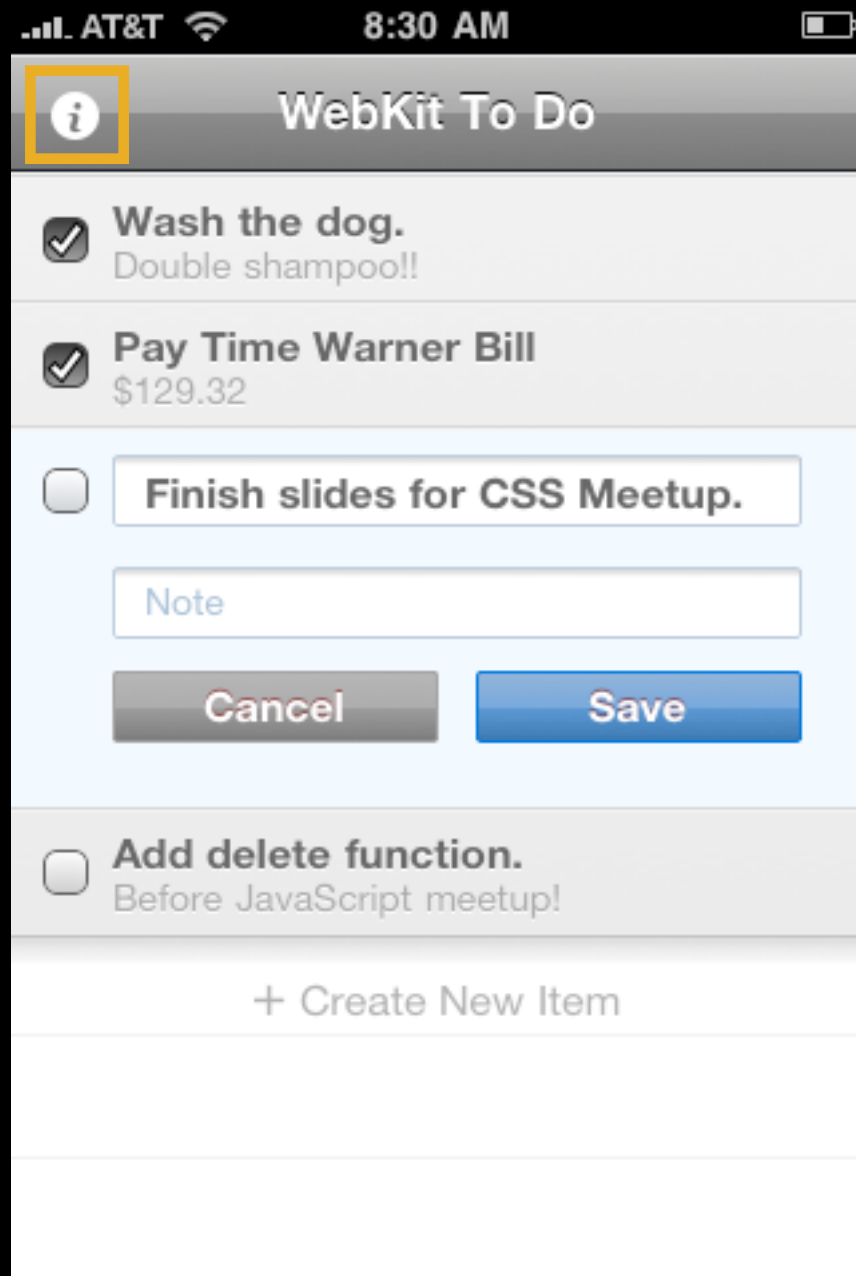
-webkit-border-radius

- webkit-border-radius: radius;
- webkit-border-radius: horizontal_radius
vertical_radius;
- webkit-border-bottom-left-radius: radius;
- webkit-border-bottom-right-radius: radius;
- webkit-border-top-left-radius: radius;
- webkit-border-top-right-radius: radius;

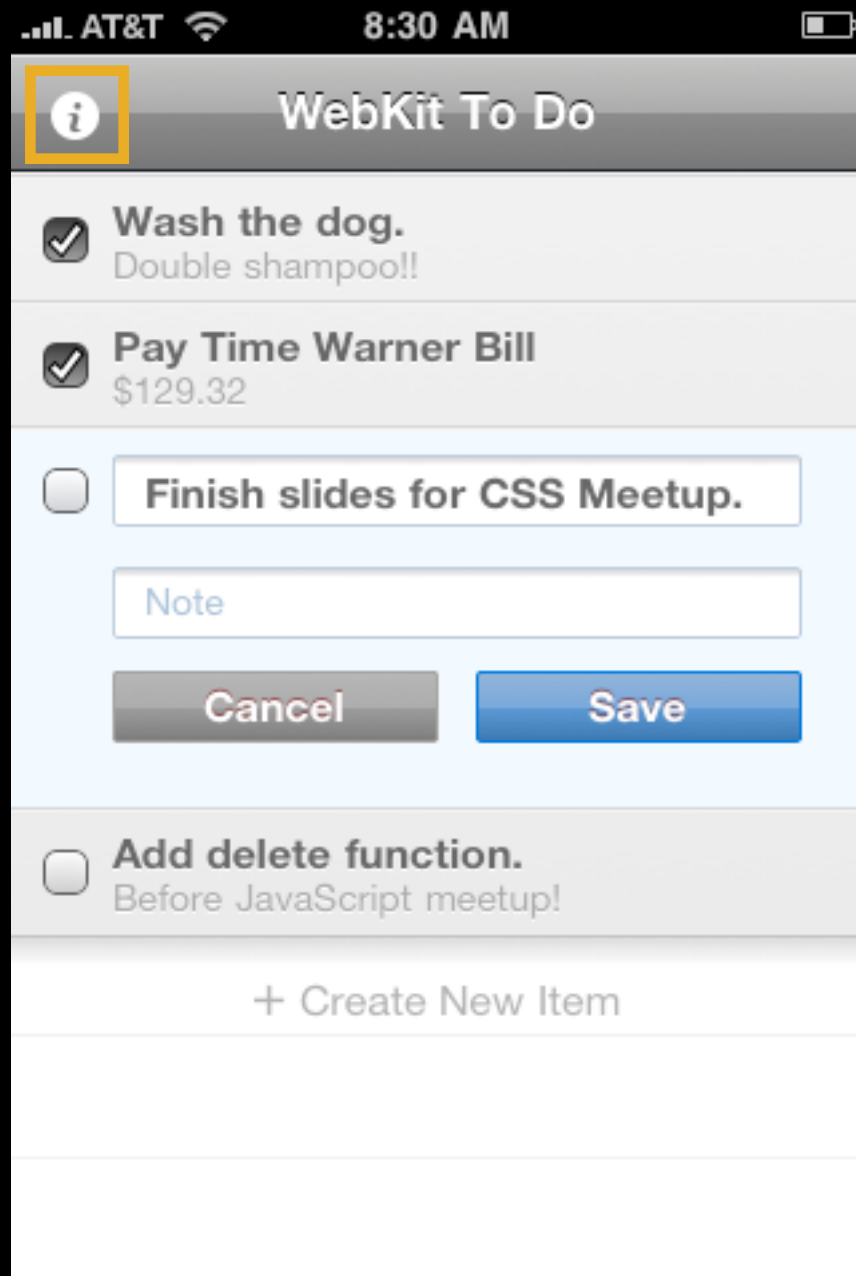
-webkit-border-radius



-webkit-border-radius

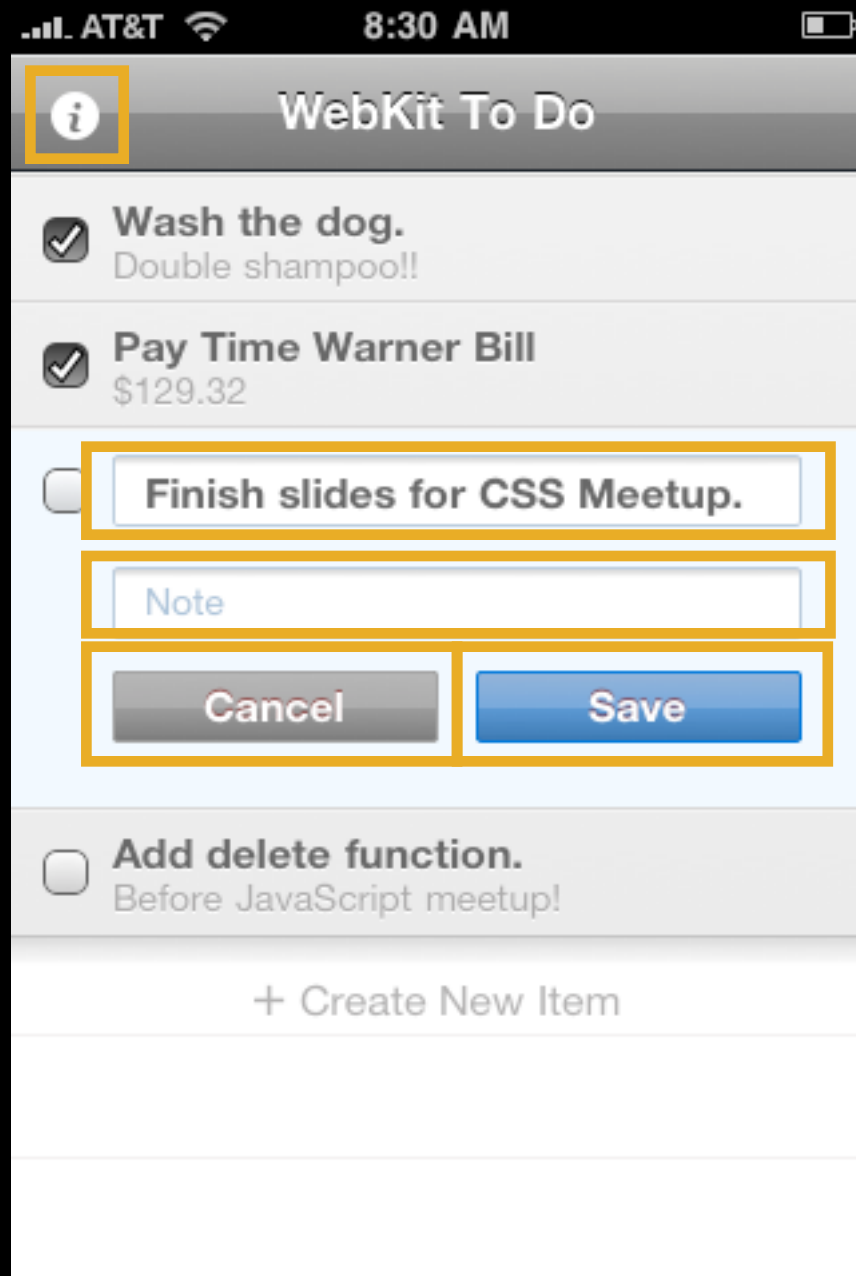


-webkit-border-radius



```
header #information
  display: block
  position: absolute
  top: 13px
  left: 15px
  height: 18px
  width: 18px
  z-index: 100
  font-family: "Georgia"
  font-size: 15px
  font-weight: bold
  font-style: italic
  text-decoration: none
  text-align: center
  color: #686868
  background-color: #FFFFFF
  -webkit-border-radius: 9px
}
```

-webkit-border-radius



```
header #information
  display: block
  position: absolute
  top: 13px
  left: 15px
  height: 18px
  width: 18px
  z-index: 100
  font-family: "Georgia"
  font-size: 15px
  font-weight: bold
  font-style: italic
  text-decoration: none
  text-align: center
  color: #686868
  background-color: #FFFFFF
  -webkit-border-radius: 9px
}
```


- webkit-border-radius
- webkit-box-shadow
- webkit-gradient
- webkit-mask
- webkit-transition
- webkit-transform
- webkit-animation

-webkit-box-shadow

**-webkit-box-shadow
(text-shadow)**

-webkit-box-shadow (text-shadow)

- Simple shadow effects
- Very similar to layer effects in Photoshop
- Properties are arranged differently

-webkit-box-shadow (text-shadow)

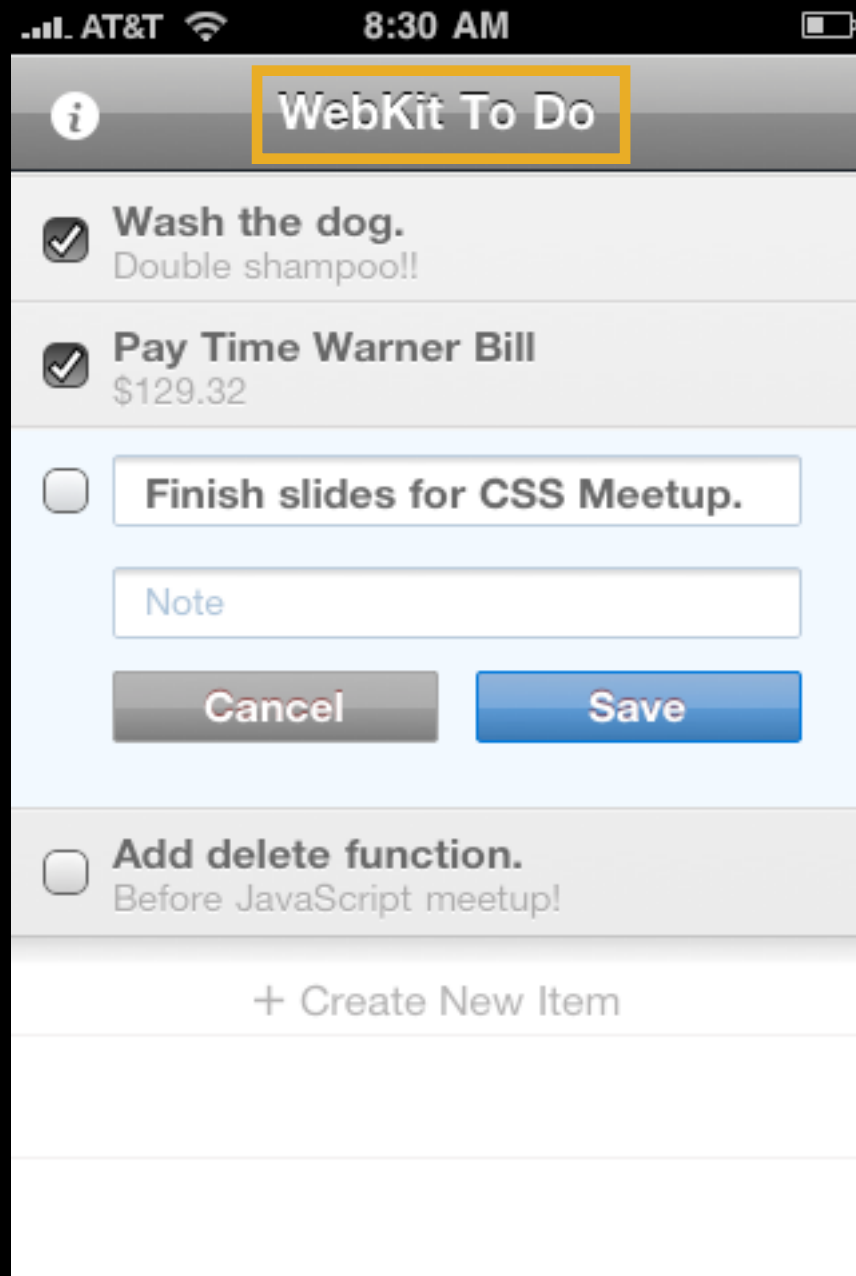
```
text-shadow: color x_offset y_offset  
            blur_radius;
```

```
-webkit-box-shadow: x_offset y_offset  
                    blur_radius color;
```

```
text-shadow: #000000 0 -1px 0;
```

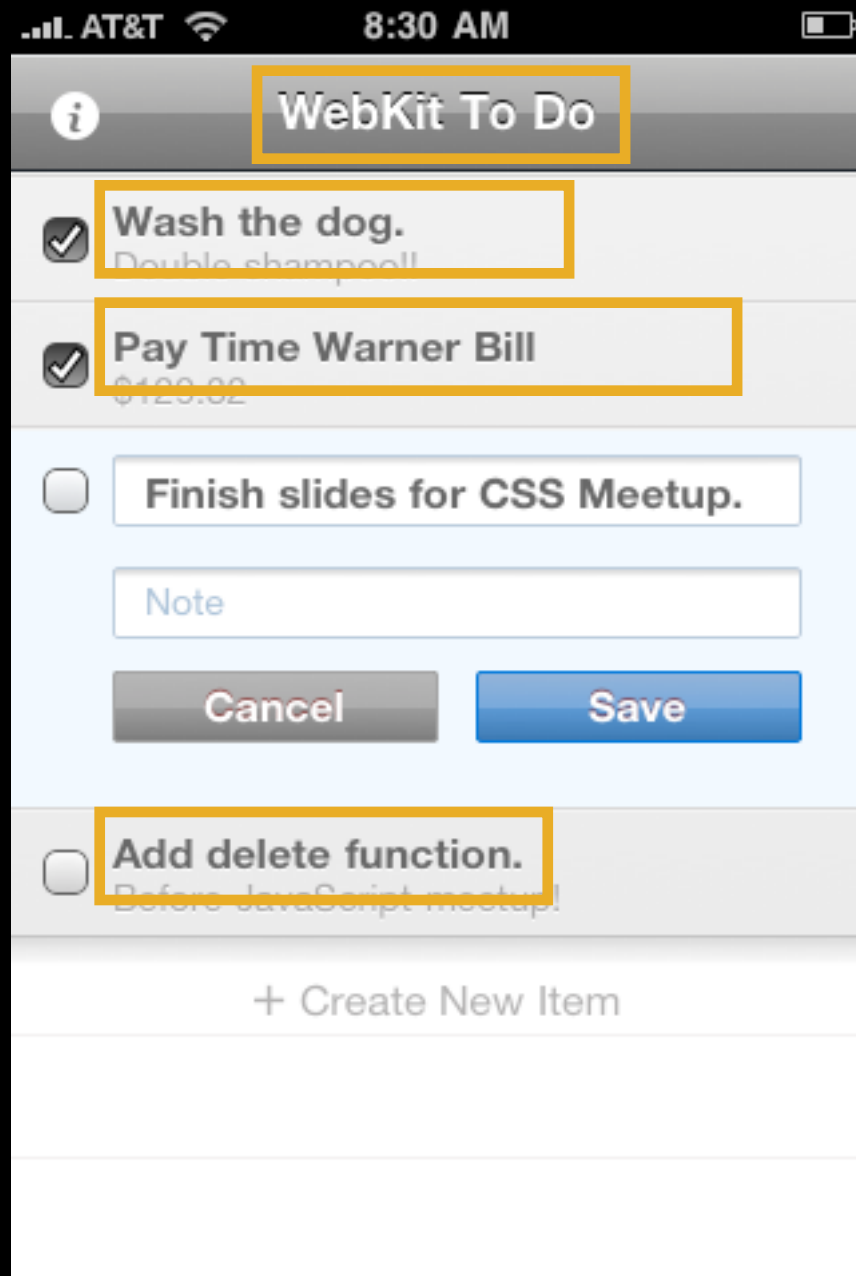
```
-webkit-box-shadow: -1px 0 0 #000000;
```

text-shadow



```
header h1 {  
    display: block  
    position: relative  
    top: 9px  
    margin: 0  
    padding: 0  
    font-size: 18px  
    color: #FFFFFFF  
    text-shadow: #000000 0 -1px 0  
    text-align: center  
}
```

text-shadow



- webkit-border-radius
- webkit-box-shadow
- webkit-gradient
- webkit-mask
- webkit-transition
- webkit-transform
- webkit-animation

-webkit-gradient

-webkit-gradient

- Not actually a rule — A “CSS Property Function”
- Used anywhere a url() function can be used
- ‘Experimental CSS 3’

-webkit-gradient

-webkit-gradient

```
-webkit-gradient(type,  
    start_point, end_point,  
    stops  
);
```

-webkit-gradient

```
-webkit-gradient(type,  
    start_point, end_point,  
    stops  
);
```

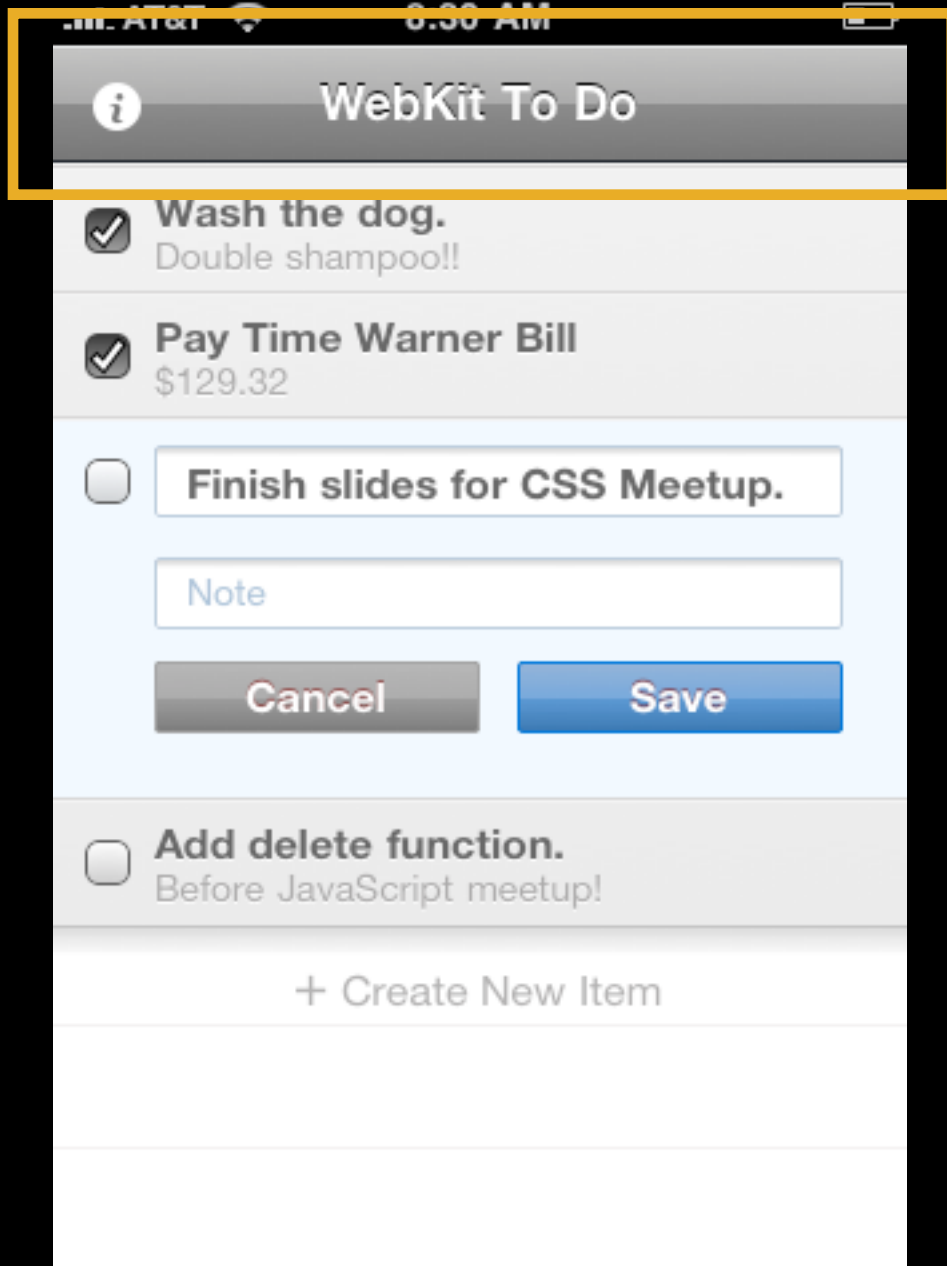
```
-webkit-gradient(type,  
    inner_center, inner_radius,  
    outer_center, outer_radius,  
    stops  
);
```

-webkit-gradient

```
-webkit-gradient(linear,  
    start_point, end_point,  
    color-stop(position, color)  
);
```

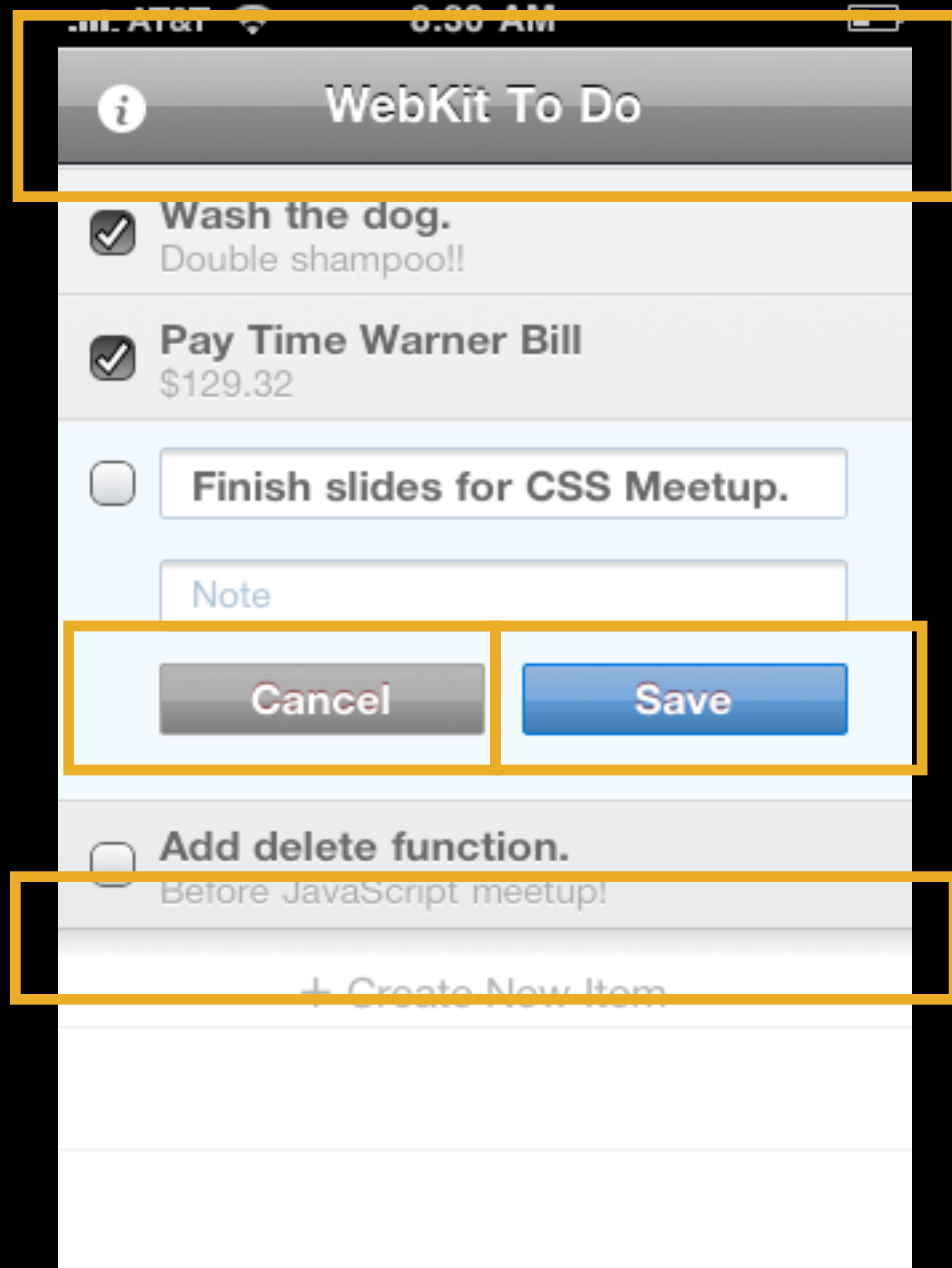
```
-webkit-gradient(radius,  
    inner_center, inner_radius,  
    outer_center, outer_radius,  
    color-stop(position, color)  
);
```

-webkit-gradient



```
background: -webkit-gradient(linear,  
    left top, left bottom,  
    color-stop(0.00 #B8B8B7),  
    color-stop(0.49 #9C9C9C),  
    color-stop(0.50 #797979),  
    color-stop(1.00 #656565)  
);
```

-webkit-gradient



```
background: -webkit-gradient(linear,  
    left top, left bottom,  
    color-stop(0.00 #B8B8B7),  
    color-stop(0.49 #9C9C9C),  
    color-stop(0.50 #797979),  
    color-stop(1.00 #656565)  
);
```


- webkit-border-radius
- webkit-box-shadow
- webkit-gradient
- webkit-mask**
- webkit-transition
- webkit-transform
- webkit-animation

-webkit-mask

-webkit-mask

- Alpha-level based masks

-webkit-mask

- Alpha-level based masks
- Knock out portions of a box with a pattern (image, gradient, etc.)

-webkit-mask

- Alpha-level based masks
- Knock out portions of a box with a pattern (image, gradient, etc.)
- Works in a “layered” context:

-webkit-mask

- Alpha-level based masks
- Knock out portions of a box with a pattern (image, gradient, etc.)
- Works in a “layered” context:
 - mask

-webkit-mask

- Alpha-level based masks
- Knock out portions of a box with a pattern (image, gradient, etc.)
- Works in a “layered” context:
 - mask
 - border

-webkit-mask

- Alpha-level based masks
- Knock out portions of a box with a pattern (image, gradient, etc.)
- Works in a “layered” context:
 - mask
 - border
 - background

-webkit-mask

-webkit-mask

- Layers alpha channel masks on to objects

-webkit-mask

- Layers alpha channel masks on to objects
- Can clip complex shapes based on a grayscale image (even -webkit-gradient!)

-webkit-mask

- Layers alpha channel masks on to objects
- Can clip complex shapes based on a grayscale image (even -webkit-gradient!)
- A pain in the butt to use.

-webkit-mask

`-webkit-mask: attachment, clip, origin, image, repeat, composite, box-image;`

- `attachment`: Allows the mask to scroll with the page
- `clip`: Extends mask into border
- `origin`: Mask's anchor position
- `image`: The mask image
- `repeat`: Sets the mask's ability to repeat
- `composite`: Extends mask into padding
- `box-image`: Sets a mask for a border box

-webkit-mask

```
border: 1px solid #C0C8CC;  
border-left: 2px solid #C0C8CC;
```



Test Item

```
-webkit-border-top-right-radius: 6px;  
-webkit-border-bottom-right-radius: 6px;
```

```
-webkit-mask: no-repeat  
              url(images/mask-btn-left.png);
```

```
background-color: #B6BDC1;
```

```
background:
```

```
    -webkit-gradient(linear,  
                    left bottom,  
                    left top,  
                    color-stop(0.48, #b5bcc0),  
                    color-stop(0.49, #c8d0d4),  
                    color-stop(0.50, #c0c8cc),  
                    color-stop(0.61, #d4dbdd),  
                    color-stop(1.00, #f4fcfe)
```

```
);
```

- webkit-border-radius
- webkit-box-shadow
- webkit-gradient
- webkit-mask
- webkit-transition**
- webkit-transform
- webkit-animation

-webkit-transition

-webkit-transition

- Basic CSS transition

-webkit-transition

- Basic CSS transition
- Specified by property

-webkit-transition

- Basic CSS transition
- Specified by property
- Similar (but simplified) timing functions to a tweening library

-webkit-transition

```
-webkit-transition: property duration  
                    timing_function delay;
```

-webkit-transition

```
-webkit-transition: property duration  
                    timing_function delay;
```

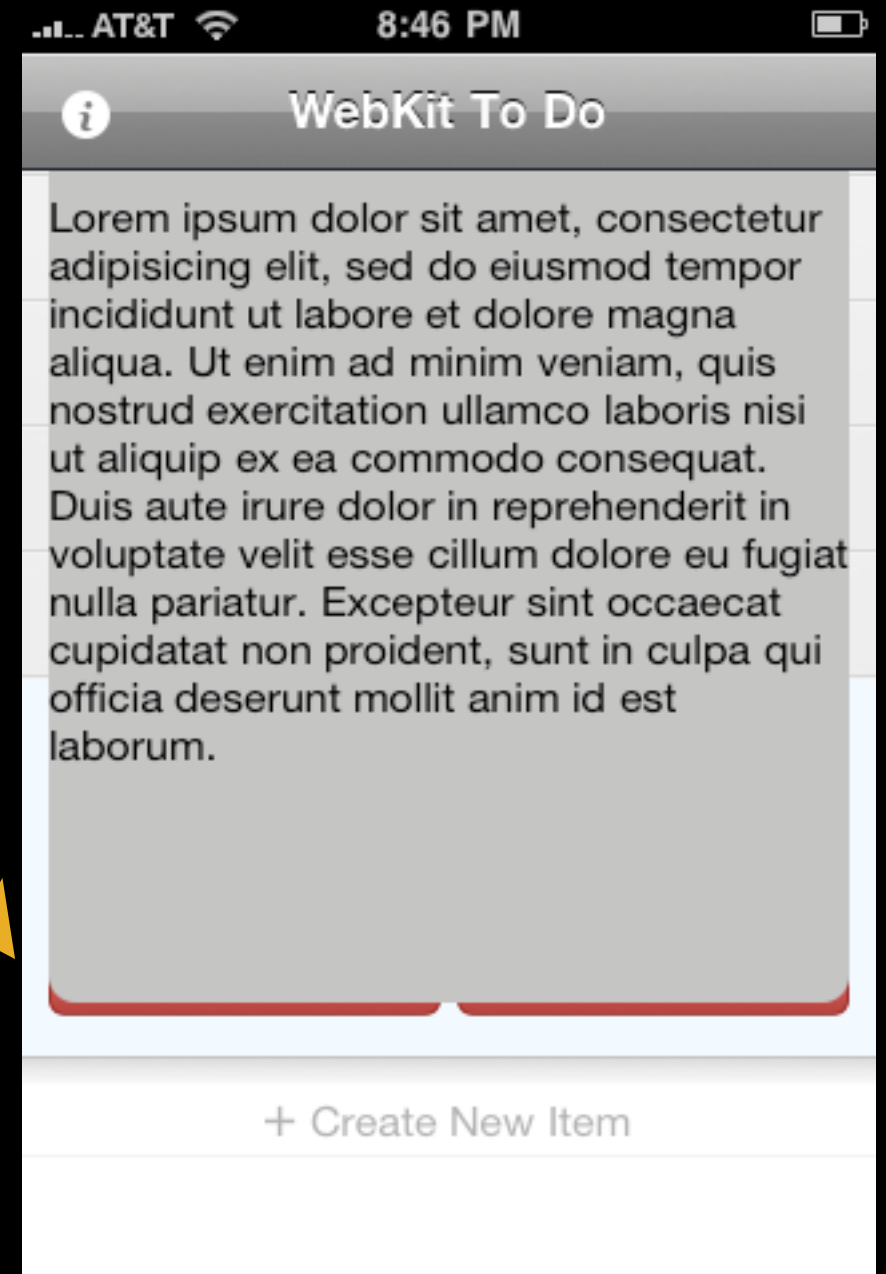
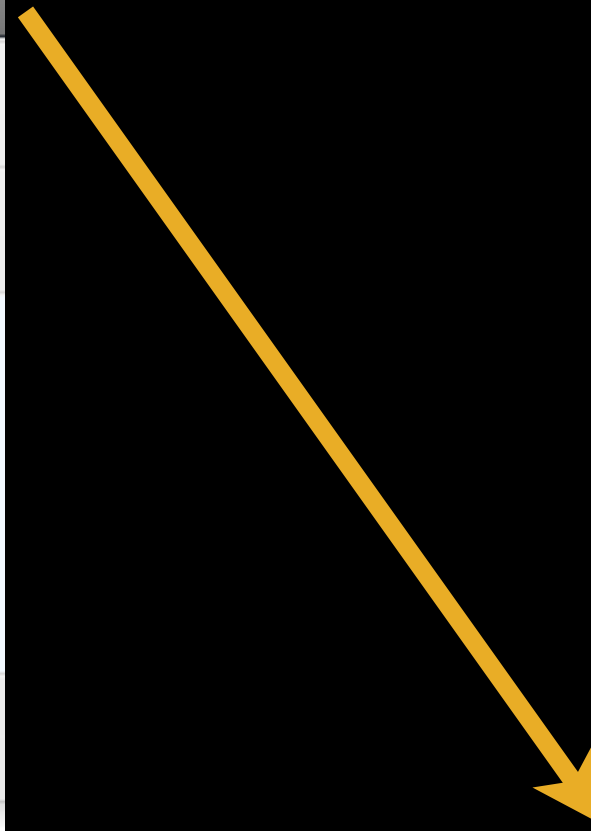
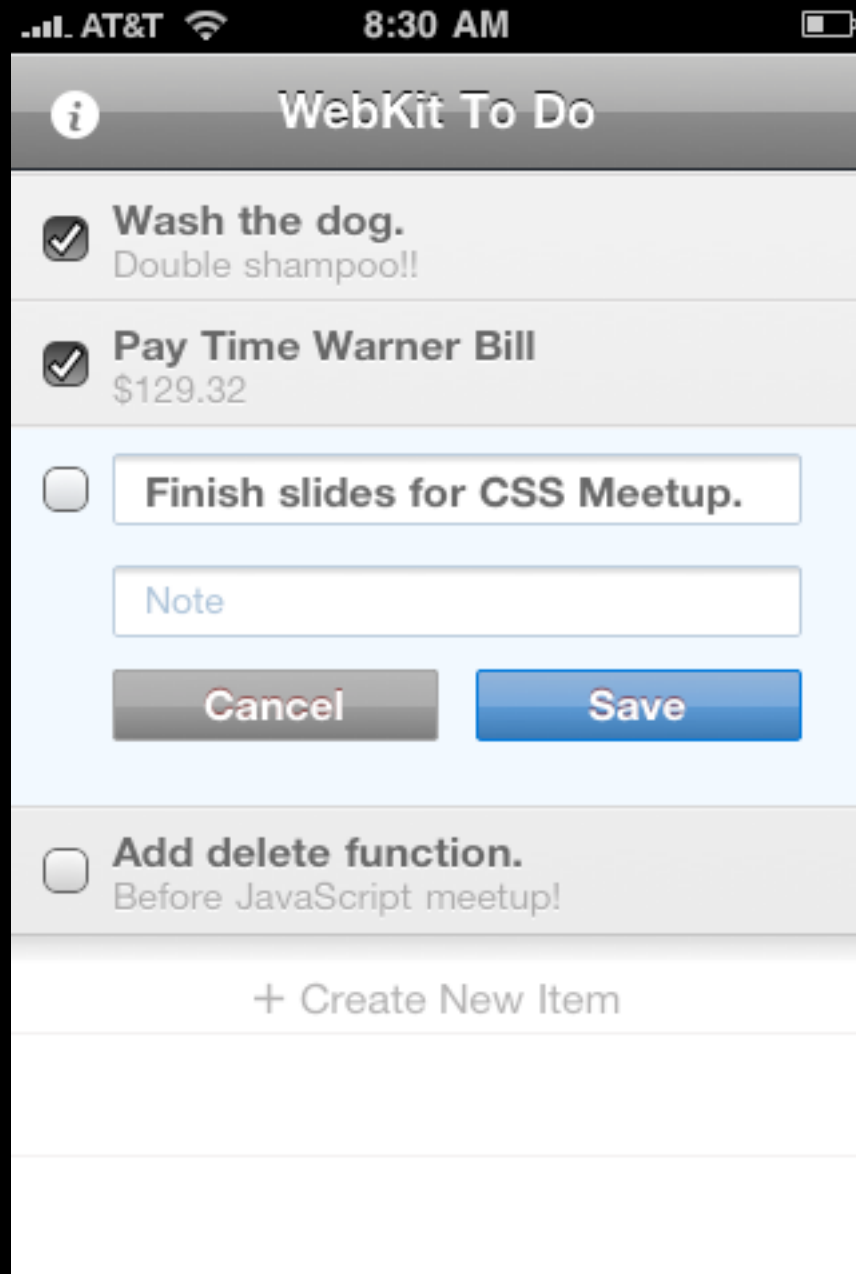
```
-webkit-transition-property: property;
```

```
-webkit-transition-duration: duration;
```

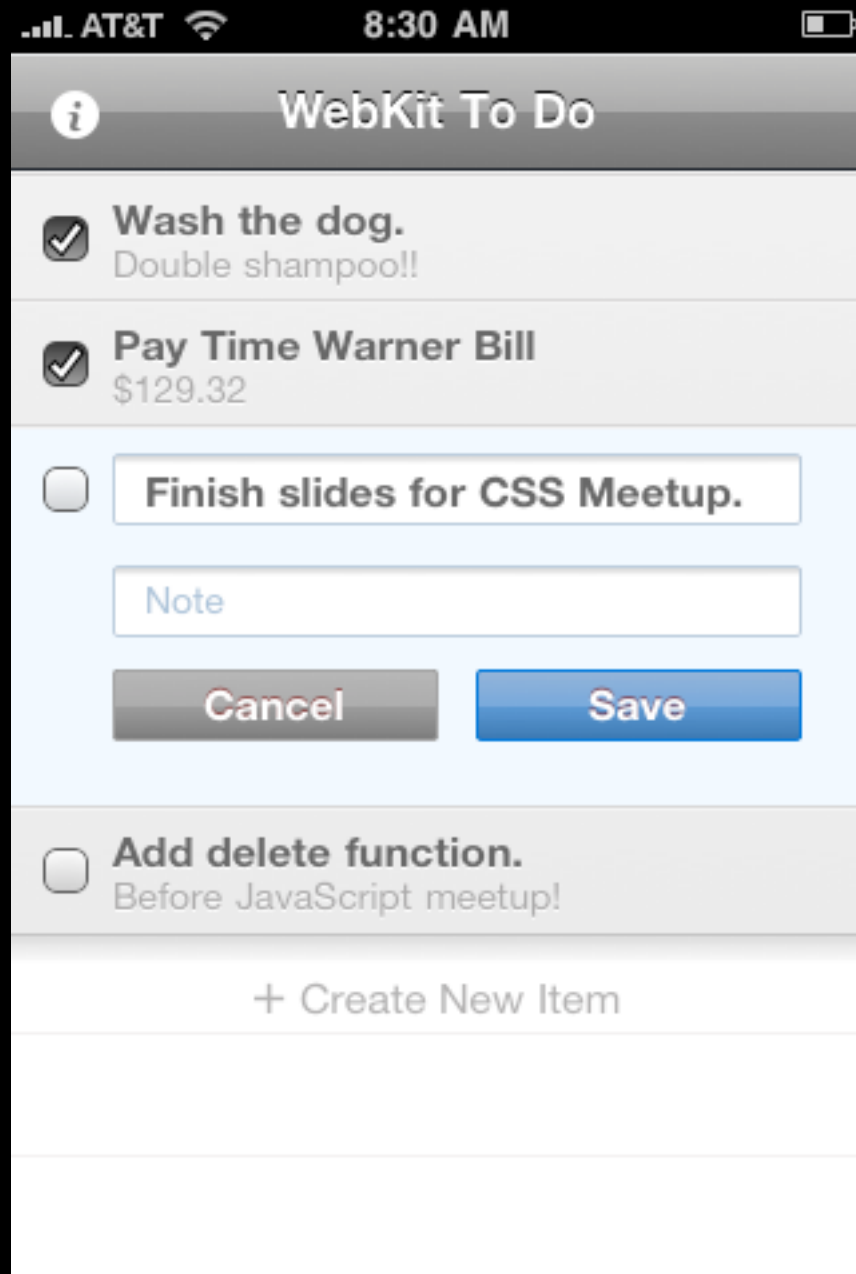
```
-webkit-transition-timing-  
    function: timing_function;
```

```
-webkit-transition-delay: delay;
```

-webkit-transition



-webkit-transition



```
#todoInfo {  
    position: absolute;  
    left: 10px;  
    top: -320px;  
    z-index: 75;  
    display: block;  
    width: 300px;  
    height: 320px;  
    background: #B8B8B7;  
    -webkit-border-radius: 10px;  
    -webkit-transition: top 25s linear;  
}
```

```
#todoInfo.visible {  
    top: 36px;  
}
```

-webkit-transition

-webkit-transition



linear

-webkit-transition



linear

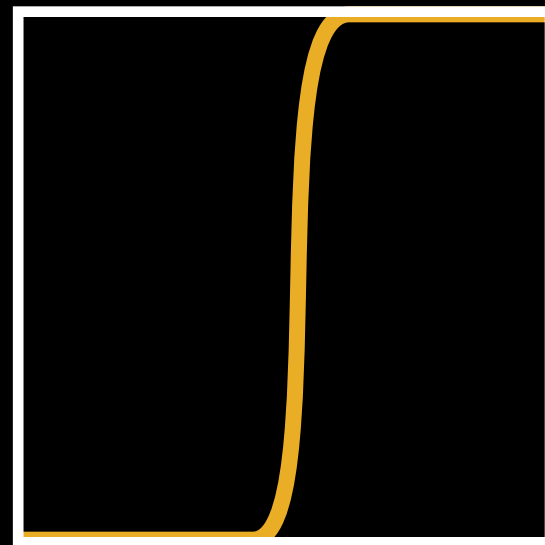


ease

-webkit-transition



linear



ease

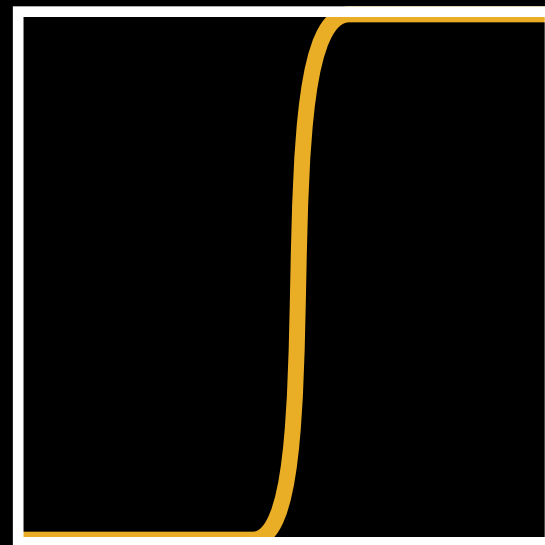


ease-in-out

-webkit-transition



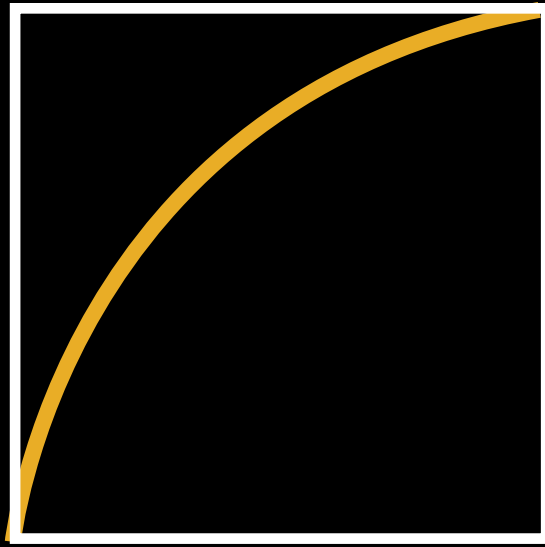
linear



ease



ease-in-out



ease-out

-webkit-transition



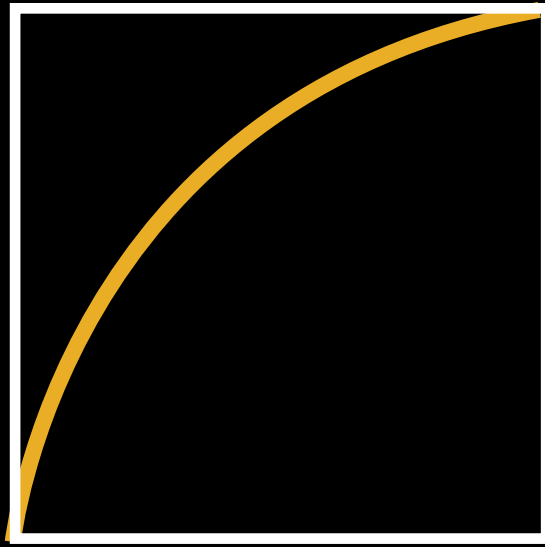
linear



ease



ease-in-out



ease-out



ease-in

-webkit-transition

-webkit-transition

- cubic-bezier() CSS Property function can create custom “tweens”

-webkit-transition

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-webkit-transition

- cubic-bezier() CSS Property function can create custom “tweens”

- webkit-transition-timing-function:

 - cubic-bezier(p0x, p0y, p1x, p1y);

- webkit-border-radius
- webkit-box-shadow
- webkit-gradient
- webkit-mask
- webkit-transition
- webkit-transform**
- webkit-animation

-webkit-transform

-webkit-transform

- Allows 3D and Flat transformations of objects

-webkit-transform

- Allows 3D and Flat transformations of objects
- Simple interface

-webkit-transform

- Allows 3D and Flat transformations of objects
- Simple interface
- Customizable (matrix) transformations

-webkit-transform

-webkit-transform: function(param);

-webkit-transform

-webkit-transform: **function**(param);

matrix
matrix3d

perspective

rotate
rotate3d
rotateX
rotateY
rotateZ

scale
scale3d
scaleX
scaleY
scaleZ
skewX
skewY

translate
translate3d
translateX
translateY
translateZ

-webkit-transform

-webkit-transform: **function**(**param**);

matrix
matrix3d

perspective

rotate
rotate3d
rotateX
rotateY
rotateZ

scale
scale3d
scaleX
scaleY
scaleZ
skewX
skewY

translate
translate3d
translateX
translateY
translateZ

Example

- webkit-border-radius
- webkit-box-shadow
- webkit-gradient
- webkit-mask
- webkit-transition
- webkit-transform
- webkit-animation**

-webkit-animation

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- Explicit animation handled directly by CSS

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- Uses an apple extension block (`@-webkit-keyframes`) to define the animation

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- Repeated effects, keyframes
- Uses an apple extension block (`@-webkit-keyframes`) to define the animation
- “Normal” CSS to turn animation on

Example

-webkit-animation

Simple animation setup:

```
@-webkit-keyframes bounce {  
  from {  
    left: 0px;  
  }  
  to {  
    left: 200px;  
  }  
}
```

-webkit-animation

Simple animation setup:

```
@-webkit-keyframes bounce {  
  from {  
    left: 0px;  
  }  
  to {  
    left: 200px;  
  }  
}
```

Simple animation Trigger:

```
div#bouncer {  
  position: absolute;  
  -webkit-animation-name: bounce;  
  -webkit-animation-duration: 4s;  
  -webkit-animation-iteration-count: 10;  
  -webkit-animation-direction: alternate;  
}
```

Complex Animation Setup: Complex Animation Trigger:

```
@-webkit-keyframes pulseAndMove {  
  0% {  
    background: #0F0;  
    left: 0px;  
    top: 0px;  
  }  
  25% {  
    background: #F00;  
    left: 20px;  
    top: 20px;  
  }  
  50% {  
    background: #00F;  
  }  
  75% {  
    background: #0FF;  
    left: 50px;  
    top: 50px;  
  }  
  100% {  
    background: #F0F;  
  }  
}
```

```
div#pulser {  
  position: absolute;  
  -webkit-animation-name: pulseAndMove;  
  -webkit-animation-duration: 4s;  
  -webkit-animation-iteration-count: 10;  
  -webkit-animation-direction: alternate;  
}
```

Example

...and everything else

...and everything else

- Just a taste

...and everything else

- Just a taste
- Apple is adding a lot more fine-grained control to CSS

...and everything else

- Just a taste
- Apple is adding a lot more fine-grained control to CSS

`-webkit-background`

`-webkit-box`

`-webkit-marquee`

`-webkit-tap`

`-webkit-text`

`-webkit-touch`

`-webkit-column`

Tools

Tools

- CSS3 Gradient Builder
<http://gradients.glrzad.com> (Damian built it!)

Tools

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<http://gradients.glrzad.com> (Damian built it!)
- Emulators:
 - iPhone — Native, easy to use
 - Android — Eclipse based, not easy to use
 - Palm Pre — VirtualBox image, easy to use, takes some time to install

Resources

Resources

- Safari CSS Reference Guide
<http://developer.apple.com/mac/library/documentation/AppleApplications/Reference/SafariCSSRef/Introduction.html>

Resources

- Safari CSS Reference Guide
<http://developer.apple.com/mac/library/documentation/AppleApplications/Reference/SafariCSSRef/Introduction.html>
- Safari Web Content Guide
<http://developer.apple.com/safari/library/documentation/AppleApplications/Reference/SafariWebContent/Introduction/Introduction.html>

Resources

- Safari CSS Reference Guide
<http://developer.apple.com/mac/library/documentation/AppleApplications/Reference/SafariCSSRef/Introduction.html>
- Safari Web Content Guide
<http://developer.apple.com/safari/library/documentation/AppleApplications/Reference/SafariWebContent/Introduction/Introduction.html>
- Surfin' Safari
<http://webkit.org/blog/>

JavaScript?

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- A lot of new touch events

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- HTML / JS Client Side Storage

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NYC JS Meetup
7pm, October 6, 2009
Rebar, Dumbo

Thanks...

- Damian Galarza, Associate Developer
Magnani Caruso Dutton
- Victor Vasquez, Associate Designer
Magnani Caruso Dutton

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Thank you, very much.