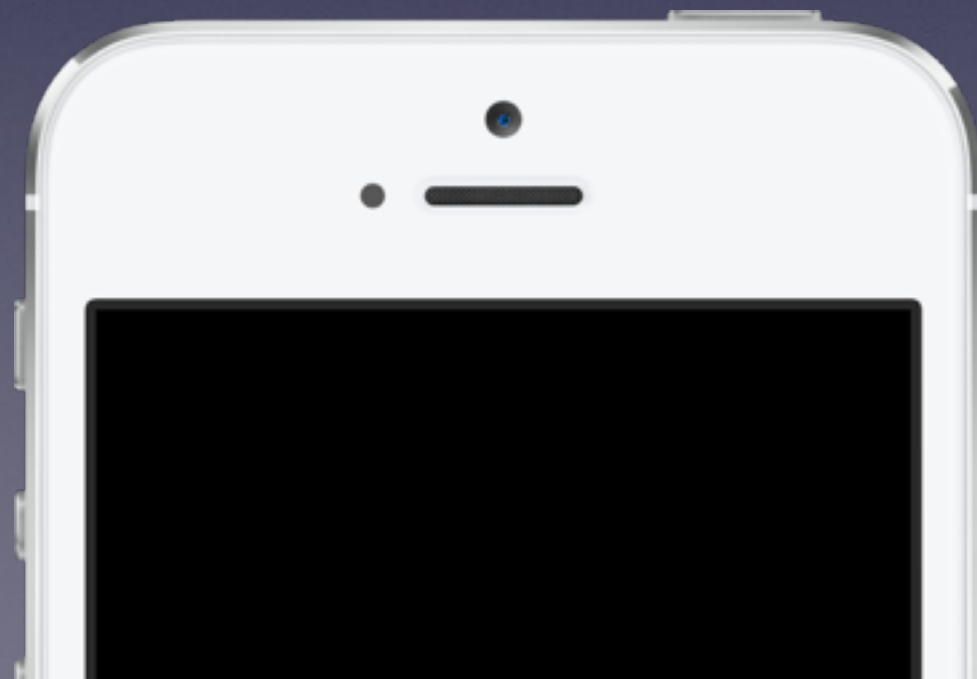


# COMS W3101: Programming for iOS

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# Views and View Controllers, part 1

- Understanding the View Controller Life-Cycle
- Working with view's programmatically
- UITableView
- Demo: Creating a custom UIViewController that displays a UITableView

# VC Life-Cycle

- **-initWithNibName:bundle:** is UIViewController's designated initializer
  - Helpful to override **-init** to call **-initWithNibName:bundle:** with the appropriate information
- The VC's view is initialized lazily. View creation happens in **-loadView**.
  - In VC's created from a NIB, **-loadView** will unarchive the view described in the NIB
  - If there is no NIB, the default implementation of **-loadView** creates an empty **UIView** to be the VC's view

# VC Life-Cycle

- In VCs without a NIB, **-loadView** is where you should create your views programmatically
- In VCs created with a NIB or programmatically, **-viewDidLoad** is called after the VC's view has been loaded
  - **-viewDidLoad** is where additional configuration of your view controller should be done
- After **-viewDidLoad**, your VC should be completely configured and ready for use



# VC Life-Cycle

- While the VC's view has been loaded, it has not yet been added to the application's view hierarchy
- We can set the **rootViewController** property of application's window
- There are ways to have a hierarchy of VCs which we will cover next class

# VC Life-Cycle

- Before the VC's view is made visible, **-viewWillAppear: (BOOL)animated** is called
  - Useful for refreshing a view's data source before the view is presented to the user
- Once the VC's view is visible, **-viewDidAppear: (BOOL)animated** is called
  - Useful for displaying an alert to a user once the VC has been displayed to the user
- The default implementation of both of these methods do nothing

# VC Life-Cycle

- Before the VC's view is removed from the hierarchy or is hidden, **-viewWillDisappear:(BOOL)animated** is called
- When the VC's view is finished being removed or hidden, **-viewDidDisappear:(BOOL)animated** is called
  - Useful for canceling network requests that are related to a specific VC
- The default implementation of both of these methods do nothing



# UIView

- UIView is the base class for all views in iOS
- It handles both the rendering of content and interaction with that content
- There are a number of subclasses provided by UIKit, including **UIButton** and **UIImageView** that provide implementations of core functionality
- UIView provides hooks for drawing custom content to the screen and animating it
- Views can add instances of **UIGestureRecognizer** to handle complex multitouch interactions



# View Geometry

- A view's geometry is defined by its **frame**, **bounds**, and **center** properties
  - The **frame** defines the origin and size of the view within the coordinate system of its **superview**
  - A view's **center** represents the center of the view within its **superview**'s coordinate system
  - The **bounds** defines internal dimensions of the view
  - The size of the **bounds** and **frame** are tied together

# View Geometry

Frame =  
{.origin = {50,50}, .size = {350,250}}



Bounds =  
{.origin = {0,0}, .size = {350,250}}

# View Appearance

- **backgroundColor** defines the background color of a view
  - Of type **UIColor**
  - Defaults to [UIColor clearColor] in iOS 7
- **alpha** defines the transparency of your view
  - 1.0 is fully opaque, 0.0 is completely transparent
- **tintColor** defines the view's 'highlight' color
  - For example, this might determine the color of a button's icon



# View Hierarchy

- You can add a view as a subview of another view by calling **-addSubview:** on the superview with the subview as the parameter
- Call **-removeFromSuperview** on a view to remove it from the view hierarchy
- A view's **superview** property will return the view it is embedded in or **nil** if its not in the hierarchy
- The **subviews** property returns an NSArray containing the subview contained within the view

# View Layout

- In a custom UIView subclass, you have the ability to layout your custom subviews in - **layoutSubviews**
- Always layout subviews with relation to a view's **bounds** which represent the internal coordinate system
- Calling **setNeedsLayout** on a view marks it for layout by the OS

# Autoresizing

- Each view as an **autoresizingMask** property that its superview will use to resize it when the superview's bounds change
- There are 7 possible values which can be combined using the C bitwise OR operator
  - **UIViewAutoresizingNone, UIViewAutoresizingFlexibleLeftMargin, UIViewAutoresizingFlexibleRightMargin, UIViewAutoresizingFlexibleTopMargin, UIViewAutoresizingFlexibleBottomMargin, UIViewAutoresizingFlexibleHeight, UIViewAutoresizingFlexibleWidth**
  - FlexibleWidth and FlexibleHeight allow the view to resize by adjusting the view's width and height
  - The others allow the view to resize by adjusting the margin between the view and the given edge in the superview



# Autoresizing

```
// This will let the distance between aView and its superview's  
// left edge to expand or shrink as the superview's width changes
```

```
[aView setAutoresizingMask:UIViewAutoresizingFlexibleLeftMargin]
```

```
// This will let the distance between aView and its superview's  
// left edge and aView's width to expand or shrink as the  
// superview's width changes. aView's height will also change as  
// its superview's height changes.
```

```
UIViewAutoresizing mask = (UIViewAutoresizingFlexibleLeftMargin |  
                           UIViewAutoresizingFlexibleWidth |  
                           UIViewAutoresizingFlexibleHeight );  
[aView setAutoresizingMask:mask]
```

# UITableView

- A view that specializes in displaying information in a vertically scrolling list
- Individual cells in a tableview are instances of **UITableViewCell**
- TableViews have a **dataSource** that conforms to the **UITableViewDataSource** protocol
  - The **dataSource** is responsible for telling the TableView how many sections and how many rows are in each section of the table
  - The **dataSource** is also responsible for providing configured instances of a **UITableViewCell** for each item in the table

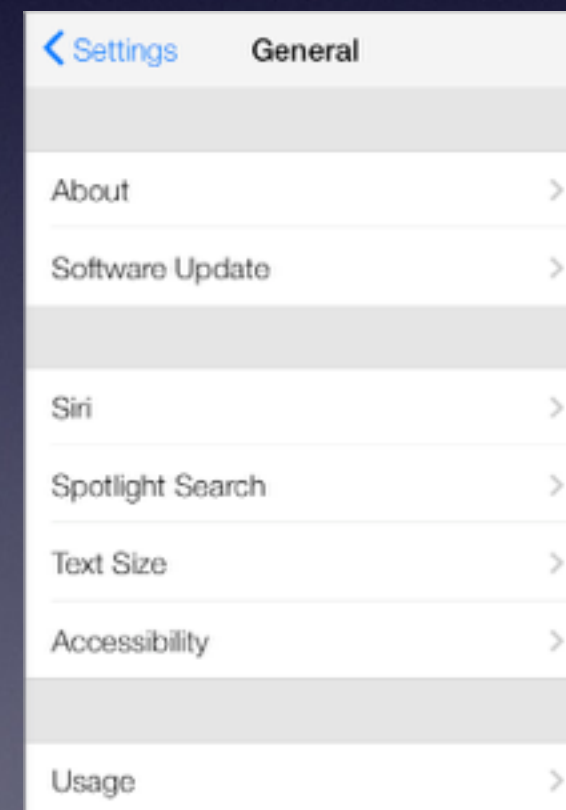
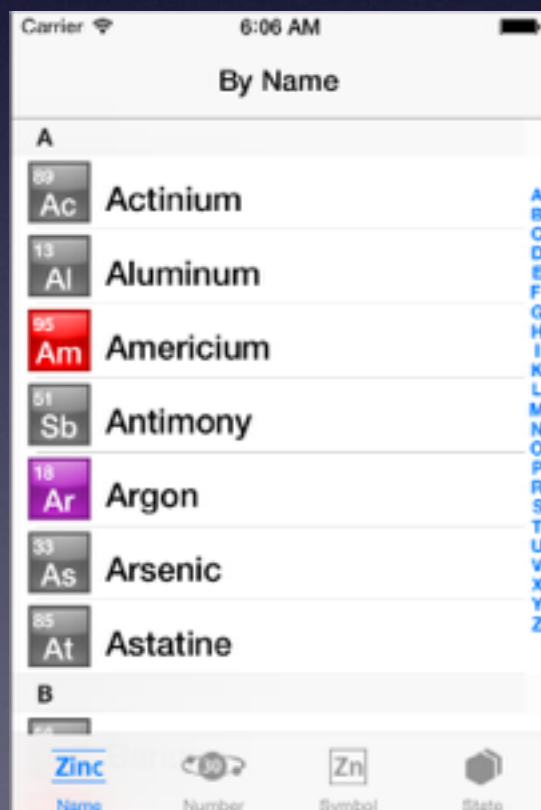
# UITableView

- TableViews also have a **delegate** property which is responsible for:
  - Responding to the selection of cells when a user interacts with the tableView
  - Configuring row reordering and editing
  - Configuring cell highlighting behavior



# UITableView

- TableViews can come in two styles:



UITableViewStylePlain

UITableViewStyleGrouped

# UITableViewDataSource

- Required Methods:

```
- (NSInteger)tableView:(UITableView *)tableView  
numberOfRowsInSection:(NSInteger)section
```

```
// This method returns the view to display for the section/row specified by indexPath
```

```
- (UITableViewCell *)tableView:(UITableView *)tableView  
cellForRowAtIndexPath:(NSIndexPath *)indexPath
```

- Optional Methods:

```
// If this method is not implemented, 1 section is the default
```

```
- (NSInteger)numberOfSectionsInTableView:(UITableView *)tableView
```

```
// This method returns the string to display as the header for the specified section
```

```
- (NSString *)tableView:(UITableView *)tableView  
titleForHeaderInSection:(NSInteger)section
```

```
// This method returns the string to display as the footer for the specified section
```

```
- (NSString *)tableView:(UITableView *)tableView  
titleForFooterInSection:(NSInteger)section
```

# UITableViewDelegate

- All methods are optional in this protocol:

```
// Provides a hook to do custom actions when a row is selected
- (void)tableView:(UITableView *)tableView
didSelectRowAtIndexPath:(NSIndexPath *)indexPath;
```

```
// Defaults to the -rowHeight property of UITableView if not implemented
- (CGFloat)tableView:(UITableView *)tableView
heightForRowAtIndexPath:(NSIndexPath *)indexPath;
```

```
// These methods allow for completely custom views to be show in the
// header and footer areas of sections
```

```
- (UIView *)tableView:(UITableView *)tableView
viewForHeaderInSection:(NSInteger)section;
```

```
- (UIView *)tableView:(UITableView *)tableView
viewForFooterInSection:(NSInteger)section;
```