Beginning iOS 10 Application Development

View Controllers

Yanping Zhao

Nov. 2016

View Controllers

View Controllers

- Manages the views and the interactions between the views and the underlying data

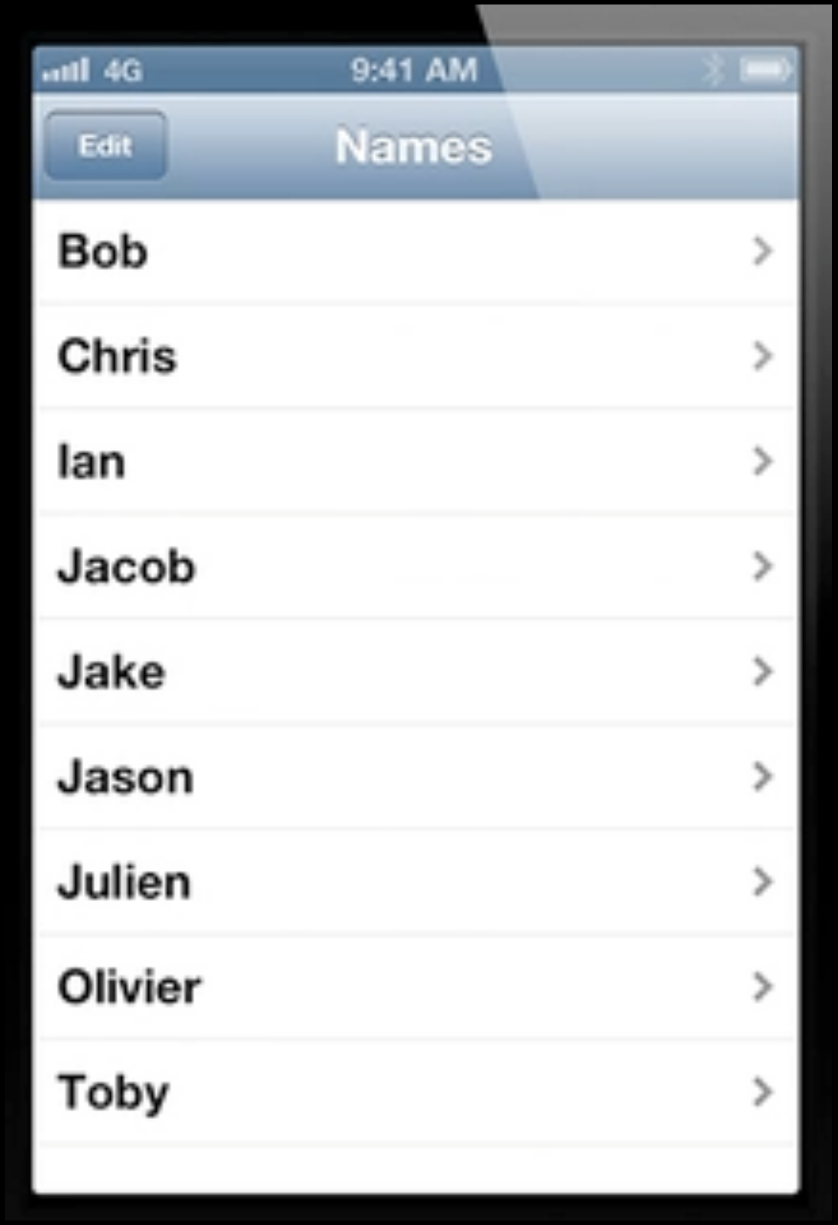
View Controllers

- Manages the views and the interactions between the views and the underlying data
- Every app has at least one view controller

View Controllers

- Manages the views and the interactions between the views and the underlying data
- Every app has at least one view controller
- The *UIViewController* class is the base class of view controllers

Content View Controllers



Bob

Chris

Ian

Jacob

Jake

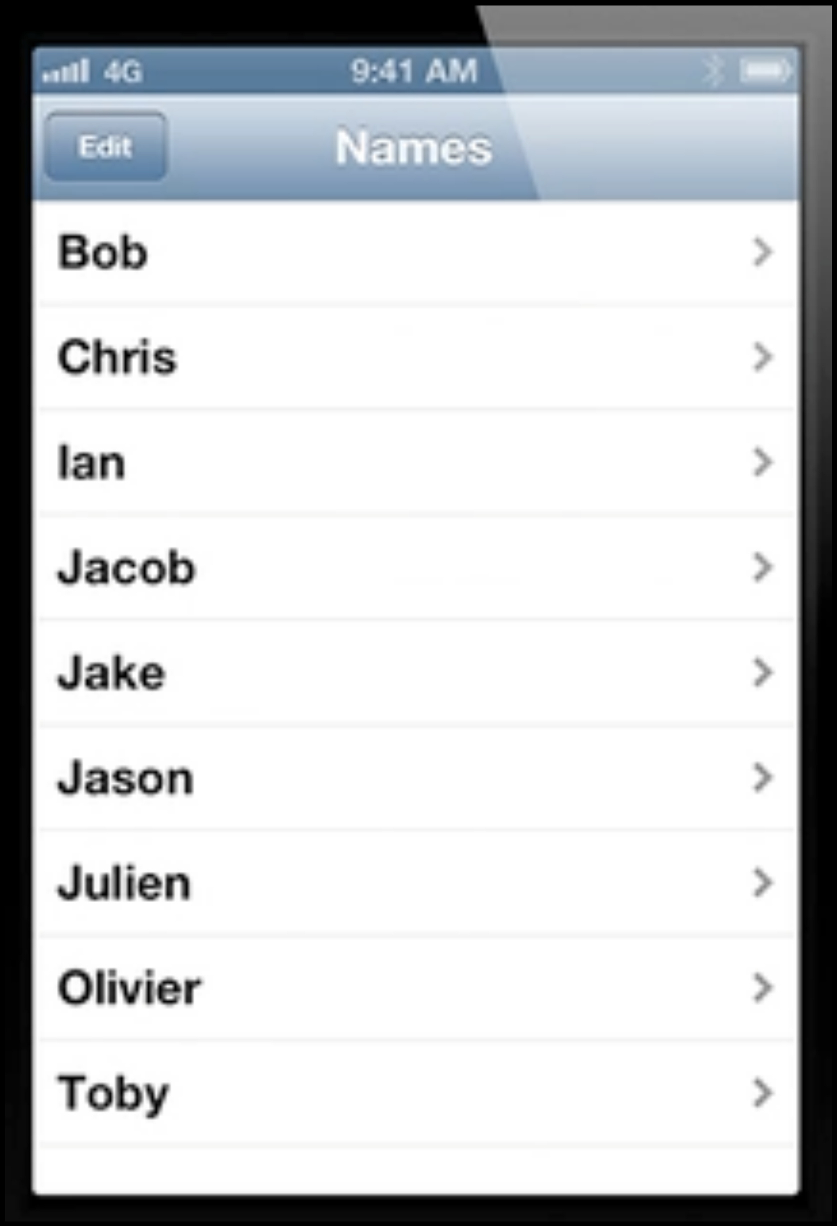
Jason

Julien

Olivier

Toby

Content View Controllers



4G 9:41 AM

Edit

Names

Bob

Chris

Ian

Jacob

Jake

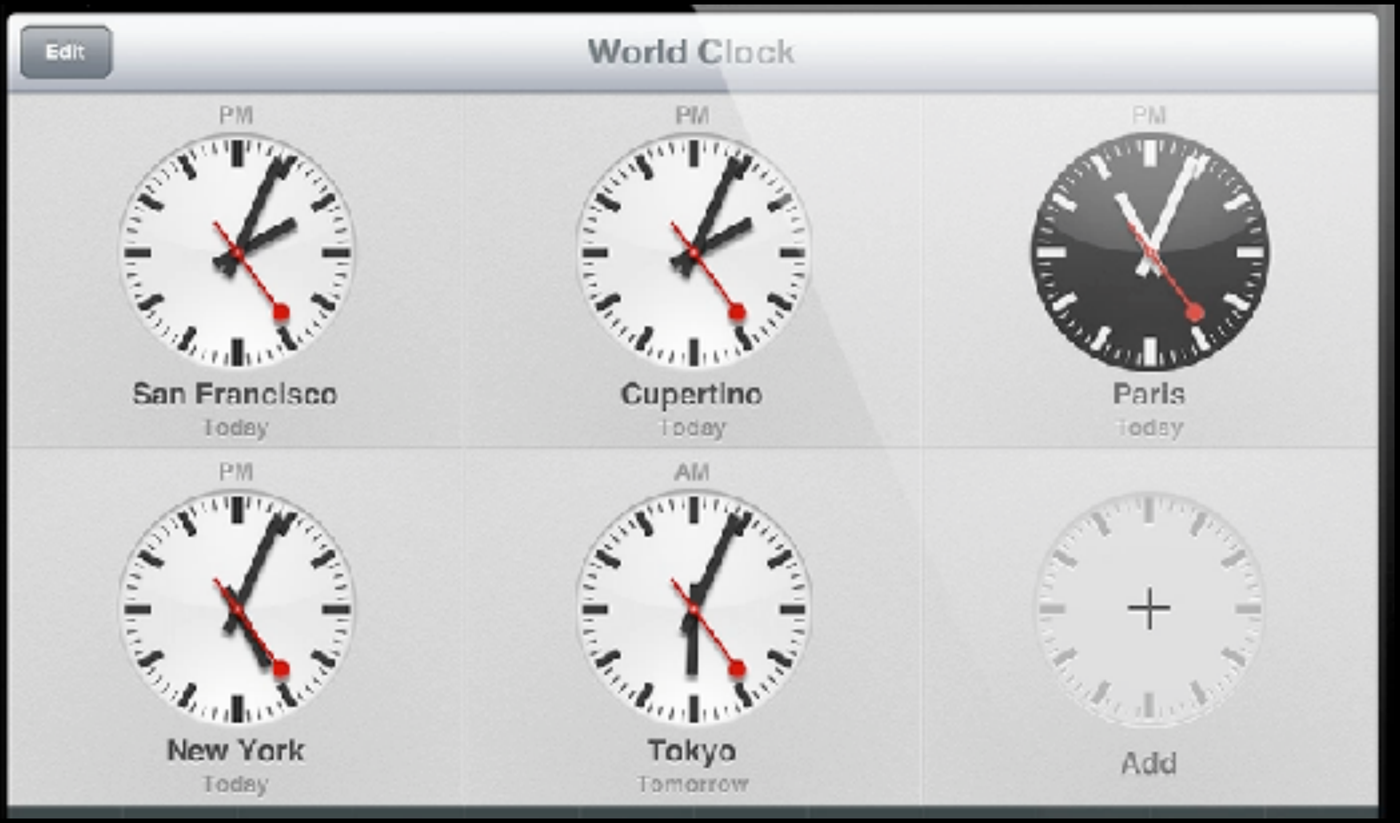
Jason

Julien

Olivier

Toby

Table View Controller



Edit

World Clock

PM

San Francisco

Today

PM

Cupertino

Today

PM

Paris

Today

PM

New York

Today

AM

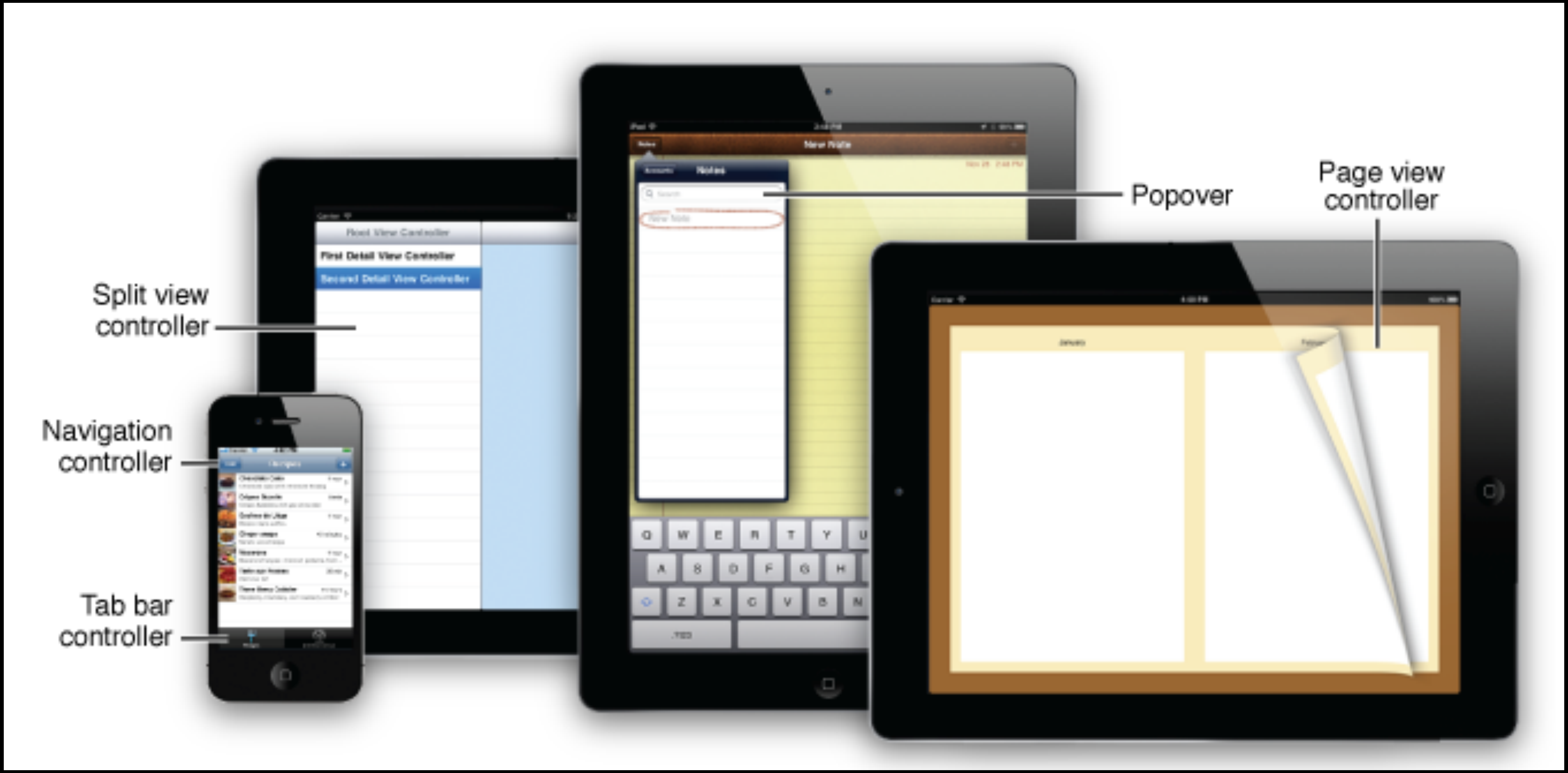
Tokyo

Tomorrow

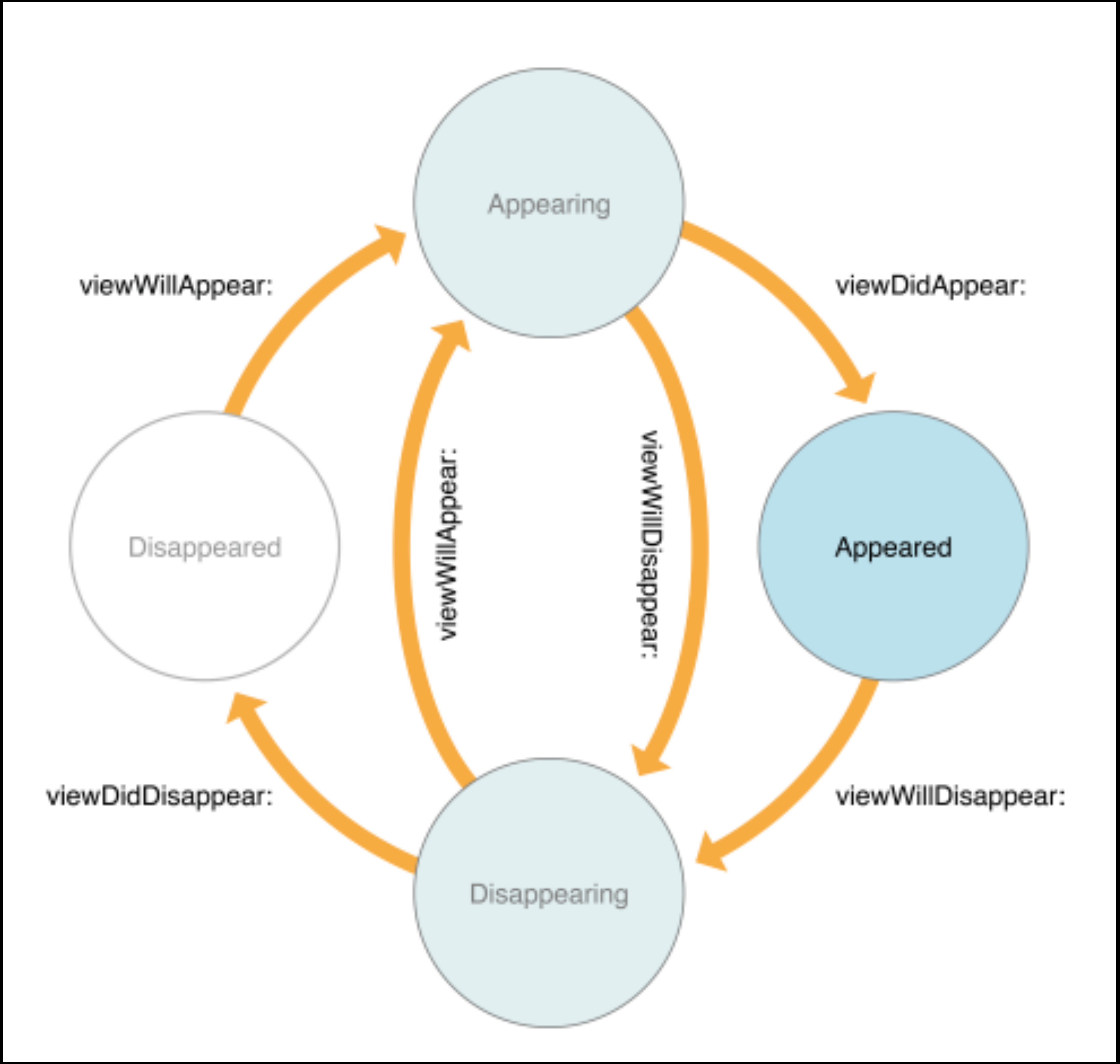
Add

Collection View Controller

Container View Controllers



View Controller LifeCycle



View Controllers Life Cycle

viewDidLoad()

View Controllers Life Cycle

viewDidLoad()

- Called when the view controller’s content view is created and loaded from a storyboard

View Controllers Life Cycle

viewDidLoad()

- Called when the view controller’s content view is created and loaded from a storyboard
- Intended for initial setup

View Controllers Life Cycle

viewDidLoad()

- Called when the view controller’s content view is created and loaded from a storyboard
- Intended for initial setup
- Might be called multiple times since views may be purged

View Controllers Life Cycle

viewWillAppear()

View Controllers Life Cycle

viewWillAppear()

- Always called immediately before the content view appears onscreen

View Controllers Life Cycle

viewWillAppear()

- Always called immediately before the content view appears onscreen
- Intended for any operations that you want always to occur before the view becomes visible

View Controllers Life Cycle

viewDidAppear()

View Controllers Life Cycle

viewDidAppear()

- Always called immediately after the content view appears onscreen

View Controllers Life Cycle

viewDidAppear()

- Always called immediately after the content view appears onscreen
- Intended for any operations that occur as soon as the view becomes visible

View Controllers Life Cycle

viewDidAppear()

- Always called immediately after the content view appears onscreen
- Intended for any operations that occur as soon as the view becomes visible
    - Fetching data

View Controllers Life Cycle

viewDidAppear()

- Always called immediately after the content view appears onscreen
- Intended for any operations that occur as soon as the view becomes visible
  - Fetching data
  - Showing an animation

View Controllers Life Cycle

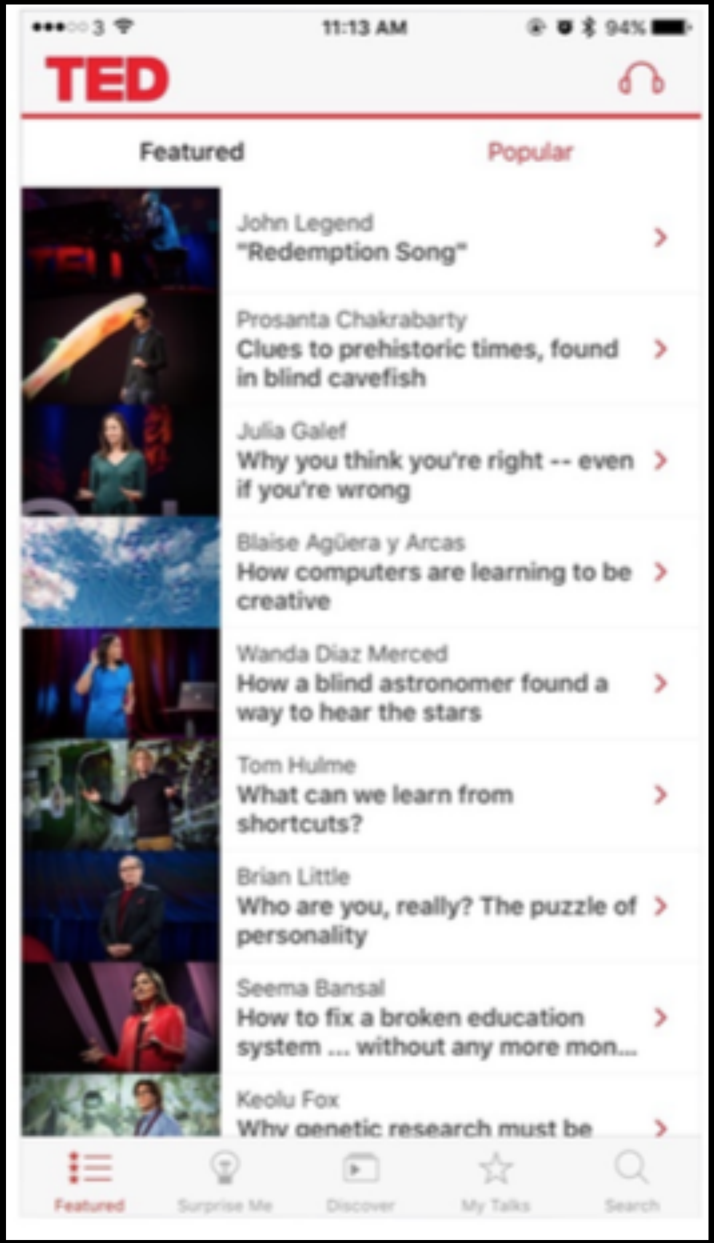
viewDidAppear()

- Always called immediately after the content view appears onscreen
- Intended for any operations that occur as soon as the view becomes visible
  - Fetching data
  - Showing an animation
  - etc…

Table View Controllers

Table View

- Displays one column of scrollable list of data
- Vertical scrolling only
- One of the most common UI elements



John Legend
"Redemption Song"

Prosanta Chakrabarty
Clues to prehistoric times, found in blind cavefish

Julia Galef
Why you think you're right -- even if you're wrong

Blaise Agüera y Arcas
How computers are learning to be creative

Wanda Diaz Merced
How a blind astronomer found a way to hear the stars

Tom Hulme
What can we learn from shortcuts?

Brian Little
Who are you, really? The puzzle of personality

Seema Bansal
How to fix a broken education system ... without any more mon...

Keolu Fox
Why genetic research must be

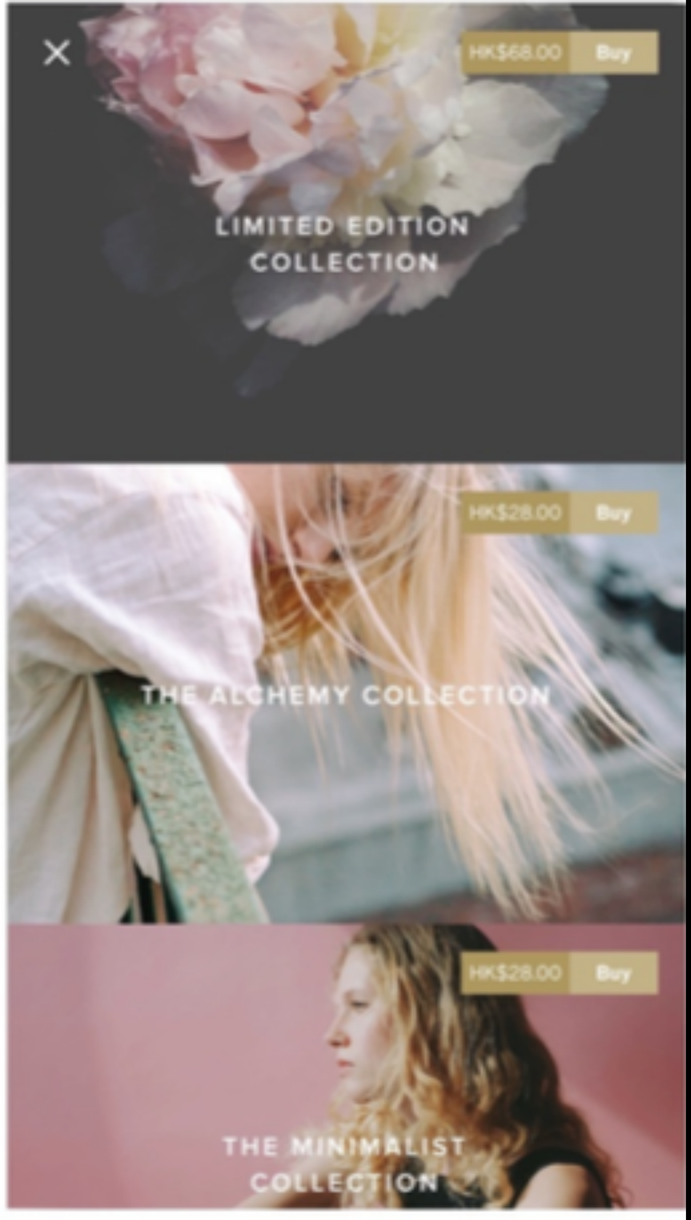
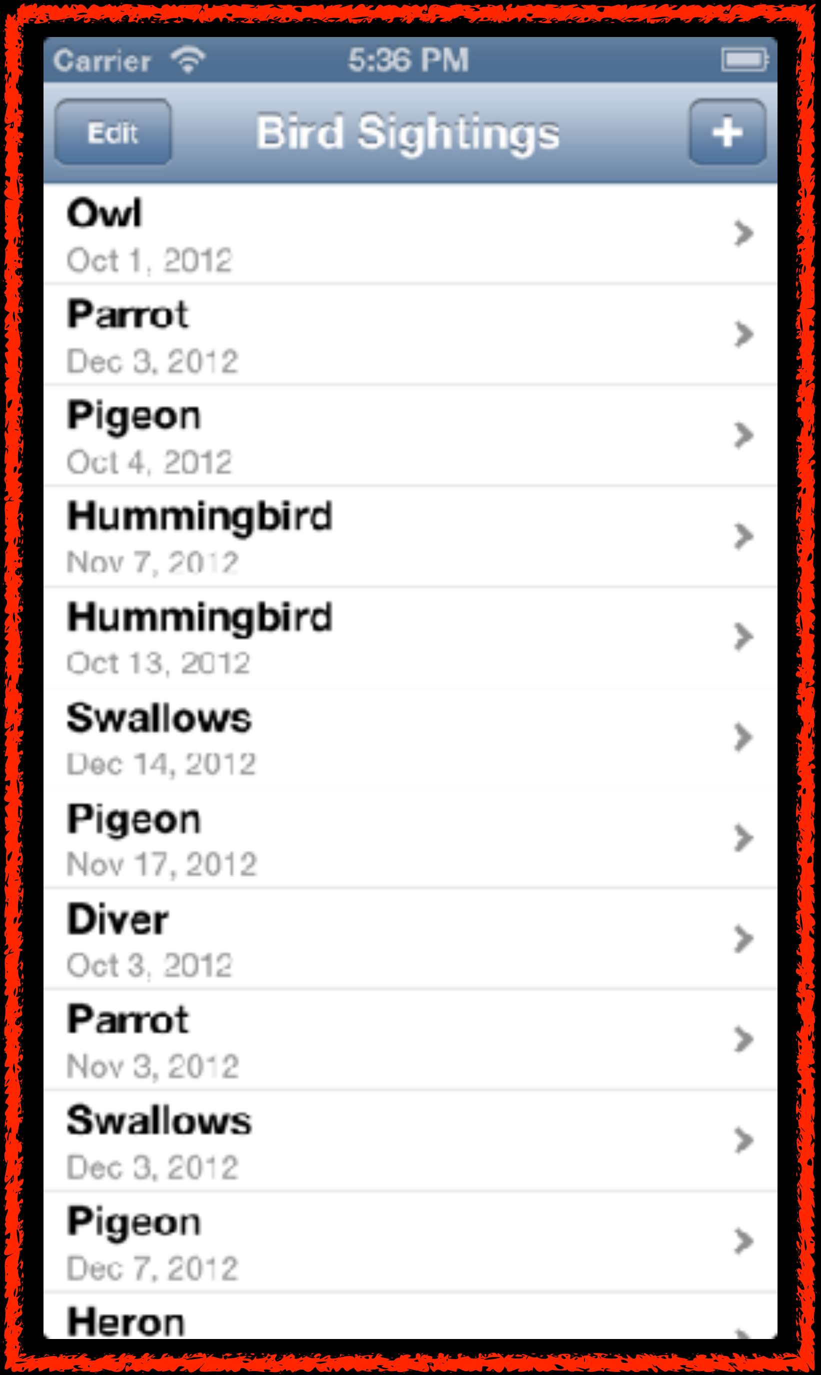


Table View Styles



Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

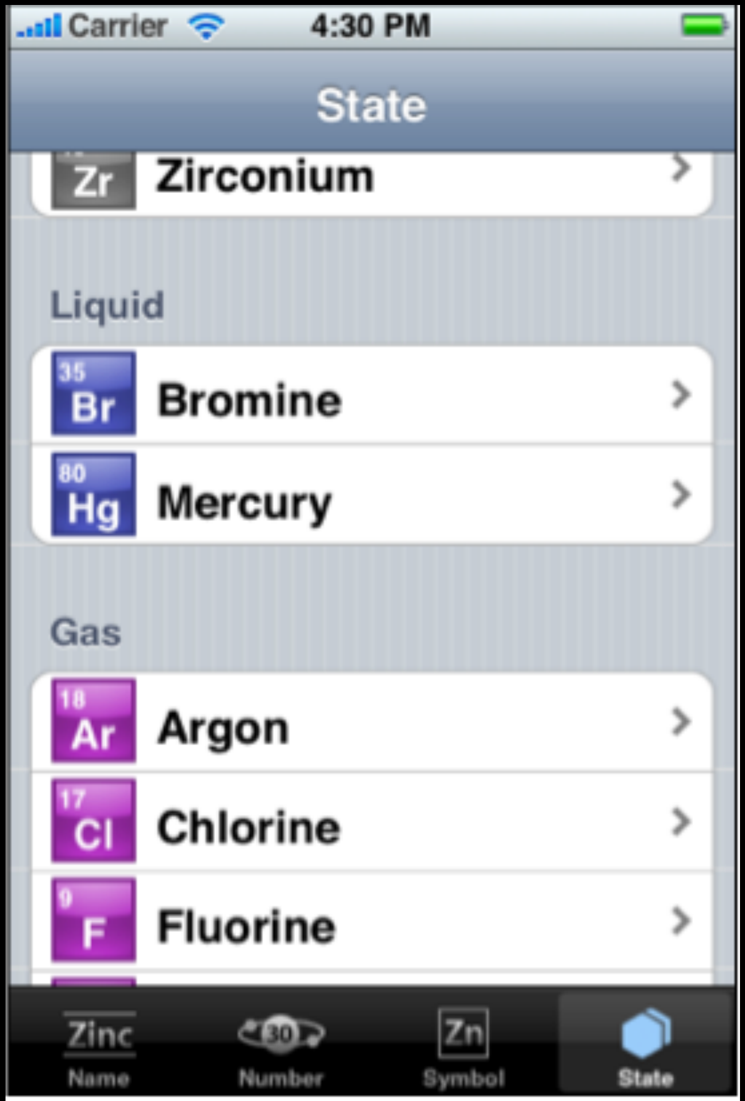
Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

Heron

Plain



Zr Zirconium

Liquid

35 Br Bromine

80 Hg Mercury

Gas

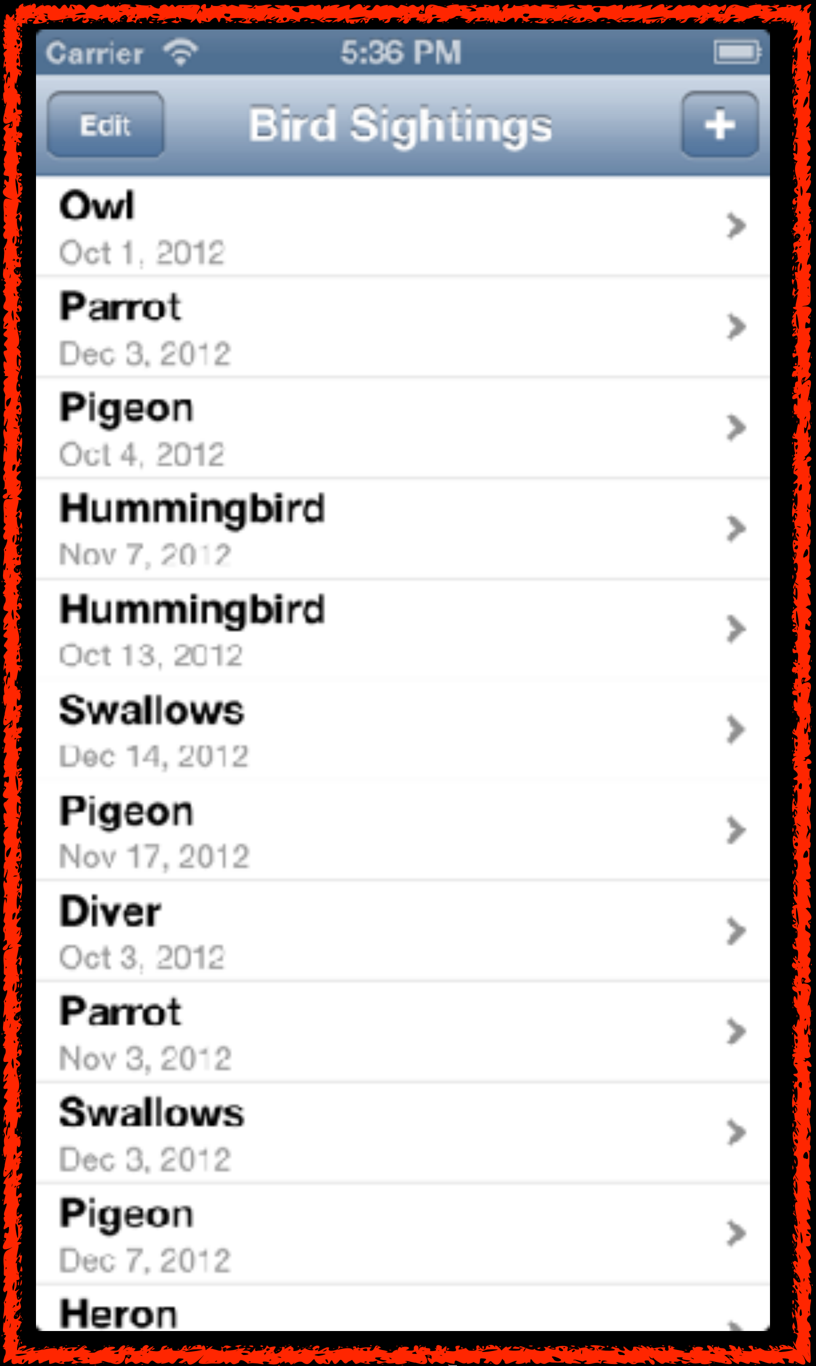
18 Ar Argon

17 Cl Chlorine

9 F Fluorine

Grouped

Plain Table Views



Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

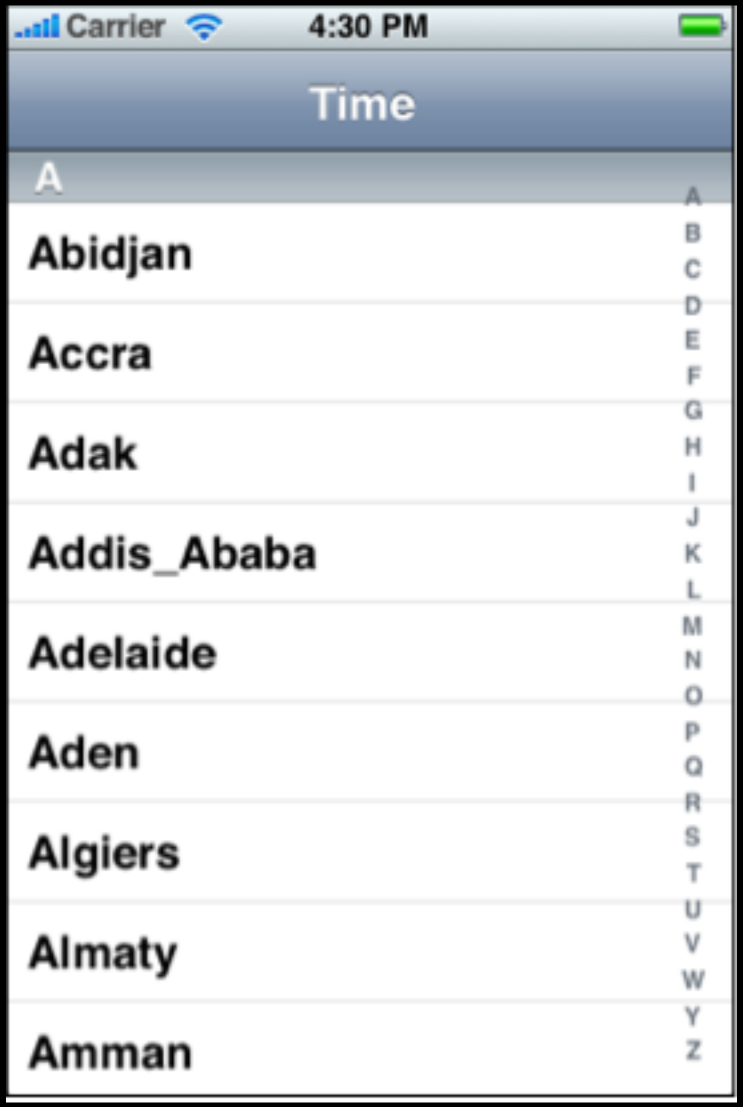
Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

Heron

Regular



A

Abidjan

Accra

Adak

Addis_Ababa

Adelaide

Aden

Algiers

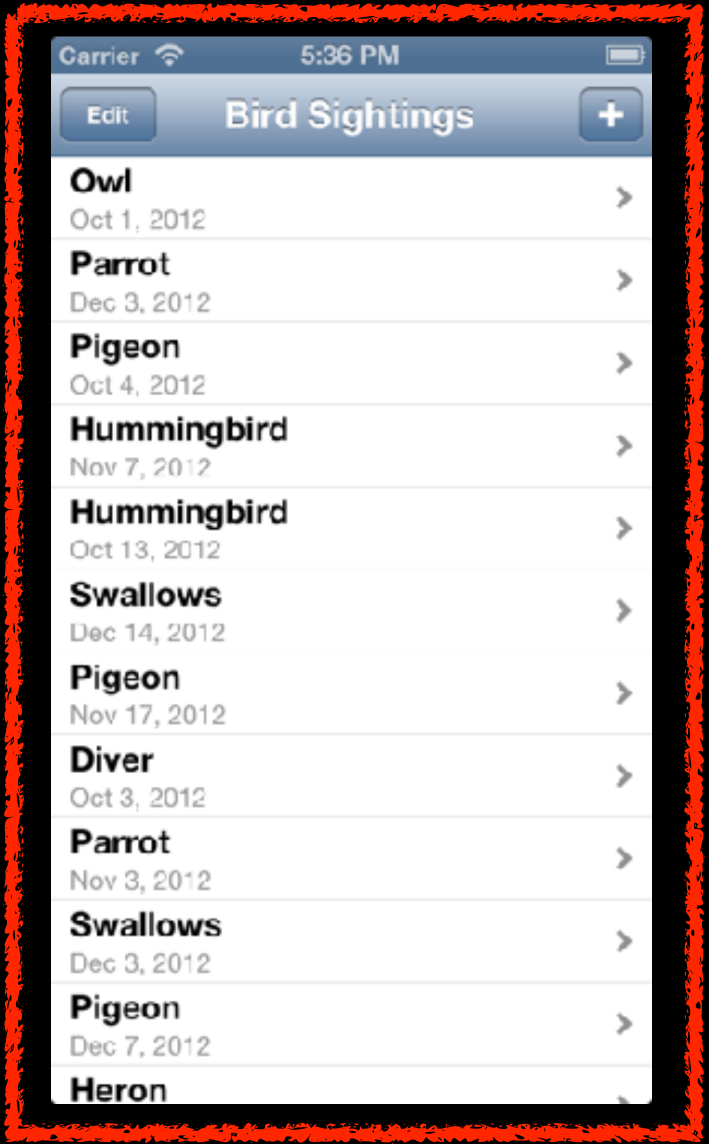
Almaty

Amman

Indexed List

Table View Data Organization

- The data are organized in sections
- Each section may contain multiple rows
- Many table views contain only one section



Carrier 5:36 PM

Edit **Bird Sightings** +

Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

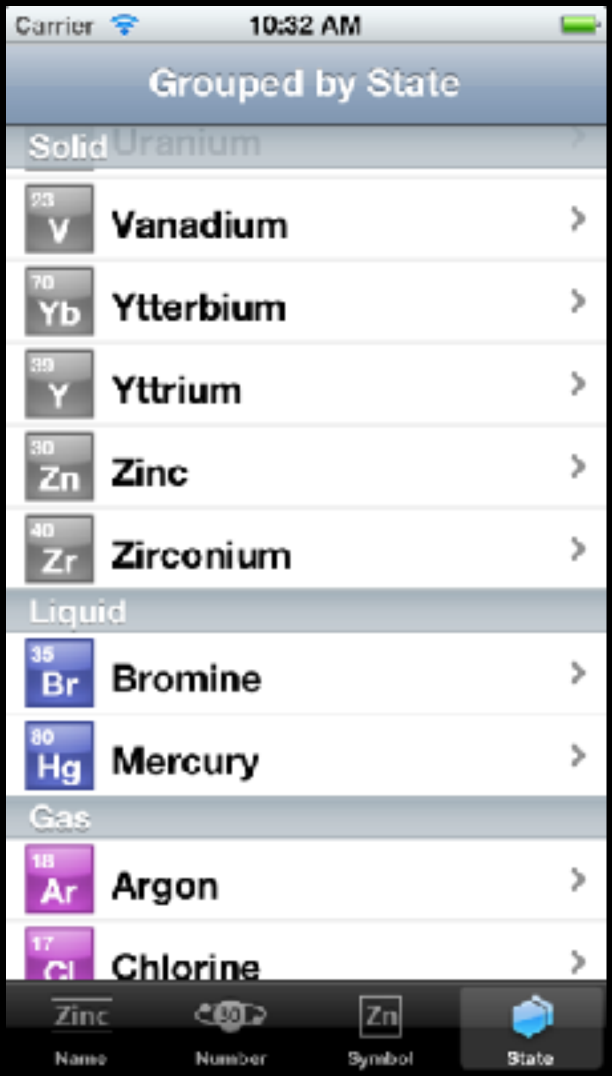
Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

Heron

One Section



Carrier 10:32 AM

Grouped by State

Solid Uranium

23 V Vanadium

70 Yb Ytterbium

39 Y Yttrium

30 Zn Zinc

40 Zr Zirconium

Liquid

35 Br Bromine

80 Hg Mercury

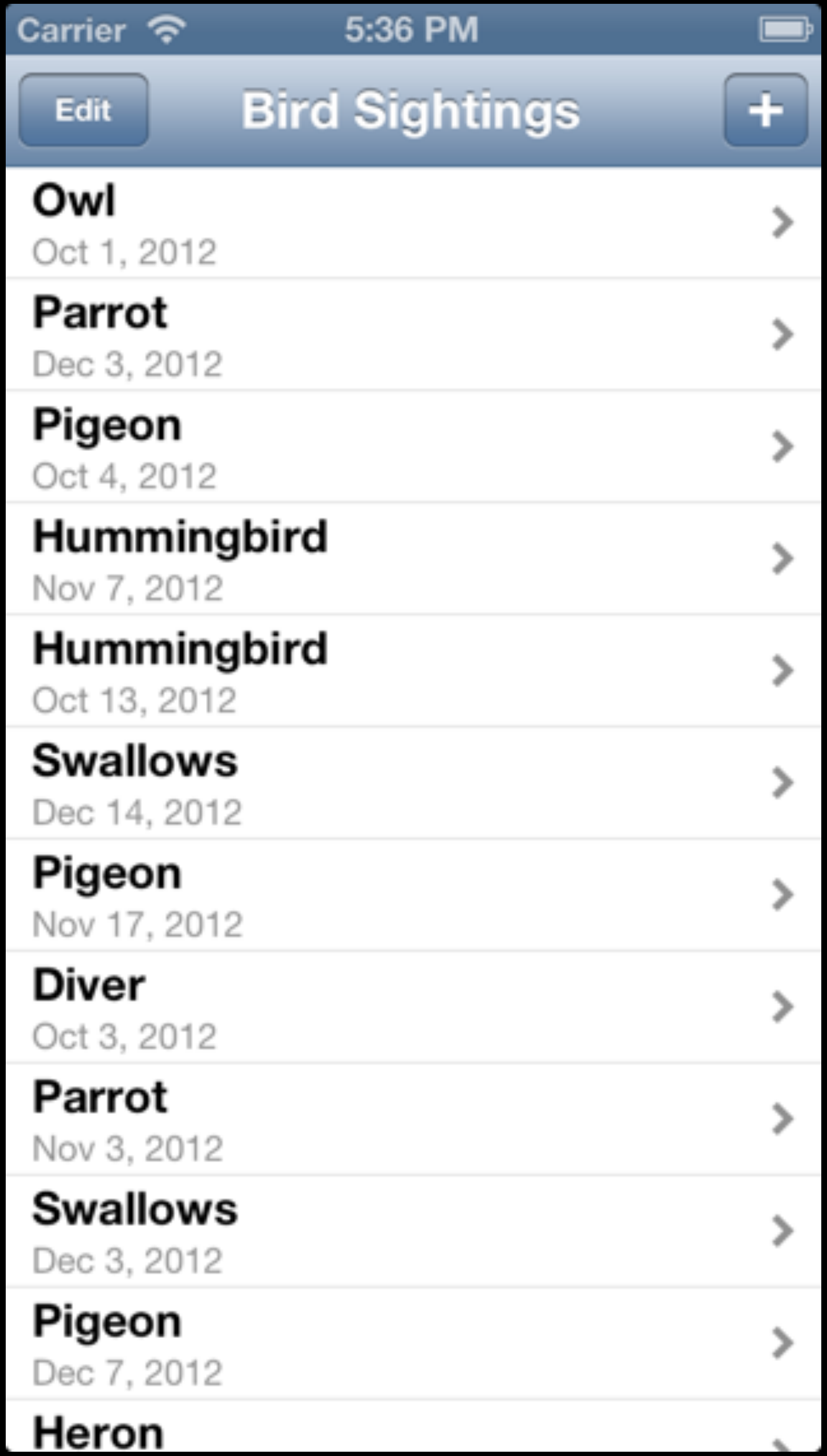
Gas

18 Ar Argon

17 Cl Chlorine

Multiple Sections

The Anatomy of A Table View



Carrier 5:36 PM

Edit Bird Sightings +

Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

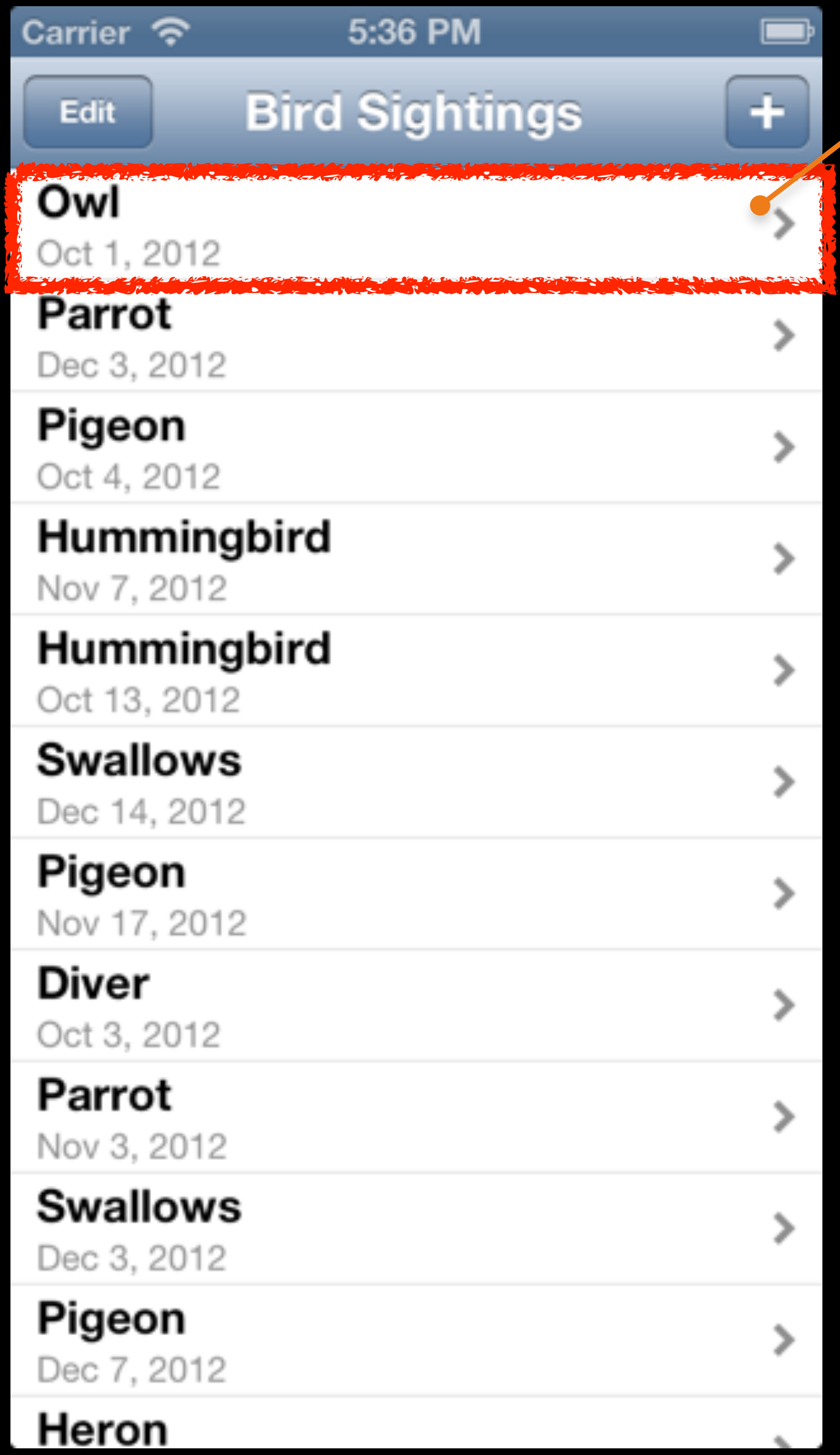
Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

Heron

The Anatomy of A Table View



Carrier 5:36 PM

Bird Sightings

Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

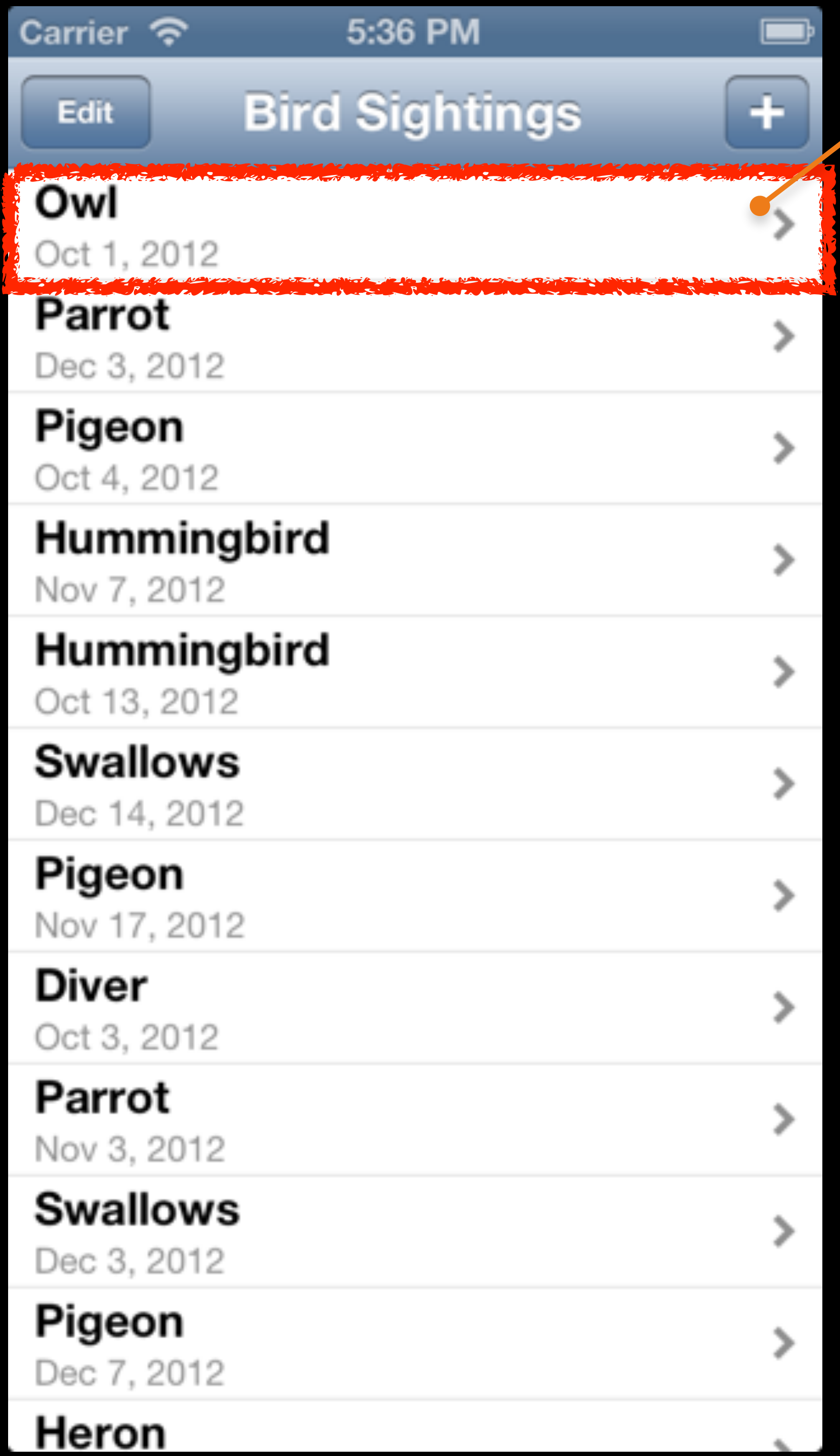
Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

Heron

The Anatomy of A Table View



Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

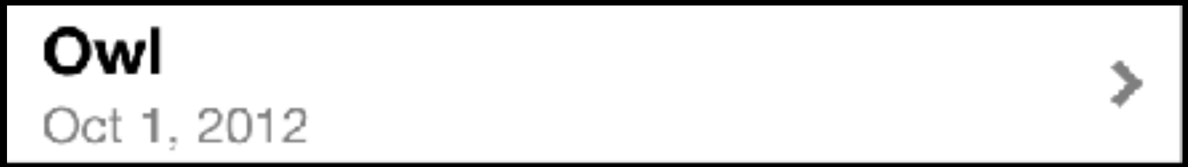
Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

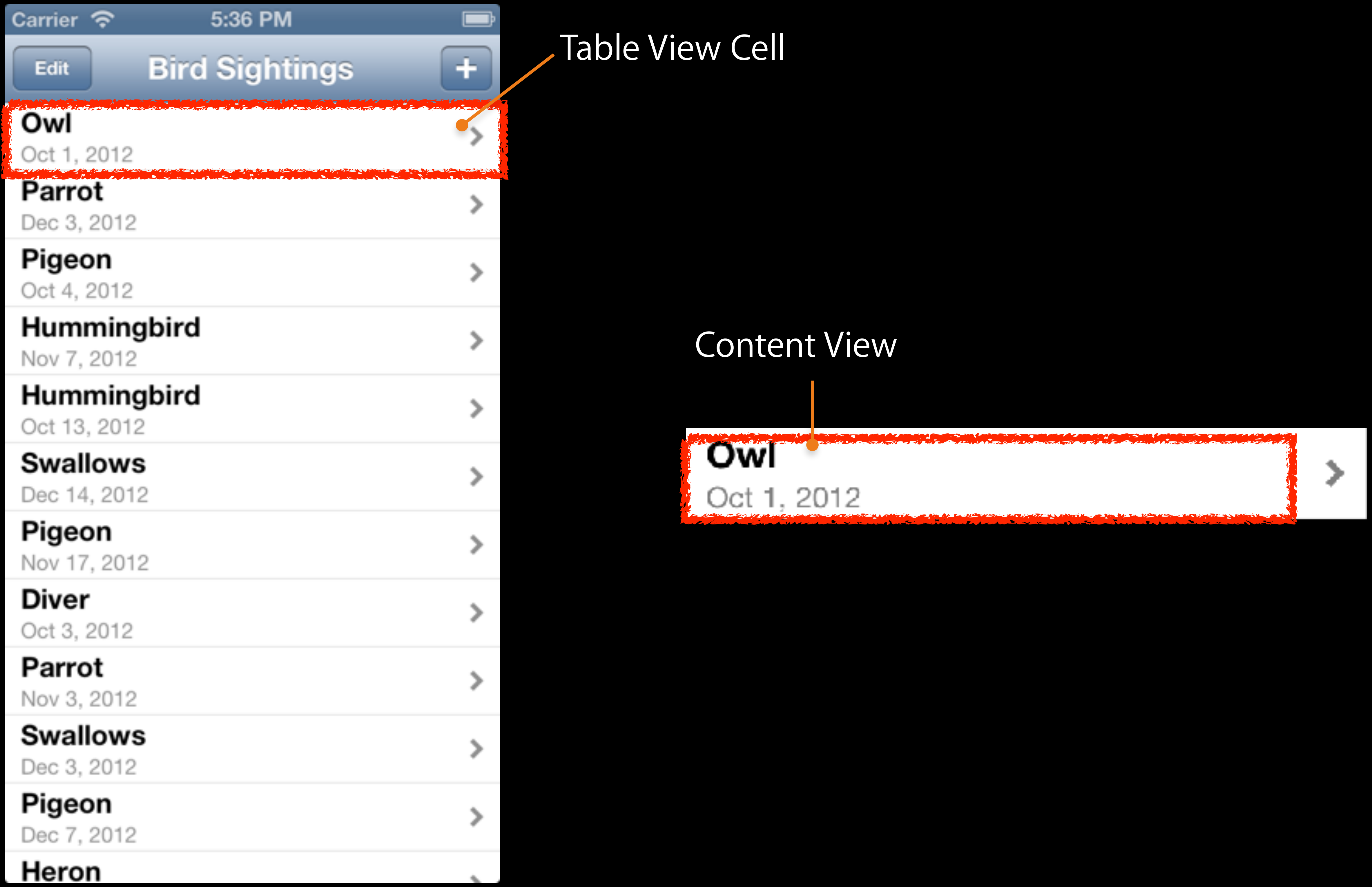
Heron

Table View Cell



Owl
Oct 1, 2012

The Anatomy of A Table View



Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

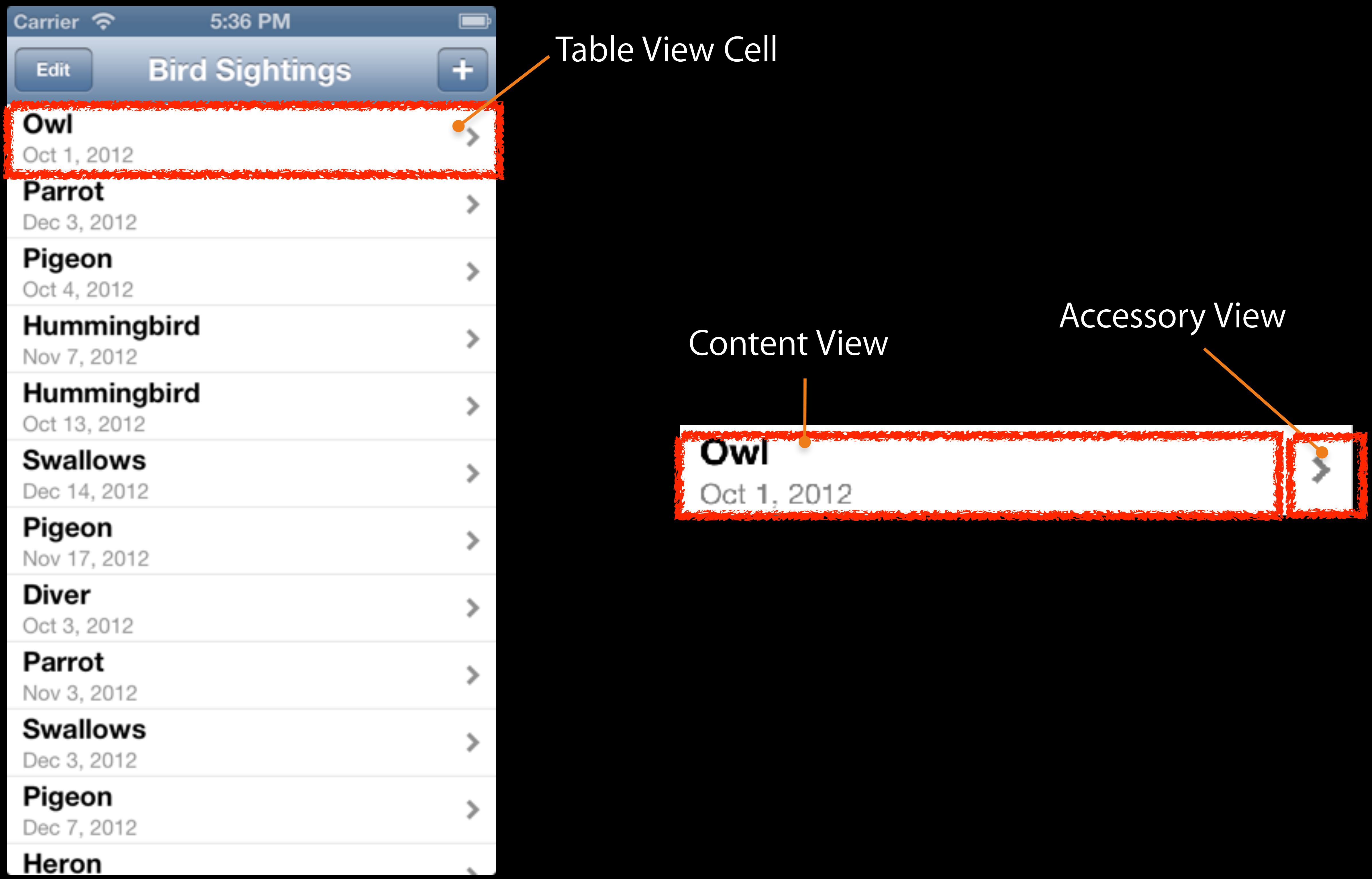
Heron

Table View Cell

Content View

Owl
Oct 1, 2012

The Anatomy of A Table View



Carrier 5:36 PM

Edit Bird Sightings +

Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

Heron

Table View Cell

Content View

Accessory View

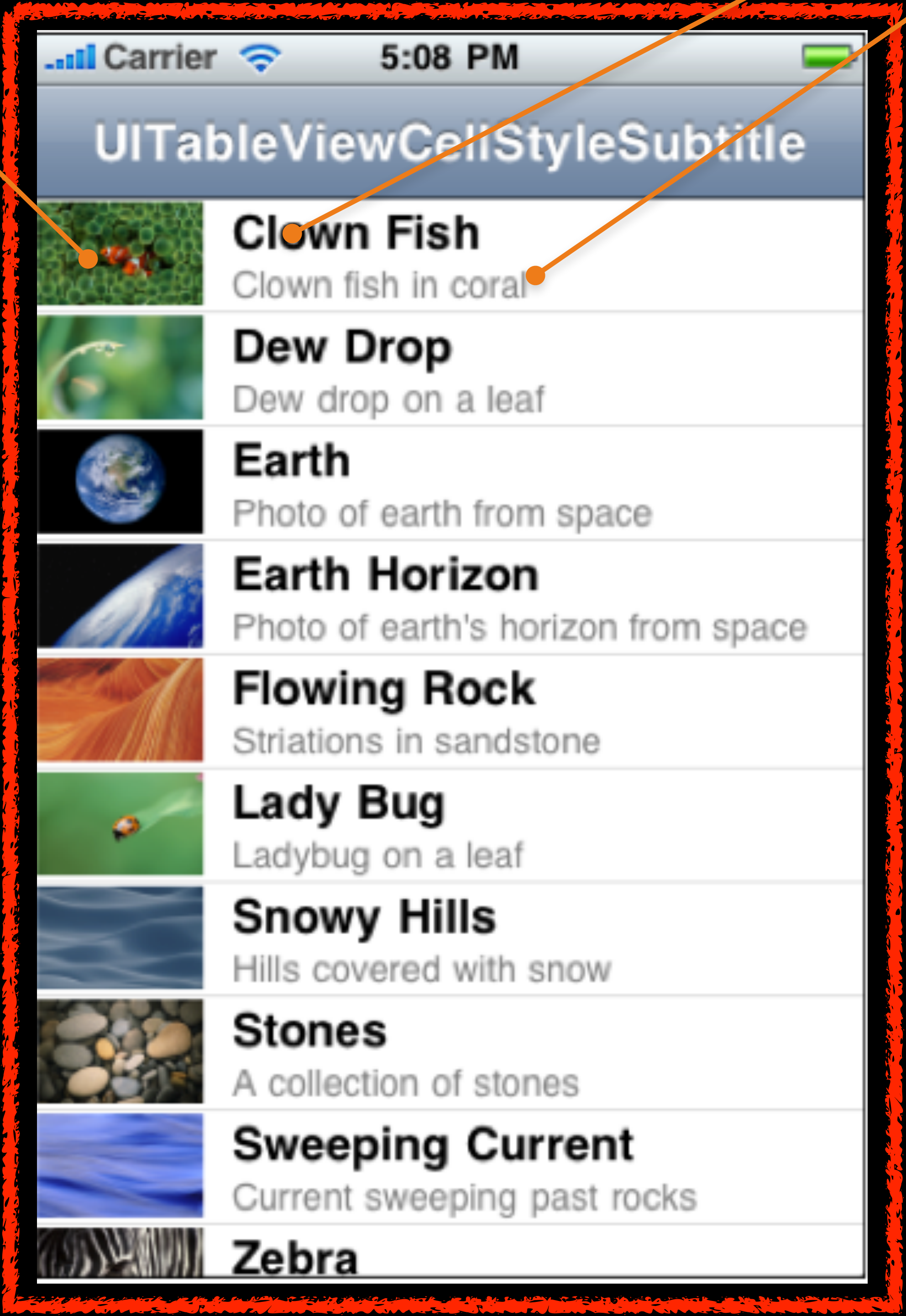
Owl
Oct 1, 2012

Table View Cells

cell.textLabel

cell.detailTextLabel

cell.image



Carrier 5:08 PM

UITableViewCellStyleSubtitle

Clown Fish
Clown fish in coral

Dew Drop
Dew drop on a leaf

Earth
Photo of earth from space

Earth Horizon
Photo of earth's horizon from space

Flowing Rock
Striations in sandstone

Lady Bug
Ladybug on a leaf

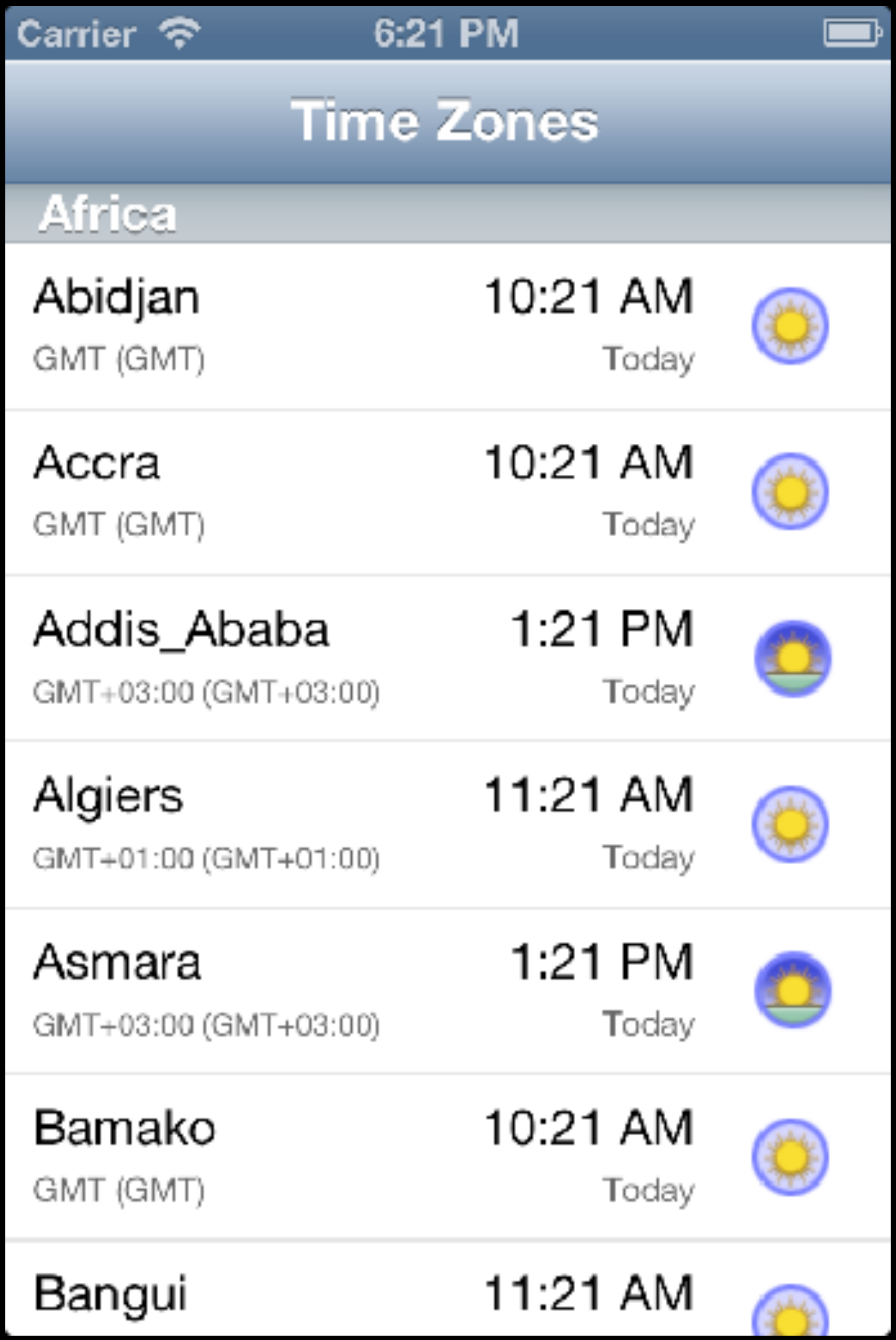
Snowy Hills
Hills covered with snow

Stones
A collection of stones

Sweeping Current
Current sweeping past rocks

Zebra

Standard - Subtitle



Carrier 6:21 PM

Time Zones

Africa

Abidjan 10:21 AM
GMT (GMT) Today

Accra 10:21 AM
GMT (GMT) Today

Addis_Ababa 1:21 PM
GMT+03:00 (GMT+03:00) Today

Algiers 11:21 AM
GMT+01:00 (GMT+01:00) Today

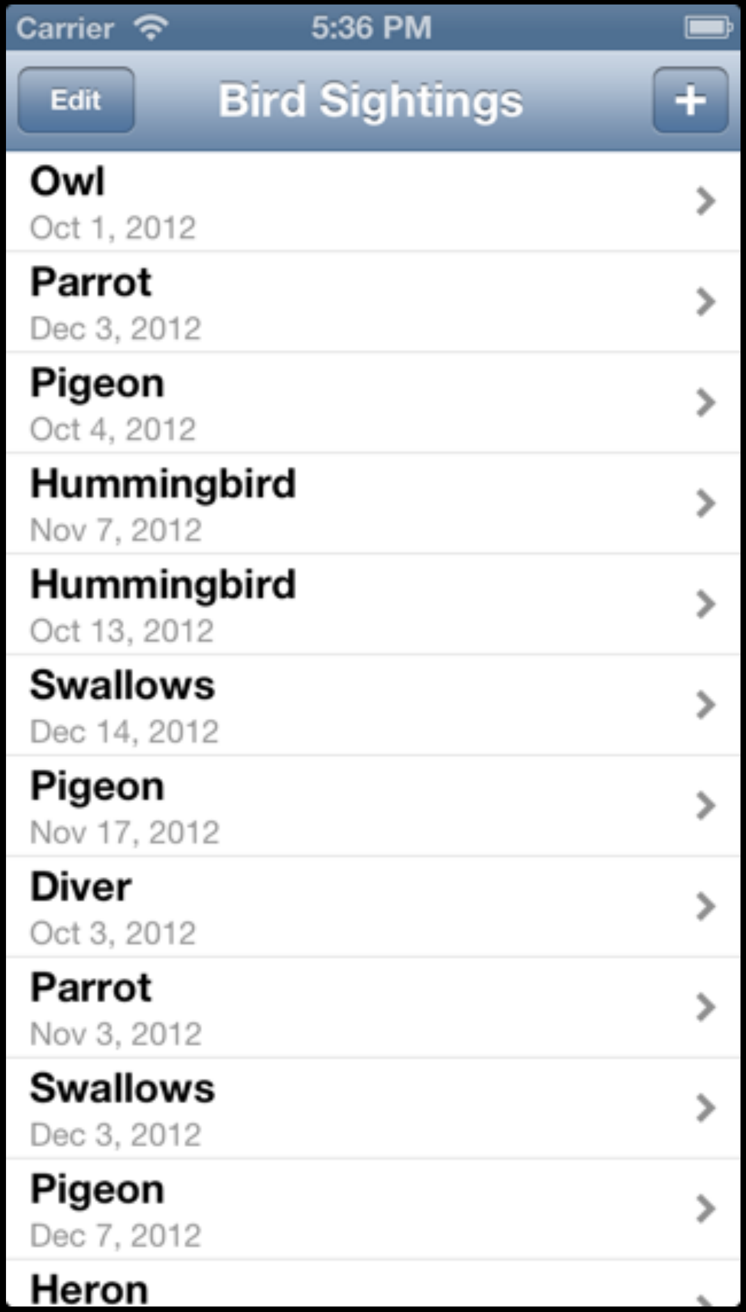
Asmara 1:21 PM
GMT+03:00 (GMT+03:00) Today

Bamako 10:21 AM
GMT (GMT) Today

Bangui 11:21 AM

Custom

Static/Prototype Table View



Owl
Oct 1, 2012

Parrot
Dec 3, 2012

Pigeon
Oct 4, 2012

Hummingbird
Nov 7, 2012

Hummingbird
Oct 13, 2012

Swallows
Dec 14, 2012

Pigeon
Nov 17, 2012

Diver
Oct 3, 2012

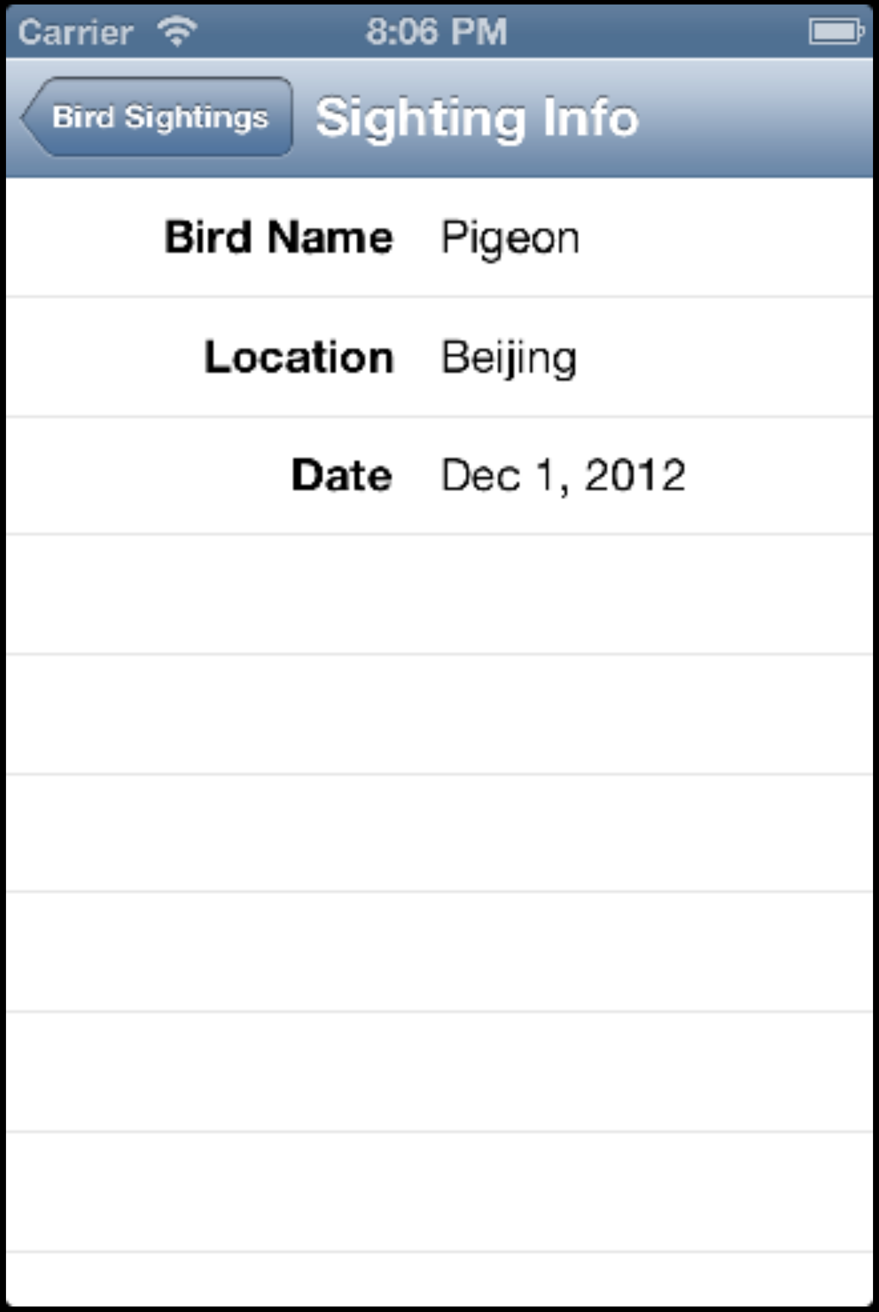
Parrot
Nov 3, 2012

Swallows
Dec 3, 2012

Pigeon
Dec 7, 2012

Heron

Prototype

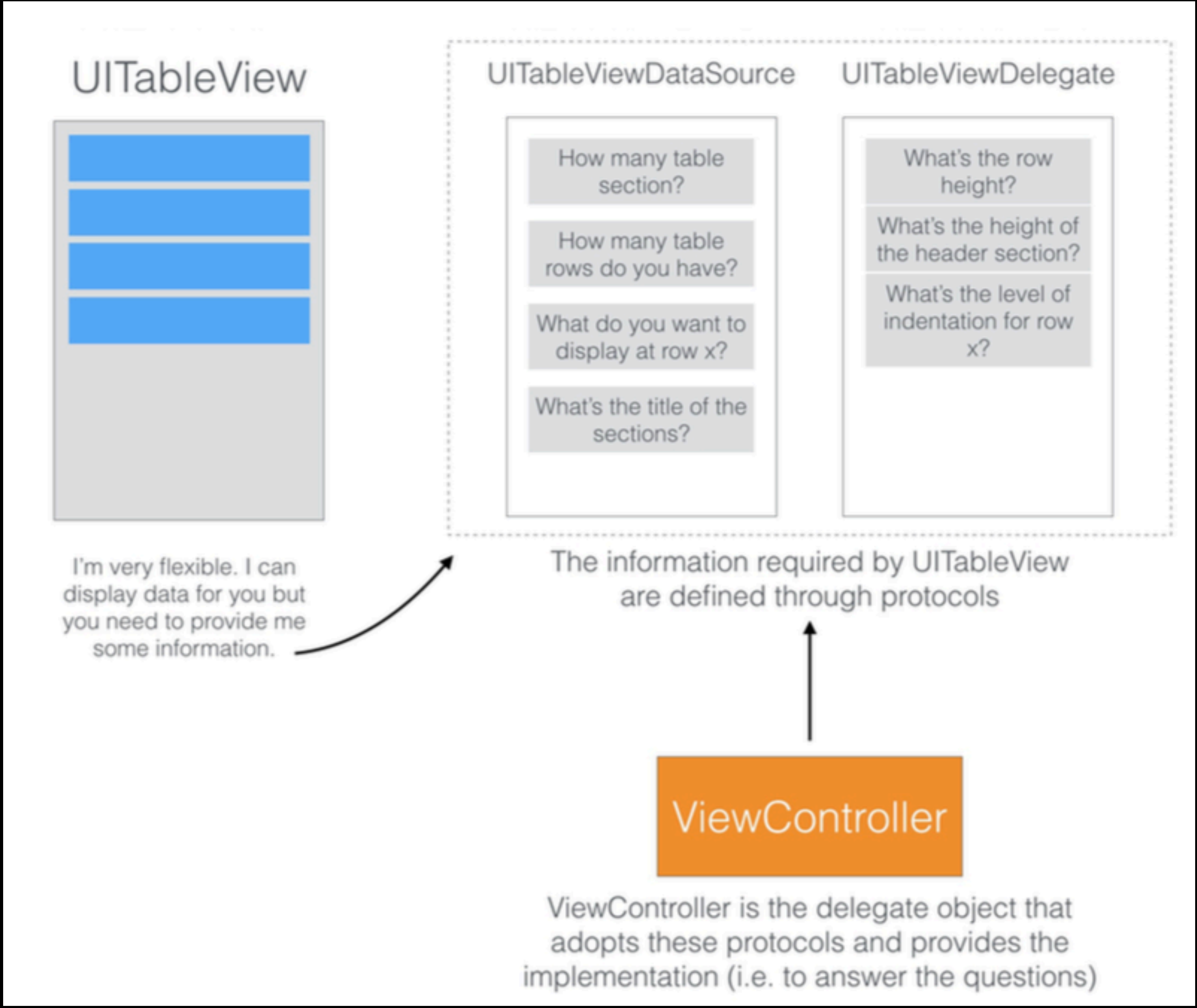


Bird Name	Pigeon
Location	Beijing
Date	Dec 1, 2012

Static

Table View Types

- Prototype - dynamic
  - the number of cells can be changed during run-time
  - The layout of a cell is not changed (to some extent)
  - The content of each cell can be changed
- Static
  - the number of cells and the layout of each cell are pre-defined and never be changed during run- time



UITableView

I'm very flexible. I can display data for you but you need to provide me some information.

UITableViewDataSource

How many table section?

How many table rows do you have?

What do you want to display at row x?

What's the title of the sections?

UITableViewDelegate

What's the row height?

What's the height of the header section?

What's the level of indentation for row x?

The information required by UITableView are defined through protocols

ViewController

ViewController is the delegate object that adopts these protocols and provides the implementation (i.e. to answer the questions)

UITableViewDataSource Protocol

- Required methods
  - `- (NSInteger)tableView:(UITableView *)tableView numberOfRowsInSection:(NSInteger)section;`
  - `- (UITableViewCell *)tableView:(UITableView *)tableView cellForRowAtIndexPath:(NSIndexPath *)indexPath;`
- Optional methods
  - `- (NSInteger)numberOfSectionsInTableView:(UITableView *)tableView;`
  - ……

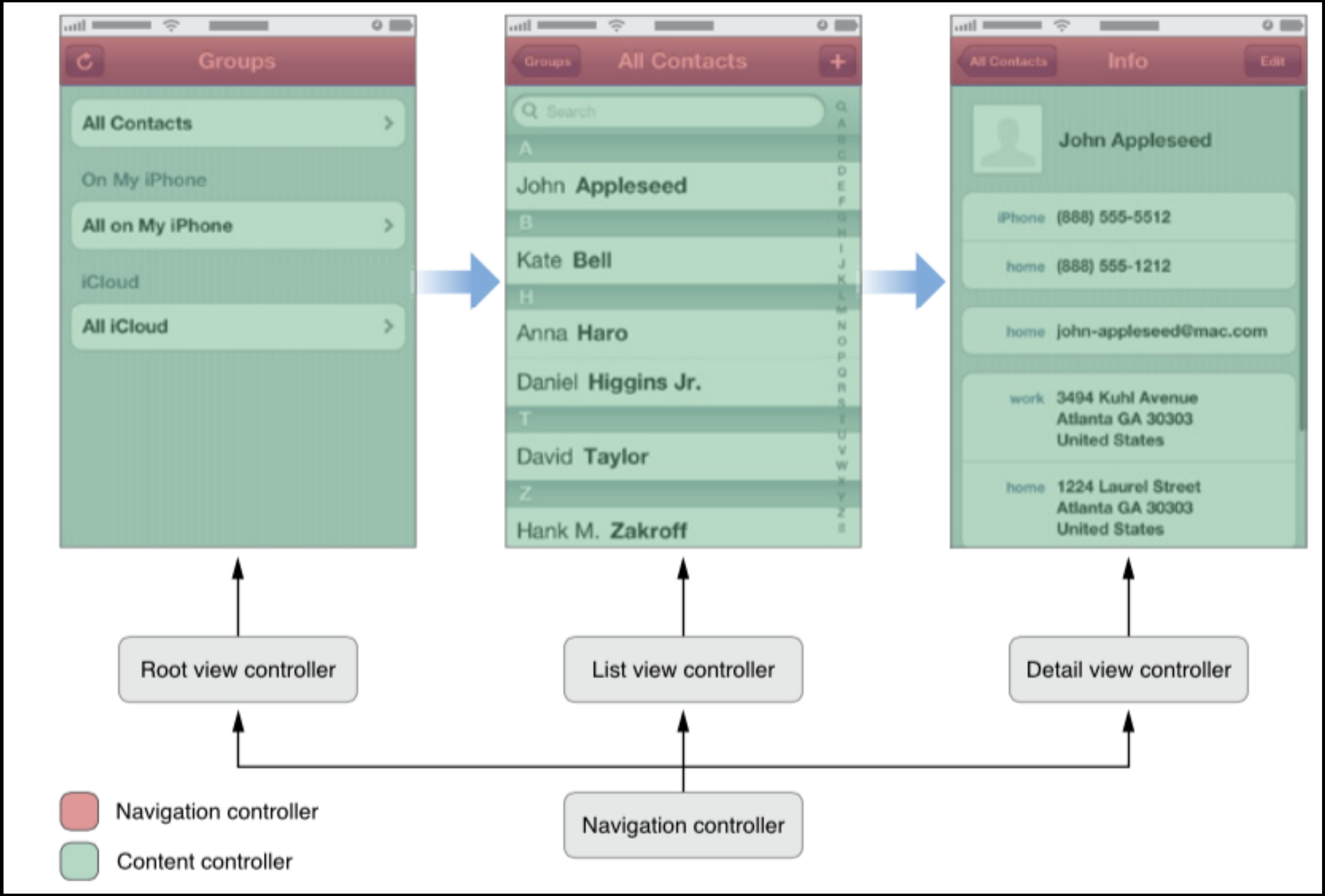
UITableViewDelegate Protocol

- All methods are optional
  - `- (BOOL)tableView:(UITableView *)tableView canEditRowAtIndexPath:(NSIndexPath *)indexPath;`
  - `- (void)tableView:(UITableView *)tableView didSelectRowAtIndexPath:(NSIndexPath *)indexPath;`

Navigation Controllers

UINavigationController

A drill-down interface for hierarchical content



Root view controller

List view controller

Detail view controller

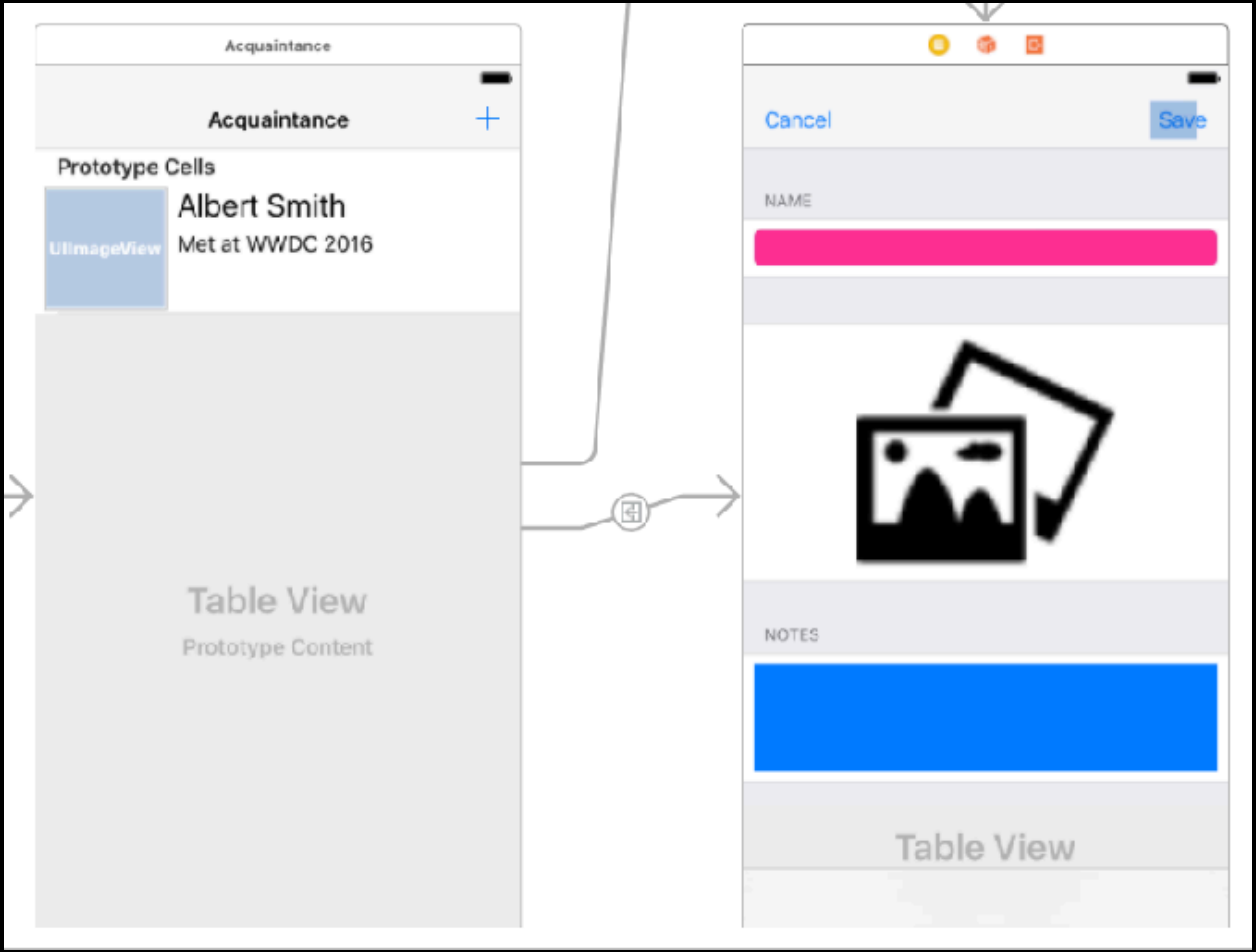
Navigation controller

🟥 Navigation controller

🟩 Content controller

What’s a Segue?

- A segues connects two scenes and manages the transition from one scene to another



Types of segue

- **Show** - the new view controller is pushed on top of the current view controller stack
    - A back button is displayed for navigating back
- **Show detail** - the new view controller in the detail view controller replaces the top of the current view controller stack
    - No navigation bar and back button for navigating back
- **Present modally** - the new view controller is presented modally, e.g., animated up from the bottom to cover the entire screen
- **Present as popover** - the new view controller is presented as a popover anchored to an existing view
    - Commonly found in iPad apps, but can be used in iPhone too

- “Table View Programming Guide for iOS”
- “View Controller Programming Guide for iOS”