PG5600
iOS programmering
Lesson # 5

Review

— Set up a new iOS project in XCode
— Components of an iOS app
— Launch flow
— Application lifecycle
— MVC
— UIView & UIViewController

Agenda

— Delegate pattern
— UINavigationController
— UITableView & UITableViewController
— UICollectionView & UICollectionViewController
— Auto Layout
— Unified Storyboard & Size classes

Delegate pattern

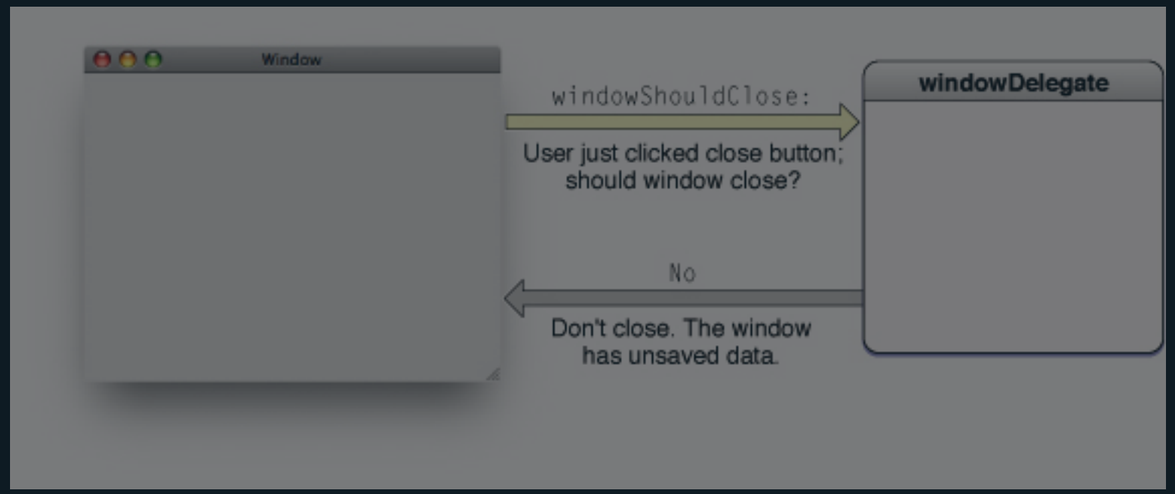
— Design pattern to get an object to delegate parts of its tasks to another object

— The delegate object holds a reference to another object called the delegate

— The delegating object calls one or more methods on the delegate

— Delegate patterns are widely used in Cocoa Touch

Delegate pattern (Cont'd)



Delegate pattern (Cont'd)

What is needed?

Delegate pattern (Cont'd)

1: A protocol

```
protocol DataHandlerProtocol {
    func didFinishGetting(data: NSData)
    func didFailGettingData(error: NSError)
}
```

Delegate pattern (Cont'd)

2: A delegate that implements the protocol

```
class A : DataHandlerProtocol {
    func didFinishGetting(data: NSData) {
        print(data)
    }

    func didFailGettingData(error: NSError) {
        print(error)
    }
}
```

Delegate pattern (Cont'd)

3: A delegating object

```
class Fetcher {
    var delegate: DataHandlerProtocol?

    func fetch() {
        delegate?.didFinishGetting(NSData())
    }
}
```

Delegate pattern (Cont'd)

Delegate-pattern by a lot of classes, some of the well known ones are:

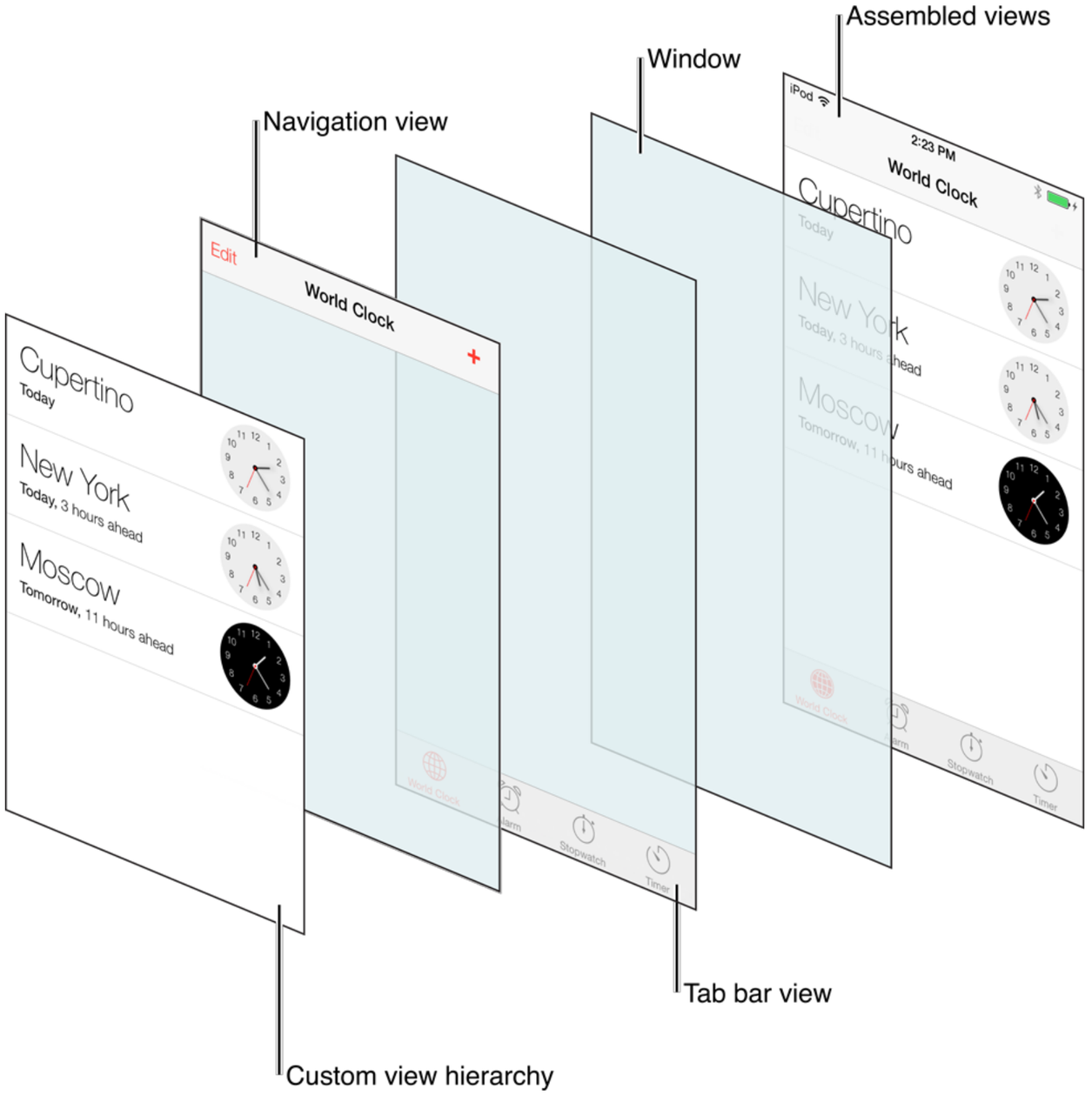
— UINavigationController
— UITableView
— UICollectionView

UINavigationController

— One of the standard components
— Keeps on a collection of UIViewController's
— A UINavigationController coordinates navigation between UIViewController
— In addition to navigation, it is also responsible for a UINavigationBar and a UIToolbar

UINavigationController (Cont'd)

Note that:
- A UINavigationController keeps a collections of UIViewController
- A UIViewController (not UINavigationController) keeps a collection of views

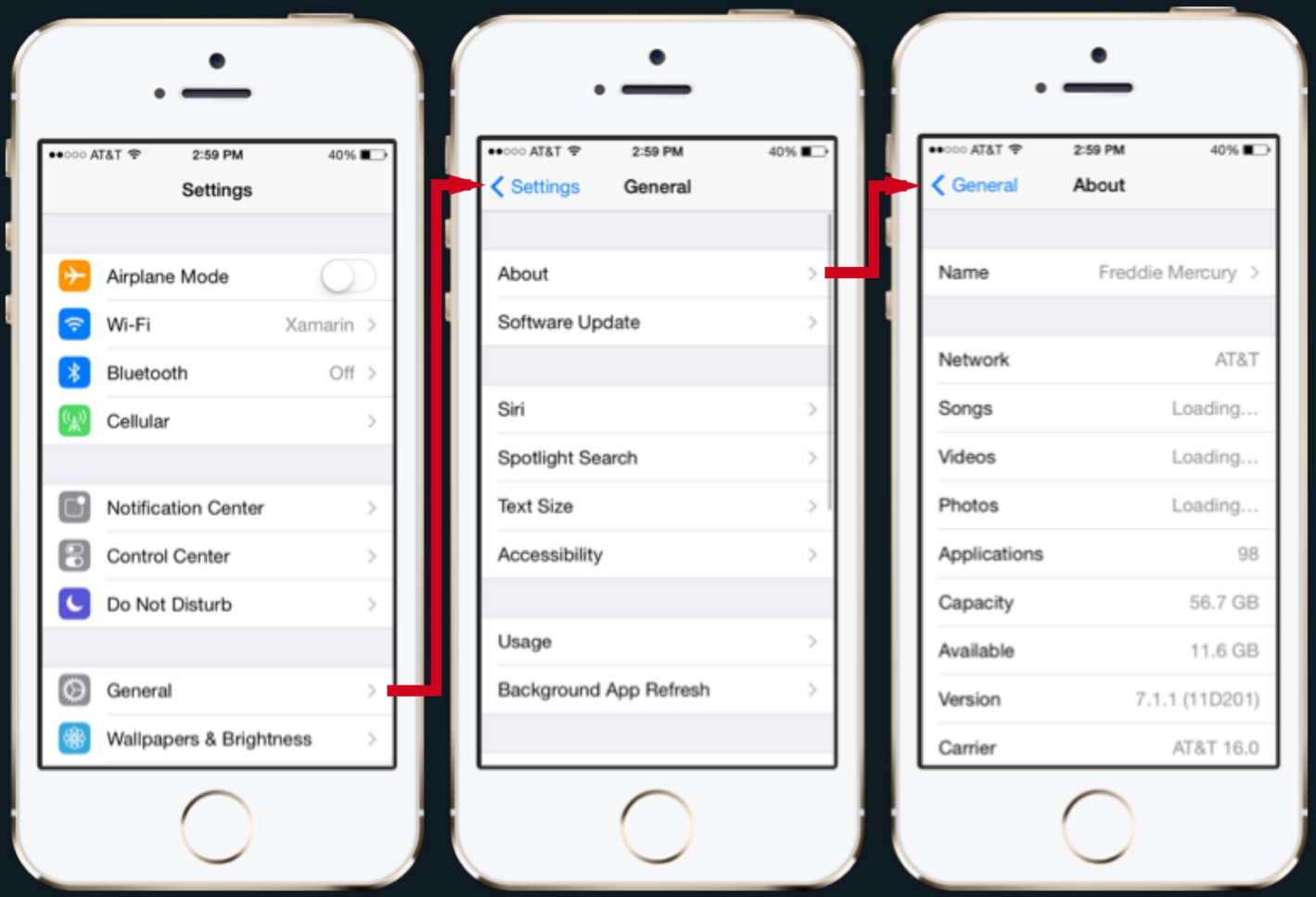

Assembled views
Window
Navigation view
Tab bar view
Custom view hierarchy
iPod
2:23 PM
World Clock
Edit
Cupertino
Today
New York
Today, 3 hours ahead
Moscow
Tomorrow, 11 hours ahead
World Clock
Alarm
Stopwatch
Timer

UINavigationController (Cont'd)

UIViewController is handled by UINavigationController by:

— Push & pop UIViewController on/off the UINavigationController view stack
— When a view is pushed, the new one comes in from the right
— When a view is popped, the view leaves to the right
— If you use storyboard, all this will be handled automatically

UINavigationController (Cont'd)



UINavigationController (Cont'd)

Can I do it in code?

```
# Presents a modal
let rootViewController = UIViewController()
var aNavigationController = UINavigationController(rootViewController: rootViewController)
presentViewController(aNavigationController animated:true, completion: nil)
```

Push & pop

```
var viewController = UIViewController()
navController.pushViewController(viewController, animated: true)
navController.popViewControllerAnimated(true)
```

UIButton & UINavigationBar

```
class ViewController: UIViewController {
    override func viewDidLoad() {
        super.viewDidLoad()

        var rightButton = UIBarButtonItem(
          barButtonSystemItem: UIBarButtonSystemItem.Add,
          target: self,
          action: #selector(buttonTouched:)
        )

        self.navigationItem.rightBarButtonItem = rightButton;
    }

    func buttonTouched(sender: AnyObject) {
        self.navigationController?.pushViewController(ViewController(), animated: true)
    }
}
```

UILabel/Title & UINavigationBar

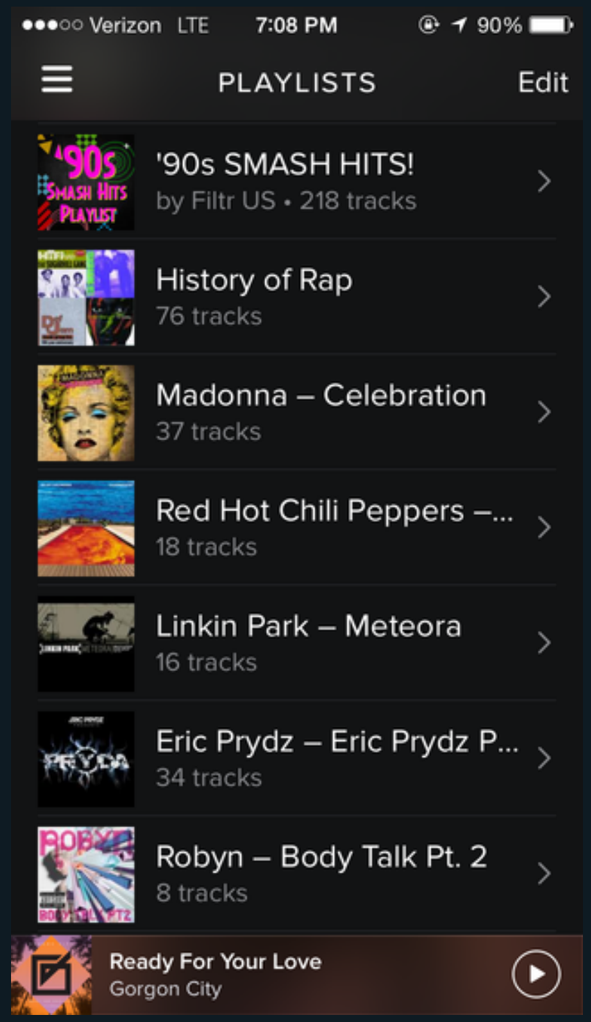
```
class ViewController: UIViewController {
    override func viewDidLoad() {
        super.viewDidLoad()

        self.navigationItem.title = "Test title"
    }
}
```

UITableView & UITableViewController

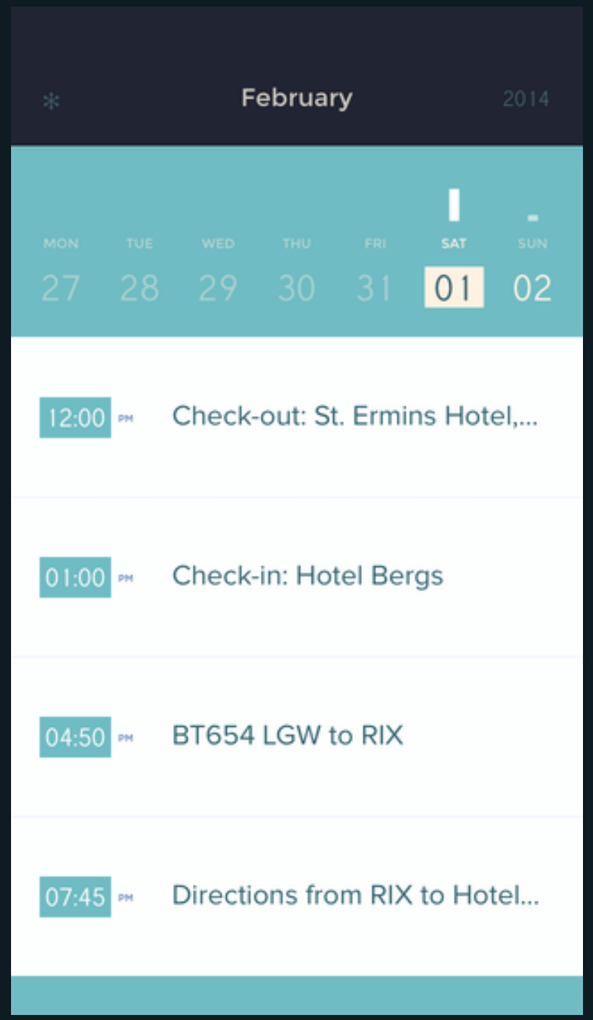
Some uses include:

— Navigating hierarchical data
— Presenting a list of elements
— Display detailed information and controls in visual groupings
— View selectable options

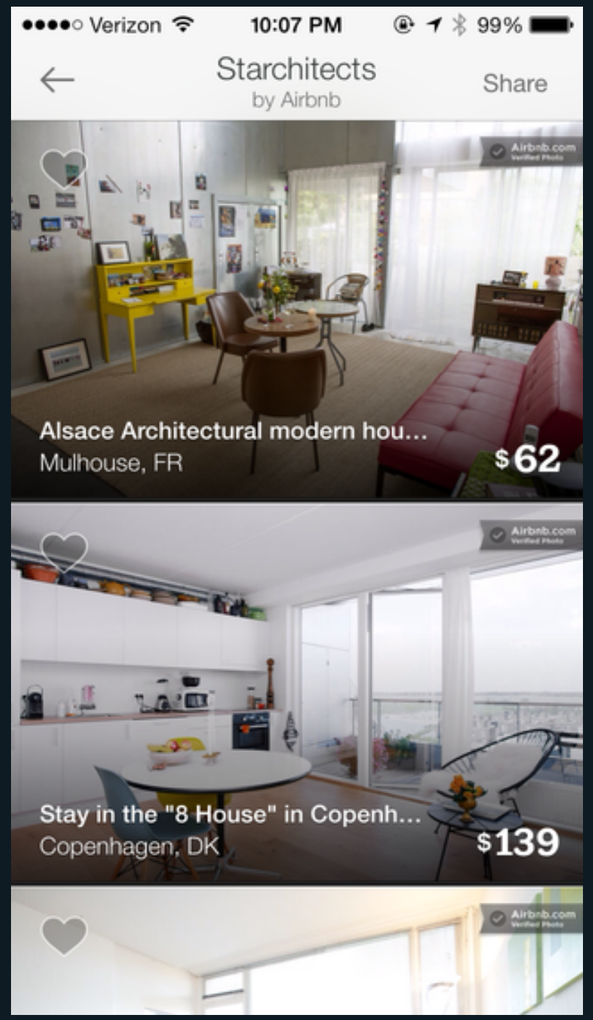
Spotify


Verizon LTE 7:08 PM 90%
PLAYLISTS
Edit
'90s SMASH HITS!
by Filtr US • 218 tracks
History of Rap
76 tracks
Madonna – Celebration
37 tracks
Red Hot Chili Peppers –...
18 tracks
Linkin Park – Meteora
16 tracks
Eric Prydz – Eric Prydz P...
34 tracks
Robyn – Body Talk Pt. 2
8 tracks
Ready For Your Love
Gorgon City

Peek

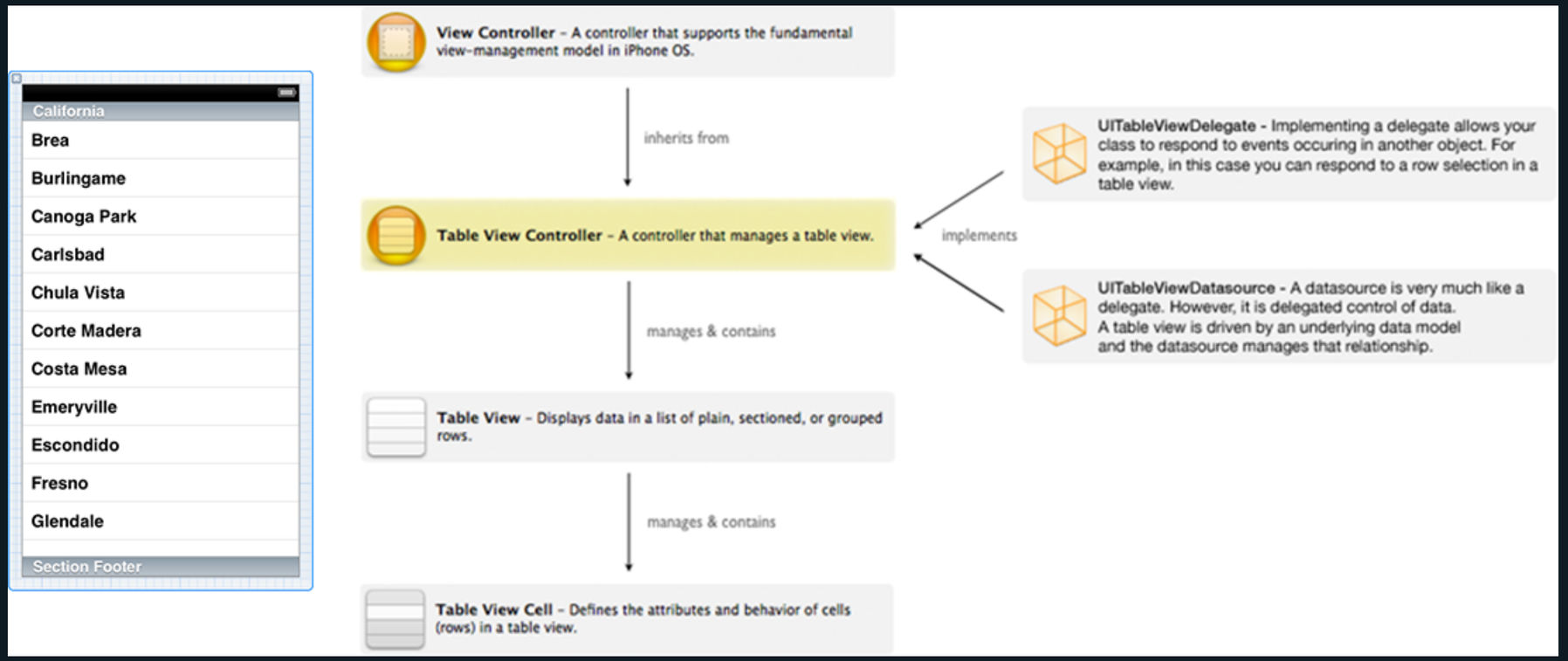

February
2014
MON 27
TUE 28
WED 29
THU 30
FRI 31
SAT 01
SUN 02
12:00 PM
Check-out: St. Ermins Hotel,...
01:00 PM
Check-in: Hotel Bergs
04:50 PM
BT654 LGW to RIX
07:45 PM
Directions from RIX to Hotel...

Airbnb


Verizon
10:07 PM
99%
Starchitects
by Airbnb
Share
Alsace Architectural modern hou...
Mulhouse, FR
$62
Stay in the "8 House" in Copenh...
Copenhagen, DK
$139

Features and Content

- Each row consists of a UITableViewCell
- Comes with some pre-defined designs (can make custom designs too)
- Can respond to clicking on a cell
- Has implemented editing capabilities:
  - Add
  - Remove
  - Reorganise


California
Brea
Burlingame
Canoga Park
Carlsbad
Chula Vista
Corte Madera
Costa Mesa
Emeryville
Escondido
Fresno
Glendale
Section Footer
View Controller – A controller that supports the fundamental view-management model in iPhone OS.
inherits from
Table View Controller – A controller that manages a table view.
manages & contains
Table View – Displays data in a list of plain, sectioned, or grouped rows.
manages & contains
Table View Cell – Defines the attributes and behavior of cells (rows) in a table view.
implements
UITableViewDelegate - Implementing a delegate allows your class to respond to events occuring in another object. For example, in this case you can respond to a row selection in a table view.
UITableViewDatasource - A datasource is very much like a delegate. However, it is delegated control of data. A table view is driven by an underlying data model and the datasource manages that relationship.

But how to put data before navigating? From the previous view controller!

```
// remmeber this?
destinationViewController as? ReceivingViewController {
    vc.message = message.text
}
```

UICollectionView

— Is a more flexible alternative to UITableView
— Changes are made using subclassing
— You can implement grid, stack, circular layout
— Or anything else you can cook up

Edit

World Clock

Cupertino

Today

New York

Today, 3 hours ahead

Paris

Today, 9 hours ahead

Beijing

Tomorrow, 15 hours ahead

Tokyo

Tomorrow, 16 hours ahead

Moscow

Tomorrow, 11 hours ahead


Cell
Paris
Chamonix
Decoration view
Supplementary view

UICollectionViewController components

1: UICollectionView

Main view containing all the other views. This is very similar to UITableView

UICollectionViewController components (Cont'd)

2: UICollectionViewCell

Like UITableViewCell in UITableView. Cells can be created programmatically or via the interface builder (IB)

UICollectionViewController components (Cont'd)

3: Supplementary Views
You can add multiple views that are not cells
This is typicaly views at the top and bottom (header and footer)

UICollectionViewController components (Cont'd)

4: Decoration View

views that add no functionality, but are intended to make the collection view visually more beautiful

UICollectionViewController components (Cont'd)

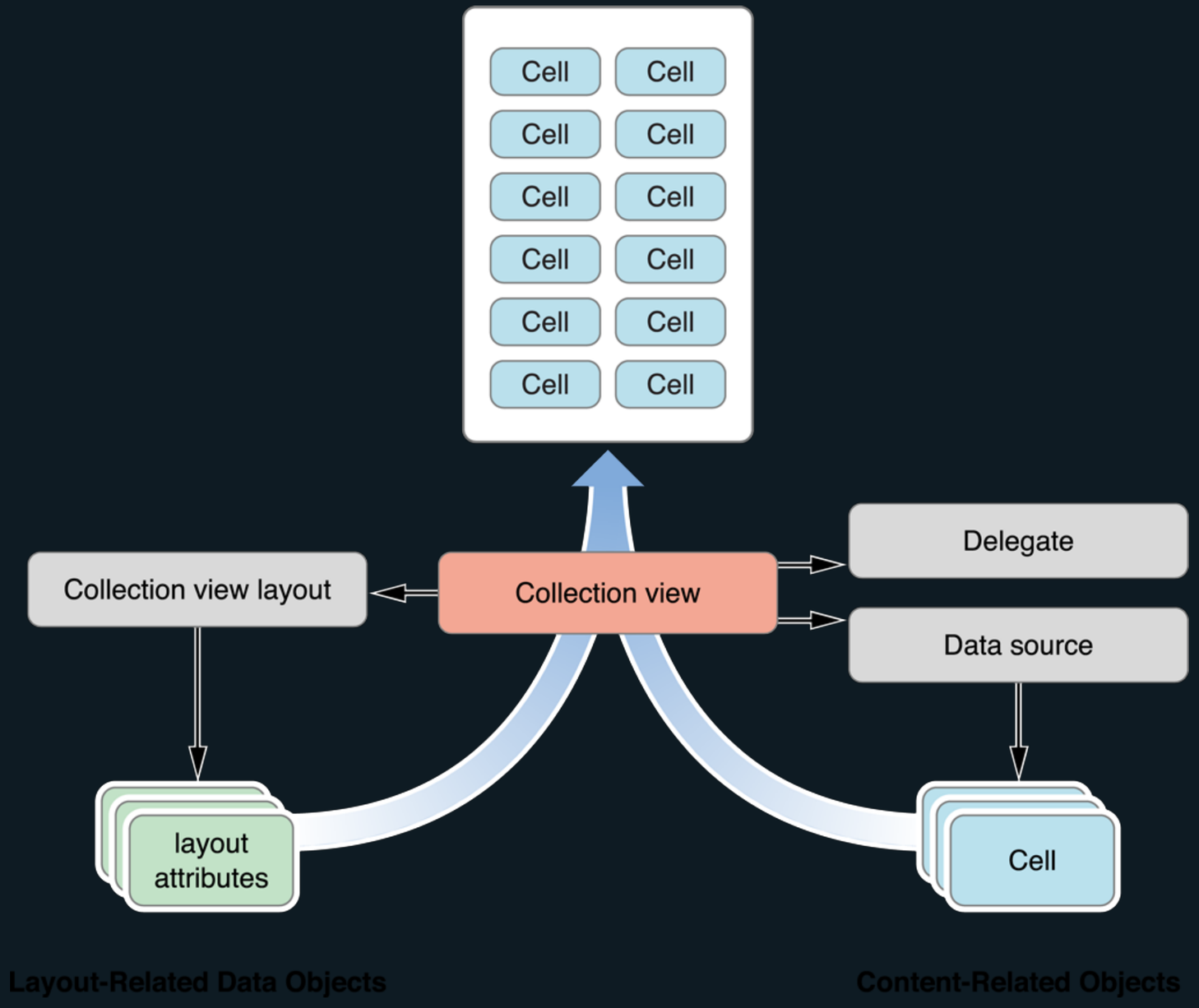
5: UICollectionViewLayout

Determines how the layout of the cells should be

Layout can be replaced runtime

UICollectionViewFlowLayout

Apple has created a custom layout that comes with collection views


Cell
Cell
Cell
Cell
Cell
Cell
Cell
Cell
Cell
Cell
Cell
Cell
Collection view layout
Collection view
Delegate
Data source
layout attributes
Cell
Layout-Related Data Objects
Content-Related Objects

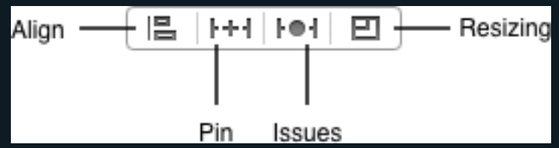
Auto Layout

- Build your user interface based on a set of rules
- You define the rules using Auto Layout
- The goal is to create a dynamic interface that responds to changes in size, orientation and location (language)
- Auto Layout is built into the Interface Builder

Auto Layout (Cont'd)

- Constant value - The physical size or offset in the number of points for the rule
- Relational - Use relationships and greater than, less than or equal to specify, for example, that a view's width >= 20, or that a textview.leading >= (superview.leading + 20).
- priority Level - Rules can have priority, so some may be less imporant than others. The priority set to max by default

Interface builder, point and click



Programatically

```
// Visual Format Language
let views = ["button1": UIButton(), "button2": UIButton()]
var constraints = NSLayoutConstraint.constraintsWithVisualFormat(
  "[button1]-[button2]",
  options: NSLayoutFormatOptions.AlignAllBaseline,
  metrics: nil,
  views: views
)
```

Alternatives are also available (not part of the course)

— https://github.com/robb/Cartography
— https://github.com/PureLayout/PureLayout
— https://github.com/SnapKit/Masonry

It's recommended to do autolayout in storyboard

Enable and disable on NSLayoutConstraint

```
var active: Bool

class func activateConstraints(constraints: [AnyObject])

class func deactivateConstraints(constraints: [AnyObject])
```

Potential problems

- Missing of rules
- The view in the inferface builder is placed somewhere else the rules will place it
- Conflicts
- Ambiguity - when there are multiple solutions for a view based on the rules

Demo

Constraints & Interface Builder

View debugging, press pause

Unified Storyboard & Size classes

What is it?

A way to make it easier to support multiple screen sizes

Unified Storyboard & Size classes (Cont'd)

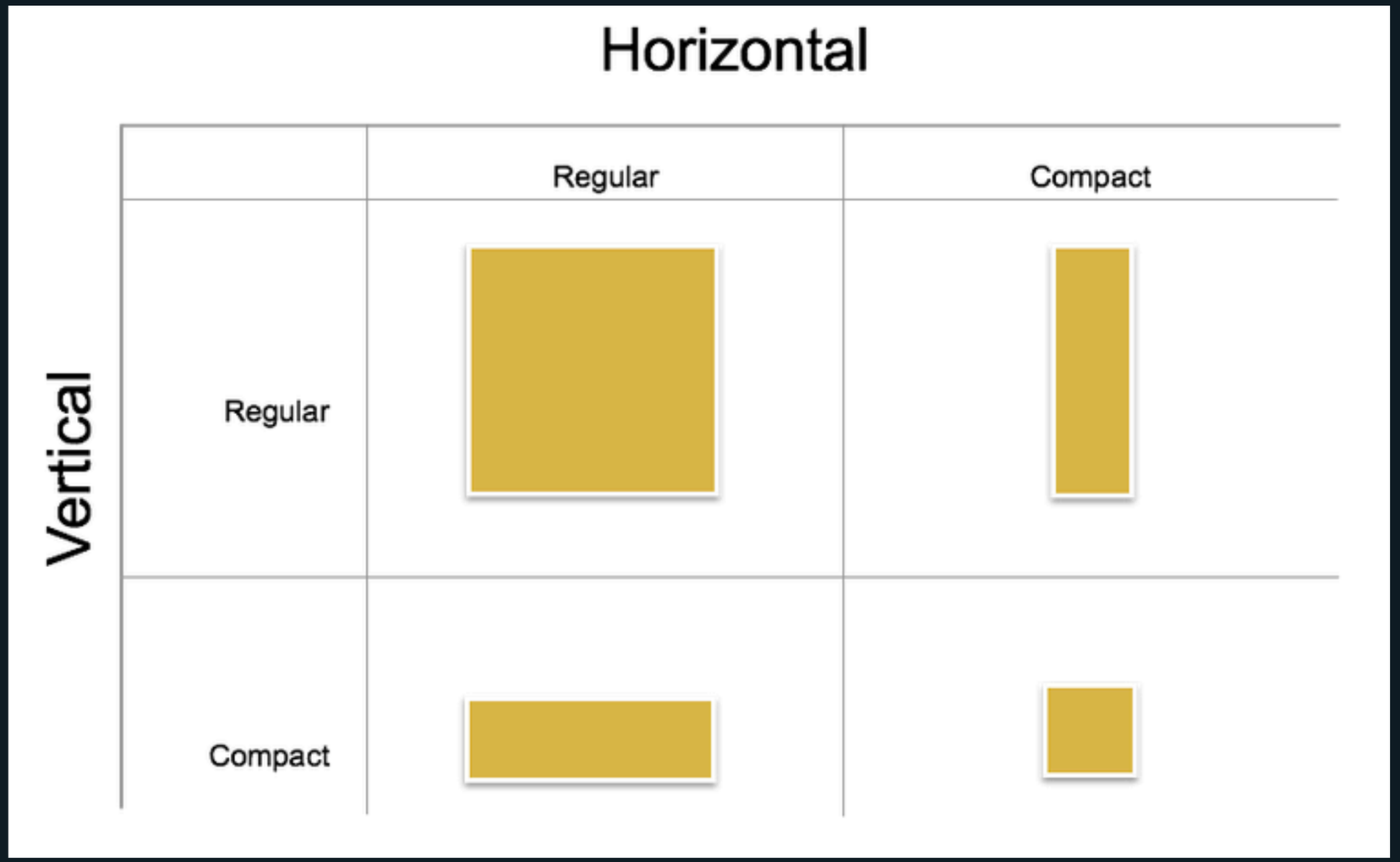
Why?

Apps should adapt to changing orientation and screen size to provide a better user experience

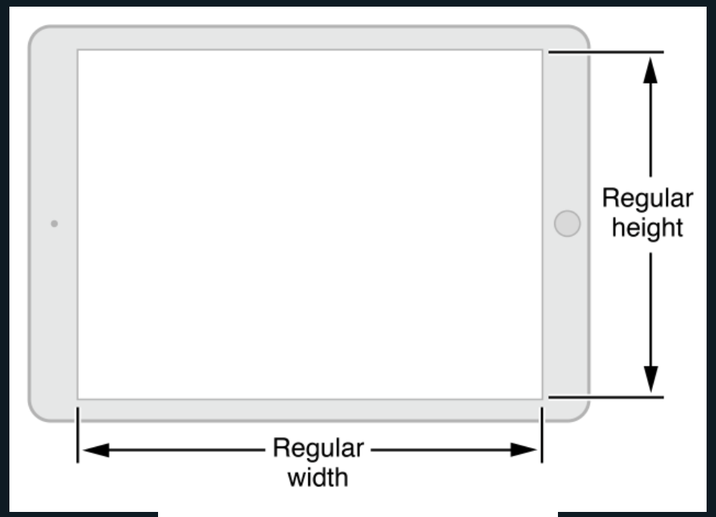
Size classes

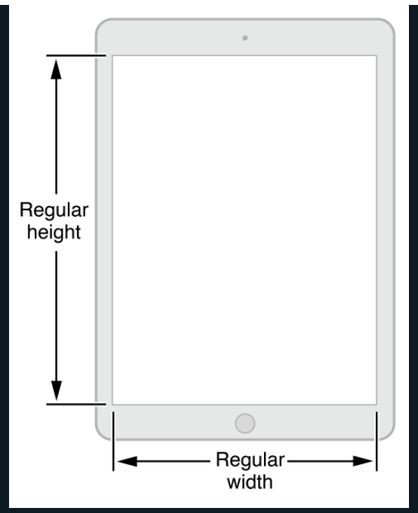
— Regular - Represents a lot of screen space
— Compact - Represents little screen space

Size classes (Cont'd)

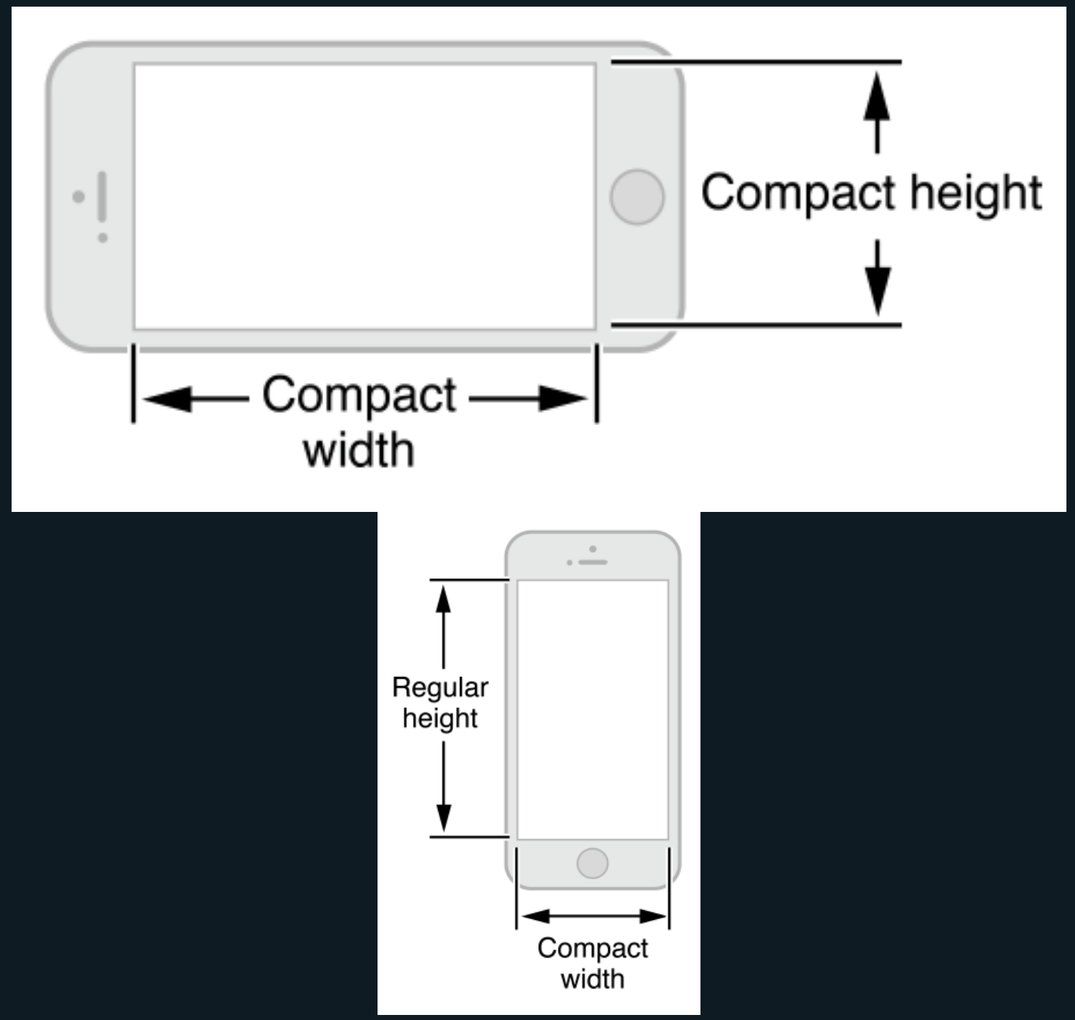


Size classes (Cont'd)





Size classes (Cont'd)



Further reading

— Chapter 6 i iOS 8 Swift Programming Cookbook
— View Controller programming guide - Apple docs
    — The adaptive model