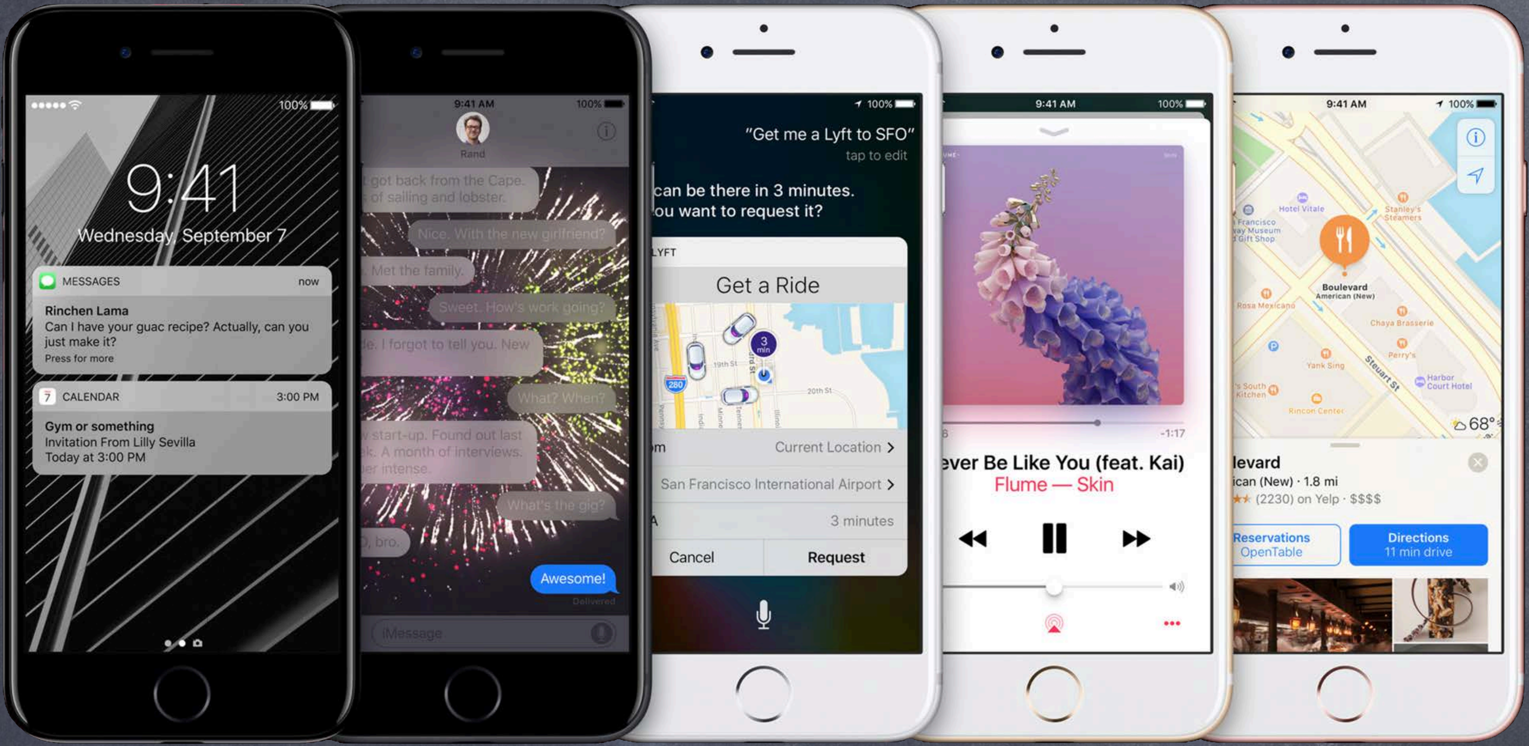


Stanford CS193p

Developing Applications for iOS
Winter 2017

Today

- Autolayout
  - Review
  - Size Classes
  - Demos

Autolayout

- You've seen a lot of Autolayout already
  - Using the dashed blue lines to try to tell Xcode what you intend
  - Reset to Suggested Constraints (if the blue lines were enough to unambiguously set constraints)
  - Size Inspector (look at (and edit!) the details of the constraints on the selected view)
  - Clicking on a constraint to select it then bring up Attributes Inspector (to edit its details)
- What else?
  - Ctrl-dragging can be done between views, not just to the edges
  - There are "pin" and "arrange" menus in the lower right corner of the storyboard
  - Document Outline is the place to go to resolve conflicting constraints
- Mastering Autolayout requires experience
  - You just have to do it to learn it
- Autolayout can be done from code too
  - Though you're probably better off doing it in the storyboard wherever possible

Autolayout

- What about rotation?
  - Sometimes rotating changes the geometry so drastically that autolayout is not enough
  - You actually need to reposition the views to make them fit properly
- Calculator
  - For example, what if we had 20 buttons in a Calculator?
  - It might be better in Landscape to have the buttons 5 across and 4 down
  - Versus in Portrait have them 4 across and 5 down
- View Controllers might want this in other situations too
  - For example, your MVC is the master of a side-by-side split view
  - In that case, you'd want to draw just like a Portrait iPhone does
- The solution? Size Classes
  - Your View Controller always exists in a certain "size class" environment for width and height
  - Currently this is either Compact or Regular (i.e. not compact)

Autolayout

- iPhone
  iPhones in Portrait are Compact in width and Regular in height
  But in Landscape, most iPhones are treated as Compact in both dimensions
- iPhone 6+ and 7+
  The iPhone Plus in Portrait orientation is also Compact in width and Regular in height
  But in Landscape, it is Compact in height and Regular in width
- iPad
  Always Regular in both dimensions
  An MVC that is the master in a side-by-side split view will be Compact width, Regular height
- Extensible
  This whole concept is extensible to any "MVC's inside other MVC's" situation (not just split view)
  An MVC can find out its size class environment via this method in `UIViewController` …

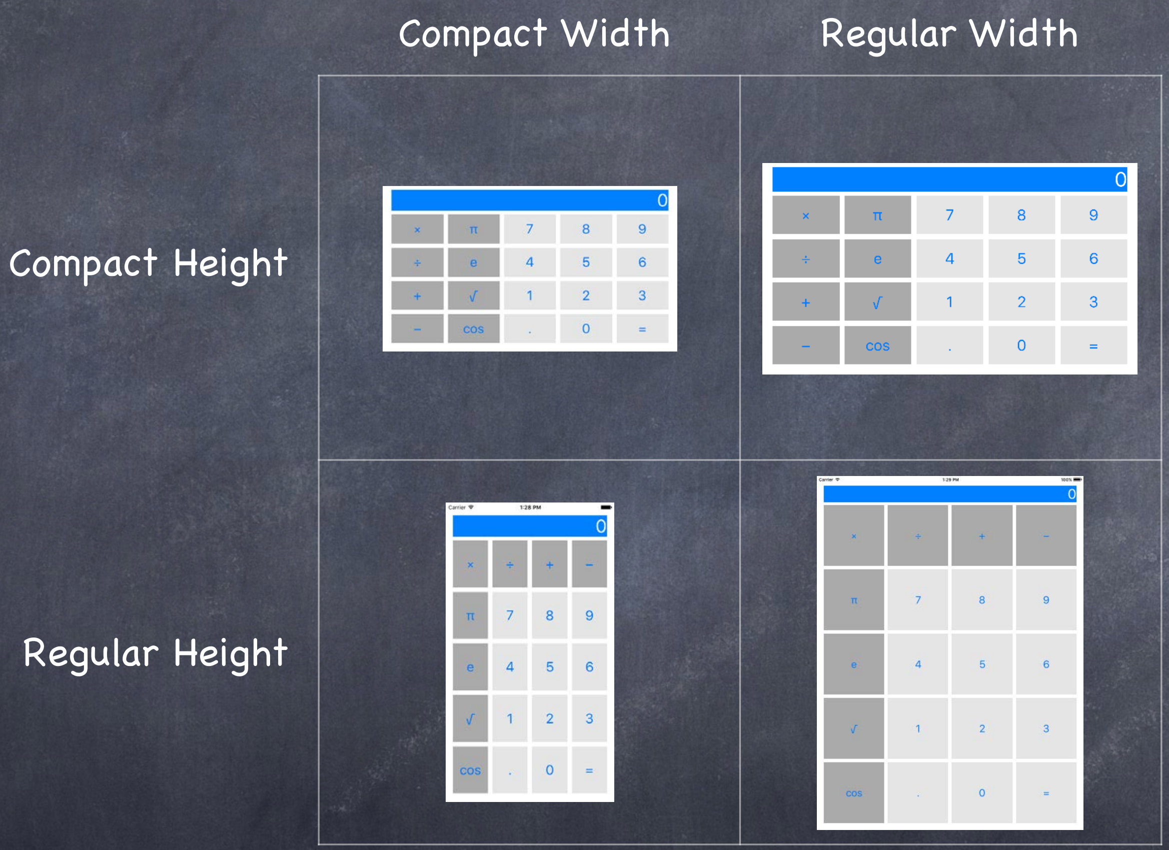
```
let mySizeClass: UIUserInterfaceSizeClass = self.traitCollection.horizontalSizeClass
```

  The return value is an enum `.compact` or `.regular` (or `.Unspecified`).

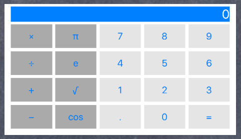
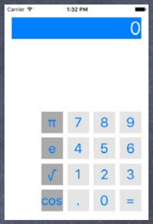
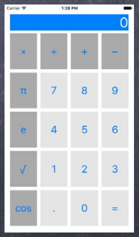
Size Classes

	Compact Width	Regular Width
Compact Height	iPhones (non-Plus) in Landscape	iPhone Plus in Landscape
Regular Height	iPhones in Portrait or Split View Master	iPads Portrait or Landscape

Size Classes



Size Classes

	Compact Width	Any Width	Regular Width
Compact Height			
Any Height			
Regular Height			

Demo

- Calculator

  Let's make our Calculator adjust to the size class environment it's in