TODAY

• Test!
• Scrollviews
• Images

NUTS AND BOLTS

The Test:
• gradescope, called Midterm2:
  • will be “published”/available from 6am to 6pm on Tuesday
  • two hour limit once you open it up
• open book and computer
NUTS AND BOLTS

Practice exams:
• posted on piazza @412
• note that these are from last year, where:
  • topics were covered in different orders
  • total coverage was different
  • very different testing procedure.
• What kind of questions will you see?
  • multiple choice
  • multiple choice w/ more than one answer
  • short answer
  • code (have Xcode available!)
    • if for some reason your machine is dead or inaccessible, note this in your answer space.

WHAT MATERIAL?

• Everything since the last test, up to and including lectures through 4/14 (Tuesday).
SCROLLVIEWS

- superclass of UITextView and UITableView, among others
- allows panning, zooming around a too-big view
- important points
  - contentView is the size of the shown subview, *in its coords*
  - bounds is much smaller
• pull a scrollView out of the object library
  • create outlet in view controller
• create a view to show
  
  \[
  \text{if let image = UIImage(named: "falconBig.jpg")} \{
  \text{imageView = UIImageView(image: image)}
  \]
• add to Scrollview
  
  scrollView.addSubview(imageView!)
• set contentSize!!
  
  scrollView.contentSize = imageView.frame.size
SCROLLVIEWS

• Set defaults

```swift
scrollView.maximumZoomScale = 4
scrollView.minimumZoomScale = 0.5
```

• Set delegate

```swift
class PhotoViewViewController: UIViewController, UIScrollViewDelegate {
    scrollView.delegate = self
```

• Add one func

```swift
func viewForZooming(in scrollView: UIScrollView) -> UIView? {
```

SCROLLVIEWS

• Scrolling programmatically

```swift
func scrollRectToVisible(CGRect, animated: Bool)
```

• Zooming programmatically

```swift
func setZoomScale(CGFloat, animated: Bool)
func zoom(to rect: CGRect, animated: Bool)
var zoomScale: CGFloat
```

• Delegate methods

• begin/end/modify zooming/dragging/scrolling/animations