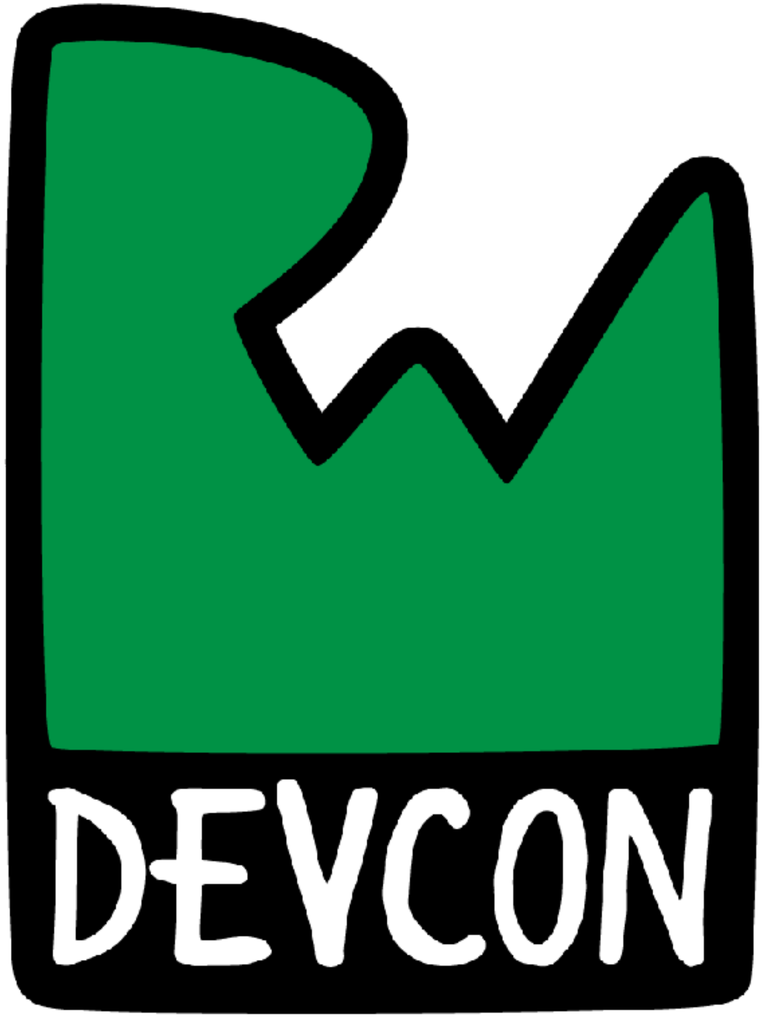
Session 5: Auto Layout Best Practices



Interface Builder

Simplicity is Key

Auto Layout is system of constraints describing the arrangement of views on a screen.

Simplicity is key. **Leave the fewest number of constraints on the canvas at any time.**

Stack Views are Your Friend

UIStackView will reduce clutter.

When aligning content in rows or columns;
consider a stack view first.

Safe Area Layout Guide

Replacement for aligning items to Top and Bottom Layout Guides.

Verdict: **simplifies the process overall. Just do it.**

Dynamic Type

New interfaces should be built for Dynamic Type…

… as lots of folks want to be able to read their device screen without searching for their

Useful Key Commands

Option
⌘
Return

Show Assistant Editor

⌘
Return

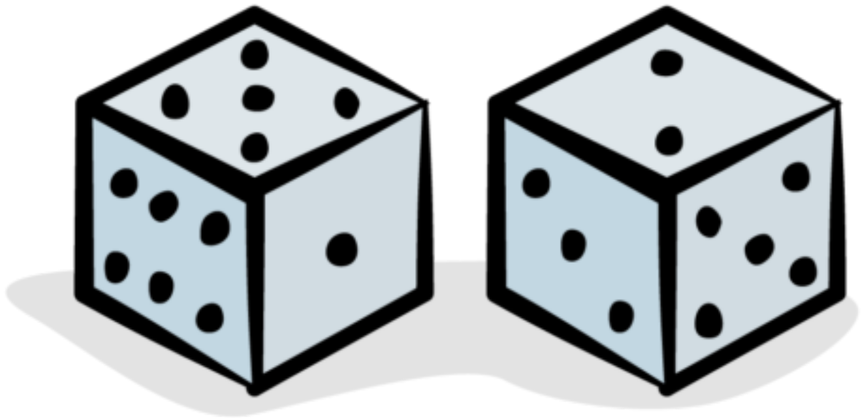
Hide Assistant Editor

Option
⌘
0 (zero)

Show / Hide Right Pane

⌘=

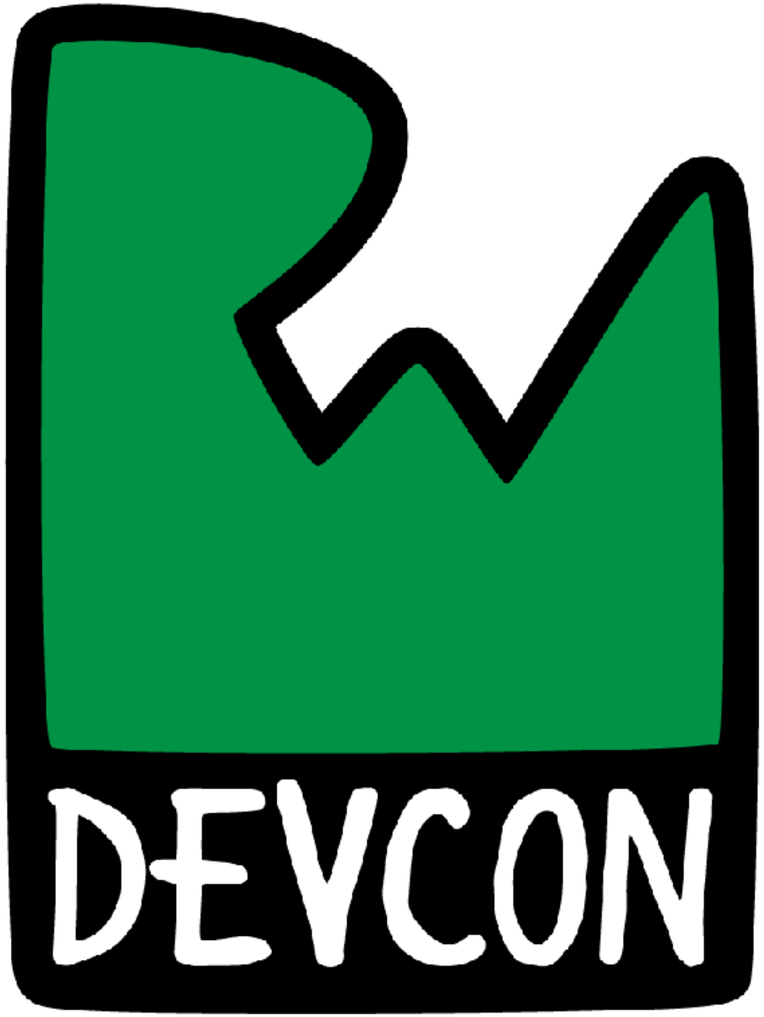
Recommended **Custom Mapping** -
‘Update All Frames’



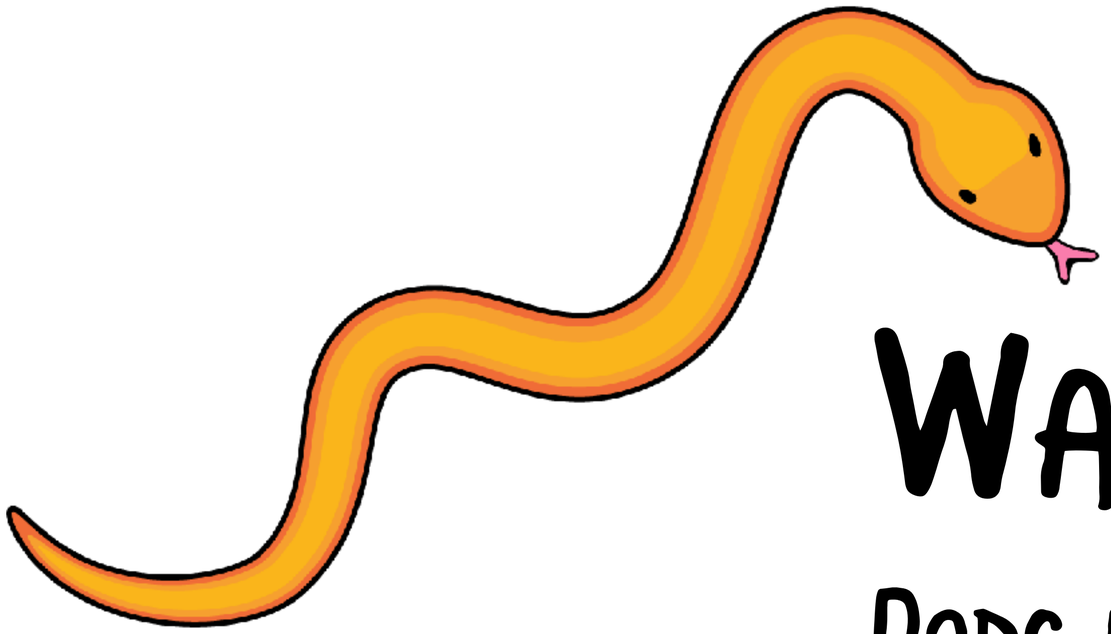
Demo 1

Board Setup - Interface Builder

Session 5: Auto Layout Best Practices

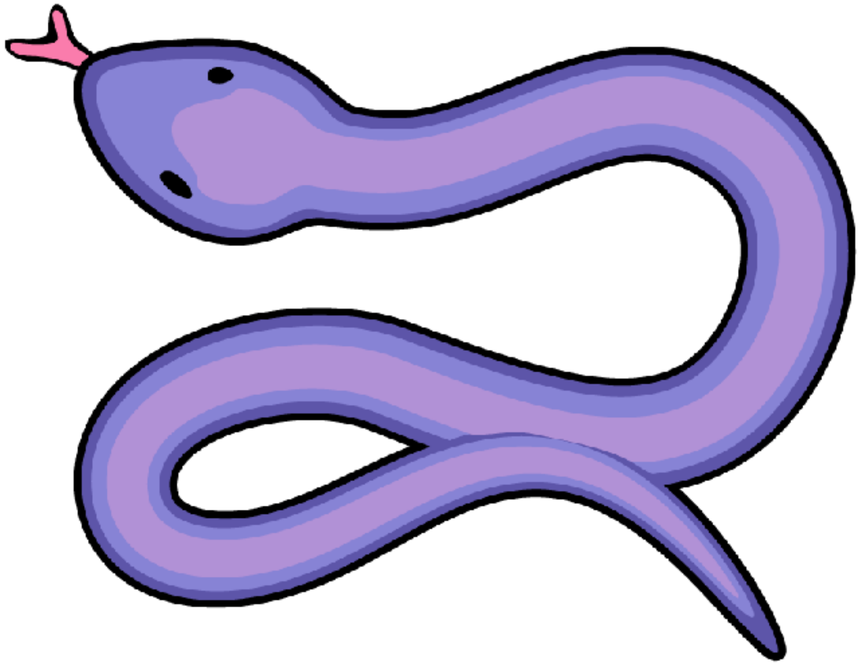


Auto Layout in Code



Warning!

Pods for Demo 2



```
sudo gem install cocoapods
```

https://cocoapods.org/

NSLayoutConstraint

```
let constraint = NSLayoutConstraint(item: playerToken,
                                    attribute: .centerYWithinMargins,
                                    relatedBy: .equal,
                                    toItem: boardView,
                                    attribute: .centerYWithinMargins,
                                    multiplier: 1.0,
                                    constant: 0.0
)
```

Visual Format Language

```
let siblingViewFormat = "|-[greenSnake]-(>=10)-[purpleSnake(==100)]-(>=10)-[redSnake]-|"
let superviewFormat =  "V:[superview]-(<=1)-[purpleSnake]"

var constraints = NSLayoutConstraint.constraints(withVisualFormat: siblingViewFormat, metrics: nil, views: views)
constraints += NSLayoutConstraint.constraints(withVisualFormat: superviewFormat, metrics: nil, views: views)

NSLayoutConstraint.activate(constraints)
```

NSLayoutAnchor

```
func addCenterYAnchor(to: UIView, constant: CGFloat = 0.0) {
  let guide = to.layoutMarginsGuide
  centerYAnchor.constraint(equalTo: guide.centerYAnchor, constant: constant).isActive = true
}
```

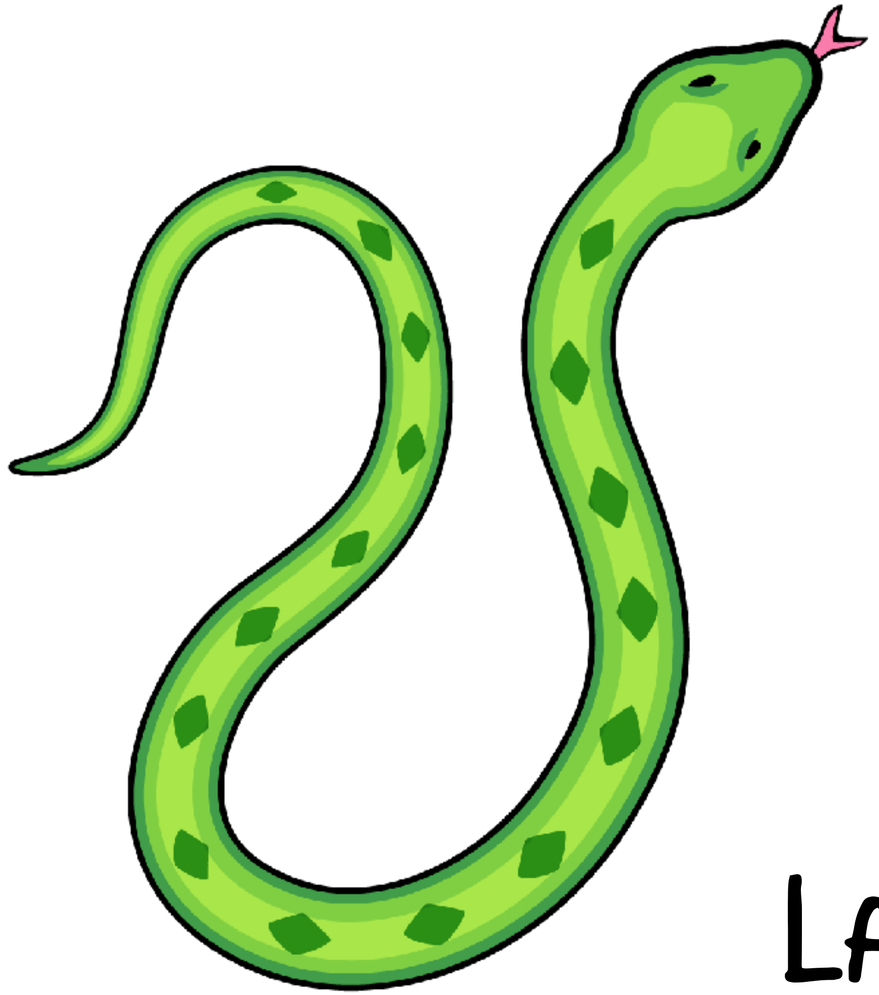
SnapKit

```
import SnapKit

  playerToken.snp.makeConstraints { make in
    make.centerX.equalTo(currentSquare)
    make.centerY.equalTo(currentSquare)
  }
```

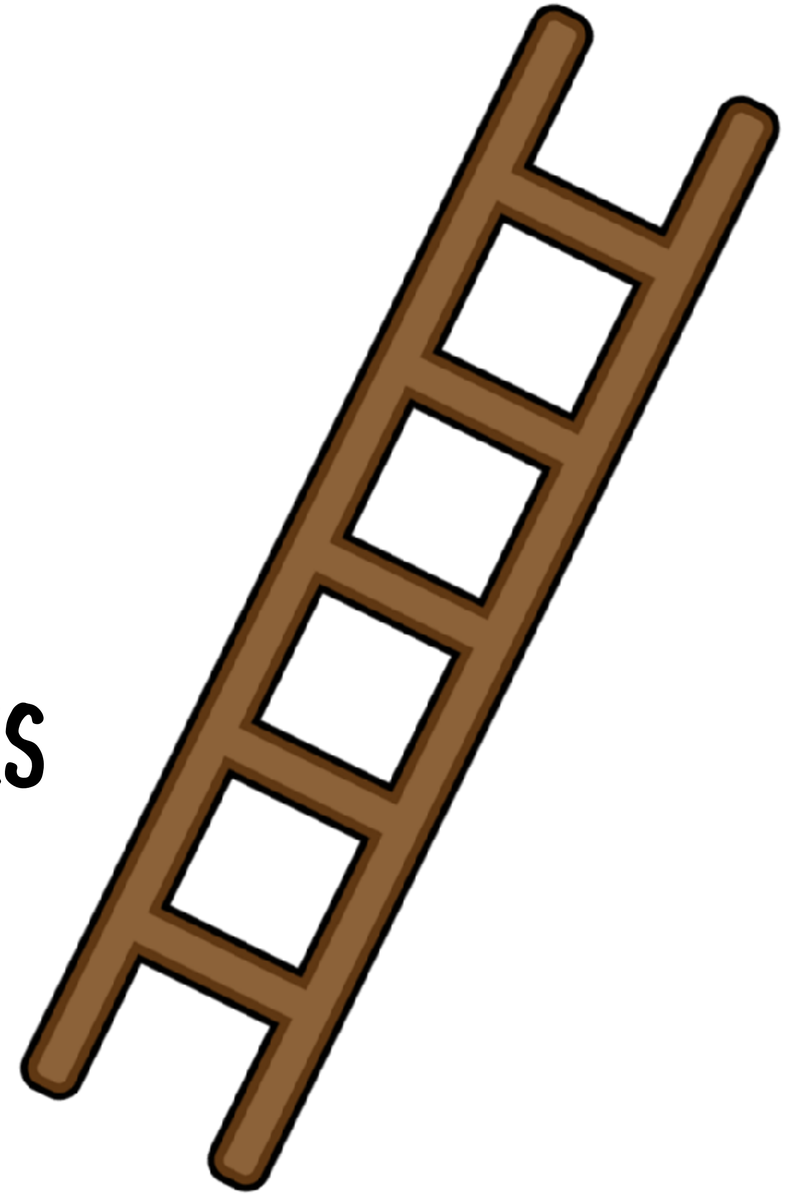
Which Option Should I Use ?

NSLayoutConstraint	Extreme granularity. **Rarely required.**
Visual Format Language	Simple views alongside sibling views.
NSLayoutAnchor	Basic alignment to other views (top, bottom, center, right).
Third Party (e.g. SnapKit, PureLayout)	Large projects, or layout-based code is extensive.

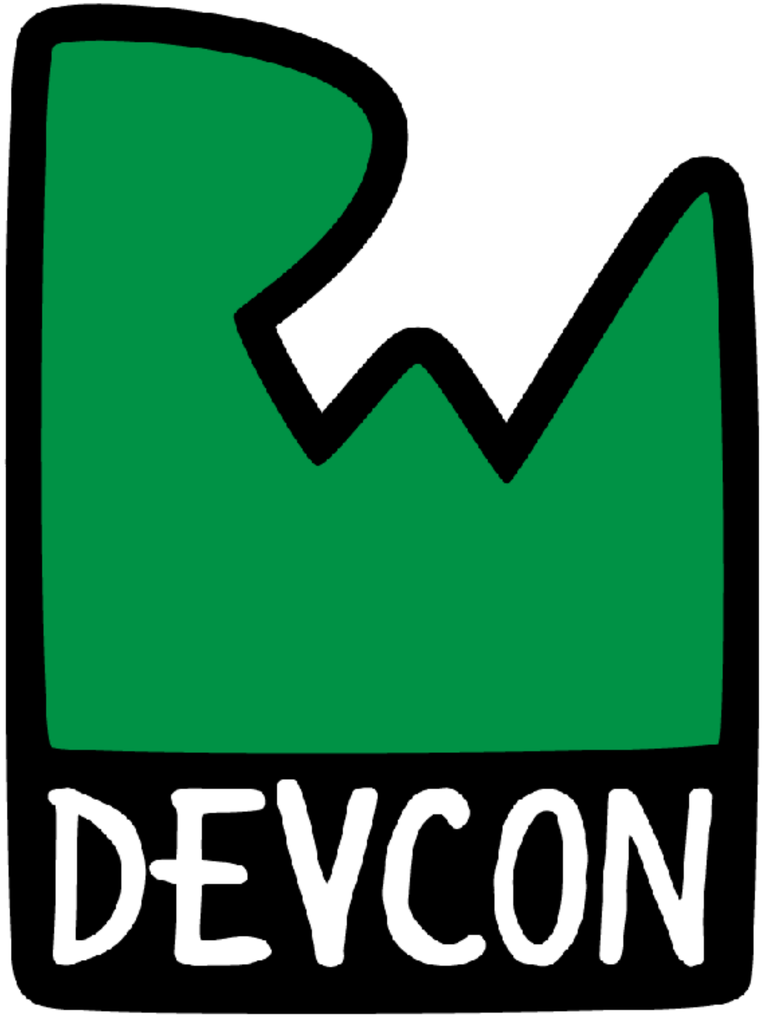


Demo 2

Ladders and Snakes



Session 5: Auto Layout Best Practices



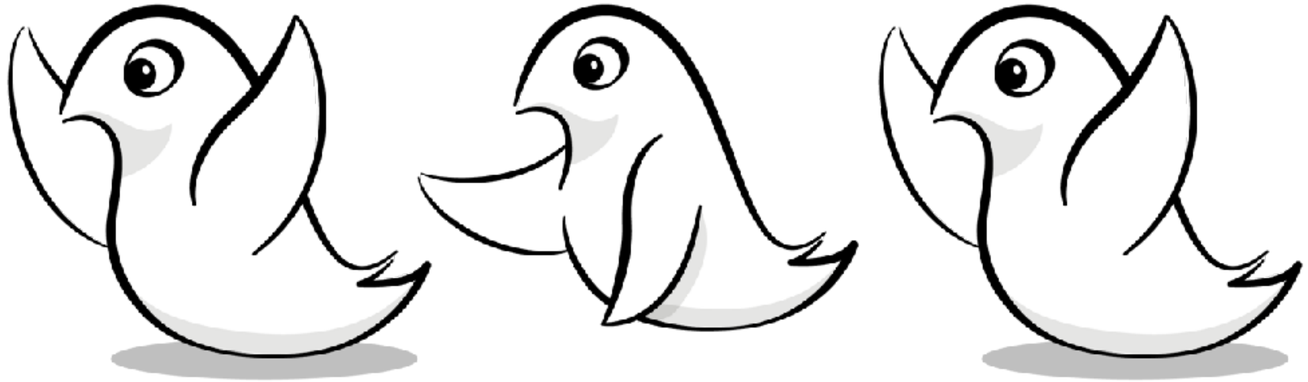
DEBUGGING CHALLENGES

AutoLayout Issue Types

Type	Interface Builder	Description
Ambiguous Layout	Missing Constraints	Not enough information to determine how to lay things out.
Unsatisfiable Constraints	Conflicting Constraints	Too much information; not all constraints provided can be satisfied.
Doesn't Look Quite Right	-	Behavior is satisfiable and not ambiguous, but logically incorrect.
Performance	-	Constraints take too long to evaluate, causing UI lag. **Very rare.**

Debugging Techniques

- Just (Re)Do It
- Visualization
- Drawing a Line

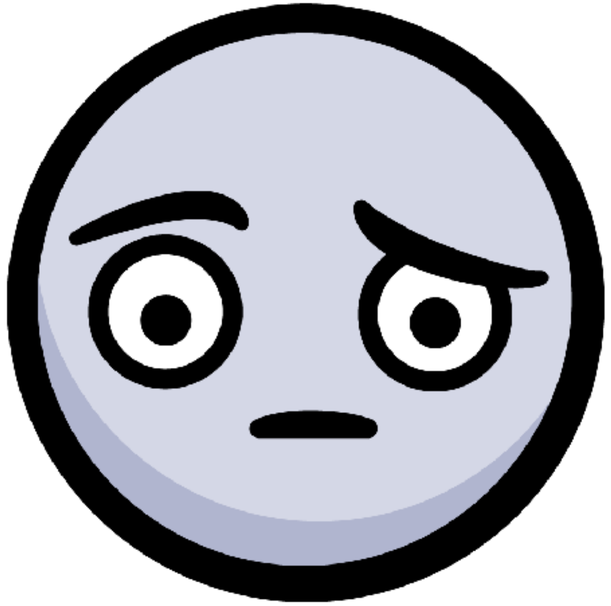


- Error Message Interpretive Dance

Just (Re)do It

For **persistent Interface Builder Issues**, look at

- Duplicates - views or constraints



- Priority
- **Editor > Resolve AutoLayout Issues**
  - **(Selected Views) > Clear Constraints**

Visualization

- Debug View Hierarchy
- Runtime: Assorted
- Drawing a Line

Drawing a Line

Examine the constraints in one direction all the way from one edge of the view to the other.

This technique is a Jerry Beers original invention (and an all around great idea). **Best applied whilst humming Johnny Cash's 'I Walk The Line'.**

Error Message Interpretive Dance

Unable to simultaneously satisfy constraints.
Probably at least one of the constraints in the following list is one you don't want.
Try this:
(1) look at each constraint and try to figure out which you don't exp
(2) find the code that added the unwanted constraint or constr

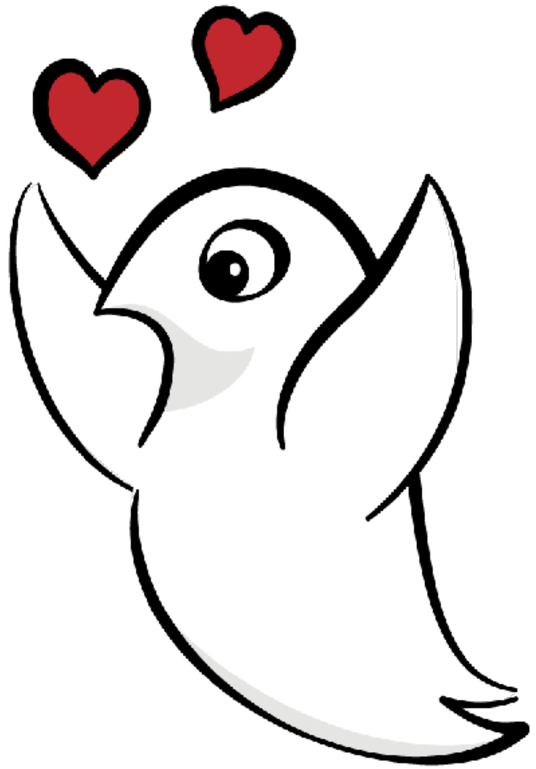
```
(
    "<NSLayoutConstraint:0x60c000896760 '-[UIView(EKLayout)  ws:positions:insets:priority  nvoke' V:|-(12)-[UIStackView:0x7f85448573d0]   (active, names:
'|':UITableViewCellContentView:0x7f8544842f50 )>",
    "<NSLayoutConstraint:0x60c000a8d430 '-[UIView(EKLay  pinViews:positions:insets:priorit  ke' V:[UIStackView:0x7f85448573d0]-(12)-|   (active, names:
'|':UITableViewCellContentView:0x7f8544842f50 )>",
    "<NSLayoutConstraint:0x60c000a828a0 '-[UIView(EKL  ek_pinViews:positions:insets:p  lock_i  V:|-(12)-[UIStackView:0x7f8544858670]   (active, names:
'|':Etsy.EtsyConvoMessageBubbleContainer:0x7f854485  ",
    "<NSLayoutConstraint:0x60c000a82ad0 '-[UIView(EK  ) ek_pinViews:positions:in  ty:]_block_inv  :[UIStackView:0x7f8544858670]-(12)-|   (active, names:
'|':Etsy.EtsyConvoMessageBubbleContainer:0x7f85448  >",
    "<NSLayoutConstraint:0x604000a81f40 'UISV-alignn  tsyProfileAvatarView:0  1eb0.bottom == Ets  yConvoMessageBubbleContainer:0x7f8544858470.bottom
(active)>",
    "<NSLayoutConstraint:0x604000a81270 'UISV-canva  ection' UIStack  544858670.top == Etsy.E  nvoMessageListingCard:0x7f8544855810.top   (active)>",
    "<NSLayoutConstraint:0x604000a812c0 'UISV-canva  ection' V:[Ets  achmentView:0x7f8544858  (0)-|   (active, names: '|':UIStackView:0x7f8544858670 )>",
    "<NSLayoutConstraint:0x604000a81ea0 'UISV-canvas  ction' UIS  0x7f8544850230.top == _UIL  Spacer:0x6040001d4640'UISV-alignment-spanner'.top   (active)>",
    "<NSLayoutConstraint:0x604000a81ef0 'UISV-canvas-  tion' V:  leAvatarView:0x7f8544851eb0  (active, names: '|':UIStackView:0x7f8544850230 )>",
    "<NSLayoutConstraint:0x604000a82030 'UISV-canvas-c  on'  View:0x7f85448573d0.top == E  :0x7f854484ff50.top   (active)>",
    "<NSLayoutConstraint:0x604000a82080 'UISV-canvas-co  StackView:0x7f8544850230]-(0  e, names: '|':UIStackView:0x7f85448573d0 )>",
    "<NSLayoutConstraint:0x604000a81310 'UISV-spacing' V:[E  nvoMessageListingCard:0x7f  0]-(12)-[EKTextView:0x7f8538955200]   (active)>",
    "<NSLayoutConstraint:0x604000a81360 'UISV-spacing' V:[EK  7f8538955200]-(12)-[E  ranslationOneClickViewAutolayout:0x7f854485d320]   (active)>",
    "<NSLayoutConstraint:0x604000a813b0 'UISV-spacing' V:[EtsyM  ut:0x7f854485d320]-(12)-[EtsyConvoAttachmentView:0x7f8544858990]
(active)>",
    "<NSLayoutConstraint:0x604000a820d0 'UISV-spacing' V:[EKLabel:0x7f85  View:0x7f8544850230]   (active)>",
    "<NSLayoutConstraint:0x604000a81d60 'UISV-spanning-boundary' _UILayoutSpacer:0x6040001d4640'UISV-alignment-spanner'.top <= Etsy.EtsyConvoMessageBubbleContainer:
0x7f8544858470.top   (active)>",
    "<NSLayoutConstraint:0x604000a82530 'UIView-Encapsulated-Layout-Height' UITableViewCellContentView:0x7f8544842f50.height == 84.3333   (active)>"
)
```

Error Message Interpretive Dance

WTF AutoLayout ?

Why the Failure AutoLayout ?

wtfautolayout.com



Error Message Interpretive Dance

Unable to s
Probably
Try this:
(1) loo
(2) fin
(
"<NSLay
'|':UITableVi
"<NSLay
'|':UITableVi
"<NSLay
'|':Etsy.Etsy
"<NSLay
'|':Etsy.Etsy
"<NSLay
(active)>",
"<NSLay
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"<NSLay
"<NSLay
"<NSLay
"<NSLay
"<NSLay
"<NSLay
(active)>",
"<NSLay
"<NSLay
0x7f854485
"<NSLay
)

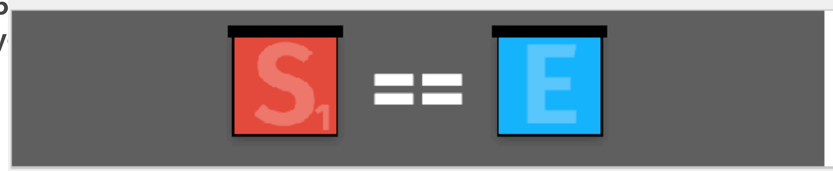
`EtsyProfileAvatarView`'s bottom edge should equal `EtsyConvoMessageBubbleContainer`'s bottom edge.‡

`StackView2`'s top edge should equal `EtsyConvoMessageListingCard`'s top edge.‡

`StackView2`'s bottom edge should equal `EtsyConvoAttachmentView`'s bottom edge.‡

`StackView3`'s top edge should equal `UISV-alignment-spanner`'s top edge.‡

`StackView3`'s bottom edge should equal `EtsyProfileAvatarView`'s bottom edge.‡



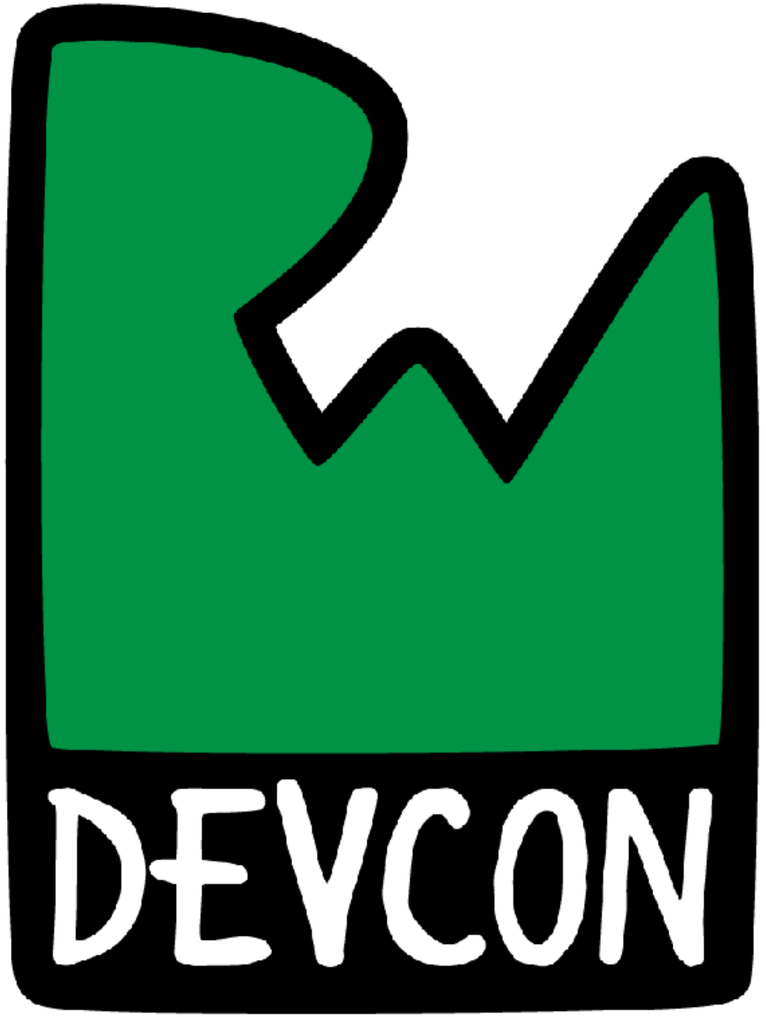
`StackView1`'s top edge should equal `EKLabel`'s top edge.‡

ames:
ames:
ames:
ames:
70.bottom
active)>",
3670)>",
'.top (active)>",
>",
ctive)>",
5544858990]
bleContainer:

Demo 3

Debugging Challenges

Session 5: Auto Layout Best Practices



Conclusion

What You Learned

- **Demo 1**: Interface Builder
- **Demo 2**: Auto Layout in Code
- **Demo 3**: Debugging Challenges

Where To Go From Here?

- **Ray Wenderlich**
  - Beginning Auto Layout (Jessy Catterwaul)
  - Mastering Auto Layout (Jerry Beers)

- objc.io Advanced Auto-layout Toolbox
- wtfautolayout.com

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