Automatic Sizing for `UICollectionViewCells`

History

History: `UITableView`

— iOS was designed for 3.5' screens.

— Subclass of `UIScrollView`

  — Table Views only scrolled vertically

  — `contentSize` was always limited to the table view's width

— *Performance* was key

`UITableView`'s points of customization

1. `UITableViewDataSource`
   — This configures the *what* is shown on-screen
2. `UITableViewDelegate`
   — This configures the *how* is shown on-screen
   — This *notifies* of user input

UITableView's Layout

- Cells width match the tableView's width.
- Cells are shown one below the other, in rows.
- Every cell's height must be calculated and returned using `tableView:heightForRowAtIndexPath:`.
  - This is done for *every* row in the tableView.

14:59

Updates

Pending

Update All

KAYAK Flights, Hotels & Cars.

Today

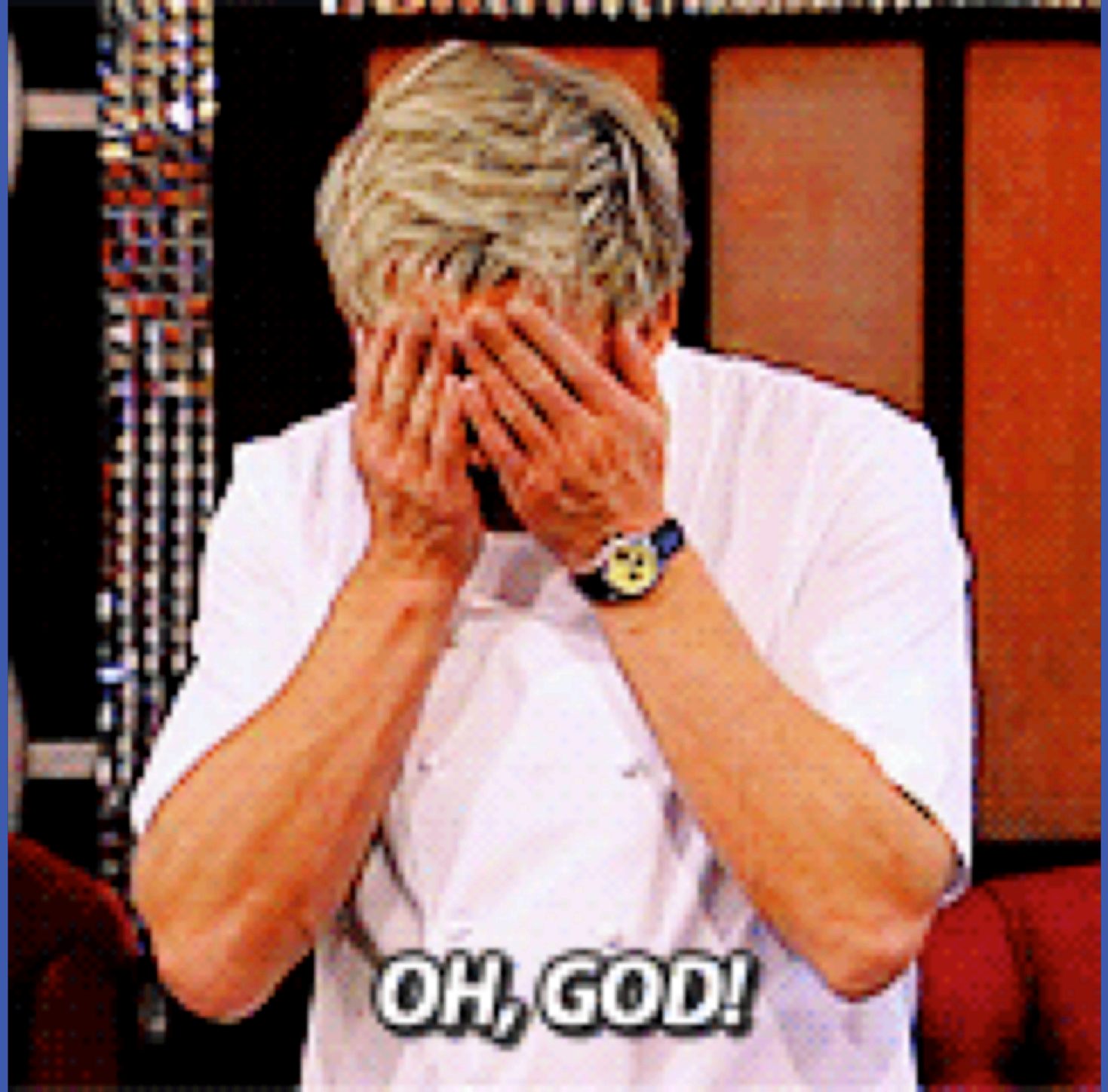
Unsure if your bag meets an airline's hand baggage requirements? We've added a co more

N26 – The Mobile Bank

Today

With this update, we have finally removed the last remnant of "headphone jack" code.
Well, actually there wasn't any "headphone jack code." So we just held a candle light vigil to them instead.
Now that we've gotten that off our chest, we can focus on less divisive issues like the dawning of iOS 12. With it, you can now use some of our most powerful personal features like accessing the balance of your Spaces or account balance. All with your voice.
Happy upgrading! And don't forget to tweet us how you're using Siri @N26.

Version 3.16 • 263.3 MB


OH, GOD!

Enter

`UITableViewAutomaticDimension`

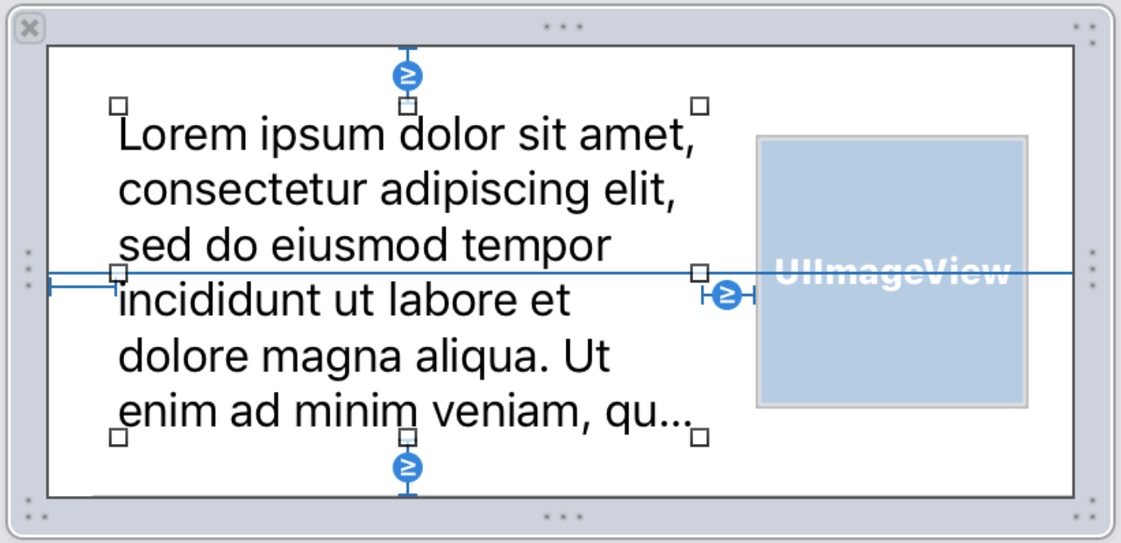
`UITableViewAutomaticDimension`

— As long as your subviews are *pinned* to the edges

— Constraints will have to be pinned to `contentView`, not the cell.

— UIKit will do a fake layout pass to calculate the cell's height

— Profit 🤑



$$cellHeight = f(cellWidth, cellContent)$$

What about `UICollectionView`?

Differences between `UICollectionView` and `UITableView`

— Collections can scroll on both axis.
— Layout is completely customizable.
— Layout can be swapped at run time.
— Built with big screens and complex interactions in mind.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9:41 AM
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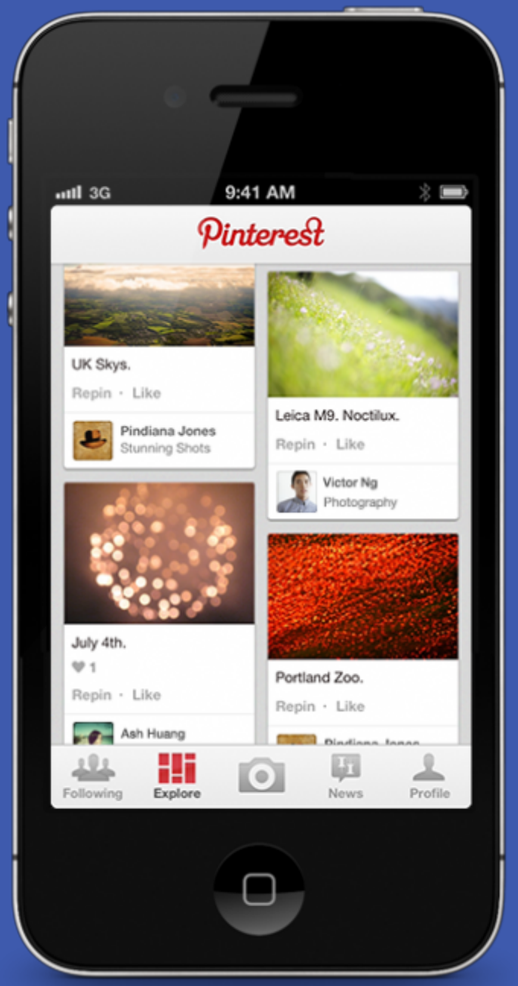
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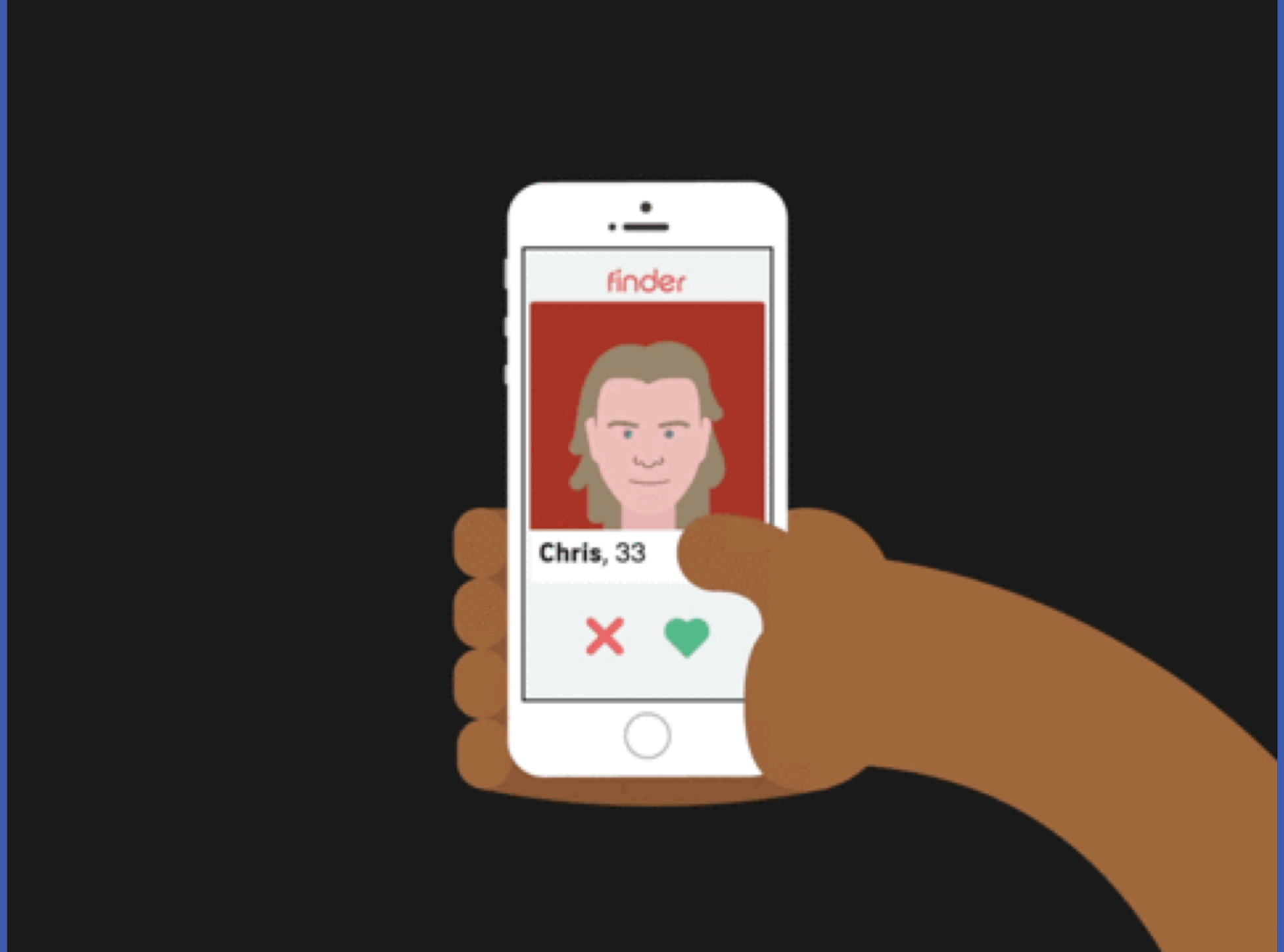
finder
Chris, 33

`UICollectionView`'s points of customization

1. `UICollectionViewDataSource`
   — This configures the *what* is shown on-screen
2. `UICollectionViewDelegate`
   — This *notifies* of user input
3. `UICollectionViewLayout`
   — This configures the *how* is shown on-screen

`UICollectionViewLayout`

- Abstract class that defines:
  - `UICollectionViewLayoutAttributes` for each cell
  - The collectionView's content size

UICollectionViewLayoutAttributes

```
@available(iOS 6.0, *)
open class UICollectionViewLayoutAttributes : NSObject, NSCopying, UIDynamicItem {
    open var frame: CGRect
    open var center: CGPoint
    open var size: CGSize
    open var transform3D: CATransform3D
    open var bounds: CGRect
    open var transform: CGAffineTransform
    open var alpha: CGFloat
    open var zIndex: Int
    open var isHidden: Bool
    open var indexPath: IndexPath
    open var representedElementCategory: UICollectionView.ElementCategory { get }
    open var representedElementKind: String? { get }
}
```

UICollectionViewLayout

— Most commonly, you use `UICollectionViewFlowLayout`.

UICollectionViewFlowLayout

A concrete layout object that organizes items into a grid with optional header and footer views for each section.

`UICollectionViewFlowLayout`

— This gives class tons of customization points:

- Scroll Direction
- *Item Size*
- Item Spacing
- Line Spacing
- *Estimated Item Size* (iOS 8+)

WTF is the difference about `itemSize` and `estimatedItemSize`?

`itemSize`

— Final size of the cell on the layout.

`itemSize`

— Final size of the cell on the layout.

— That's it 🤡

`estimatedItemSize`

- Hints to `UICollectionViewFlowLayout` about the probable size of a cell.
  - Enables first layout pass to do the math for every cell before they're visible.

`estimatedItemSize`

— The actual size is retrieved calling `preferredLayoutAttributesFittingAttributes:` on the *cell*.

— The collectionView's layout object will call this method passing appropiate `UICollectionViewLayoutAttributes`.

```
class PostCollectionViewCell: UICollectionViewCell {

    override func preferredLayoutAttributesFitting(_ layoutAttributes:
        UICollectionViewLayoutAttributes) -> UICollectionViewLayoutAttributes {•••}
```

```
override func preferredLayoutAttributesFitting(_ layoutAttributes:
    UICollectionViewLayoutAttributes) -> UICollectionViewLayoutAttributes {
    let estimatedSize = contentView.systemLayoutSizeFitting(
        CGSize(width: layoutAttributes.frame.size.width, height:
            UIView.layoutFittingCompressedSize.height),
        withHorizontalFittingPriority: .required,
        verticalFittingPriority: .fittingSizeLevel
    )
    layoutAttributes.frame.size = estimatedSize
    return layoutAttributes
}
```

Where is `UICollectionViewFlowLayoutAutomaticSize`?

This math is a lot harder:

$$cellHeight = f(cellWidth, cellContent)$$

First conclusions:

- Now you know why these terms are used interchangeably:
  - `Automatic cell sizing`
  - `Flow layout automatic sizing`

Demo

Takeaways:

Takeaways:

- For your layout code, please:
  - Use `UIStackView`
    - And set it to `.fill` & `.fill`
  - Use `layoutMargins`

What do I have to build?	What do I use?
Form	`UITableView`
Literally anything else	`UICollectionView`

Documentation:

— A Tour of UICollectionView, WWDC 2018 - Session 225

— UICollectionView Custom Layout Tutorial: Pinterest, raywenderlich.com