View Frame and Bounds
Core Graphics Fundamental Structures

- **CGPoint**: a structure that contains a point in a two-dimensional coordinate system.
  
  Ex. `let pt = CGPoint(x:3, y:-5)`

- **CGSize**: a structure that contains width and height values.
  
  Ex. `let mySize = CGSize(width:10, height:5)`

- **CGRect**: a structure that contains the location and dimensions of a rectangle.
  
  Ex. `let rect = CGRect(x: 3, y: 5, width: 10, height: 5)`
  
  or `let rect = CGRect(origin:pt, size:mySize)`
Frame and Bounds

- *Frame* and *Bounds* are fundamental concepts for all of the elements in the UI.

- Each view has both a frame and a bounds structure. The structure is a CGRect and consists of 4 floats.
  - The **frame** of an UIView is the rectangle, expressed as a location \((x,y)\) and size \((width, height)\) **relative to the superview it is contained within**.
  - The **bounds** of an UIView is the rectangle, expressed as a location \((x,y)\) and size \((width, height)\) **relative to its own coordinate system** \((0,0)\).
Frame and Bounds

Frame
origin = (0,0)
width = 219
height = 300

Bounds
origin = (0,0)
width = 219
height = 300
Frame and Bounds

Frame
origin = (71,50)
width = 219
height = 300

Bounds
origin = (0,0)
width = 219
height = 300
Scroll Views
Scroll Views

- Scroll Views provide a way to present content larger than a single screen.
  - Critical for phones since they have limited screen real estate
  - Also helpful for iPads

- Scroll Views provide a way for moving within the content to view various parts of it.