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)
  ```

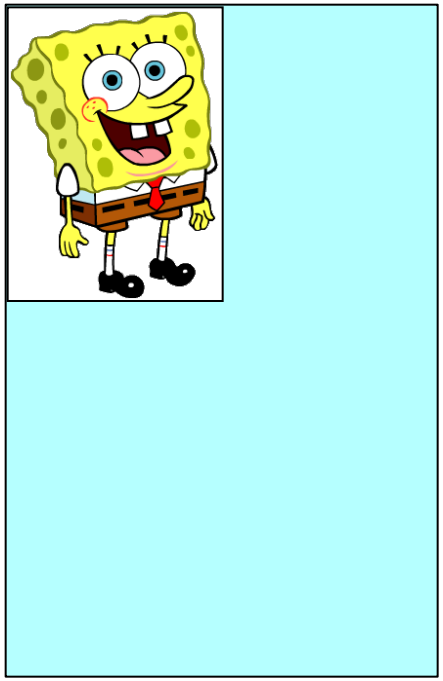
- `CGRect`: a structure that contains the location and dimensions of a rectangle.

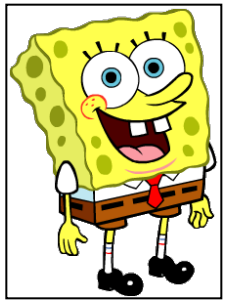
  Ex.
  ```
  let rect = CGRect(x: 3, y: 5,
                    width: 10, height: 5)
  ```
  or
  ```
  let rect = CGRect(origin:pt,
                    size:mySize)
  ```

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

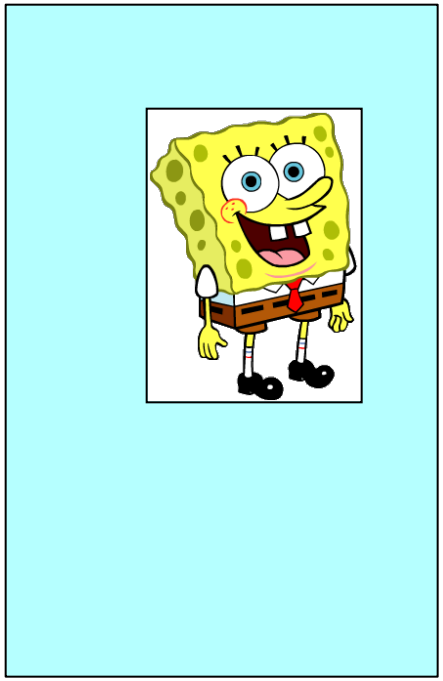


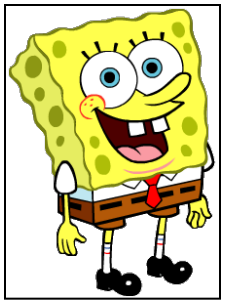


Frame
origin = (0,0)
width = 219
height = 300

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.

To implement scrolling:

- Create a `UIScrollView` and define its properties
- Make the `UIScrollView` a subview of the VC's view
- Make the view you want scrollable a subview of the `UIScrollView`.