iPhone App Development

CM420-09-2016-C
Lesson 3

Lecturer

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Git

https://github.com/bryanttang/iOS-Class-2016-9

Practice

- ✓ Show your Converter

Summary

- Review
- Class (Advance)
- UIView
- UIViewController
- Gesture
- Animation

Basic Class

Calculator

Attributes

result
M1
M2
M3

Function

-Add
-Sub
-Cross
-Div

Class(Advance)

- Example [UIView alloc]

NSObject + alloc:

UIView + animateWithDuration: animations:

Class(Advance)

- Class Method

Declare:

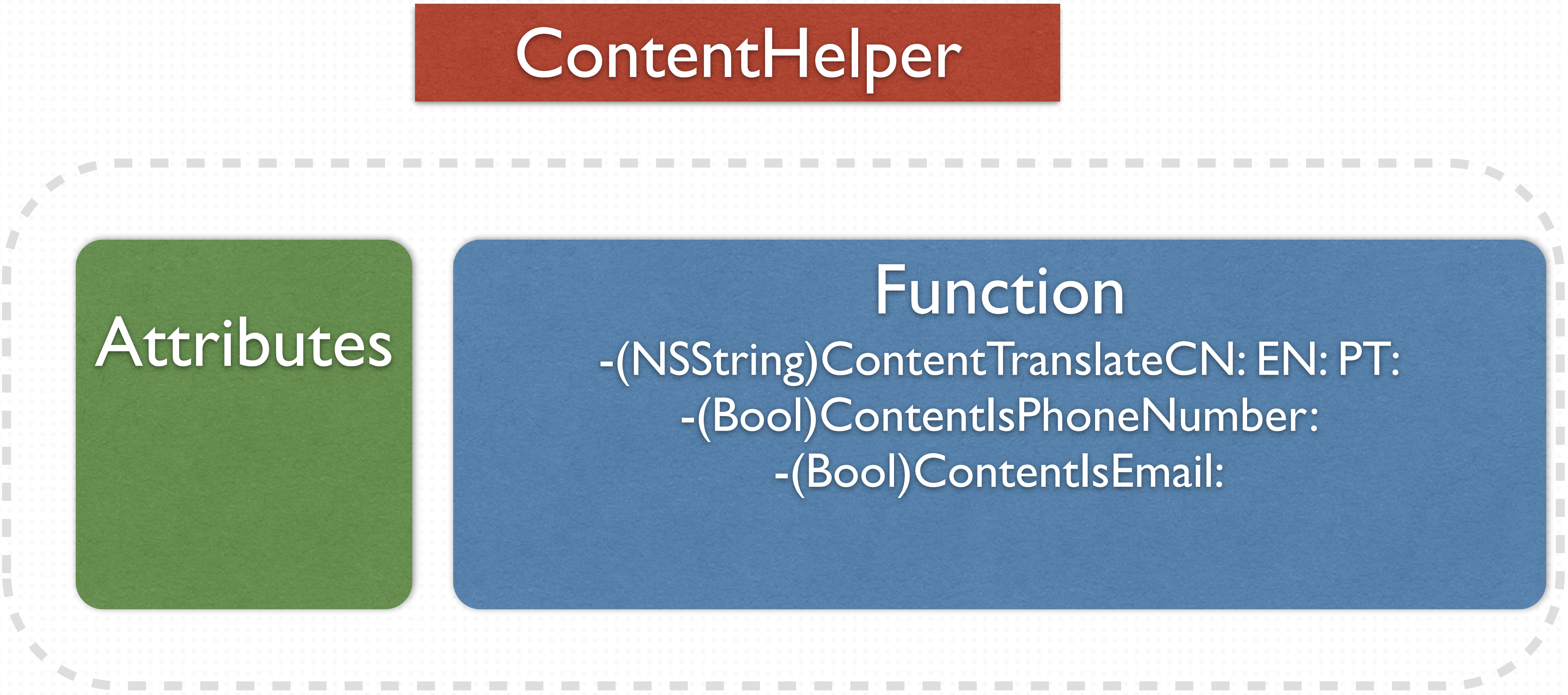
```
+ methodName:
```

Implement:

```
+ methodName:(id)params{

}
```

Class(Advance)

- Example: TranslateHelper



```
-(NSString)ContentTranslateCN: EN: PT:
-(Bool)ContentIsPhoneNumber:
-(Bool)ContentIsEmail:
```

Character

- Self and Super

Car

Car's super is Object

Car's self is Car

Properties (Engine, wheels, air conditioner, head light, etc.)

Bus

Bus's super is Car

Bus's self is Bus

car's Properties+Properties (More seat, call bell, payment system, etc.)

Character

- Example:

```
self.color = [UIColor blueColor];

[super init];
```

Setter & Getter

```
Car.color = [UIColor redColor];

UIColor *color = Car.color
```

Instance Property

- What is Setter and Getter exactly?
  - Getter

```
- (NSString *)something
{
 return something;
}
```

  - Setter

```
- (void)setSomething:(NSString*)newSomething
{
    something = newSomething;
}
```

Instance Property

something is one of property inside ObjectA

For:

```
@property (strong) NSString *something;
    id a = ObjectA.something;
    ObjectA.something = otherthing;
```

For:

```
NSString *something;
    id a = ObjectA.something;
    ObjectA.something = otherthing;
```

Instance Property

something is one of property inside ObjectA

For:
```
@property (strong) NSString *something;

    id a = ObjectA.something;
    ObjectA.something = otherthing;
```

For:
```
NSString *something;

    id a = ObjectA.something;          X
    ObjectA.something = otherthing;    X
```

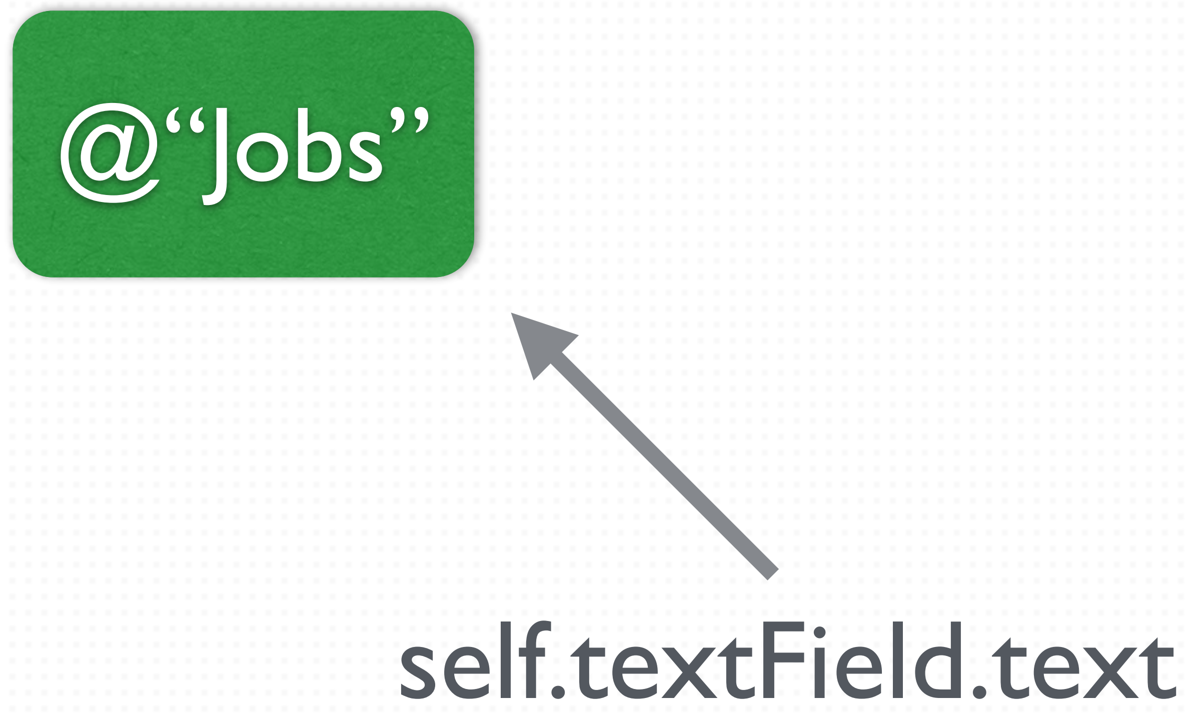
Variable Ownership

- Strong and Weak?

$$\texttt{NSString}\ \underbrace{\texttt{*name}}_{\text{Pointer}}\ \texttt{=}\ \underbrace{\texttt{@“Jobs”}}_{\text{Memory}}$$

Variable Ownership

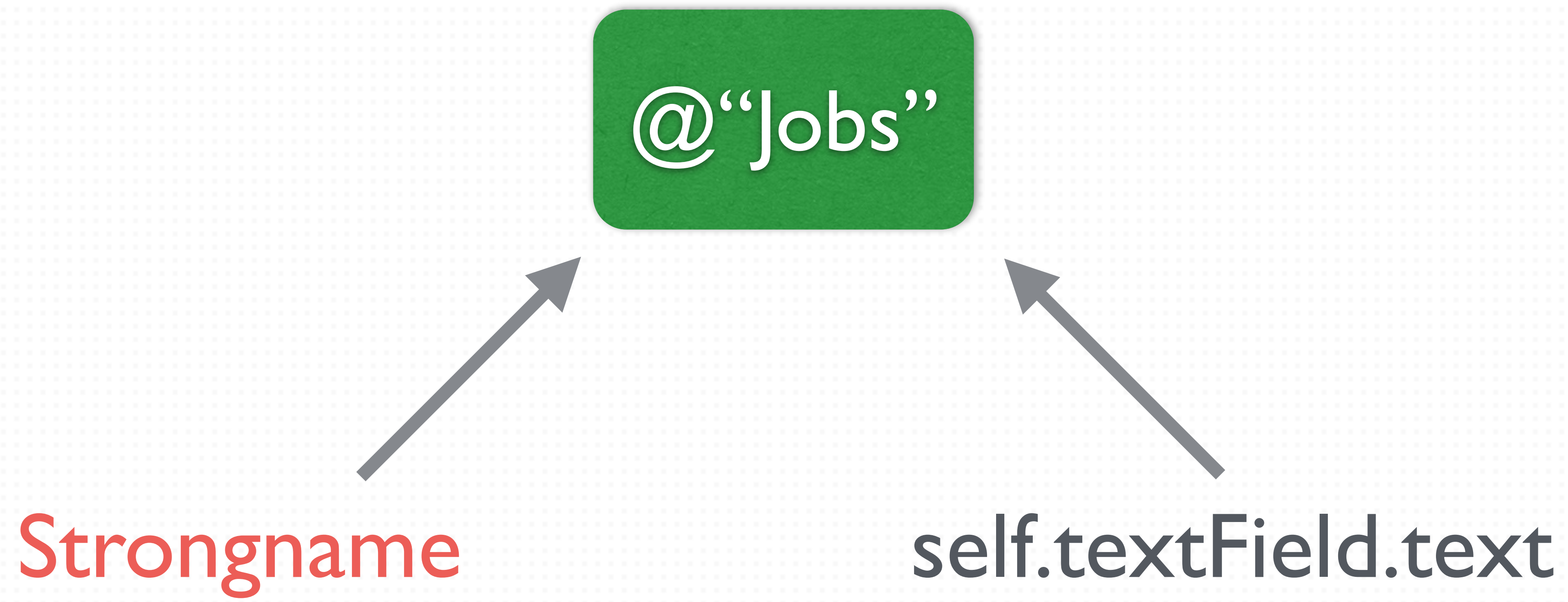
```
self.textField.text = @“Jobs”
```



Variable Ownership

- Strong variable (pointer)

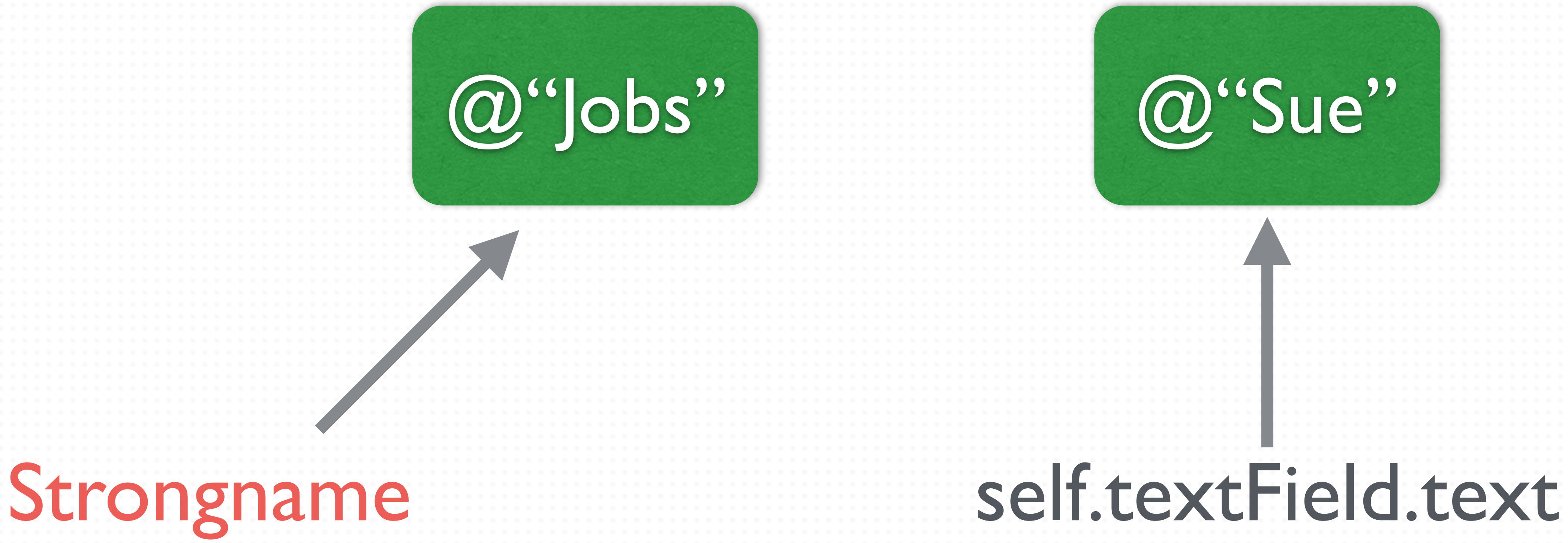
```
self.textField.text = @"Jobs" ;
Strongname = self.textField.text ;
```



Variable Ownership

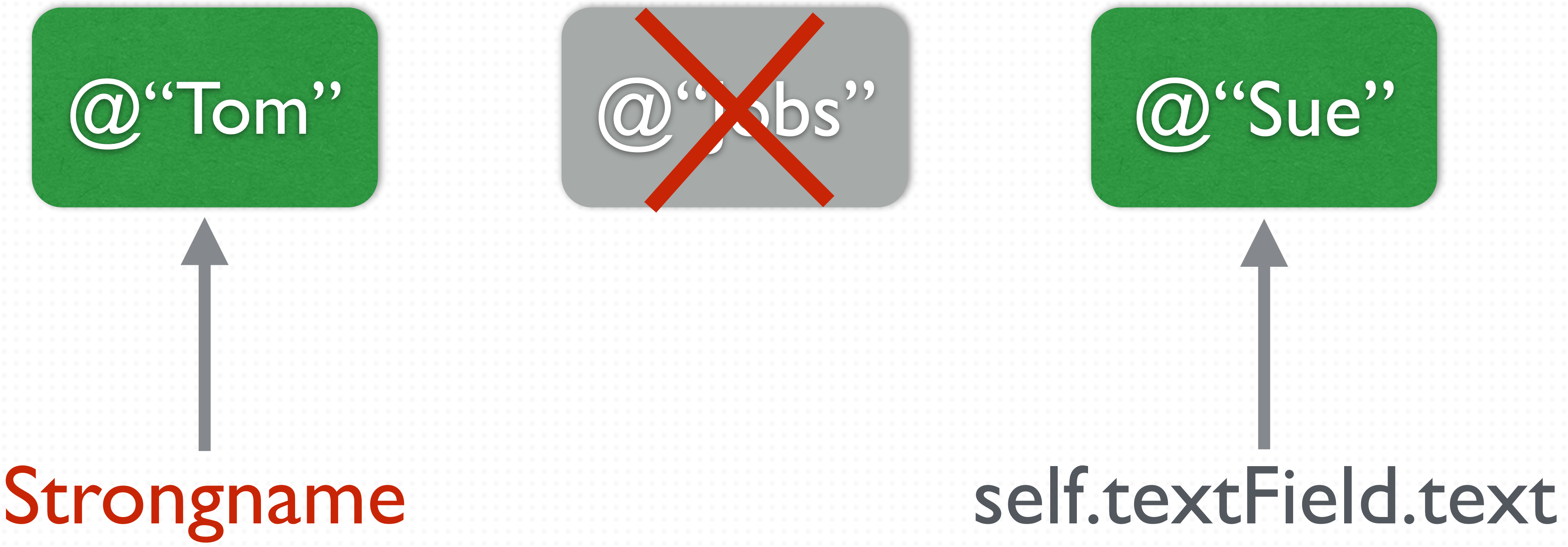
- Still hold memory

```
self.textField.text = @“Sue” ;
Strongname = ?
```



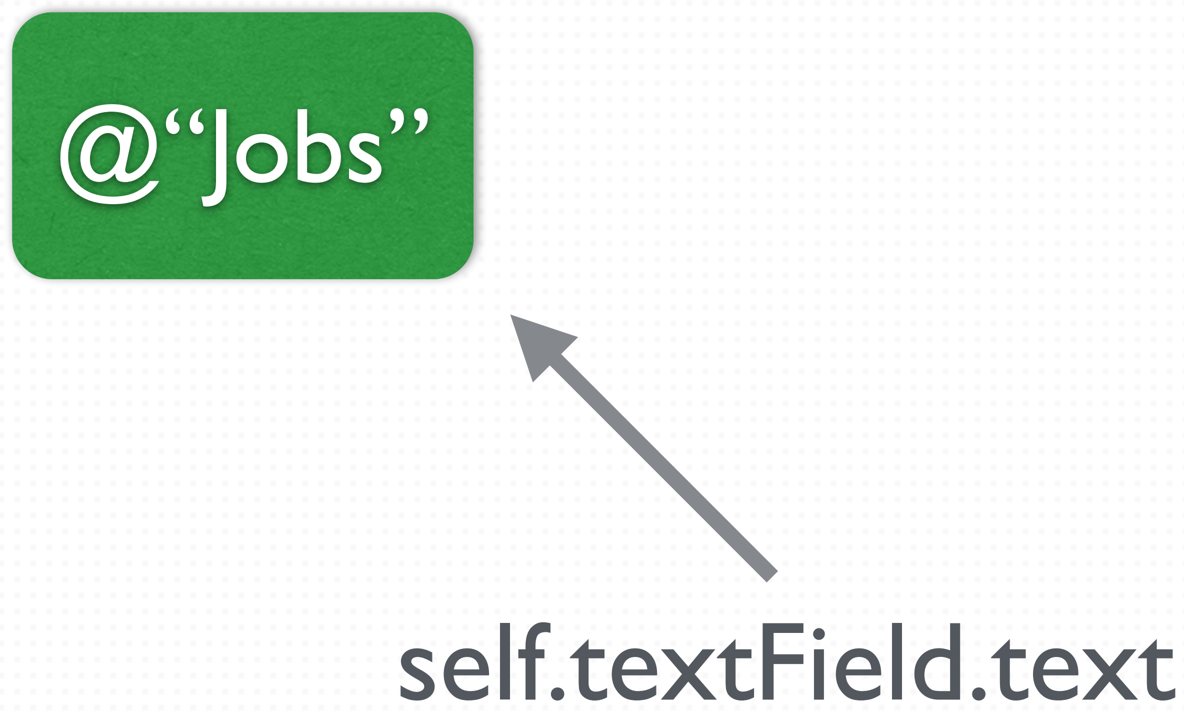
Variable Ownership

- Memory free when strong pointer point to another memory



Variable Ownership

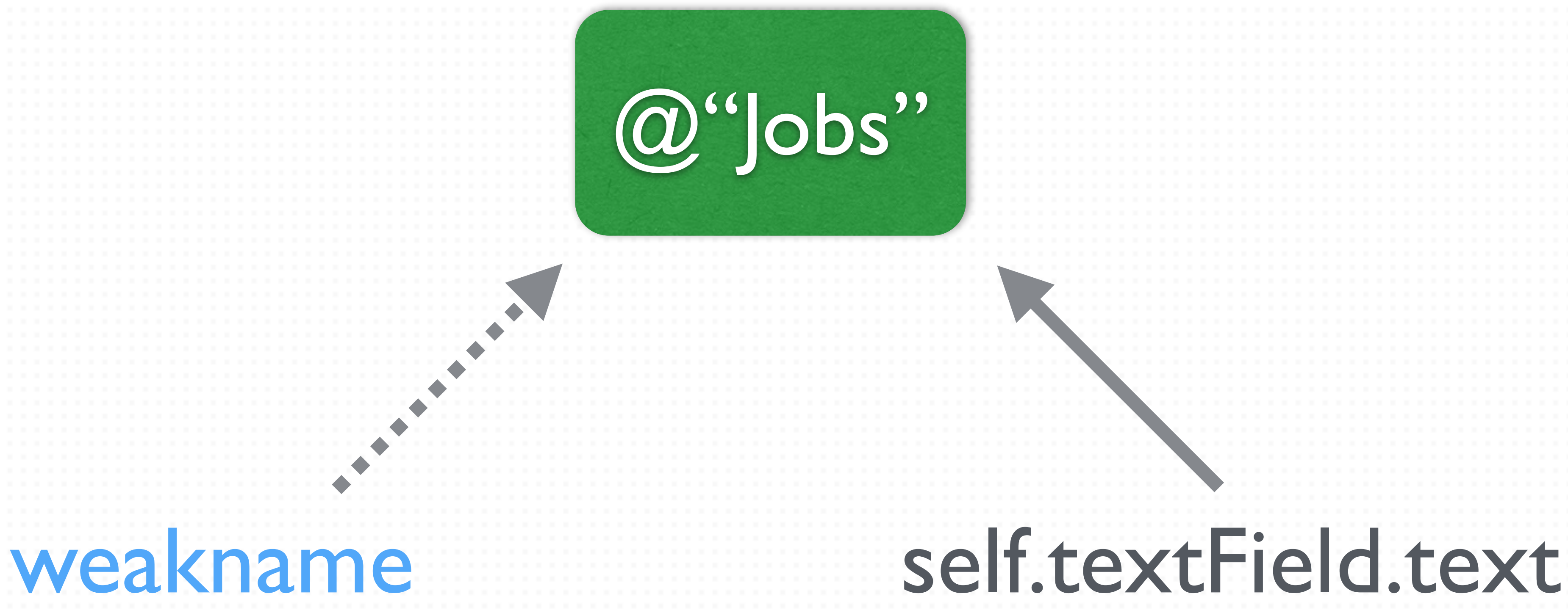
self.textField.text = @“Jobs”



Variable Ownership

- Weak

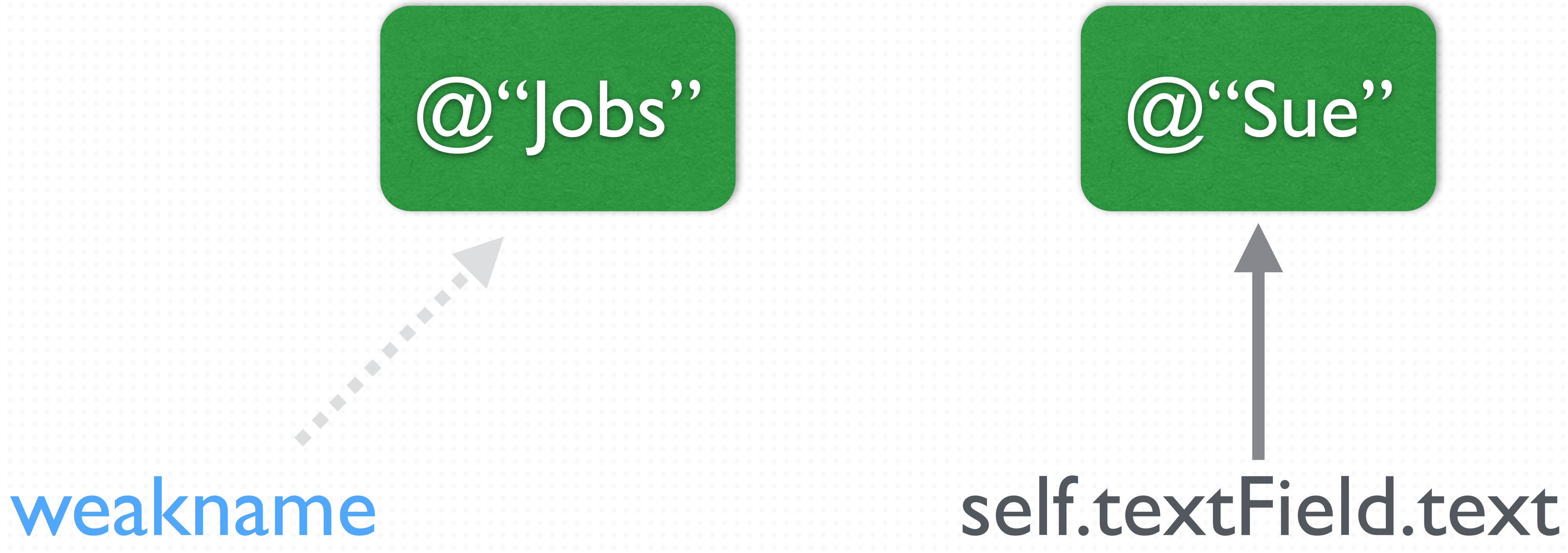
```
self.textField.text = @"Jobs" ;
Weakname = self.textField.text ;
```



Variable Ownership

- Weak

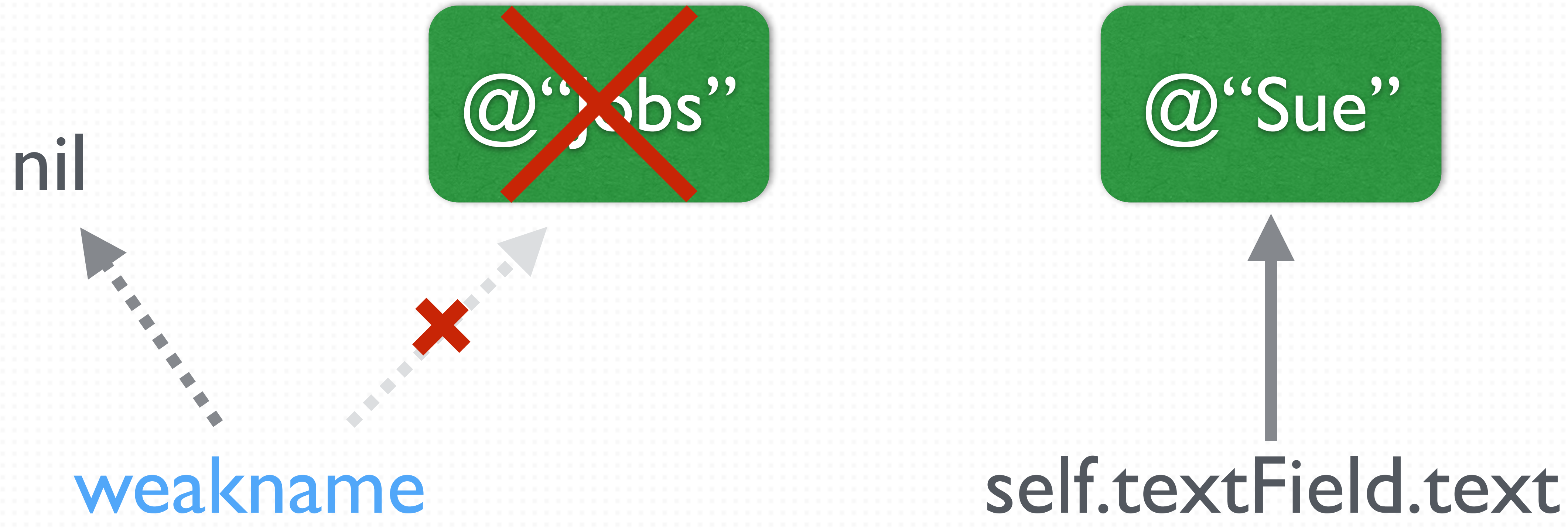
```
self.textField.text = @“Sue” ;
weakname = ?
```



Variable Ownership

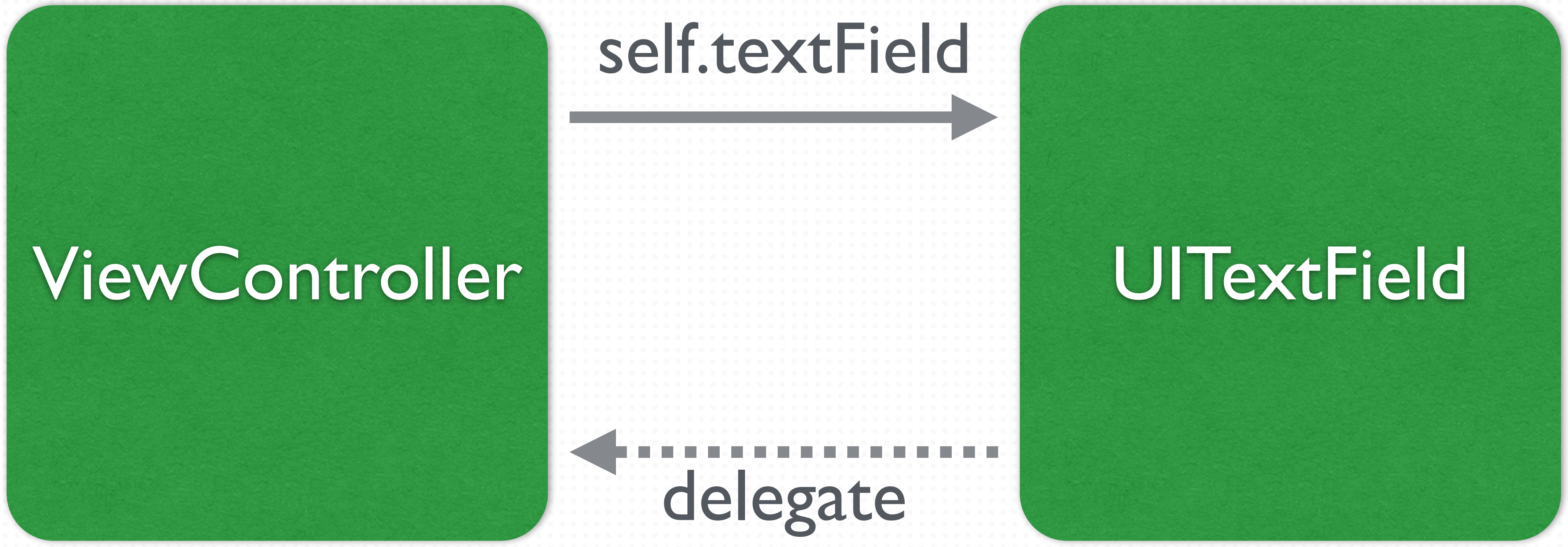
- Weak

```
self.textField.text = @"Sue" ;
weakname = nil
```



Variable Ownership

- Relationship between object and its delegate

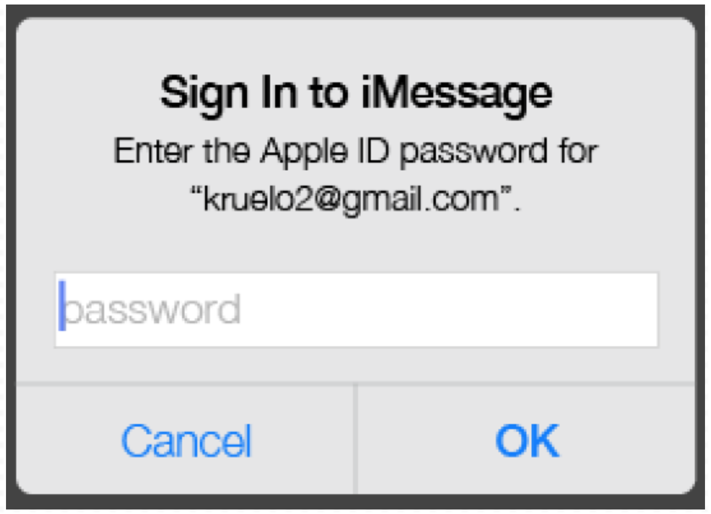


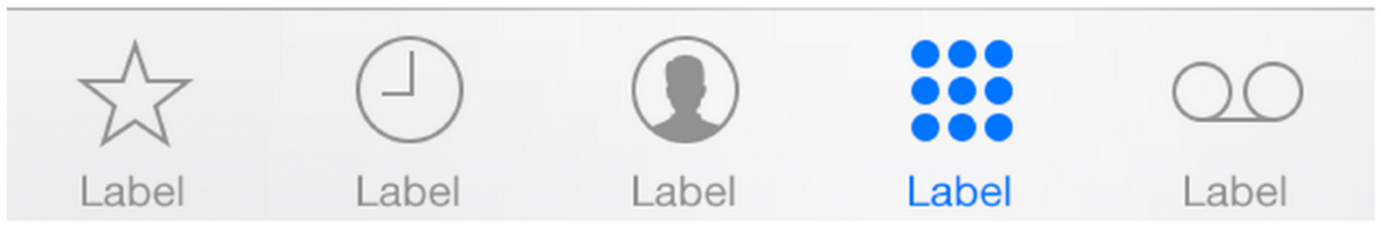
UI

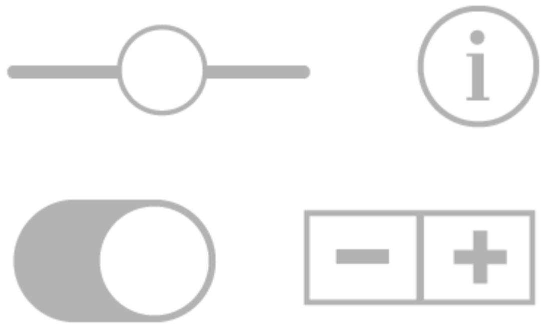
UI is what you see

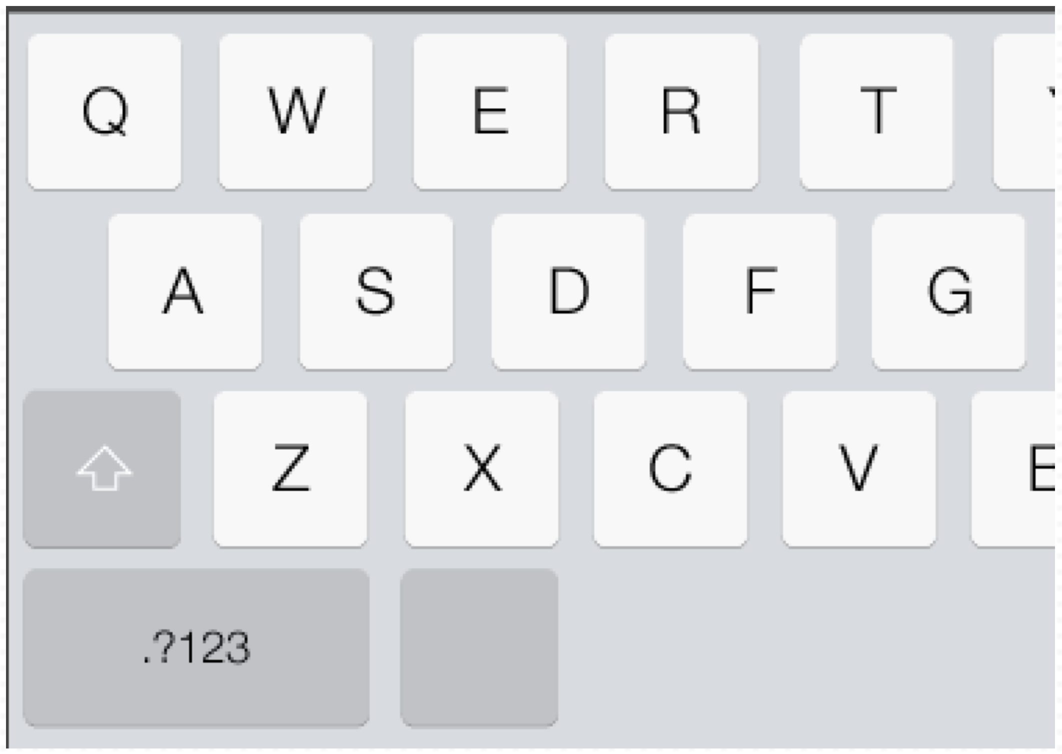
UIView

- What is UIView?









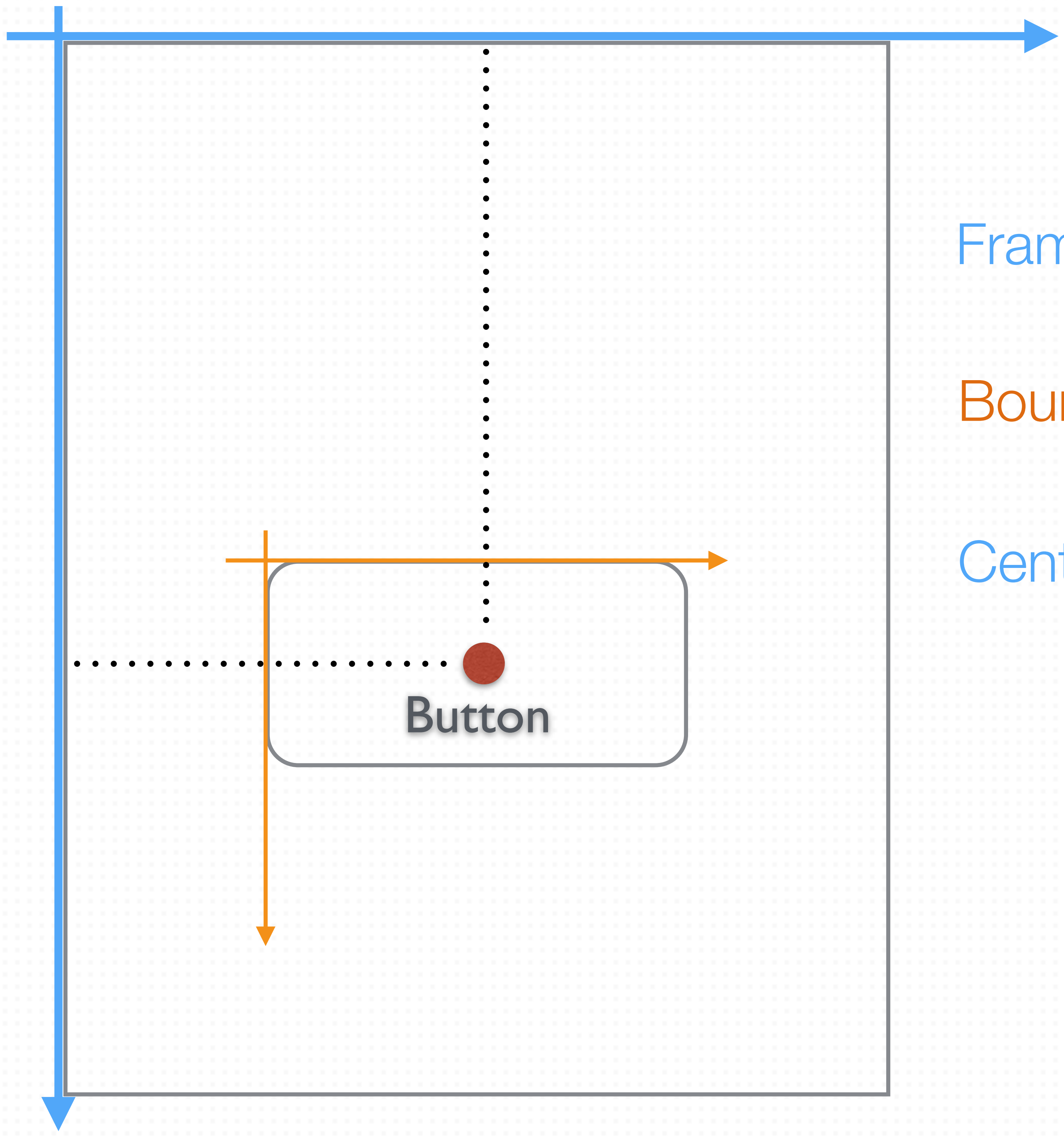
UIView

- UIButton
- UILabel
- UITextField
- UIImageView
- UITableView
- …

UIView-Attributes

- Frame (size, position), Bounds, Center
- Background color, alpha, Hidden
- Transform

Frame,Bounds,Center



Frame: (20,100, height,weight)

Bound: (0,0, height, weight)

Center: (20+weight/2, 100 +height/2)

UIView-Behavior

- Method:

  -addSubview:

  -animateWithDuration: animations:

- Event: -touchesBegan: withEvent:

UIButton

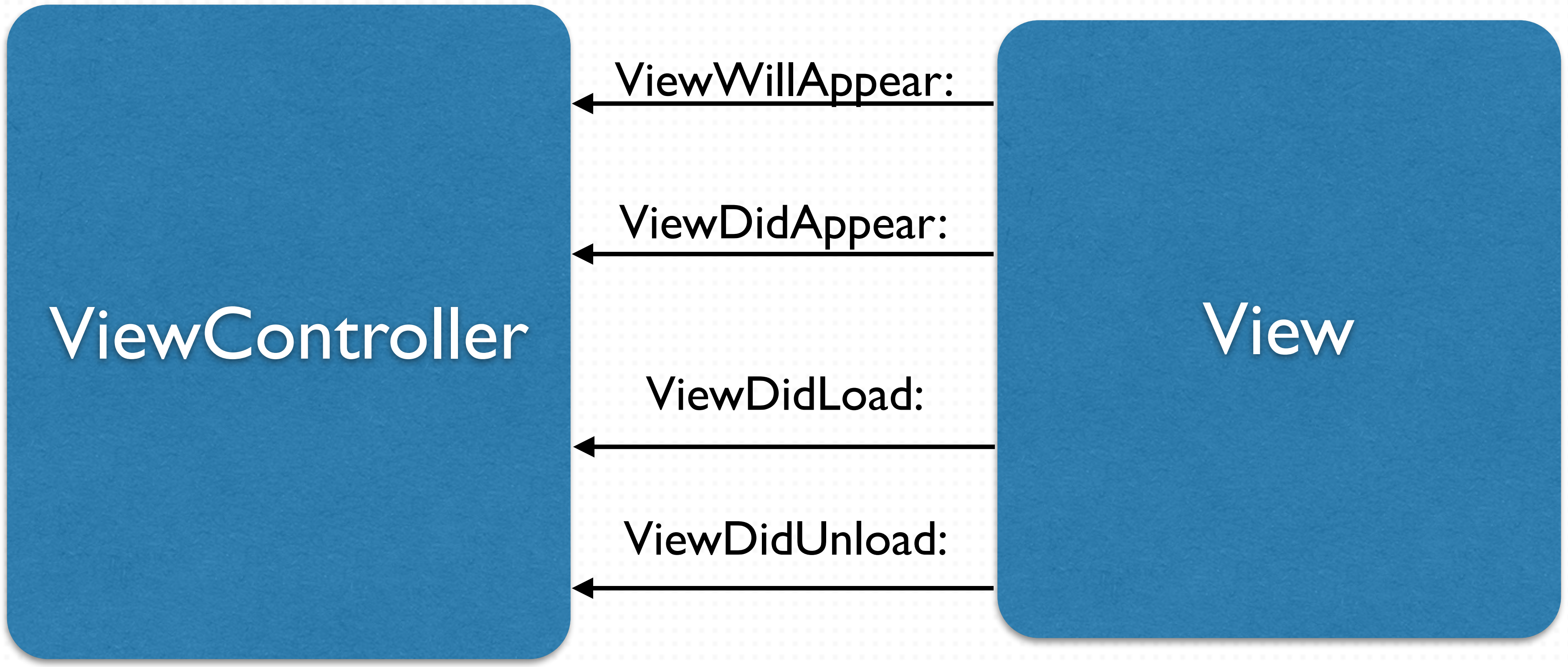
- UIView Attributes + Target (delegate)
- Method: -setTitle: forState:
- Event: -touchUpInside: , -touch

Controller

What would controller do?

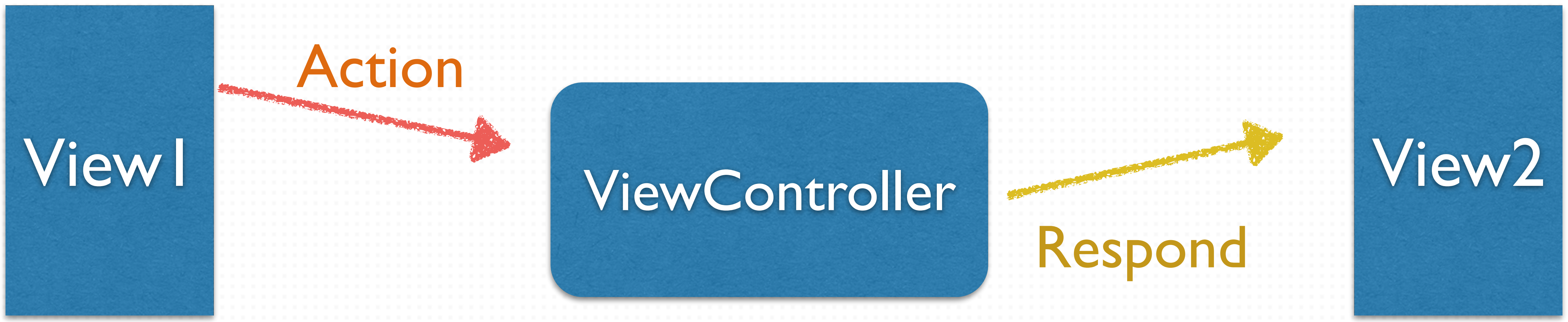
UIView & UIViewController

- How a ViewController manage a view cycle?



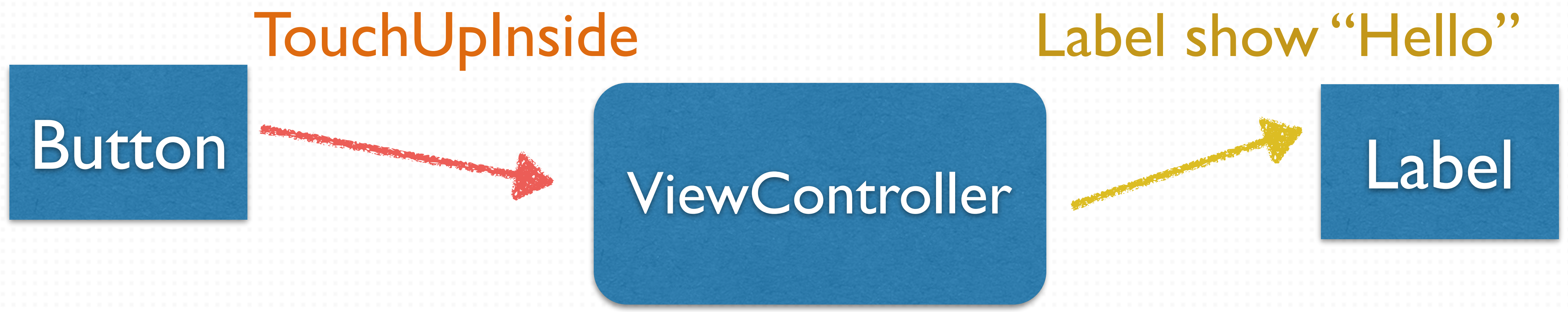
UIView & UIViewController

- How a ViewController control a view?



UIView & UIViewController

- Example: Button

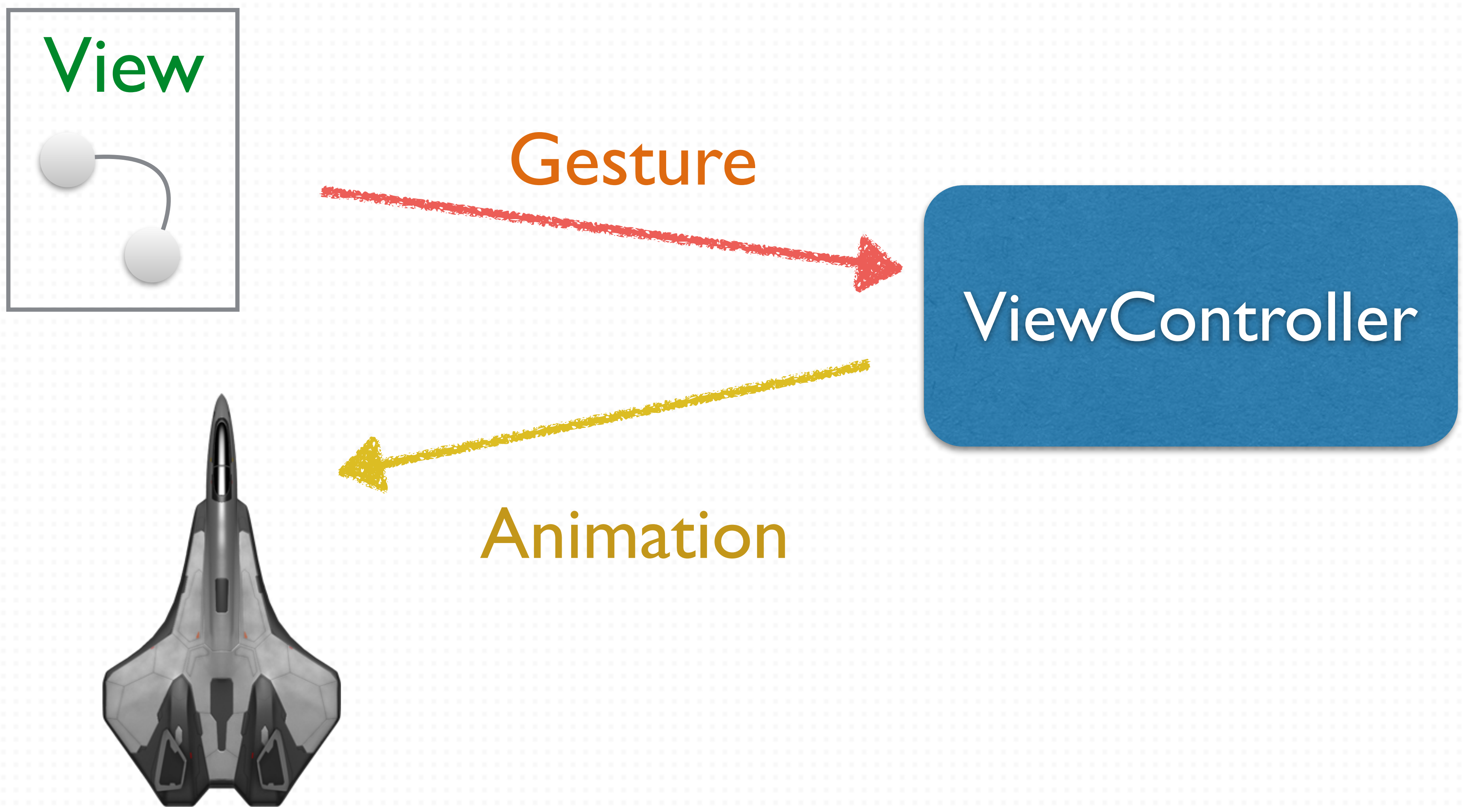


Gesture Recognition

Demo

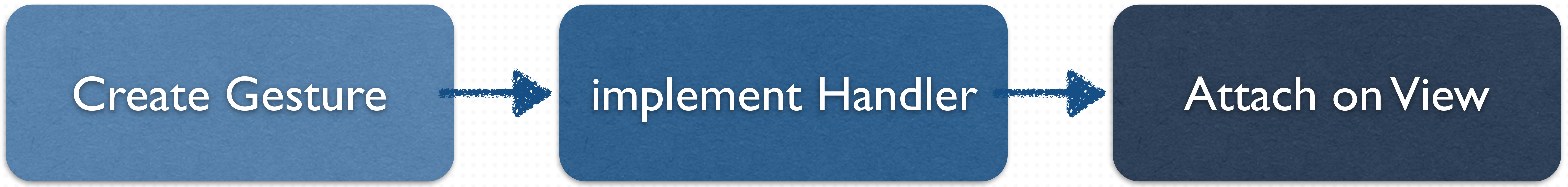
Gesture

- Example: Gesture on



Gesture

- How to?



Gesture Recognizer

- Tap

```
UITapGestureRecognizer *tapGesture = [[UITapGestureRecognizer alloc] initWithTarget:self action:@selector(tapGestureHandler:)];
tapGesture.numberOfTapsRequired = 2;
[button addGestureRecognizer:tapGesture];
```

```
- (void)tapGestureHandler:(UIGestureRecognizer*)gestureRecognizer
{
    NSLog(@"Tap Gesture Triggered. %d fingers tapped.", gestureRecognizer.numberOfTouches);
}
```

@selector

```
@selector(sendMessage:to:)

- (void)sendMessage:(id)msg to:(id)somebody
```

@selector

```
@selector(helloWorld)

- (void)helloWorld
```

`@selector(helloWorld:)`

`- (void)helloWorld:(id)param`

Gesture Recognizer

- Long Press

```
UILongPressGestureRecognizer *longPressGesture =
[[UILongPressGestureRecognizer alloc] initWithTarget:self
action:@selector(longPressHandler:)];

longPressGesture.minimumPressDuration = 2.0; (2 Seconds)

[button addGestureRecognizer:longPressGesture];
```

Gesture Recognizer

- Swipe

```
UISwipeGestureRecognizer *swipeGesture = [[UISwipeGestureRecognizer alloc]
initWithTarget:self action:@selector(swipeGestureHandler:)];

swipeGesture.direction = UISwipeGestureRecognizerDirectionLeft;

[self.view addGestureRecognizer:swipeGesture];
```

Gesture Recognizer

- Rotation

```
UIRotationGestureRecognizer *rotationGesture = [[UIRotationGestureRecognizer alloc] initWithTarget:self action:@selector(rotationGestureHandler:)];
[self.view addGestureRecognizer:rotationGesture];
```

```
- (void)rotationGestureHandler:(UIRotationGestureRecognizer*)gestureRecognizer
{
    float degree = gestureRecognizer.rotation * 180 / M_PI;
    NSLog(@"Rotating: %fdeg", degree);
}
```

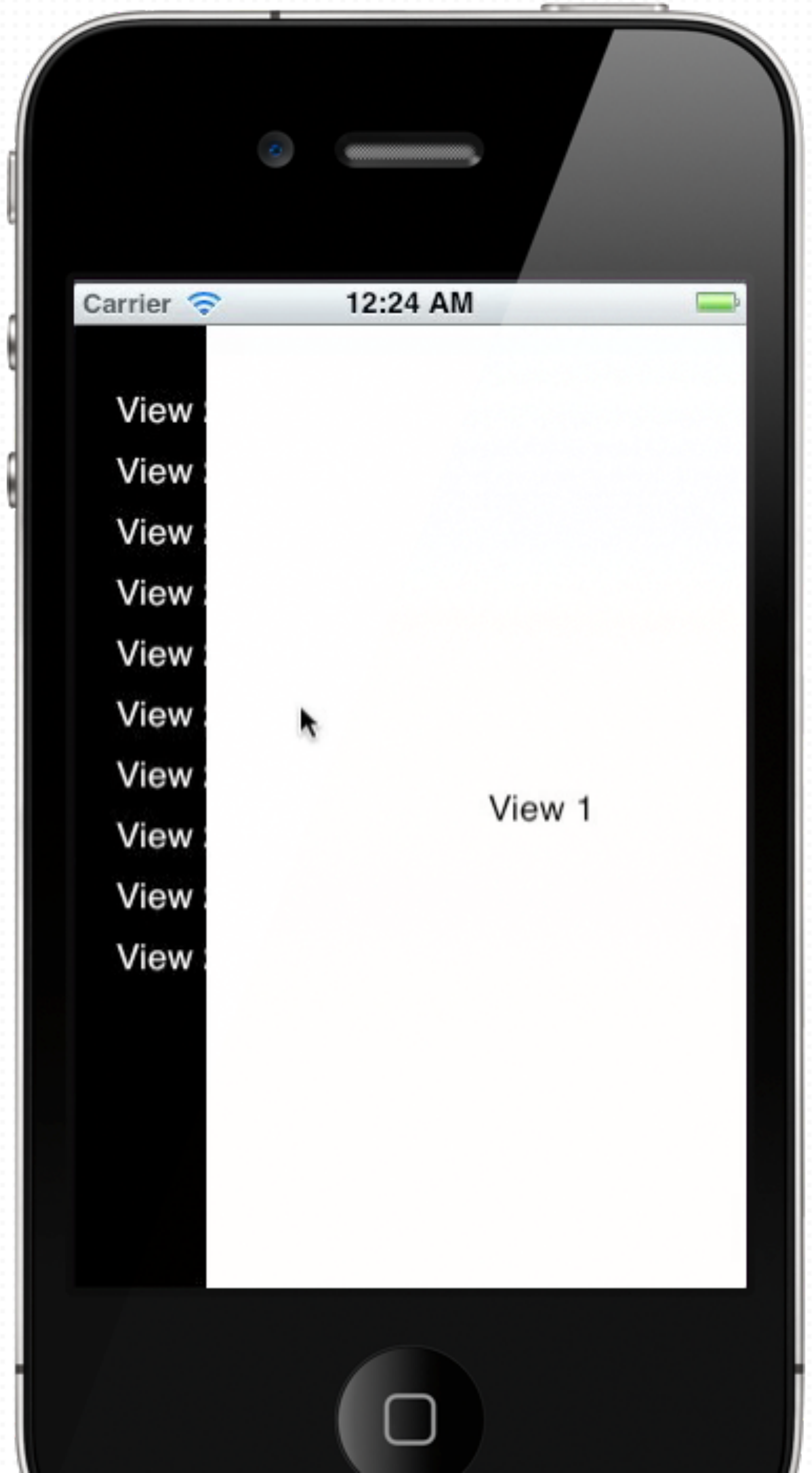
Gesture Recognizer

- Pan

```
UIPanGestureRecognizer *panGesture = [[UIPanGestureRecognizer alloc] initWithTarget:self action:@selector(panGestureHandler:)];
[self.view addGestureRecognizer:panGesture];
```

```
- (void)panGestureHandler:(UIPanGestureRecognizer*)gestureRecognizer
{
  NSString *translation = NSStringFromCGPoint([gestureRecognizer translationInView:self.view]);
  NSString *velocity = NSStringFromCGPoint([gestureRecognizer velocityInView:self.view]);
  NSLog(@"translation: %@, velocity: %@", translation, velocity);
}
```

View Panning



View Panning

- ViewDidLoad

```
- (void)viewDidLoad
{
    [super viewDidLoad];

    UIPanGestureRecognizer *panGesture = [[UIPanGestureRecognizer alloc]
initWithTarget:self action:@selector(panGestureHandler:)];
    [self.view addGestureRecognizer:panGesture];
}
```

View Panning

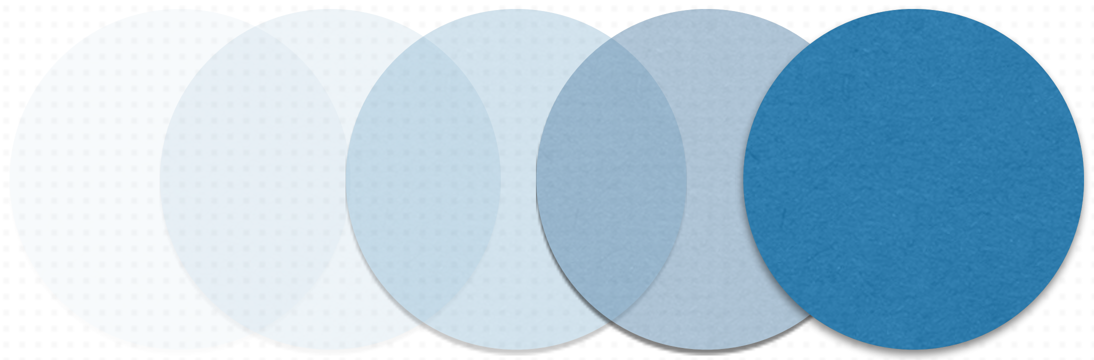
- Handling panning gesture

```
- (void)panGestureHandler:(UIPanGestureRecognizer*)gesture
{
    CGPoint translation = [gesture translationInView:self.view];
    NSLog(@"%@", NSStringFromCGPoint(translation));

    CGRect frame = self.fgView.frame;

    // gesture ended.
    if (gesture.state == UIGestureRecognizerStateEnded)
    {
        frame.origin.x = 0;
    }else {
        frame.origin.x = frame.origin.x + translation.x;
    }

    // transform the frame.
    self.fgView.frame = frame;

    [gesture setTranslation:CGPointZero inView:self.view];
}
```

Animation

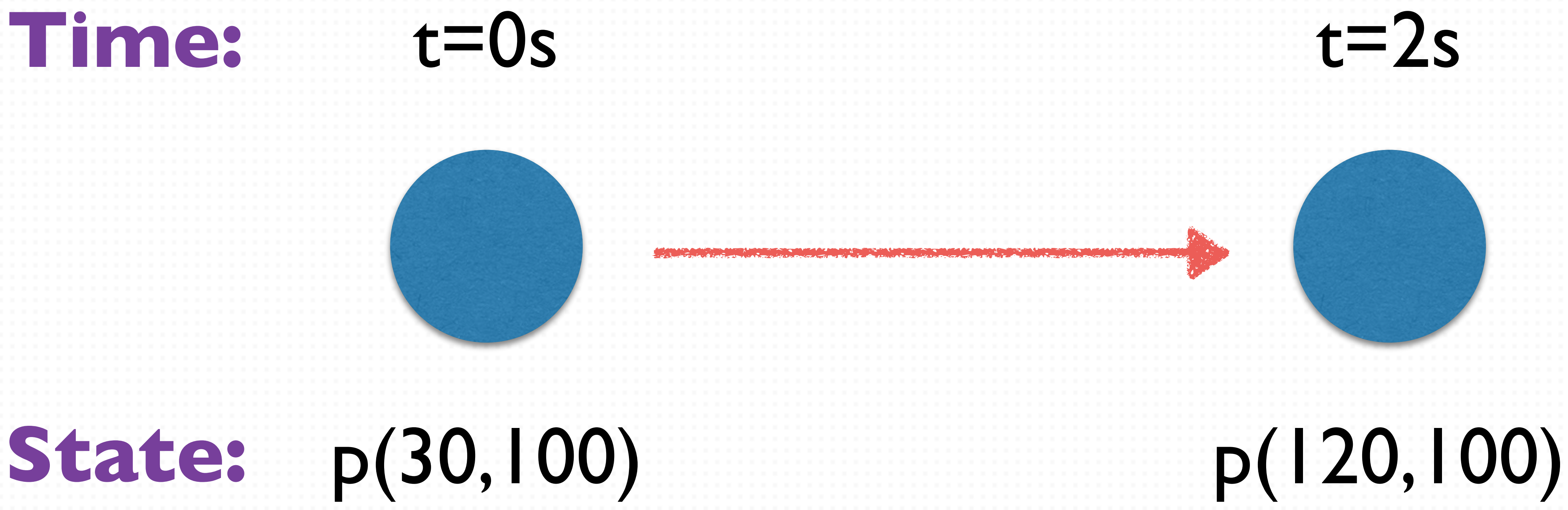
Animation

- Give UIView a life - Move!



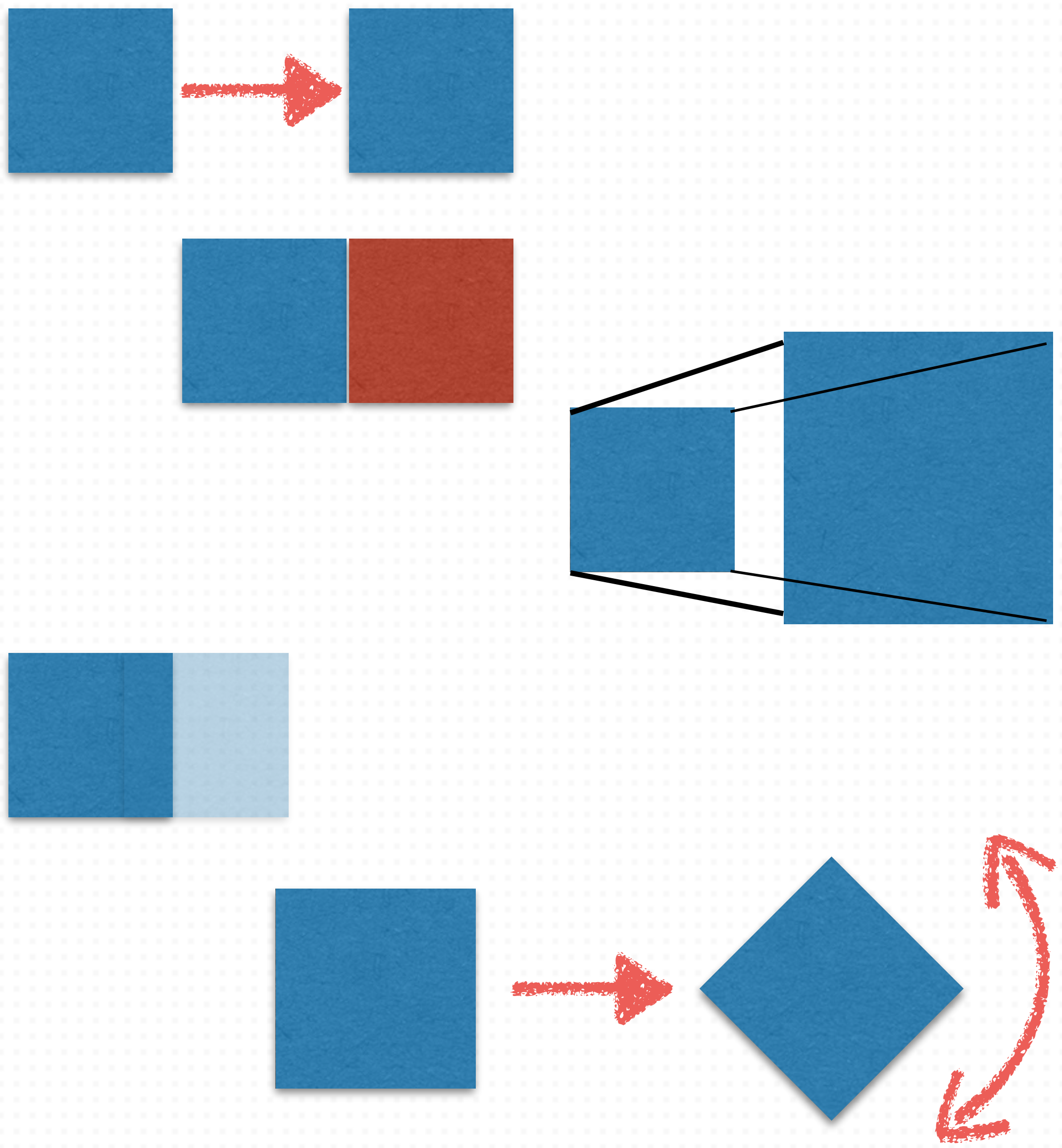
Animation

- UIView transit from one state to other state



Animation

- State
  - Position
  - Color
  - Scale
  - Opacity
  - Rotation



Animation

- Implement an animation on UIView

```
view.frame = CGRectMake(0,200, 40, 40);
```

```
[UIView animateWithDuration:0.4 animations:^{
    //UIView that wants to have animation
    view.frame = CGRectMake(100, 200, 40,40 );
}];
```

Animation

- Multistage animation (Nested animation)

```
[UIView animateWithDuration:0.5
                  delay:0.0
                options:UIViewAnimationOptionBeginFromCurrentState
             animations:^{
                  //###  first animation  ###
             }
             completion:^(BOOL finished){[UIView animateWithDuration:0.5
                                                     delay:0.0
                                                 options:UIViewAnimationOptionBeginFromCurrentState
                                                 animations:^{
                                                    //### second animation ###
                                                 }
                                                 completion:^(BOOL finished){//## and so on.. ##
                                                 }];}];
```

Animation

- Transform
  - Translation
  - Rotation
  - Scale

Animation

- Make Translation Matrix

```
CGAffineTransform CGAffineTransformMakeTranslation ( CGFloat tx, CGFloat ty);
```

- Make Rotation Matrix

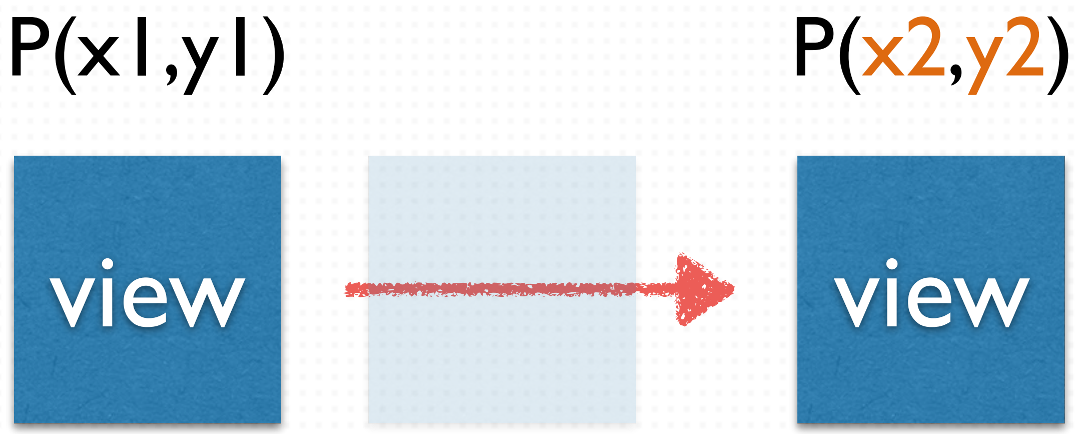
```
CGAffineTransform CGAffineTransformMakeRotation ( CGFloat angle);
```

- Make Scale Matrix

```
CGAffineTransform CGAffineTransformMakeScale ( CGFloat sx, CGFloat sy);
```

Animation

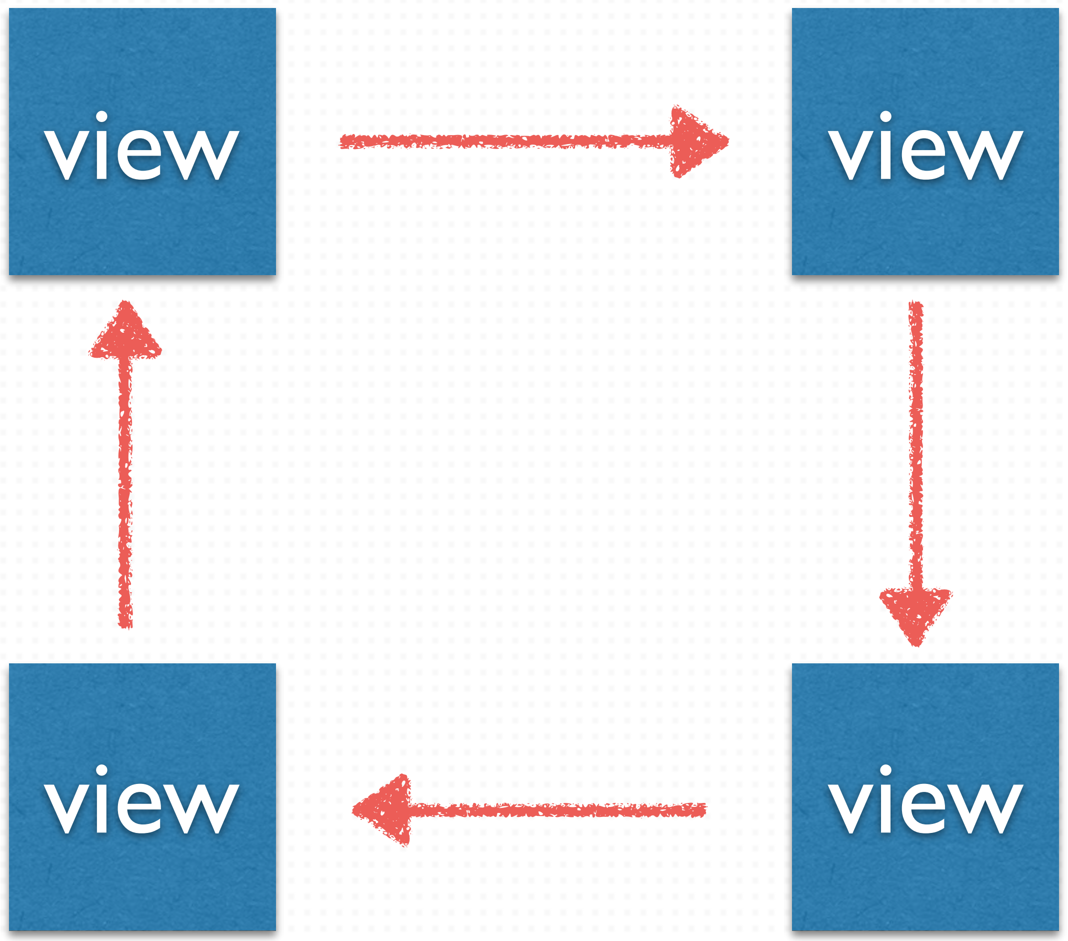
- Translation a UIView



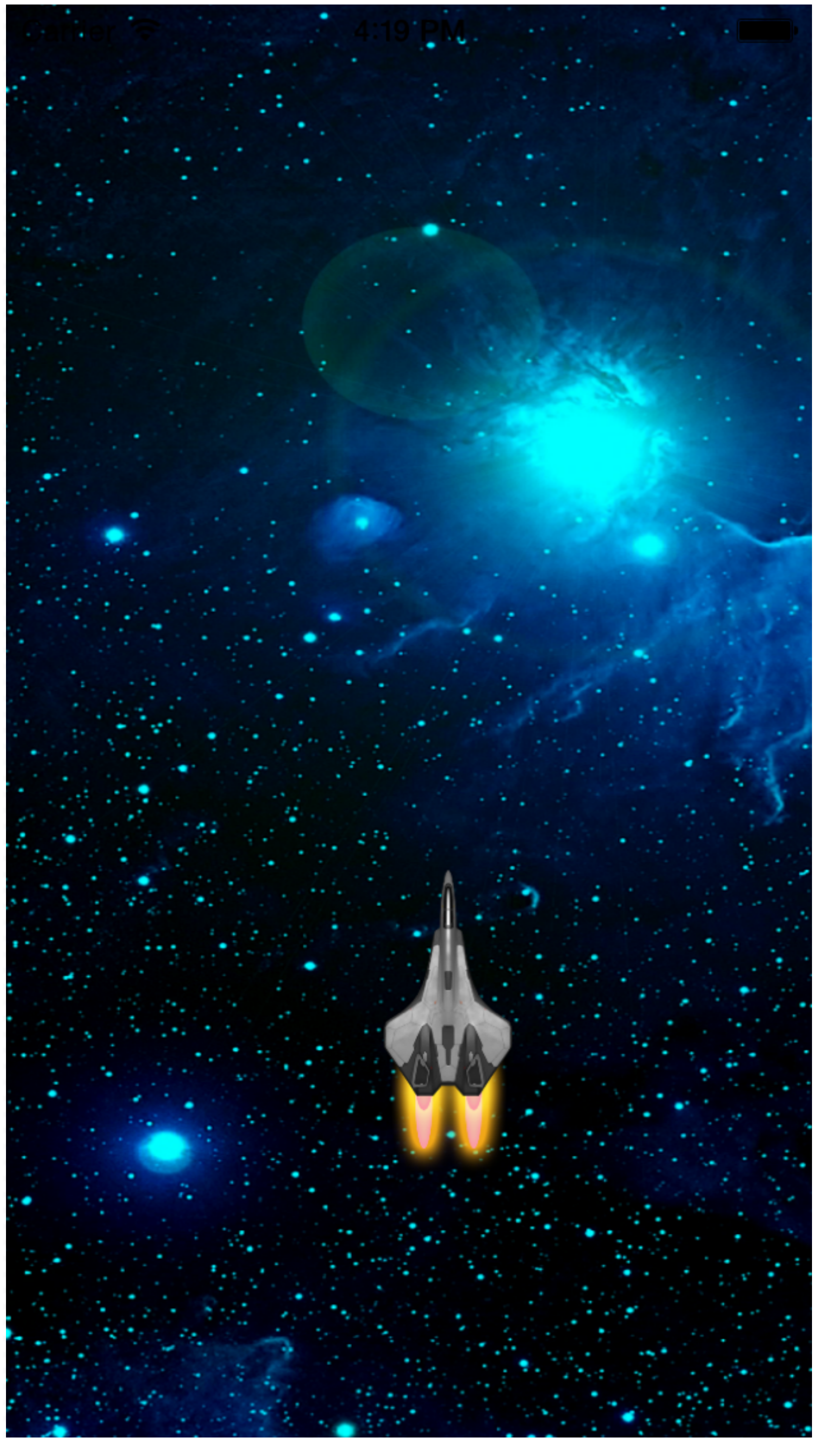
```
view.transform = CGAffineTransformMakeTranslation(x2, y2);
```

Animation

- How about?



Practice



Exercise

✓ Think about how to make use of gestures.

✓ Design an app with gesture features and animation.

✓ Present it to the class in next lesson.