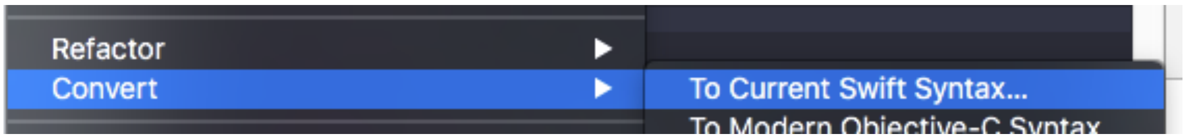
Swift

Bug reporting

If you see other errors, please file a bug report at https://bugreport.apple.com and include the details

Swift Migration Assistant

To make a swift 2.2 project a Swift 3 project
Edit>Convert>ToCurrentSwiftSyntax..

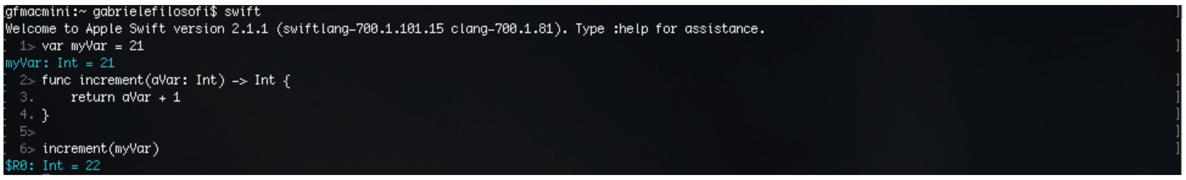


Eventually you will be presented with all the changes. The changes will be applied once you click on 'Save'.

Running Swift from terminal

One possibility is to use REPL (Read Evaluate Print Loop)

1. Open .bash_profile and add the line swift="/Applications/<Xcode_version>.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/bin/swift"
2. Open a terminal and type *swift*. Then enter instructions



```
gfmacmini:~ gabrielefilosofi$ swift
Welcome to Apple Swift version 2.1.1 (swiftlang-700.1.101.15 clang-700.1.81). Type :help for assistance.
  1> var myVar = 21
myVar: Int = 21
  2> func increment(aVar: Int) -> Int {
  3.     return aVar + 1
  4. }
  5>
  6> increment(myVar)
$R0: Int = 22
```

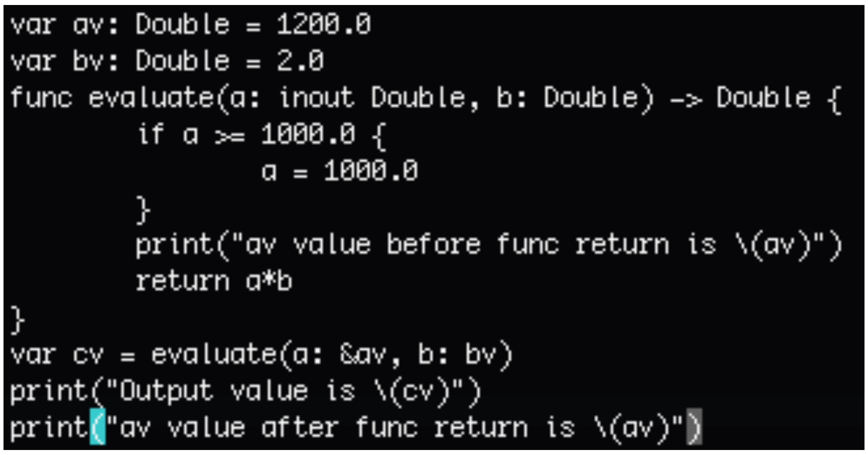
To see LLDB debugging commands type :help.
To escape from REPL mode type Cmd+d, or :q

Another possibility is

1. Edit the swift file, <filename>.swift
2. Open a terminal and type *xcrun swift <filename>.swift*

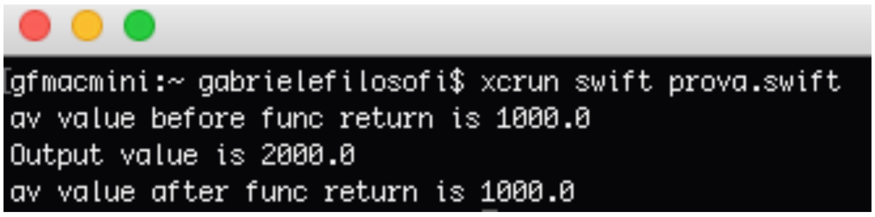
Example

Edit prova.swift



```
var av: Double = 1200.0
var bv: Double = 2.0
func evaluate(a: inout Double, b: Double) -> Double {
        if a >= 1000.0 {
                a = 1000.0
        }
        print("av value before func return is \(av)")
        return a*b
}
var cv = evaluate(a: &av, b: bv)
print("Output value is \(cv)")
print("av value after func return is \(av)")
```

then



```
gfmacmini:~ gabrielefilosofi$ xcrun swift prova.swift
av value before func return is 1000.0
Output value is 2000.0
av value after func return is 1000.0
```

Another possibility is to use swift script files. Add the following line on top of the script file
#!/usr/bin/xcrun swift

Introduction to Swift

Swift is C-influenced but not a C-superset, like Objective-C.

Like in Python, the use of rounded parenthesis is not essential to swift. It is just for readability.

Coding Style

CamelCase: programming style where strings obtained by chaining multiple words have all the words but the first one beginning with a capital letter.

Swift line codes doesn't require semicolons. They are allowed but not needed and the standard practice is not to use semicolons at all

Where is the main entry-point ?

All swift files in a App are order-independent.
For example, you can define a enum type in file a.swift

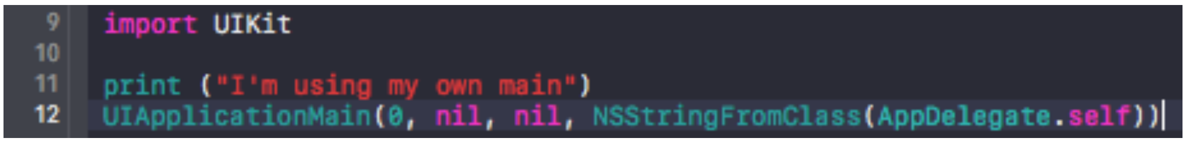
```
enum Direction {
        case north
        case south
        case west
        case est
}
```
and use it in another file b.swift

```
var dir = Direction.north
```

In swift a Top-level code is any swift executable statement not written within a function or class body.
Top-level code is not allowed in most of swift source files. The exception is a special file named “main.swift”, which behaves much like a playground file, but is built with your app’s source code.
Swift doesn’t require a main method or function to say where the execution starts.
With “main.swift” you can take complete control over initialization. In effect, the first line of code to run in “main.swift” is implicitly defined as the main entry-point for the program.
If you add @UIApplicationMain to a regular Swift file, this causes the compiler to synthesize a main entry point for you, and eliminates the need for a “main.swift” file.
This is what happens when you start with a template project.

Exercise

1. Create a new project in Xcode
2. Comment out the line @UIApplicationMain in AppDelegate.swift
3. Add a new source file and call it main.swift, and copy the following code inside



```
import UIKit

print ("I'm using my own main")
UIApplicationMain(0, nil, nil, NSStringFromClass(AppDelegate.self))
```

Playground

Playground is a valuable tool for quickly writing and testing swift code.
Playground files allow top-level code execution.
Code within a playground file is order-dependent.
Playground contain three areas

- code editor
- results
- timeline

Useful buttons in playground

```
INSTANCE OF A    "Hello"

                 "Hello"
                 "Hello World"
                 "Hello World"
```

This is the quick Look and it is an API

All variables are declared with keyword var

Type inference means that swift infers the type of a variable from code we have written

Type of a variable can be defined by value assignment
 var myVariable = "Hello"
or by type annotation
 var myVariable : String

We cannot change the type of a variable

Types are Int, Float, Double, Bool, String, Character.
Other valid types are Int8, Int16, Int32, Int64, Uint, Uint8, Uint16,…

NOTE
Use UInt only when you specifically need an unsigned integer type with the same size as the platform's native word size. If this is not the case, Int is preferred, even when the values to be stored are known to be non-negative. A consistent use of Int for integer values aids code interoperability, avoids the need to convert between different number types, and matches integer type inference, as described in Type Safety and Type Inference.

NOTE
Type aliases are useful when you want to refer to an existing type by a name that is contextually more appropriate, such as when working with data of a specific size from an external source:
typealias AudioSample = UInt16

All constants are declared with keyword let

The value of a constant can be assigned only once. After that it cannot change anymore

In Objective-C a string variable had to be declare of type NSString, while a string constant had to be declared of type NSImmutableString. In Swift we use var and let, both for basic types and for more complex structures.

The print function

The print(_:separator:terminator:) function is a global function that prints one or more values to an appropriate output. In Xcode, for example, the print(_:separator:terminator:) function prints its output in Xcode's "console" pane. The separator and terminator parameter have default values, so you can omit them when you call this function. By default, the function terminates the line it prints by adding a line break. To print a value without a line break after it, pass an empty string as the terminator—for example, print(someValue, terminator: ""). For information about parameters with default values, see Default Parameter Values.

In many languages, in order to create strings with program dependent contents we use Concatenation
 "Congratulation " + name + "." + CRLF + "Your score is " + score.toString()
or string Formatting
 ("Congratulation %@. Your score is %i", name, score)
In swift we use Interpolation, with the notation \(..)
 print("Congratulation \(name). Your score is \(score + 12))

UTF

UTF: Unicode Transformation Format
let caffè = "caff\u{E8}"
let caffèCorretto = "caffe" + \u{300}
.count on both vars gives 5
var circledi: Character = \u{24D8}
var circledà = Character = \u{e0}\u{20dd}
Some fonts have more than one glyphs for some of their characters.

For type conversion use builtin functions Int(), Double(), String(), ..

Tuples

Tuples are ordered set of value of any type. They are very useful as return values of function.
For example a HTTP status code is returned by a HTTP server whenever you request a web page. This could be given with the following tuple
let http404Error = (404, "Not Found")
..
let (statusCode, statusMessage) = http404Error
Then you can access the single parts of a touple
print ("\(statusCode)")
or
print(http404Error.0)
NOTE
Tuples are useful for temporary groups of related values. They are not suited to the creation of complex data structures. If your data structure is likely to persist beyond a temporary scope, model it as a class or structure, rather than as a tuple. For more information, see Classes and Structures.

Optionals and Unwrapping

You use *optionals* in situations where a value may be absent. An optional says: Here's an example of how optionals can be used to cope with the absence of a value. Swift's Int type has an initializer which tries to convert a String value into an Int value. However, not every string can be converted into an integer.
The example below uses the initializer to try to convert a String into an Int:

```
let possibleNumber = "123"
let convertedNumber = Int(possibleNumber) // convertedNumber is inferred to be of type "Int?", or "optional Int"
```

Once you're sure that the optional *does* contain a value, you can access its underlying value by adding an exclamation mark (!) to the end of the optional's name. The exclamation mark effectively says, "I know that this optional definitely has a value; please use it." This is known as *forced unwrapping* of the optional's value.

You use *optional binding* to find out whether an optional contains a value, and if so, to make that value available as a temporary constant or variable. Optional binding can be used with if and while statements to check for a value inside an optional, and to extract that value into a constant or variable, as part of a single action.
Example:

```
if let newvar = optionalvar {
  //use newvar with the unwrapped value of optionalvar
}
```

When it is clear from a program's structure that an optional will *always* have a value, after that value is first set, it is useful to remove the need to check and unwrap the optional's value every time it is accessed. In this cases use an *implicitly unwrapped optional* by placing an exclamation mark after the optional type.
Example:

```
@IBOutlet var mmap: MKMapView!
```

Error Handling

Swift has powerful means to detect, propagate and evaluate error conditions.
Example:

```
func makeASandwich() throws {
// ...
}

do {
        try makeASandwich()
        eatASandwich()
} catch Error.OutOfCleanDishes {
        washDishes()
} catch Error.MissingIngredients(let ingredients) {
        buyGroceries(ingredients)
}
```

Using assertions

An assertion is a way to test a variable or expression is true and terminate the app with a message when it is found false.

Example:

```
let age = -3
assert(age >= 0, "A person's age cannot be less than zero")
```

Use an assertion whenever a condition has the potential to be false, but must *definitely* be true in order for your code to continue execution. Suitable scenarios for an assertion check include:

- An integer subscript index is passed to a custom subscript implementation, but the subscript index value could be too low or too high.
- A value is passed to a function, but an invalid value means that the function cannot fulfill its task.
- An optional value is currently nil, but a non-nil value is essential for subsequent code to execute successfully.

NOTE

Assertions cause your app to terminate and are not a substitute for designing your code in such a way that invalid conditions are unlikely to arise. Nonetheless, in situations where invalid conditions are possible, an assertion is an effective way to ensure that such conditions are highlighted and noticed during development, before your app is published.

Switch

In Swift the round braces around the condition statement is not necessary, instead the curly braces around the action statements are mandatory, even you have a single line instruction

The statement

```
if x { .. }
```

works in C even though x is an integer valuje. In swift it is not valid because the conditional expression must be a Bool value

In swift there is not the automatic fall through behaviour in switch statement. For example, in C you can write

```
switch myVar {
        case 1:
        case 2:
        case 3:
                x = 1
        break;
        case 4:
                x = 21
        break;
        default:
        break;
 }
```
You can do this because the break keyword holds.
In swift you must write explicitly a statement for each condition

```
switch myVar {
        case 1:
                x = 1
        case 2:
                x = 1
        case 3:
                x = 1
        case 4:
                x = 21
        default:
                break
 }
```

You can also use the range operator
```
switch myVar {
        case 1…3:
                x = 1
        case 4:
                x = 21
        default:
                break
 }
```

The swift for loop uses the syntax
```
for each-item in some-collection
        // use each-item
{
```

Example
```
for k in 1..>100 {
        print(“current k is \(k)")
 }
```

Example
```
let myName = "Gabriele"
for eachChar in myName {
        print(“next letter in name is current \(eachChar)")
```

```
 }
```

Functions

Function with no arguments and no return declaration is

```
func myFunction() {
       print(“Hello")
 }

//Function call
myFunction()
```

A function has a type. The function above has type () -> ()

Function with one argument and no return declaration is

```
func myFunction( name : String ) {
       println(“Hello \(name)")
 }
```

The function type is (String) -> ()

Function call

```
myFunction(“Jane")
```

In swift, function parameters are considered constants, so you cannot change them, unless you add keyword var in front of the parameter inside the function parameters list

```
func myFunction( name : String, var age : Int ) {
       print(“Hello \(name). Next year you will be \(age + 1)” years old)
 }

//Function call
myFunction(“Jane", 21)
```

Add a return to the function:

```
func myFunction( name : String, var age : Int ) -> String {
       return “Hello \(name). Next year you will be \(age + 1)” years old)
 }
```

Function type is (String, Int) -> String

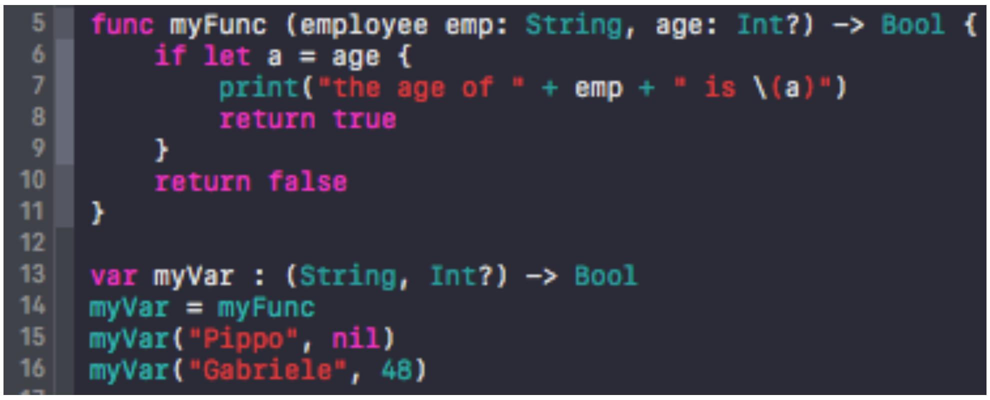
Example:

```
func COSTestExec( name : String, var datarate : Int ) -> Bool {
  switch name {
    case “ergo":
```

```
    ...
    case “dmc":
    ...
    default:
    break
  }
  return False
}
```

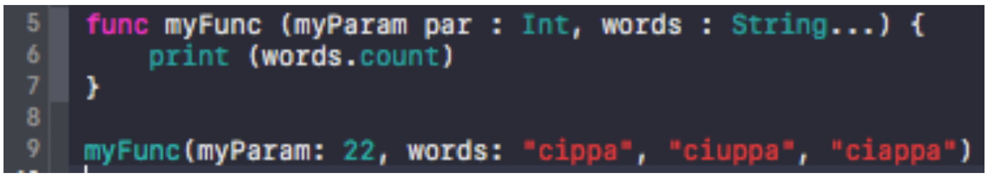
(BOOL)COSTestExec:(String *)name

You can assign a function to a variable of the same type.



```swift
func myFunc (employee emp: String, age: Int?) -> Bool {
    if let a = age {
        print("the age of " + emp + " is \(a)")
        return true
    }
    return false
}

var myVar : (String, Int?) -> Bool
myVar = myFunc
myVar("Pippo", nil)
myVar("Gabriele", 48)
```

Variadic parameters: You can have function with an arbitrary number of parameters



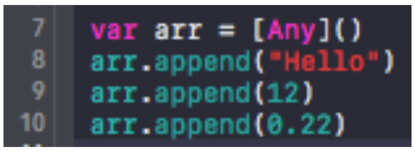
```swift
func myFunc (myParam par : Int, words : String...) {
    print (words.count)
}

myFunc(myParam: 22, words: "cippa", "ciuppa", "ciappa")
```

Type cast

as
as!
as?
is

Any and AnyObject

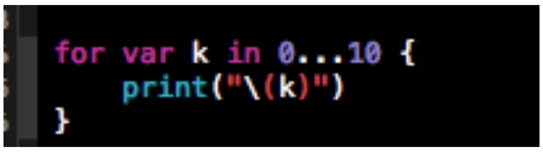
Any is an alias for any type.
Var cassetto = [Any]()
è un array di qualsiasi tipo



```swift
var arr = [Any]()
arr.append("Hello")
arr.append(12)
arr.append(0.22)
```

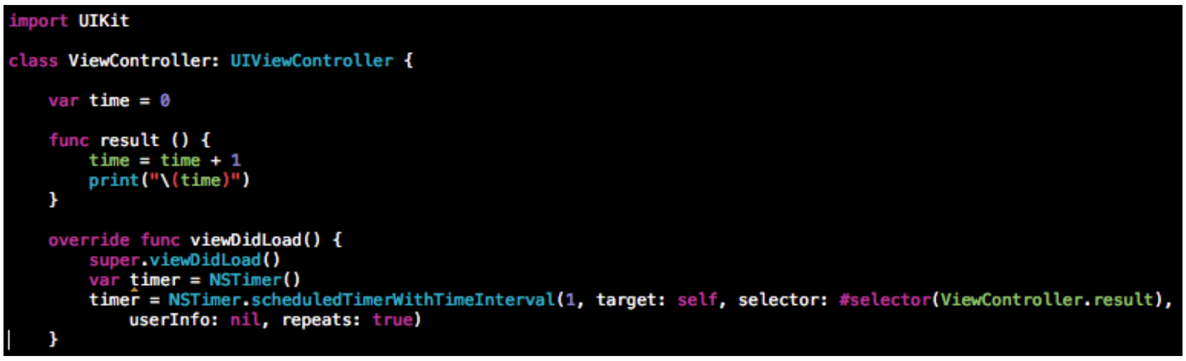
AnyObject is an alias for any object

For loop



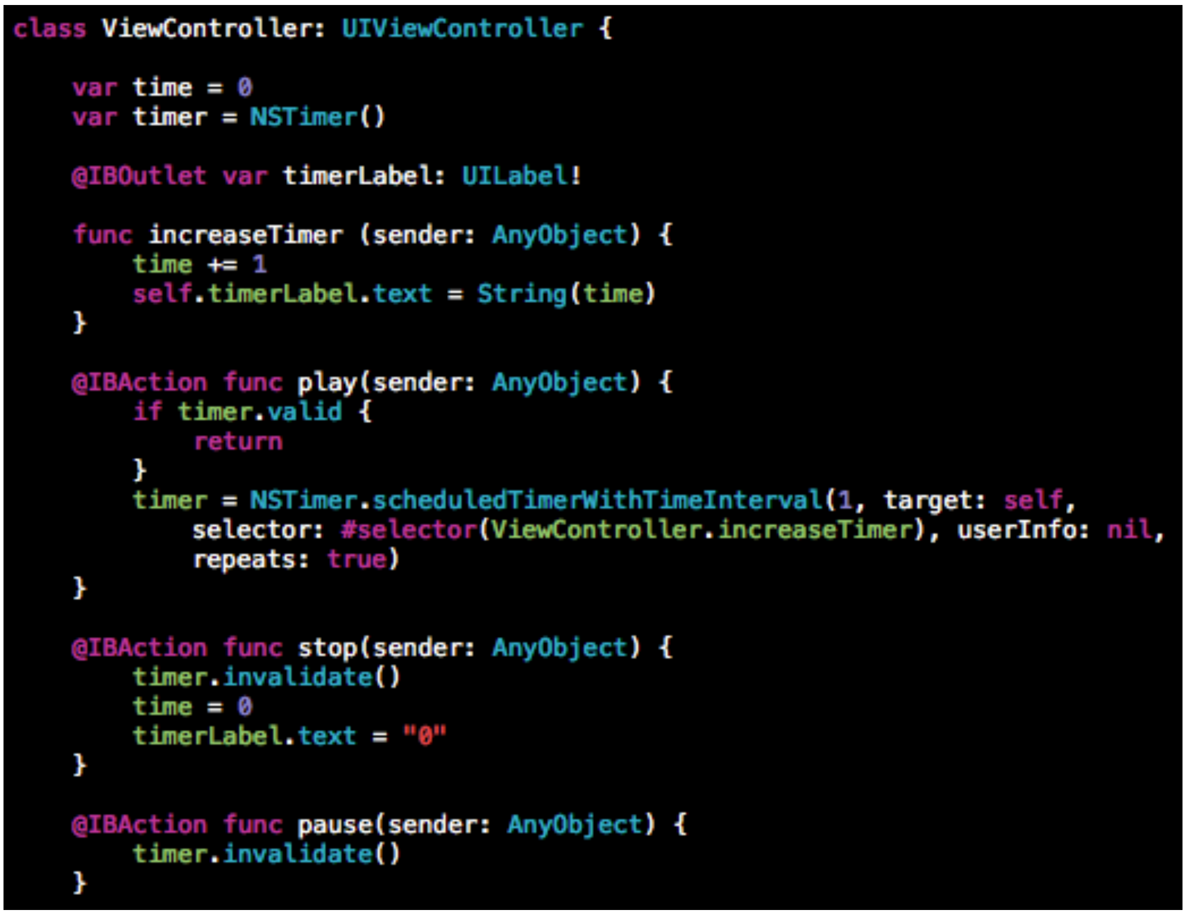
```
for var k in 0...10 {
    print("\(k)")
}
```

Timer



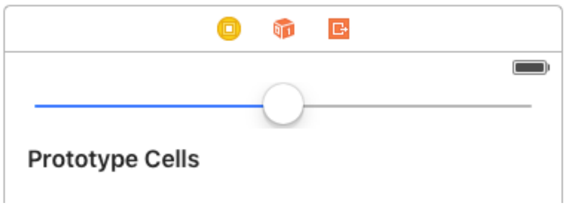
```
import UIKit

class ViewController: UIViewController {

    var time = 0

    func result () {
        time = time + 1
        print("\(time)")
    }

    override func viewDidLoad() {
        super.viewDidLoad()
        var timer = NSTimer()
        timer = NSTimer.scheduledTimerWithTimeInterval(1, target: self, selector: #selector(ViewController.result),
            userInfo: nil, repeats: true)
    }
```

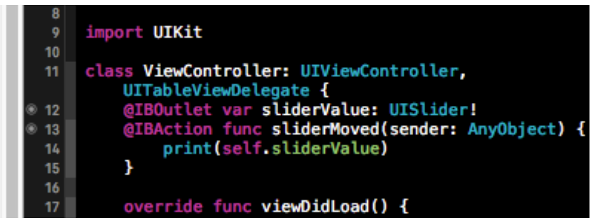
The stopwatch app



```
class ViewController: UIViewController {

    var time = 0
    var timer = NSTimer()

    @IBOutlet var timerLabel: UILabel!

    func increaseTimer (sender: AnyObject) {
        time += 1
        self.timerLabel.text = String(time)
    }

    @IBAction func play(sender: AnyObject) {
        if timer.valid {
            return
        }
        timer = NSTimer.scheduledTimerWithTimeInterval(1, target: self,
            selector: #selector(ViewController.increaseTimer), userInfo: nil,
            repeats: true)
    }

    @IBAction func stop(sender: AnyObject) {
        timer.invalidate()
        time = 0
        timerLabel.text = "0"
    }

    @IBAction func pause(sender: AnyObject) {
        timer.invalidate()
    }
```

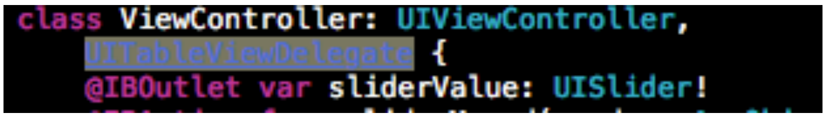
Slider



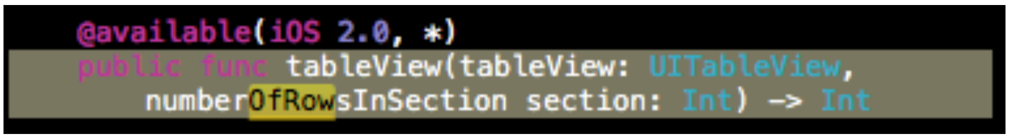

```
import UIKit

class ViewController: UIViewController,
    UITableViewDelegate {
    @IBOutlet var sliderValue: UISlider!
    @IBAction func sliderMoved(sender: AnyObject) {
        print(self.sliderValue)
    }

    override func viewDidLoad() {
```

Tip for quick search of class or protocol methods

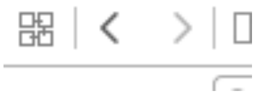
to find the method prototype of a protocol, just Cmd+click on protocol name,


```
class ViewController: UIViewController,
    UITableViewDelegate {
    @IBOutlet var sliderValue: UISlider!
```

find and copy the desired methods


```
    @available(iOS 2.0, *)
    public func tableView(tableView: UITableView,
        numberOfRowsInSection section: Int) -> Int
```

then click the left arrow on top bar to go back, and paste

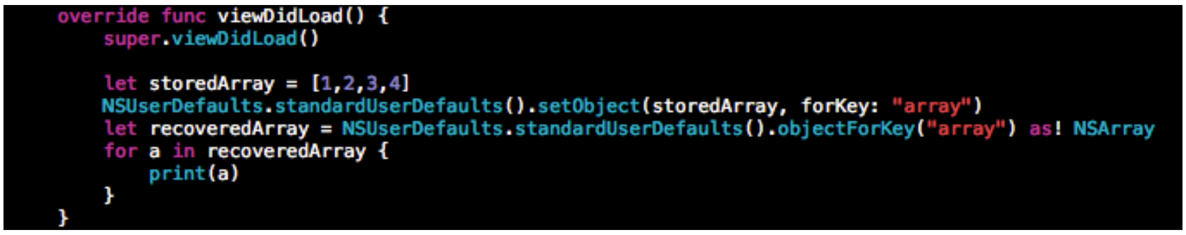


How to automatically update cells of a TableView

Simply create an outlet "myTable" by Ctrl+click and drag the TableVIew from storyboard to ViewController.swift, then call
myTable.reloadData()

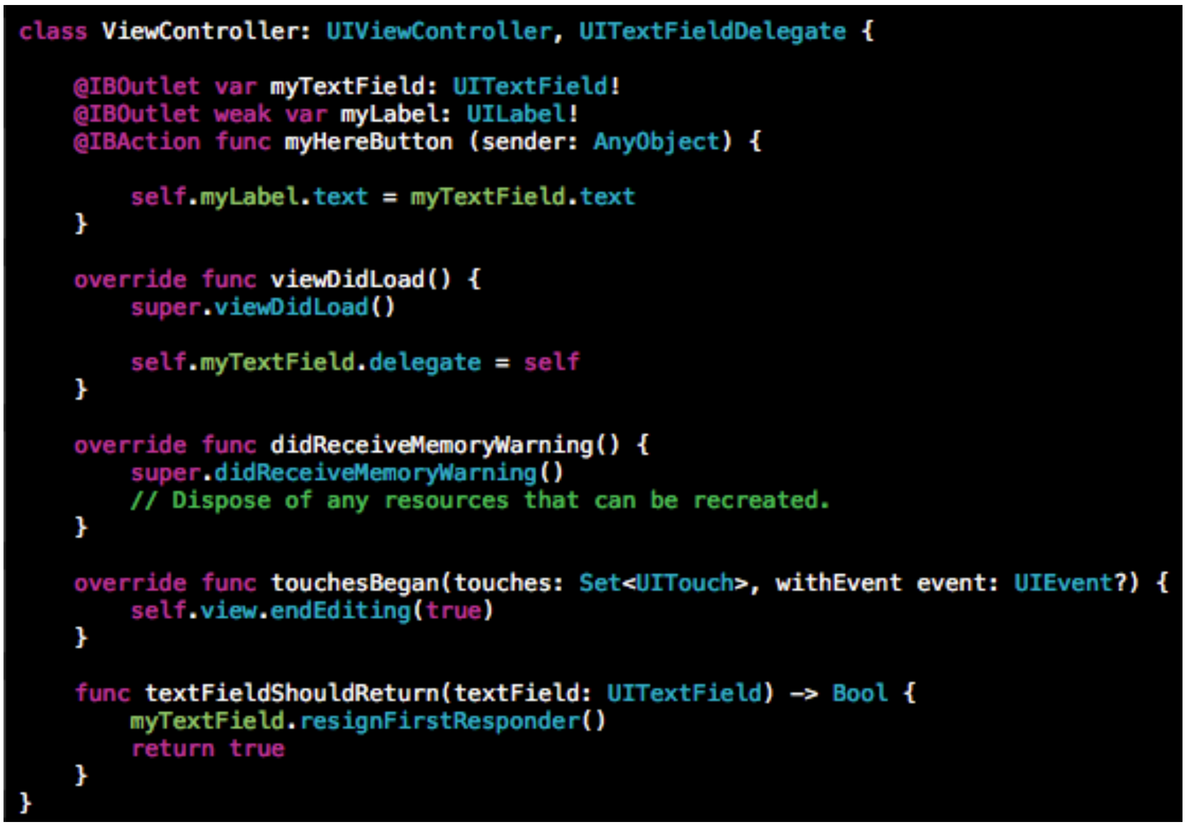
Permanent storage

The simplest way to store variables permanently is by using NSUserDefault


```
    override func viewDidLoad() {
        super.viewDidLoad()

        let storedArray = [1,2,3,4]
        NSUserDefaults.standardUserDefaults().setObject(storedArray, forKey: "array")
        let recoveredArray = NSUserDefaults.standardUserDefaults().objectForKey("array") as! NSArray
        for a in recoveredArray {
            print(a)
        }
    }
```

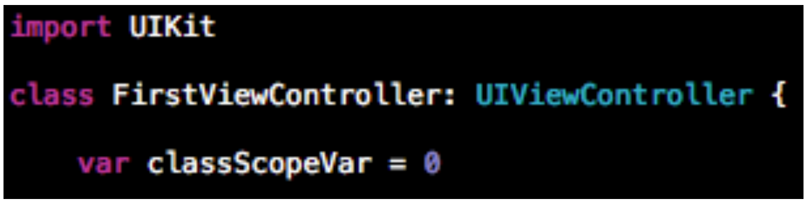
Controlling Keyboard

It is possible to get control of the sw keyboard. For example suppose we want the keyboard disappears when tapping the active view and/or the return button

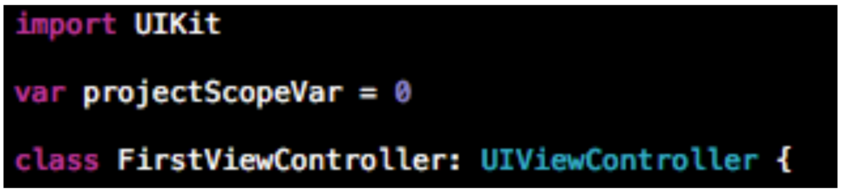

```
class ViewController: UIViewController, UITextFieldDelegate {

    @IBOutlet var myTextField: UITextField!
    @IBOutlet weak var myLabel: UILabel!
    @IBAction func myHereButton (sender: AnyObject) {

        self.myLabel.text = myTextField.text
    }

    override func viewDidLoad() {
        super.viewDidLoad()

        self.myTextField.delegate = self
    }

    override func didReceiveMemoryWarning() {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recreated.
    }

    override func touchesBegan(touches: Set<UITouch>, withEvent event: UIEvent?) {
        self.view.endEditing(true)
    }

    func textFieldShouldReturn(textField: UITextField) -> Bool {
        myTextField.resignFirstResponder()
        return true
    }
}
```

Scope of variables

If you want a variable be accessible to all methods of a class, declare it within the class body but outside any method

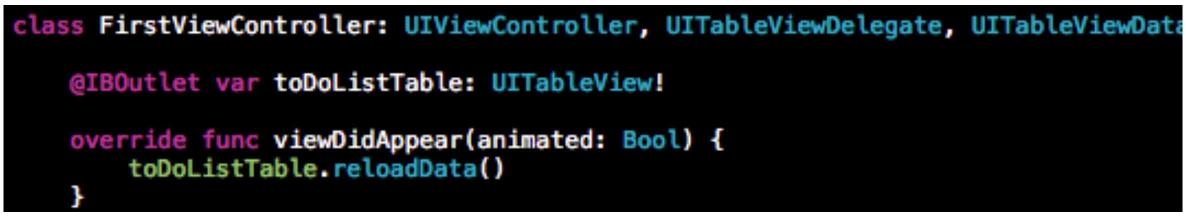

```
import UIKit

class FirstViewController: UIViewController {

    var classScopeVar = 0
```

If the variable has to a accessed to all project's classes, then declare it outside any class body


```
import UIKit

var projectScopeVar = 0

class FirstViewController: UIViewController {
```

Update the view content

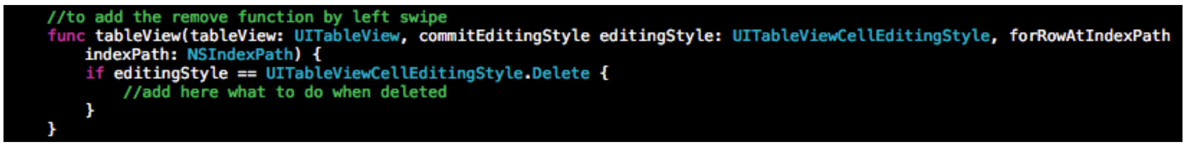
Use the method viewDidAppear to update the content of the view every time the view appears, not just when it is created



```
class FirstViewController: UIViewController, UITableViewDelegate, UITableViewDat

    @IBOutlet var toDoListTable: UITableView!

    override func viewDidAppear(animated: Bool) {
        toDoListTable.reloadData()
    }
```

Add the delete function by swipe-left to the cell editing

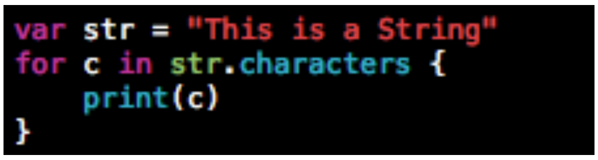
To add the delete function by swipe left to the table view cell editing use the following method of the UITableViewDelegate protocol



```
    //to add the remove function by left swipe
    func tableView(tableView: UITableView, commitEditingStyle editingStyle: UITableViewCellEditingStyle, forRowAtIndexPath
        indexPath: NSIndexPath) {
        if editingStyle == UITableViewCellEditingStyle.Delete {
            //add here what to do when deleted
        }
    }
```

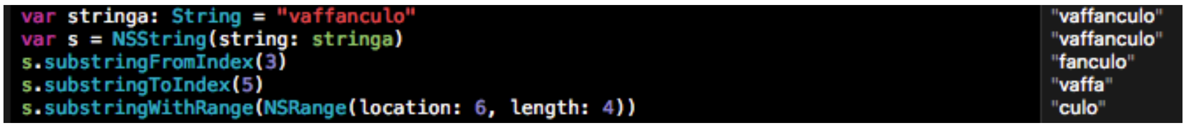
String manipulation

To cycle over all string characters



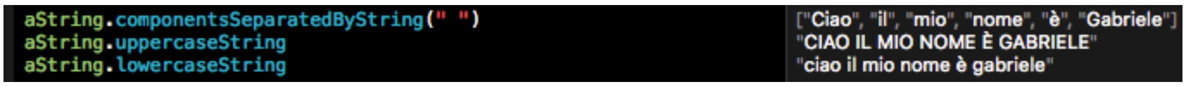
```
var str = "This is a String"
for c in str.characters {
    print(c)
}
```

get substrings



```
var stringa: String = "vaffanculo"                     "vaffanculo"
var s = NSString(string: stringa)                     "vaffanculo"
s.substringFromIndex(3)                               "fanculo"
s.substringToIndex(5)                                 "vaffa"
s.substringWithRange(NSRange(location: 6, length: 4)) "culo"
```

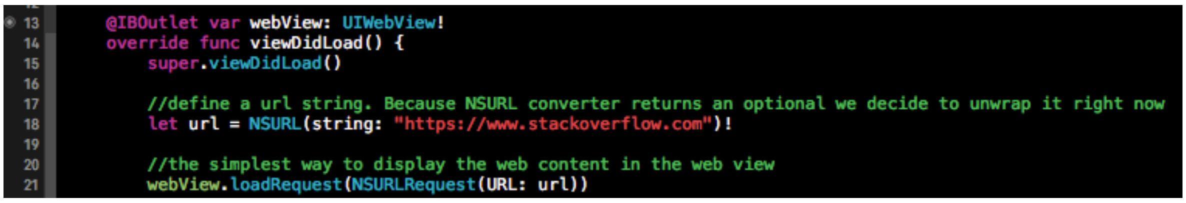
others



```
aString.componentsSeparatedByString(" ")   ["Ciao", "il", "mio", "nome", "è", "Gabriele"]
aString.uppercaseString                    "CIAO IL MIO NOME È GABRIELE"
aString.lowercaseString                    "ciao il mio nome è gabriele"
```

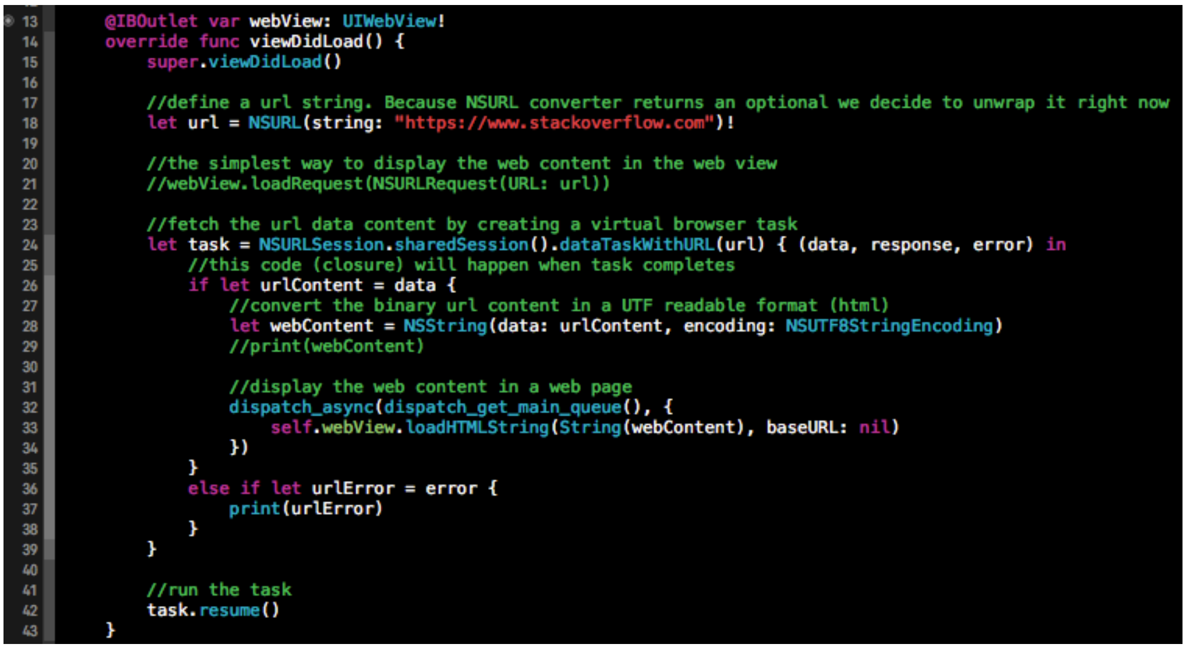
Download web contents

The simples way to display content from a web site



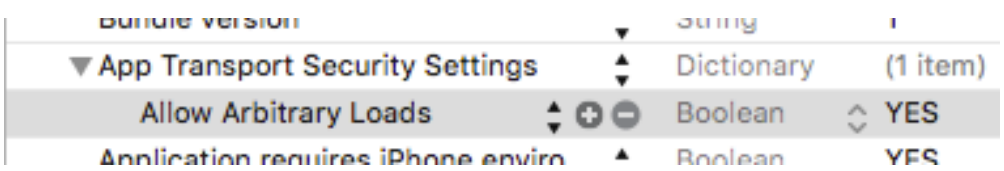
```
    @IBOutlet var webView: UIWebView!
    override func viewDidLoad() {
        super.viewDidLoad()

        //define a url string. Because NSURL converter returns an optional we decide to unwrap it right now
        let url = NSURL(string: "https://www.stackoverflow.com")!

        //the simplest way to display the web content in the web view
        webView.loadRequest(NSURLRequest(URL: url))
```

A more sophisticated way consists in downloading the binary data from the web site, convert it in UTF8 html and then display in in the web view, all that executed within a task



```
    @IBOutlet var webView: UIWebView!
    override func viewDidLoad() {
        super.viewDidLoad()

        //define a url string. Because NSURL converter returns an optional we decide to unwrap it right now
        let url = NSURL(string: "https://www.stackoverflow.com")!

        //the simplest way to display the web content in the web view
        //webView.loadRequest(NSURLRequest(URL: url))

        //fetch the url data content by creating a virtual browser task
        let task = NSURLSession.sharedSession().dataTaskWithURL(url) { (data, response, error) in
            //this code (closure) will happen when task completes
            if let urlContent = data {
                //convert the binary url content in a UTF readable format (html)
                let webContent = NSString(data: urlContent, encoding: NSUTF8StringEncoding)
                //print(webContent)

                //display the web content in a web page
                dispatch_async(dispatch_get_main_queue(), {
                    self.webView.loadHTMLString(String(webContent), baseURL: nil)
                })
            }
            else if let urlError = error {
                print(urlError)
            }
        }

        //run the task
        task.resume()
    }
```

Before running the app, we need to add the following item to the info.plist file

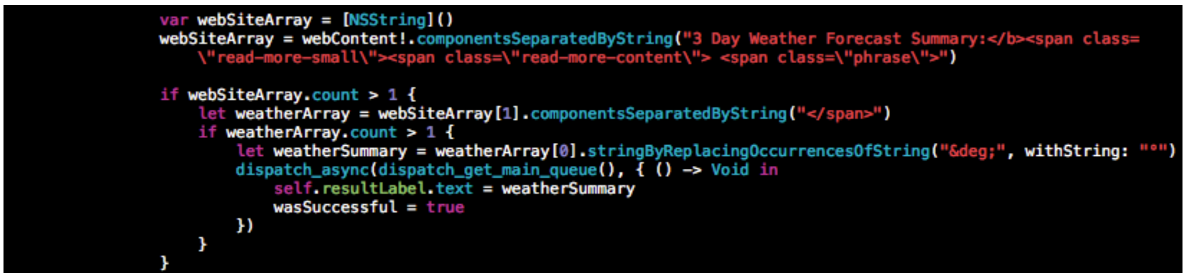


▼ App Transport Security Settings	Dictionary	(1 item)
Allow Arbitrary Loads	Boolean	YES

In order to isolate the substring "my substring" from the string "what precedes my substring and what follows it"

1. define an array of string myArray
2. call method myArray.componentsSeparatedByString("precedes ")
3. pick myArray[1]
4. define an array of string anotherArray = myArray[1]
5. call method anotherArray.componentsSeparatedByString(" and")
6. pick anotherArray[1]

Example:



```
var webSiteArray = [NSString]()
webSiteArray = webContent!.componentsSeparatedByString("3 Day Weather Forecast Summary:</b><span class=
    \"read-more-small\"><span class=\"read-more-content\"> <span class=\"phrase\">")

if webSiteArray.count > 1 {
    let weatherArray = webSiteArray[1].componentsSeparatedByString("</span>")
    if weatherArray.count > 1 {
        let weatherSummary = weatherArray[0].stringByReplacingOccurrencesOfString("&deg;", withString: "°")
        dispatch_async(dispatch_get_main_queue(), { () -> Void in
            self.resultLabel.text = weatherSummary
            wasSuccessful = true
        })
    }
}
```

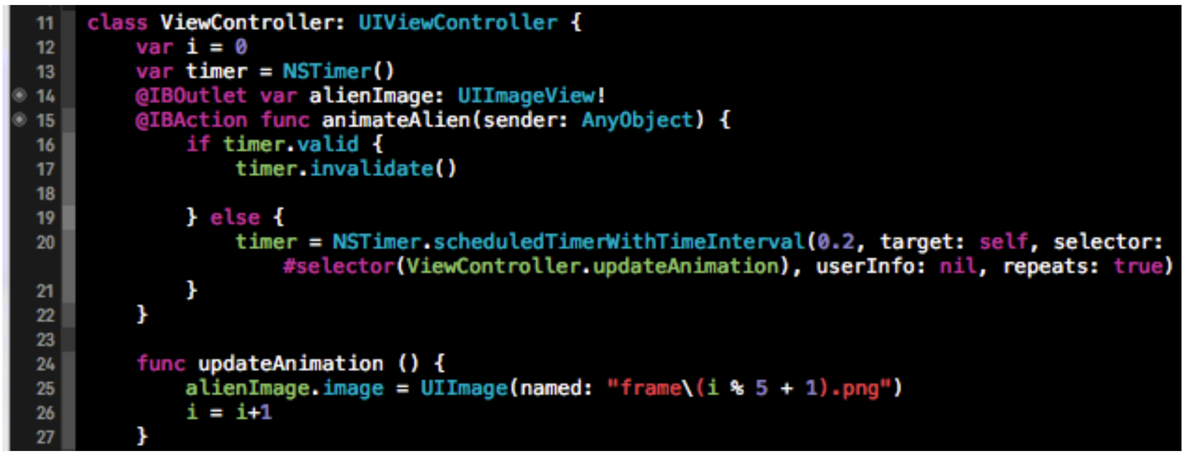
Animations

A lot of GIF animations can be downloaded for free from

http://www.heathersanimations.com
Save one of them on mac.
Install GIMP and the export plug-in.
Open the GIF file with GIMP and export the single frames of the animation as frameN.bmp, N=1.2,...
Import the frames in Assets.xcassets and then load the first one in a ImageView

Animate the UIImage with the frames of a animated GIF

To reproduce a GIF animation we can change the content of a UIImage on time basis, making use of a timer.



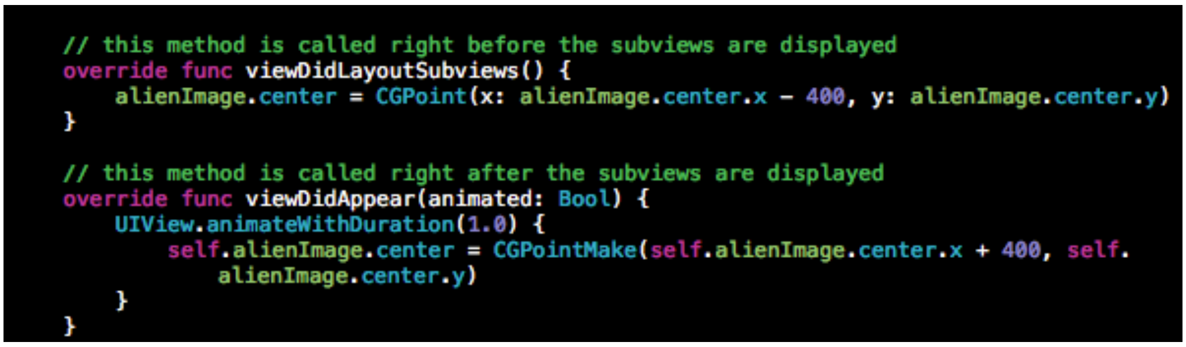
```
class ViewController: UIViewController {
    var i = 0
    var timer = NSTimer()
    @IBOutlet var alienImage: UIImageView!
    @IBAction func animateAlien(sender: AnyObject) {
        if timer.valid {
            timer.invalidate()

        } else {
            timer = NSTimer.scheduledTimerWithTimeInterval(0.2, target: self, selector:
                #selector(ViewController.updateAnimation), userInfo: nil, repeats: true)
        }
    }

    func updateAnimation () {
        alienImage.image = UIImage(named: "frame\(i % 5 + 1).png")
        i = i+1
    }
```

Adding animation at laugh time

To create animation at launch time we can override two methods of the UIViewController class,
viewDidLayoutSubviews and viewDidAppear

Shifting a image in the screen

Suppose we want the initial scene appearing form one side of the screen (top, bottom, left, right).

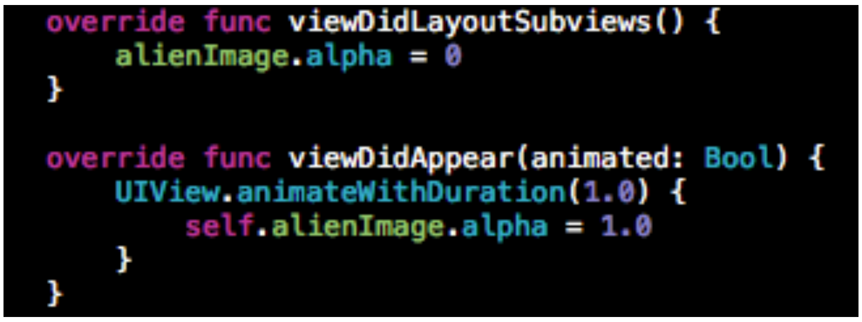


```
// this method is called right before the subviews are displayed
override func viewDidLayoutSubviews() {
    alienImage.center = CGPoint(x: alienImage.center.x - 400, y: alienImage.center.y)
}

// this method is called right after the subviews are displayed
override func viewDidAppear(animated: Bool) {
    UIView.animateWithDuration(1.0) {
        self.alienImage.center = CGPointMake(self.alienImage.center.x + 400, self.
            alienImage.center.y)
    }
}
```

In the example above the image centre is shifted to the left right before it is displayed, then it is shifted to the right of the same amount right after it is displayed, and the transition is made 1 second lasting. The effect is that the alien image move into the scene from the left when the app is launched.

Fading

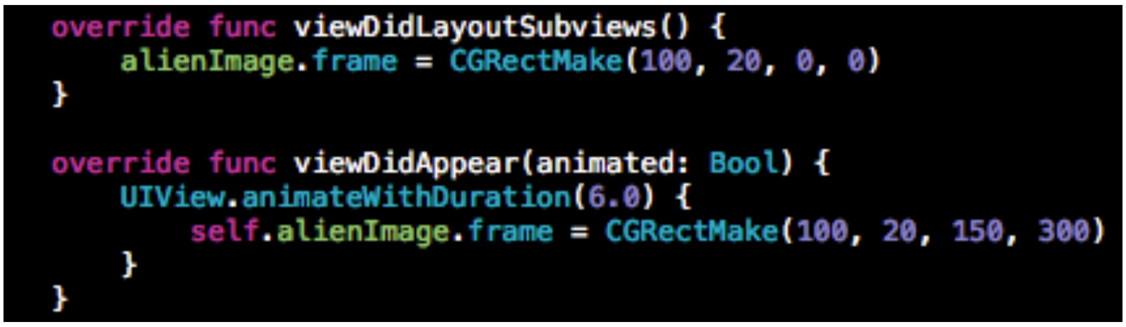
If we want our image to fade in when the application launches, we proceed as described above, this time leveraging the alpha property of the UIImage



```
override func viewDidLayoutSubviews() {
    alienImage.alpha = 0
}

override func viewDidAppear(animated: Bool) {
    UIView.animateWithDuration(1.0) {
        self.alienImage.alpha = 1.0
    }
}
```

Moving and scaling

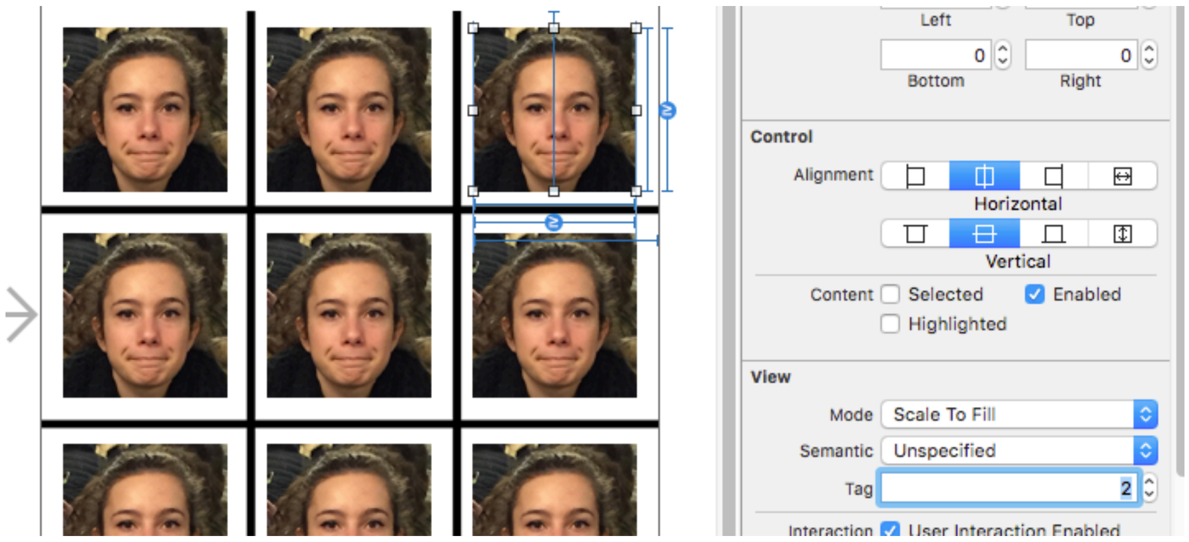
This is another effect we can use. The image appears in a moving rectangle frame



```
override func viewDidLayoutSubviews() {
    alienImage.frame = CGRectMake(100, 20, 0, 0)
}

override func viewDidAppear(animated: Bool) {
    UIView.animateWithDuration(6.0) {
        self.alienImage.frame = CGRectMake(100, 20, 150, 300)
    }
}
```

Using tags

Every view object contained in a screen has a integer that you can change in order to identify the object from code.
In this case we have 9 buttons within the main view and we have assigned them the tags 0 to 8. We also take care to assign a different tag (e.g. 10) to all other objects.



Left Top
0 0
Bottom Right

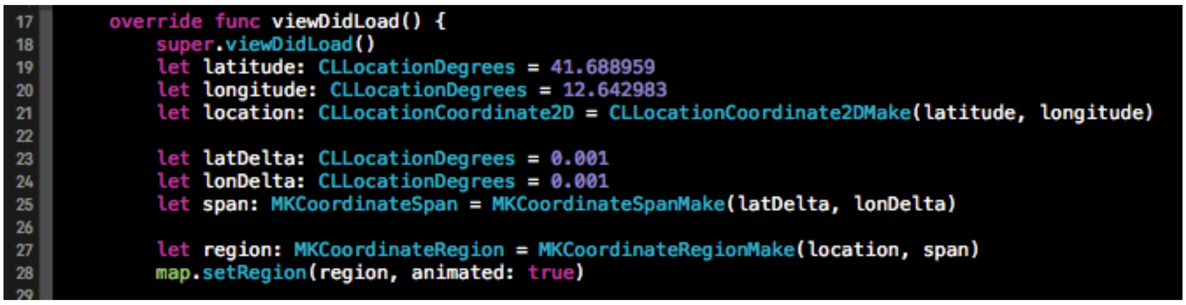
Control
Alignment: Horizontal, Vertical
Content: Selected [ ], Enabled [✓], Highlighted [ ]

View
Mode: Scale To Fill
Semantic: Unspecified
Tag: 2
Interaction: [✓] User Interaction Enabled

Using maps

To add a map pointing in a specific location

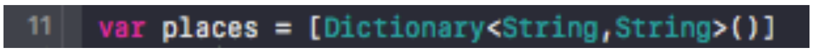
1. add a Map Kit View object to the storyboard
2. import UIMapKit in ViewController.swift and add the MKMapViewDelegate protocol to the class definition
3. Create an outlet for the map view in the ViewController.swift
4. Point the map on a specific location. To do that declare the following constants and then call the setRegion method



```
    override func viewDidLoad() {
        super.viewDidLoad()
        let latitude: CLLocationDegrees = 41.688959
        let longitude: CLLocationDegrees = 12.642983
        let location: CLLocationCoordinate2D = CLLocationCoordinate2DMake(latitude, longitude)

        let latDelta: CLLocationDegrees = 0.001
        let lonDelta: CLLocationDegrees = 0.001
        let span: MKCoordinateSpan = MKCoordinateSpanMake(latDelta, lonDelta)

        let region: MKCoordinateRegion = MKCoordinateRegionMake(location, span)
        map.setRegion(region, animated: true)
```

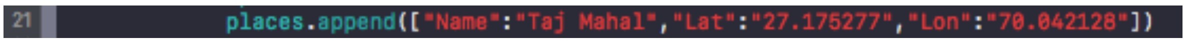
Using a dictionary

To declare a empty dictionary for storing String:String key-value pairs



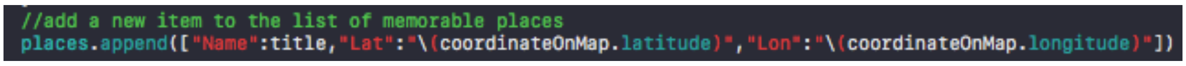
```
var places = [Dictionary<String,String>()]
```

To append a new triple of pairs:



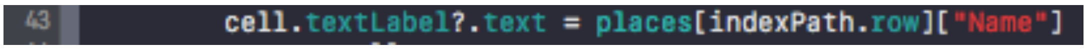
```
            places.append(["Name":"Taj Mahal","Lat":"27.175277","Lon":"78.042128"])
```

or, in another example,



```
//add a new item to the list of memorable places
places.append(["Name":title,"Lat":"\(coordinateOnMap.latitude)","Lon":"\(coordinateOnMap.longitude)"])
```

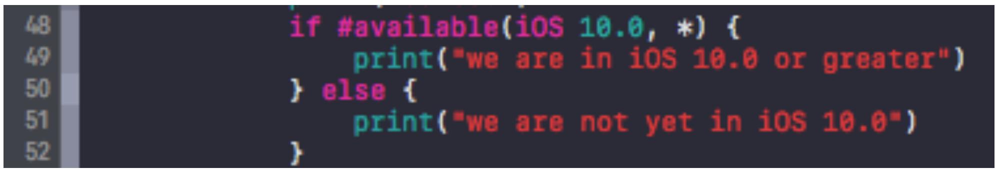
To access the value string associated to the “Name” key:



```
            cell.textLabel?.text = places[indexPath.row]["Name"]
```

Making the code compatible with different iOS versions

May be that some versions of iOS support different versions of Swift.
Swift 3.0 is a major release that is *not* source-compatible with Swift 2.2.
In these cases you could use the #available in an if or guard to protect code that should only be run on certain systems
The correct way to proceed is this



```
        if #available(iOS 10.0, *) {
            print("we are in iOS 10.0 or greater")
        } else {
            print("we are not yet in iOS 10.0")
        }
```