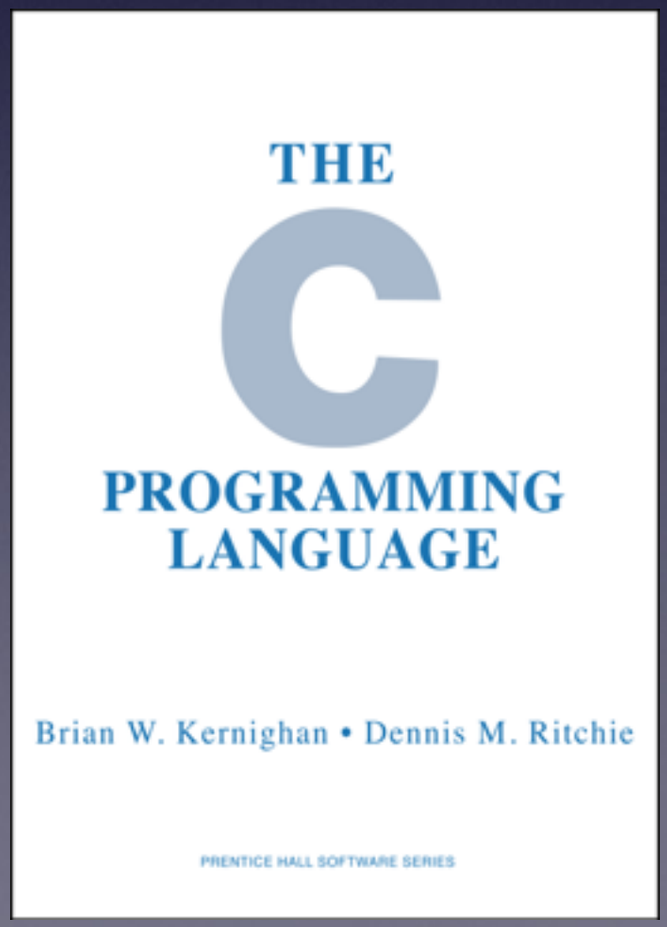
Swift and Objective-C Interoperability

Oleksandr Kobylinskyi

C

C was originally developed by Dennis Ritchie between 1969 and 1973 at AT&T Bell Labs, and used to (re-)implement the Unix operating system.



Objective-C

- Objective-C is a general-purpose, object-oriented programming language that adds Smalltalk-style messaging to the C programming language.

- Objective-C was created primarily by Brad Cox and Tom Love in the early 1980s.

- Objective-C is a thin layer on top of C, and is often called a "strict superset" of C, meaning that it should be possible to compile any C program with an Objective-C compiler, and to freely include C code within an Objective-C class.

C and Objective-C Interoperability

```
#import "TemperatureConverter.h"

double fahrtocelsius(double);
double celsiustofhar(double);

@implementation TemperatureConverter

double fahrtocelsius(double fahr)
{
    double celsius = (5.0 / 9.0) * (fahr - 32.0);
    return celsius;
}

double celsiustofahr(double celsius)
{
    double fahr = (9.0 * celsius) / 5.0 + 32;
    return fahr;
}

- (double)celsiusToFahr:(double)celsius
{
    return celsiustofahr(celsius);
}

- (double)fahrToCelsius:(double)fahr
{
    return fahrtocelsius(fahr);
}

@end
```

C and Objective-C Interoperability

.h - Header file
.c - C implementation file
.m - Objective-C implementation file
.cpp - C++ implementation file
.mm - ??? implementation file

```
TemperatureConverter *converter = [[TemperatureConverter alloc] init];
double degrees = [converter celsiusToFahr:60.0f];
NSLog(@"Celsius:%f", degrees);

degrees = [converter fahrToCelsius:degrees];
NSLog(@"Fahr:%f", degrees);
```

```
Celsius:140.000000
  Fahr:60.000000
```

Objective-C++ - WTF??

- Apple's Objective-C compiler allows you to freely mix C++ and Objective-C code in the same source file. This Objective-C/C++ language hybrid is called Objective-C++. With it you can make use of existing C++ libraries from your Objective-C applications.

- Developer can create Objective-C objects inside C++.

```
id object = [someObject alloc] init];
[object release];
```

- And C++ objects inside Objective-C

```
Object *object = new Object();
delete object;
```

Swift

Swift was developing by Taylor Swift from 2010 to 2014 and has been introduced on music festival. :-)

- Swift is a new programming language introduced by Apple Inc. on WWDC 2014 conference for Apple developers.
- Swift is a multi-paradigm, compiled programming language created by Apple Inc..
- Development on Swift began in 2010 by Chris Lattner, with the eventual collaboration of many other programmers.

Swift cheatsheet

- **var - variable**

```
var a = 1
```

- **let - constant**

```
let c = 3
```

- **Arrays**

```
let colors = [red, blue, green]
```

```
var letters: [String] = [“a”, “b”, “c”, "d"]
```

- **Dictionaries**

```
var days = ["mon": "monday", "tue": “tuseday"]
```

- **Functions**

```
func iAdd(a: Int, b: Int) -> Int {
  return a + b
}
iAdd(2, 3) // returns 5
```

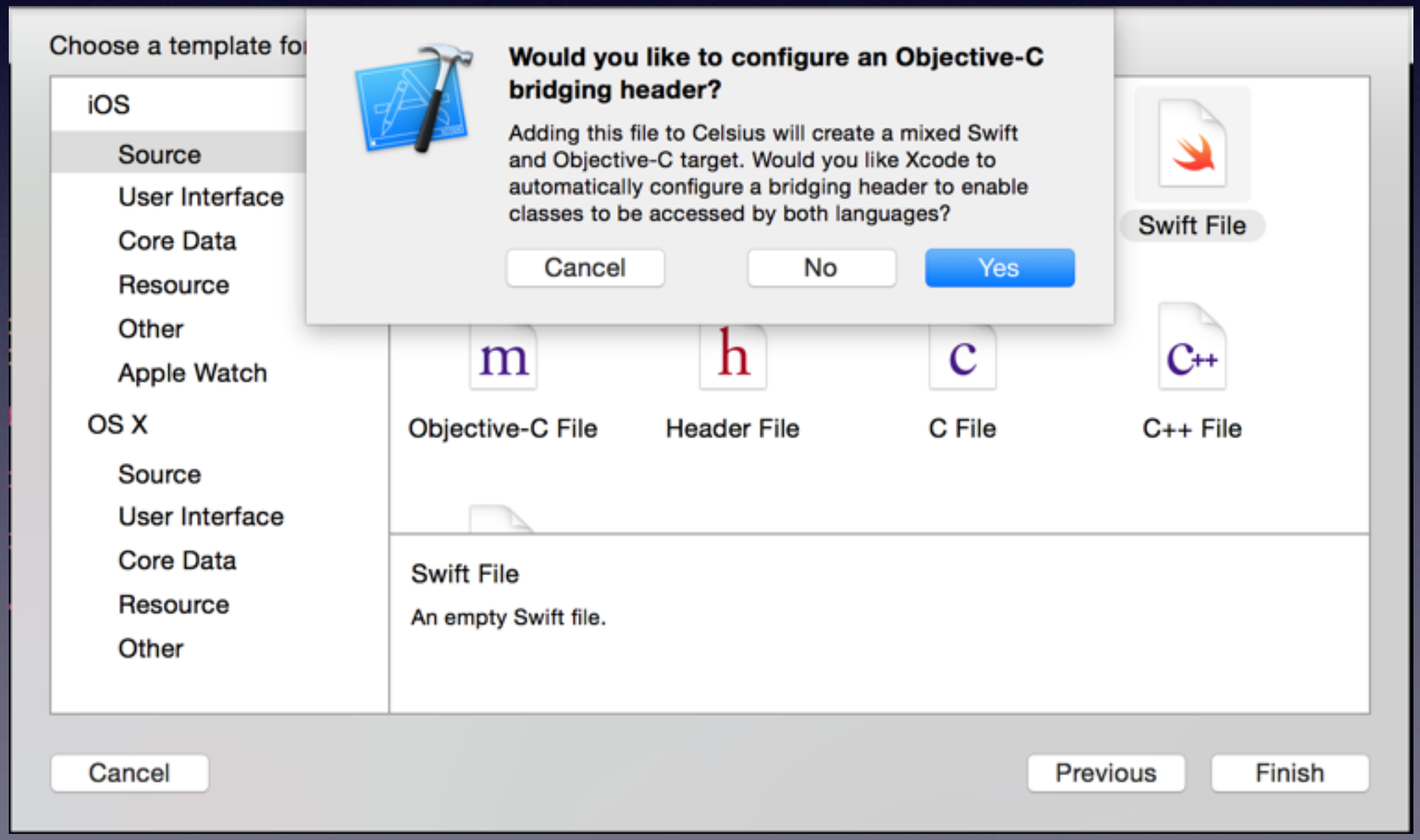
- **Classes**

```
class Counter {
  var count: Int = 0
  func inc() {
    count++
  }
  func add(n: Int) {
    count += n
  }
}
```

- **Sets, Closures, Enumerations, Structures, Extensions, Protocols, Generics, Tuples, …**

From Objective-C To Swift

.swift - Swift header and implemetation file



Import Objective-C files to Swift

$(ProductModuleName)-Bridging-Header.h

Import Swift files to Objective-C

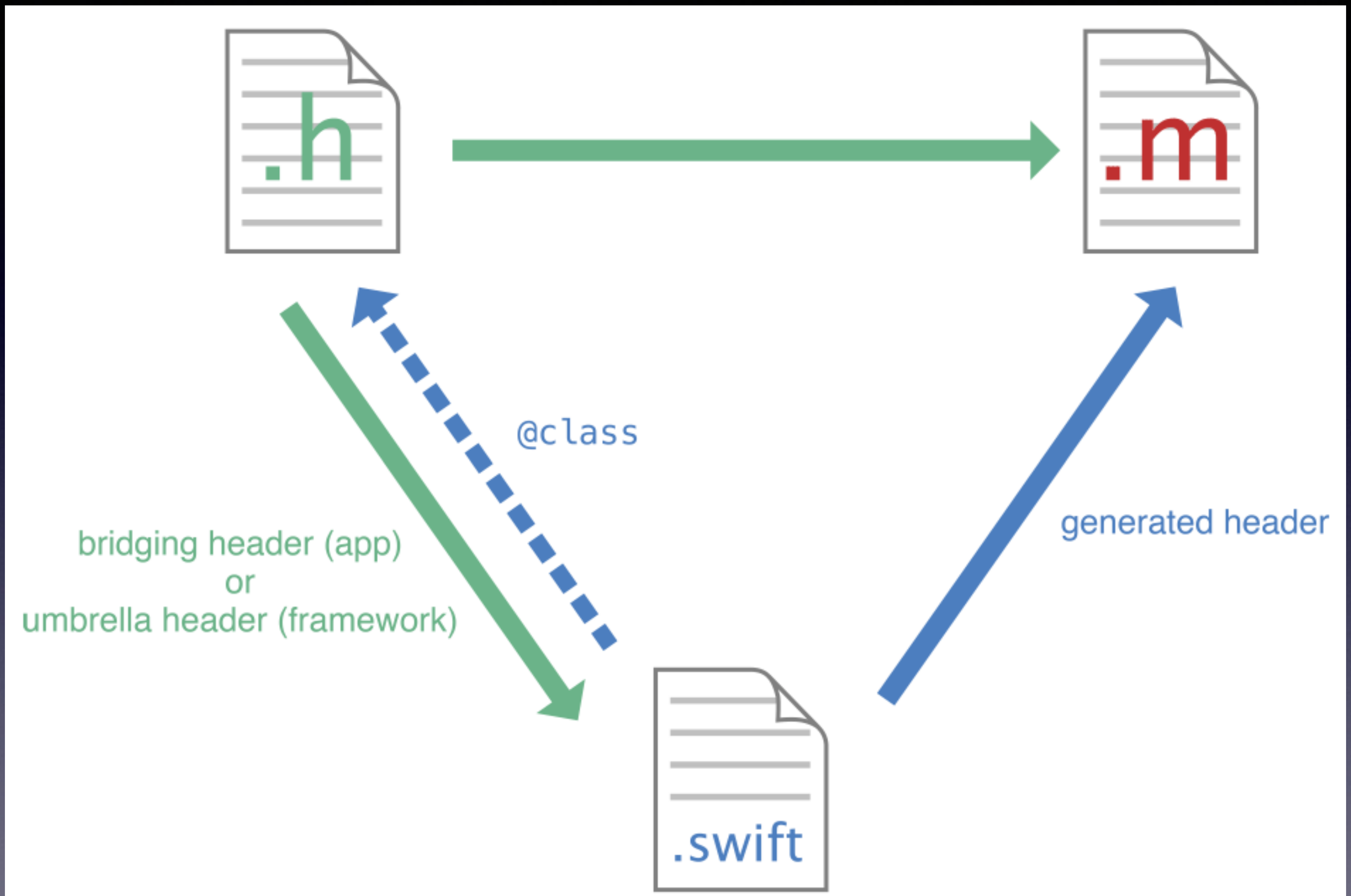
$(ProductModuleName)-Swift.h
Defines module = YES
Enable modules = YES

Swift object in Objective-C

SwiftObject *object = [SwiftObject alloc] init];
Superclass should be NSObject

Objective-C object in Swift

let object = Object()


.h
.m
@class
bridging header (app)
or
umbrella header (framework)
generated header
.swift

Sample - Swift

$(ProductModuleName)-Bridging-Header.h

```
#import “TemperatureConverter.h"
```

TemperatureConverterSwift.swift

```
@objc class TemperatureConverterSwift : NSObject {
    func celsiusToFahr(celsiusDegrees celsius: Double) -> Double {
        let converter = TemperatureConverter()
        return converter.celsiusToFahr(celsius)
    }

    func fahrToCelsius(fahrDegrees fahr: Double) -> Double {
        let converter = TemperatureConverter()
        return converter.fahrToCelsius(fahr)
    }
}
```

Sample - Objective-C

```
#import “$(ProductModuleName)-Swift.h”

TemperatureConverterSwift *converterSwift =
[[TemperatureConverterSwift alloc] init];
degrees = [converterSwift
celsiusToFahrWithCelsiusDegrees:60.0f];

NSLog(@"Swift Celsius:%f", degrees);

degrees = [converterSwift
fahrToCelsiusWithFahrDegrees:degrees];

NSLog(@"Swift Fahr:%f", degrees);
```

```
Swift Celsius:140.000000
  Swift Fahr:60.000000
```

Samples

```
UITableView *myTableView = [[UITableView alloc] initWithFrame:CGRectZero
style:UITableViewStyleGrouped];
```

```
let myTableView: UITableView = UITableView(frame: CGRectZero, style: .Grouped)
```

```
UIColor *color = [UIColor colorWithRed:0.5 green:0.0 blue:0.5 alpha:1.0];
```

```
let color = UIColor(red: 0.5, green: 0.0, blue: 0.5, alpha: 1.0)
```

```
[myTableView insertSubview:mySubview atIndex:2];
```

```
myTableView.insertSubview(mySubview, atIndex: 2)
```

- Objective-C id == Swift AnyObject
- Swift Extension == Objective-C Category or Objective-C Extension
- All Swift types are values, except classes.
- C programming language types: bool = CBool, int = CInt, long = CLong, …

Information

- Apple documentation
- Book - Swift programming language
- Apple’s Swift blog

https://developer.apple.com/swift/blog/

- This week in Swift - NatashaTheRobot’s blog

https://swiftnews.curated.co/

- GitHub - Swift open-source code

Q&A

Thx.)