PG5600 **iOS-programmering**

Lesson # 1

Benjamin Breiby
Håkon Bogen

Beining & Bogen

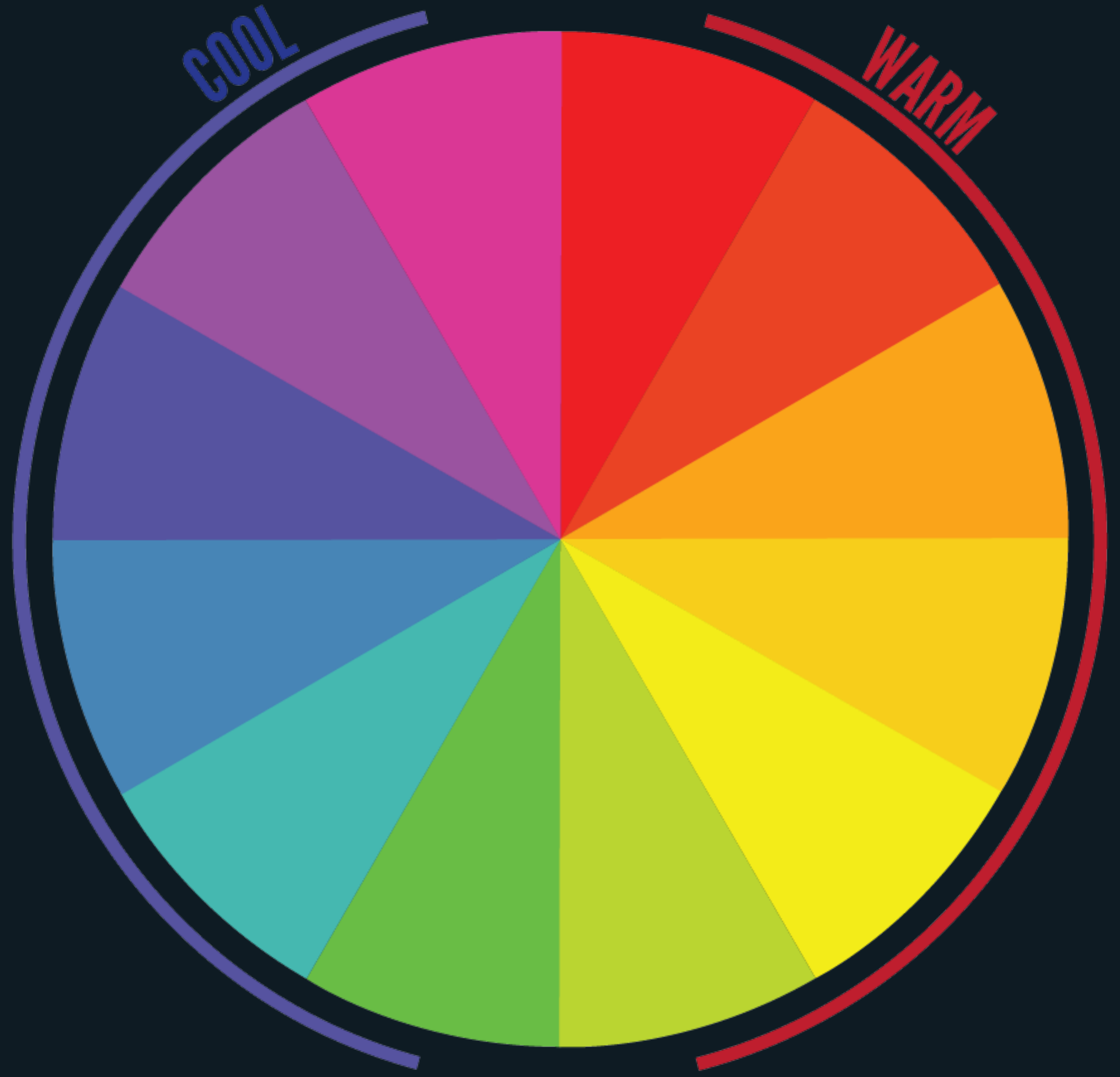
beiningbogen.no

Github-repo

https://github.com/BeiningBogen/iOS-Kristiania

Quick survey

COLOUR WHEEL



Agenda

- Practical information
- iOS History
- iOS ecosystem
- XCode
- Swift

Practical information

- The Swift Programming Language
- https://swift.org/
- iOS-programming with Swift - O'Reilly
- A major exam that counts 100%

iOS History

- iPhone OS 1 - 2007
- iPhone OS 2 - 2008 (iPhone SDK)
- iPhone OS 3 - 2009
- iOS 4 - 2010

  …
- iOS 13 - 2019
- iOS 14 - Fall 2020

iOS ecosystem

- Portal: developer.apple.com
- Devices: iPhone, iPad, Apple Watch, Apple TV
- Platforms: iOS / Cocoa Touch / Objective-C/Swift
- Development tools: XCode, Instruments, Bots
- distribution: App Store, iTunes Connect

Xcode

- Xcode 11 : https://developer.apple.com/support/xcode/
- Xcode 12 : Coming in September

DEMO

Swift

But first.... Obj-C

- Objective C was created by NeXT
- Adopted by Apple to develop OS
- Lots of "hugging" [] and ;'s

What is Swift?

- A programming language created by Apple to replace Objective C (used mainly for iOS and OS X)
- It's open source, and seeing increasing use on servers and other platforms
- Modern and powerful - inspired by Python, Ruby, C#

What is Swift? (cont'd)

- Works side-by-side with C and Objective-C
- Object Oriented, Imperative, and Functional

What does it look like?

Write to console

```
print("Hello world")
```

Constants and variables

```
let schoolName: String = "Høyskolen Kristiania"

var numberOfemployees: Int = 320
numberOfemployees = 500
```

Type inference

```
var numberOfemployees = 350
numberOfemployees = 500


let schoolName = "Høyskolen Kristiania"
```

Strings

```
let subject = "iOS programmering"

if "iOS programmering" == subject {
    print("I ❤️ " + subject)
}
```

Strings (cont'd)

Oh yeah! You can use emojis as variables 😛

```
let 🚀 = "falcon 9 rocket"
```

...but you really shouldn't.

String interpolation

```swift
let n1 = 10, n2 = 8
let mathString = "\(n1) * \(n2) is \(n1 * n2)"
// "10 * 8 is 80"

let 🚀 = "Falcon 9"
print("\(🚀) has just launched") // Falcon 9 has just launched
print("\(🚀.count)")   //  8
```

Numbers

```
let integer = 42 // Int
let integer2: Int = 24
let decimal = 13.37
let decimal2: Float = 30.456 // 32 bit precision
let decimal3: Double = 30.456 // 64 bit precision
// Double is the default inferred type
```

Tuples

Group multiple values into one value. Well suited for functions that return multiple values.

```
let (x, y) = (50, 300)

let error = (401, "Unauthorized")
print(error.0) // 401
print(error.1) // Unauthorized

// Decomposing the tuple
let (statusCode, message) = error
print(statusCode) // 401
```

Tuples (cont'd)

```
// Named fields in tuples
let error = (code: 401, message: "Unauthorised")
print(error.message) // Unauthorised
// Almost like a class!
```

Optionals

```swift
var userInput: String? = getInputValue()

if userInput == nil {
    print("Du må skrive navnet ditt 😡😡")
} else {
    // Force unwrap with `!`
    let name = userInput!
    print(name)
}
```

Optionals (cont'd)

- http://www.aidanf.net/learn-swift/optionals
- https://learnswiftwithbob.com/course/swift-fundamentals/optionals.html
- http://swift.ayaka.me/posts/2015/10/5/optional
- https://www.youtube.com/watch?v=uT2IHQpE3ms

Optionals (cont'd)

```swift
if let userInput = getInputValue() {
   print(userInput)
} else {
   // Handle a nil value
}

// You can provide a default value with `??`
let userInput = getInputValue() ?? "N/A"
print(userInput)
```

Ranges

```
for n in 1...10 { // 1 through and including 10
    print("\(n) * 2 is \(n * 2)")
}

for n in 1..<10 { // 1 through and including 9
    print("\(n) * 2 is \(n * 2)")
}
```

Ranges (cont'd)

```
for n in stride(from: 1, to: 10, by: 2) {
    print("\(n) * 2 is \(n * 2)")
}

for n in stride(from: 1, through: 10, by: 2) {
    print("\(n) * 2 is \(n * 2)")
}

// Alternatively, since stride returns a `Sequence`
stride(from: 1, to: 10, by: 2).forEach { n in
    print("\(n) * 2 is \(n * 2)")
}
```

Collection types

There are three types of primary collections in Swift

- Arrays
- Dictionaries
- Sets

Array

Ordered collections of values

```
// Declaration
let jobs = [String]()

let jobs = Array<String>()

// Note that no type was specified
var jobs = ["iOS Developer", "Project manager", "Frontend Developer"]

// Retrieval
jobs[0]

// Iteration
for job in jobs {
    print(job)
}
```

Array (cont'd)

```
// Modification

jobs.append("Adviser")
jobs += ["Adviser", "Backend Developer"]
jobs[0] = "Backend Developer"
jobs[2..<5] = ["Adviser", "Backend Developer", "Project Manager"]
```

Dictionary

Unordered collections of key-value associations

```
// Declaration
let emptyDictionary = [String: Float]()
var jobs = ["Adviser" : 35, "iOS Developer" : 21, "Project Manager" : 32]

// Retreival
jobs["iOS Developer"]  // = 21

for (key, value) in jobs {
    print("\(key): \(value)")
}

// Modification
people["Adviser"] = 45
people["Project Manager"] = 81
```

Set

Unordered collections of unique values

```
var people = Set(["Elon Musk", "Neil DeGrasse Tyson", "Bill Nye"])

people.remove("Elon Musk")   // Returns nil if the element is not found

people.insert("Carl Sagan")
```

Loops

There are 3 types in Swift

- While
- Repeat-while
- For-in

Do you know the difference?

Control flow

- if
- switch
- guard

If

- Nothing special about if statements in Swift. Keep in mind that parenthesis are optional

```
if age <= 10 {
    print("👶🏻")
} else if age >= 80 {
    print("👴🏽")
} else {
    print("🕺🏻💃🏼?")
}
```

Switch

Here, Apple has gone completey bananas!!!

- No implicit fallthrough. In other words, you don't need to use a break after every case!
- You can use any object in a Switch
- If you omit the default case, you have to implement every possibility. Otherwise... Yup, you guessed it. COMPILE ERROR!

Switch (cont'd)

```
switch age {
case 1,2,3,4,5,6,7,8,9,10:
    println("👶🏻")
case 80...100:      // You can match an interval!
    println("👴🏽")
default:
    println("💃🕺?")
}
```

Can you switch on instances?

```
let 👶🏻Button = UIButton()
let 👴🏽Button = UIButton()

switch sender {
  case childButton:
    println("👶🏻")
  case oldisButton:
    println("👴🏽")
  default:
    println("💃🕺?")
}
```

Playground

- Runs code continuously
- Test out new algorithms, test, explore, fix a specific bug

Playground Demo

REPL

read–eval–print loop support

Start with `xcrun swift`

Swift online editor

https://swiftlang.ng.bluemix.net/#/repl

To run Swift in the terminal

You have to put the correct xcode version with

`xcode-select`

```
xcode-select -s /Applications/Xcode.app/Contents/Developer
```

Reading material

— 3-11 in TSPL (The Swift Programming Language)

Homework

https://github.com/BeiningBogen/iOS-Kristiania