SCIENCES SORBONNE UNIVERSITÉ

Swift, about inheritance

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As an introduction…

- **Swift is an OO language**
  - So it supports inheritance
- **Simple inheritance**
  - But associated with templates (à la C++)
    - **Not discussed here**
  - Also an extension mechanism
    - **Not discussed here**

Inheritance, an example


```
class Student       {
    private var number = 0
    private var name = ""

    init (nm : String, nu : Int) {
        name = nm
        number = nu
    }

    func identity () -> String {
        return "\(name) (\(number))"
    }

    func myName() -> String {
        return name
    }

    func myNumber() -> Int {
        return number
    }
}
```

Inheritance, an example


```
class PairedStudent : Student {

    private var pair : PairedStudent?

    func setMyPair (p : PairedStudent) {
        pair = p
    }

    func myPair () -> PairedStudent {
        return pair! // I want to crash if there is none
    }

    func myPairOrNone () -> PairedStudent? {
        return pair // May return "nil"
    }
}

let s1 = PairedStudent(nm : "Stan Laurel", nu :1000)
let s2 = PairedStudent(nm : "Oliver Hardy", nu :1001)
let s3 = PairedStudent(nm : "Charlot", nu :1002)

s1.setMyPair(p: s2)
s2.setMyPair(p: s1)

print ("\(s1.myName()) is paired with \(s1.myPair().myName())")
print ("\(s2.myName()) is paired with \(s2.myPairOrNone()?.myName() ?? "nobody")")
print ("\(s3.myName()) is paired with \(s3.myPairOrNone()?.myName() ?? "nobody")")
```

Inheritance, an example


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class PairedStudent : Student {

    private var pair : PairedStudent?

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        pair = p
    }

    func myPair () -> PairedStudent {
        return pair! // I want to crash if there is none
    }

    func myPairOrNone () -> PairedStudent? {
        return pair // May return "nil"
    }
}
```

```
Stan Laurel is paired with Oliver Hardy
Oliver Hardy is paired with Stan Laurel
Charlot is paired with nobody
```

Initialization?

Be aware, call to super.init after

- Not like Objective-C

```
enum Color {case red, black, yellow}

class Car {
    var paint: Color
    init(c: Color) {
        paint = c
    }
}
class RaceCar: Car {
    var hasTurbo: Bool

    init(c: Color, turbo: Bool) {
        hasTurbo = turbo
        super.init(c: c) // oposite of Objective-C
    }
}
```

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Advanced initialization

«Convenience» versus «designated»

- Strict hierarchical invocations

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Designated initializer

main ones to be used
at least one per class

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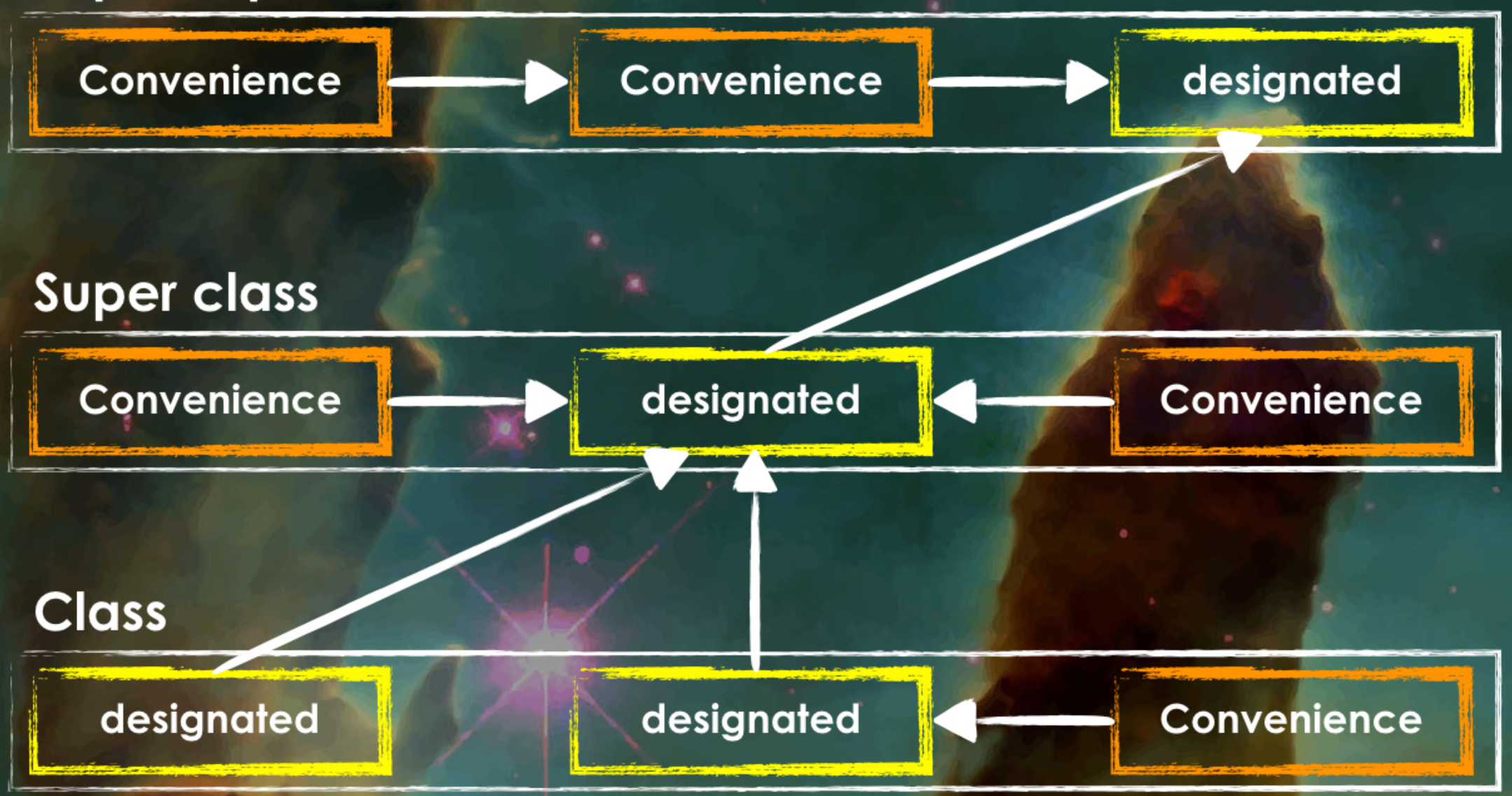
Convenience initializer

Practical for programers
no reference to initializers of the super

Advanced initialization

«Convenience» versus «designated»

- Strict hierarchical invocations



An example


```
class RaceCar: Car {
    var hasTurbo: Bool

    init(c: Color, turbo: Bool) {
        hasTurbo = turbo
        super.init(c: c)
    }

    convenience override init (c: Color) { // overrides init inherited from super
        self.init(c: c, turbo: true)
    }

    convenience init () {
        self.init(c: .red)
    }
}
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As a conclusion…

Classical OO mechanisms

Embeds all you need for memory management

- Elaborate secure applications…
- Remind
  - **The ecosystem is the challenge**
  - **The ecosystem is enriched by developers**
  - **So programming must be made easy**
  - **The compiler does more work**

- By the way…
  - **Issue identified in the late 60's**
  - **Remember the HOLWG (1975, origin of Ada)**