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FUNCTIONAL PROGRAMMING

THANK YOU!!

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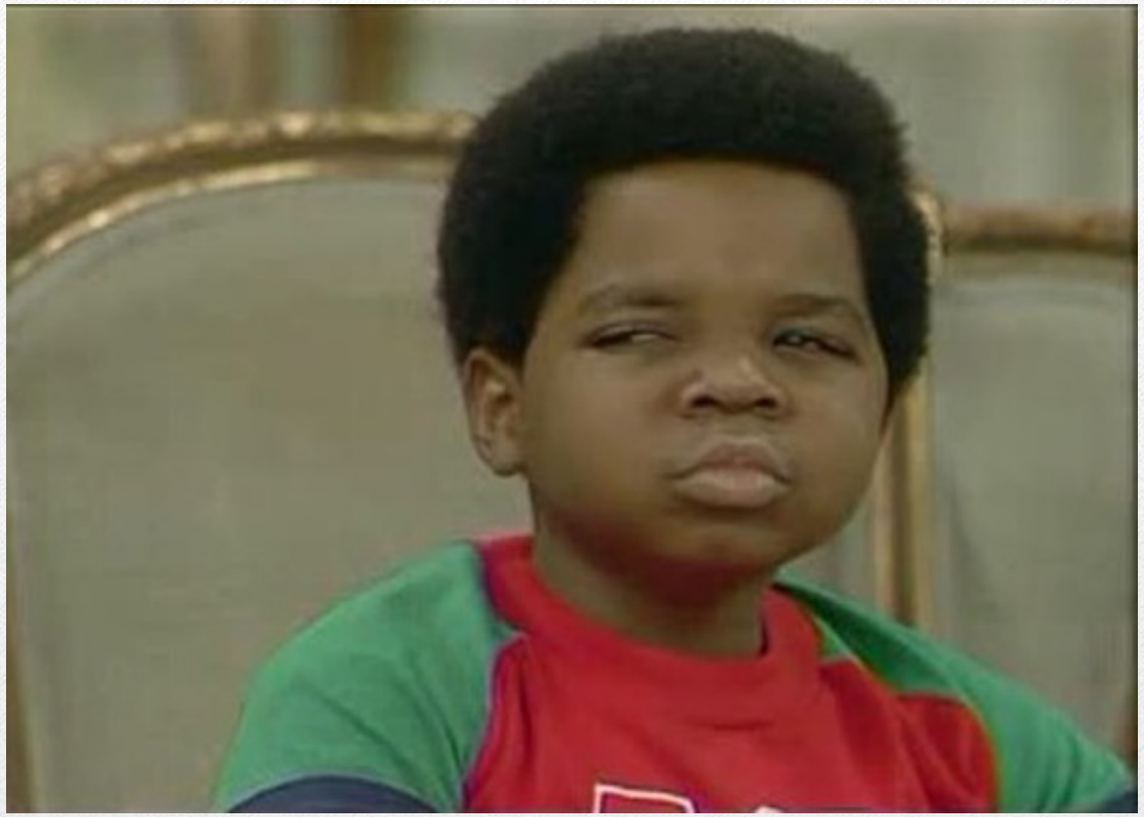
SWIFT IS NOT FUNCTIONAL



WHAT WE WILL COVER

1. First Class Functions
2. High Order Functions
3. Chaining
4. Pure Functions
5. Currying

FIRST CLASS FUNCTIONS

Basic Example

```
func basicFunc () -> () -> () {
    func inner() {
        println("Inner function")
    }

    return inner
}

var myFunc =  basicFunc()
myFunc() // “Inner Function”
```

Real World Example

```
func deposit (amount:Float) -> String {
    return String(
        format: "You have deposited $%.2f into your account",
        amount
    )
}

func withdraw (amount:Float) -> String {
    return String(
        format: "You have withdrew $%.2f from your account",
        amount
    )
}
```

Real World Example (cont.)

```
func bankTransaction (type:String) -> (Float) -> (String) {
    if type == "withdraw" {
        return withdraw
    }
    return deposit
}
```

Real World Example (cont.)

```
let morningTransaction = bankTransaction("deposit")
morningTransaction(234.04)
// You have deposited $234.04 into your account

let eveningTransaction = bankTransaction("withdraw")
eveningTransaction(100.00)
// You have withdrawn $100.00 from your account
```

HIGH ORDER FUNCTIONS

Map Function

```
let arrNumbers = [ 1000, 2045, 3500,
                   4099, 5777, 6331, 7000 ]

var formattedNumbers: [String] = []

for number in arrNumbers {
    let formattedNumber =
NSNumberFormatter.localizedStringFromNumber(
        number, numberStyle: .DecimalStyle
    )
    formattedNumbers.append(formattedNumber)
}
```

Map Function

```
let mapFormattedNumbers = arrNumbers.map {
    NSNumberFormatter.localizedStringFromNumber(
        $0, numberStyle: .DecimalStyle
    )
}

mapFormattedNumbers
//1,000, 2,045, 3,500, 4,099, 5,777, 6,331, 7,000
```

Filter Function

```
let filterEvenNumbersOnly = arrNumbers.filter { $0 % 2 == 0 }
filterEvenNumbersOnly
//[1,000, 3,500, 7,000]
```

Reduce Function

```
let totalSum = arrNumbers.reduce(0) { $0 + $1 }
totalSum //29,752
```

CHAINING

Chaining Example

```
struct Person {
    let name: String
    let age: UInt
}

let people = [
    Person(name: "Alice", age: 22),
    Person(name: "Bob", age: 23),
    Person(name: "Mallory", age: 25)
]
```

Chaining Example (cont.)

```
let ageSum = people.map({$0.age}).reduce(0, combine: +)
ageSum // 70
```

Chaining Example (cont.)

```
let morePeople = [
    Person(name: "Alice", age: 22),
    Person(name: "Bob", age: 23),
    Person(name: "Mallory", age: 25),
    Person(name: "Toni", age: 23),
    Person(name: "Zach", age: 21)
]

let namesBeforeJason = morePeople.map({$0.name}).filter {
    name in name.compare("Jason") ==
    NSComparisonResult.OrderedAscending
}
```

Chaining Example (cont.)

```
namesBeforeJason //[“Alice”, “Bob”]
```

Chaining Example (cont.)

```
let namesBeforeJason = morePeople.map({$0.name}).filter {
    name in name.compare("Jason") ==
    NSComparisonResult.OrderedAscending
}
```

Chaining Example (cont.)

```
namesAfterJason //[“Mallory”, “Toni”, “Zach”]
```

PURE FUNCTIONS

Imperative Example

```
var sum = 0.0
var numbers = [10,20,30,40]

func meanImperative() -> Double {
    for number in numbers {
        sum += Double(number)
    }

    let mean = sum / Double(numbers.count)
    return mean
}
```

Imperative Example (cont.)

```
meanImperative() // 25.0
meanImperative() // 50.0
```

Functional Example

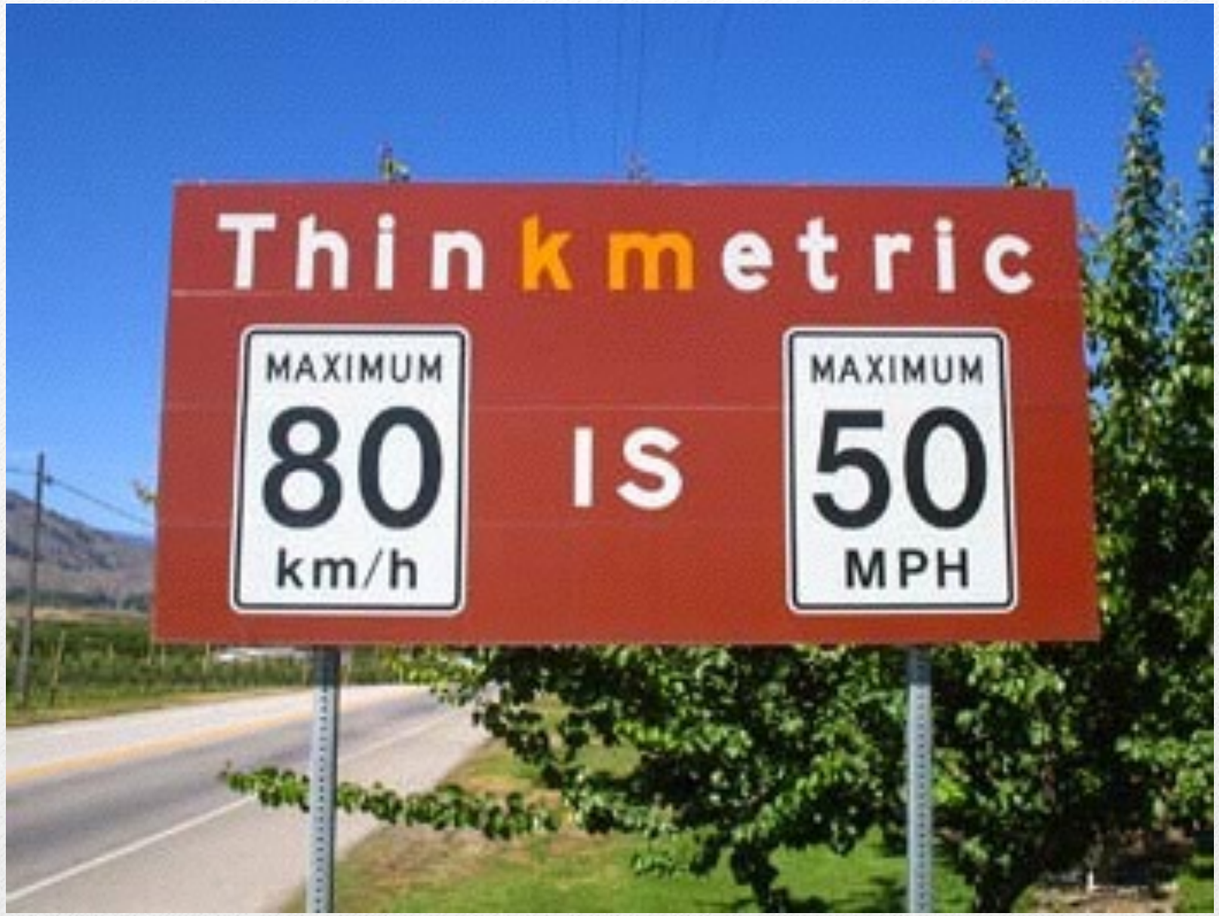
```
func meanFunctional(numbers:[Int]) -> Double {
    let sum = numbers.reduce(0, combine: {$0 + $1})
    return Double(sum) / Double(numbers.count)
}
```

Functional Example (cont.)

```
meanFunctional(numbers) // 25.0
meanImperative(numbers) // 25.0
```

CURRYING

Miles to km



Imperative Example

```
func converter(factor:Double, unit:String, toConvert:Double)
-> String {
    return "\(toConvert * factor) \(unit)"
}

let miles2kmConvert  = converter(1.6,  "km", 25) //40.0 km
let pounds2kgConvert = converter(0.45, "kg", 50) //22.5 kg
```

Functional Example

```
func converter(factor:Double)(unit:String)(toConvert:Double)
-> String {
    return "\(toConvert * factor) \(unit)"
}

let miles2kms = converter(1.6)(unit:"km")
miles2kms(toConvert:25)

let pounds2kg = converter(0.45)(unit:"kg")
pounds2kg(toConvert:50)
```

Useful Resources

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END! THANK YOU