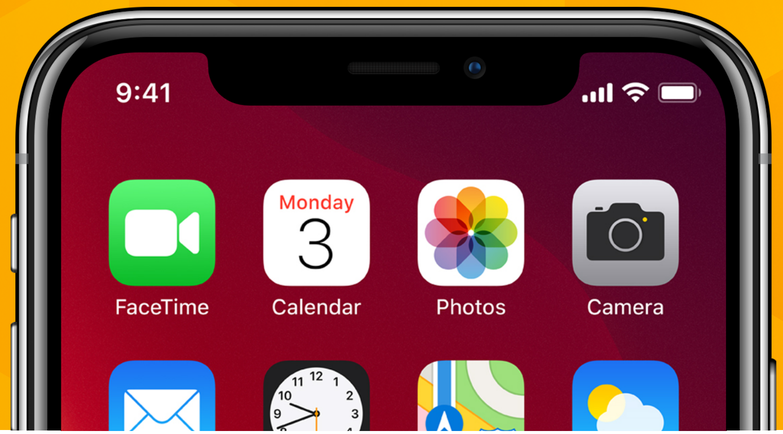

iOS Application Development

Lecture 4: Navigation and Workflow

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Recap

- Strings
- Functions
- Structs
  - Initializers, (mutating) functions
- Computed properties, property observers
- Structs vs. classes
- Collections (Array & Dictionary)

Optionals

Variables with nil

```
struct Book {
    var name: String
    var publicationYear: Int
}

let firstHarryPotter = Book(name: "Harry Potter and the Philosopher's Stone",
   publicationYear: 1997)
let secondHarryPotter = Book(name: "Harry Potter and the Chamber of Secrets",
   publicationYear: 1998)
```

```
let unannouncedBook = Book(name: "Rebels and Lions", publicationYear: 0)
```

- Zero isn't accurate, because that would mean the book is over 2,000 years old.

```
let unannouncedBook = Book(name: "Rebels and Lions", publicationYear: nil)
```

Optionals

- Normal variable in Swift **cannot** be nil

```
var string = nil // error!!
```

- Optionals contain either an instance of the expected type or nothing at all (nil).

```
var string: String? = nil // this works

var string: String? = "something" // this works as well
```

```
struct Book {
    var name: String
    var publicationYear: Int?
}
```

Working with Optionals

- Optionals can be unwrapped using the **force-unwrap** operator **!**:

```
let unwrappedYear = publicationYear! // potential runtime error
```

- Before unwrapping an optional we need to make sure the value is not **nil**:

```
if publicationYear != nil {
    let actualYear = publicationYear!
    print(actualYear)
}
```

- Shorter version:

```
if let actualYear = publicationYear {
   print(actualYear)
}
else { }
```

Working with Optionals

- Can we use the same name for a constant using optional bindings?

```
let publicationYear : Int? = 2014

let actualYear : Int = 2022

if let actualYear = publicationYear {
    print(actualYear)
}

print(actualYear)
```

Working with Optionals

- It is possible to use the same variable names for optional bindings?

```
let publicationYear : Int? = 2014

let actualYear : Int = 2022

if let actualYear = publicationYear { // this works
    print(actualYear) // Output?
}

print(actualYear) // Output?
```

Working with Optionals

- It is possible to use the same variable names for optional bindings

```
let publicationYear : Int? = 2014

let actualYear : Int = 2022

if let actualYear = publicationYear { // this works
    print(actualYear) // Output: 2014
}

print(actualYear) // Output: 2022
```

Working with Optionals

- Unwrapping multiple optionals:

```
if let actualYear = publicationYear {
    if let bookEdition = edition {
        print(actualYear,bookEdition)
    }
}
```

```
if let actualYear = publicationYear,
   let bookEdition = edition {
       print(actualYear,bookEdition)
   }
```

- Optionals in functions:

```
func textFromURL(url: URL?) -> String?
{
    return nil
}
```

- Failable initializers:

```
init?()
{
    return nil
}
```

Optional Chaining

- Unwrapping nested optionals:

```
class Person {
    var age: Int
    var residence: Residence?
}
class Residence {
    var address: Address?
}
class Address {
    var buildingNumber: String
    var streetName: String
    var apartmentNumber: String?
}
```

```
if let theResidence = person.residence {
  if let theAddress = theResidence.address {
     if let theApartmentNumber =
            theAddress.apartmentNumber {
               print("He/she lives in apartment
                  number \(theApartmentNumber).")
     }
  }
}
```

- Shorter version:

```
if let theApartmentNumber = person.residence?.address?.apartmentNumber {
    print("He/she lives in apartment number \(theApartmentNumber).")
}
```

Type Casting & Inspection

Type Casting

```
class Vehicle {}

class Car : Vehicle {}

class Motorcycle  : Vehicle {}

func allVehicles() -> [Vehicle] {
    // returns all vehicles
}

let vehicles = allVehicles()

for vehicle in vehicles {
    if let car = vehicle as? Car {
        // ..
    } else if let motorcycle =
        vehicle as? Motorcycle {
        // ..
    }
}
```

- Force cast:

```
let cars = allVehiclesFrom
(manufacturer: "Porsche") as! [Car]
```

- Use `as!` only when you are certain that the specific type is correct.
- If not your app will crash

The Any Type

- The `Any` type can represent an instance of any type: string, double, func, struct, class …

```
var items: [Any] = [5,"Tom", 6.7, Car()]
if let firstItem = items[0] as? Int {
    print(firstItem+4) //9
}
```

- The `AnyObject` type can represent any class within Swift, but not a struct

Guard

The Guard Command

```
func singHappyBirthday() {

    if birthdayIsToday {

        if invitedGuests > 0 {
            if cakeCandlesLit {
                print("Happy Birthday to you!")
            } else {
                print("The cake's candles
                       haven't been lit.")
            }
        } else {
            print("It's just a family party.")
        }
    } else {
        print("No one has a birthday today.")
    }
}
```

```
guard condition else {
    //false: execute some code & return
}
//true: execute some code
```

```
func singHappyBirthday() {
    guard birthdayIsToday else {
        print("No one has a birthday today.")
        return
    }
    guard invitedGuests > 0 else {
        print("It's just a family party.")
        return
    }
    guard cakeCandlesLit else {
        print("The cake's candles haven’t
               been lit.")
        return
    }
    print("Happy Birthday to you!")
}
```

Guard

- If statements only allow access to the constant within the brackets.

```
if let eggs = goose.eggs {
    print("The goose laid \(eggs.count) eggs.")
}
//`eggs` is not accessible here
```

- Guard statements allow access to the constant throughout the rest of the function

```
guard let eggs = goose.eggs else { return }
//`eggs` is accessible hereafter
print("The goose laid \(eggs.count) eggs."
```

- Unwrapping multiple optionals:

```
func processBook(title: String?, price: Double?, pages: Int?) {
    guard let theTitle = title, let thePrice = price, let thePages = pages else
                                                                { return }
    print("\(theTitle) costs $\(thePrice) and has \(thePages) pages.")
}
```

Enumeration

Enumerations

- Define an enumeration:

```
enum CompassPoint {
    case north
    case east
    case south
    case west
}
```

```
enum CompassPoint {
    case north, east, south, west
}
```

- Using enumerations:

```
var compassHeading = CompassPoint.west
// The compiler assigns ‘compassHeading’
as a ‘CompassPoint’

var anotherHeading: CompassPoint = .west
anotherHeading = .north
```

```
let compassHeading: CompassPoint = .west

switch compassHeading {
  case .north:
    print("I am heading north")
  case .east:
    print("I am heading east")
  case .south:
    print("I am heading south")
  case .west:
    print("I am heading west")
}
```

Enumerations

- Type safety benefits:

```
struct Movie {
    var name: String
    var releaseYear: Int
    var genre: String
}
```

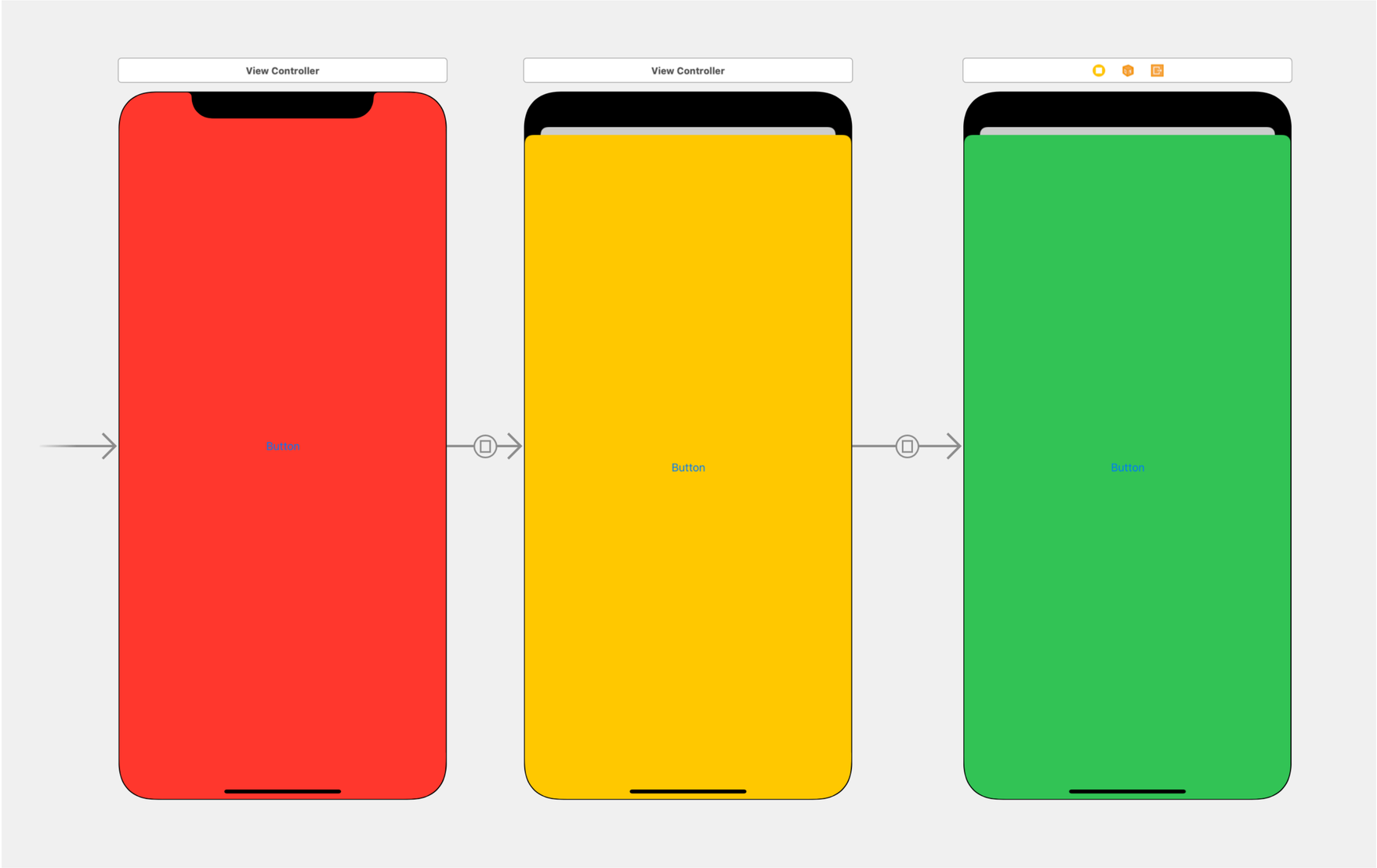
```
let movie = Movie(name: "Finding Dory",
                  releaseYear: 2016,
                  genre: "Aminated")
```

```
let movie = Movie(name: "Finding Dory",
                  releaseYear: 2016,
                  genre: "Tom")
```

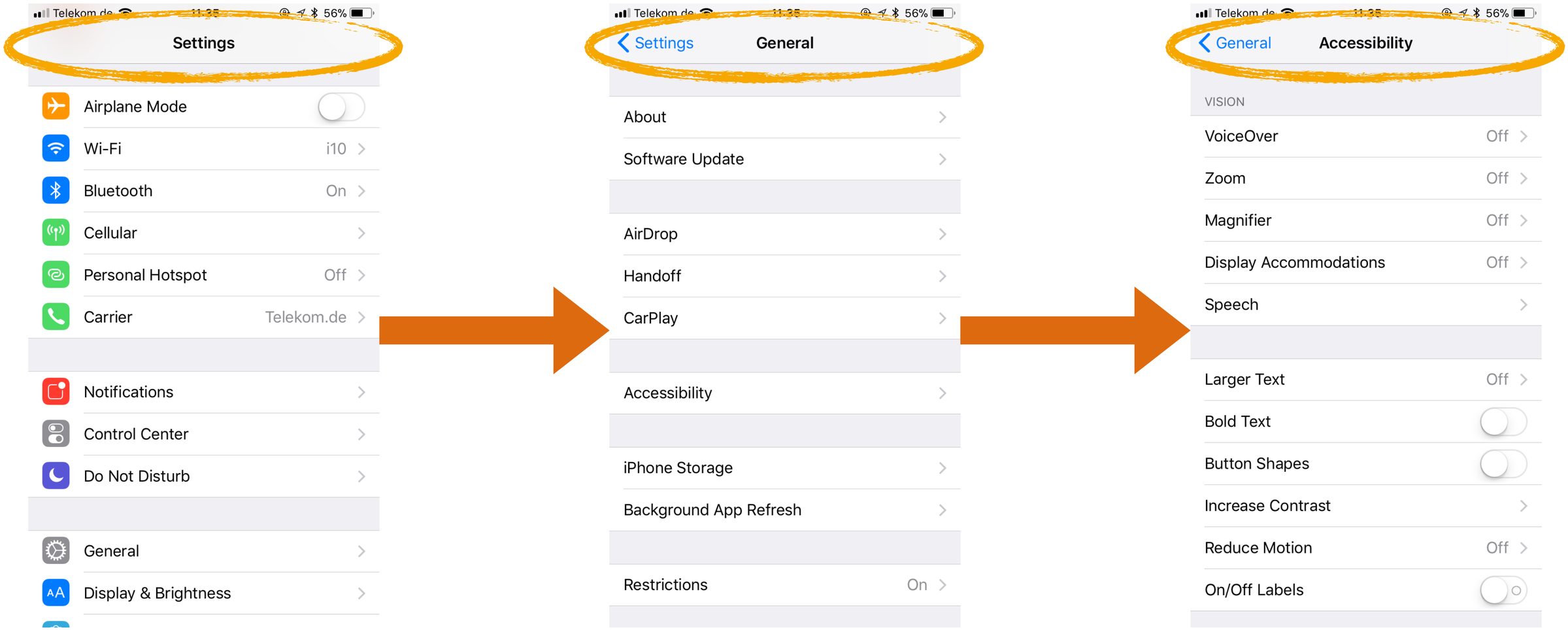
```
enum Genre {
    case animated, action, romance,
         documentary, biography, thriller
}

struct Movie {
    var name: String
    var releaseYear: Int
    var genre: Genre
}

let movie = Movie(name: "Finding Dory",
releaseYear: 2016,
    genre: .animated)
```

Segues and Navigation Controller

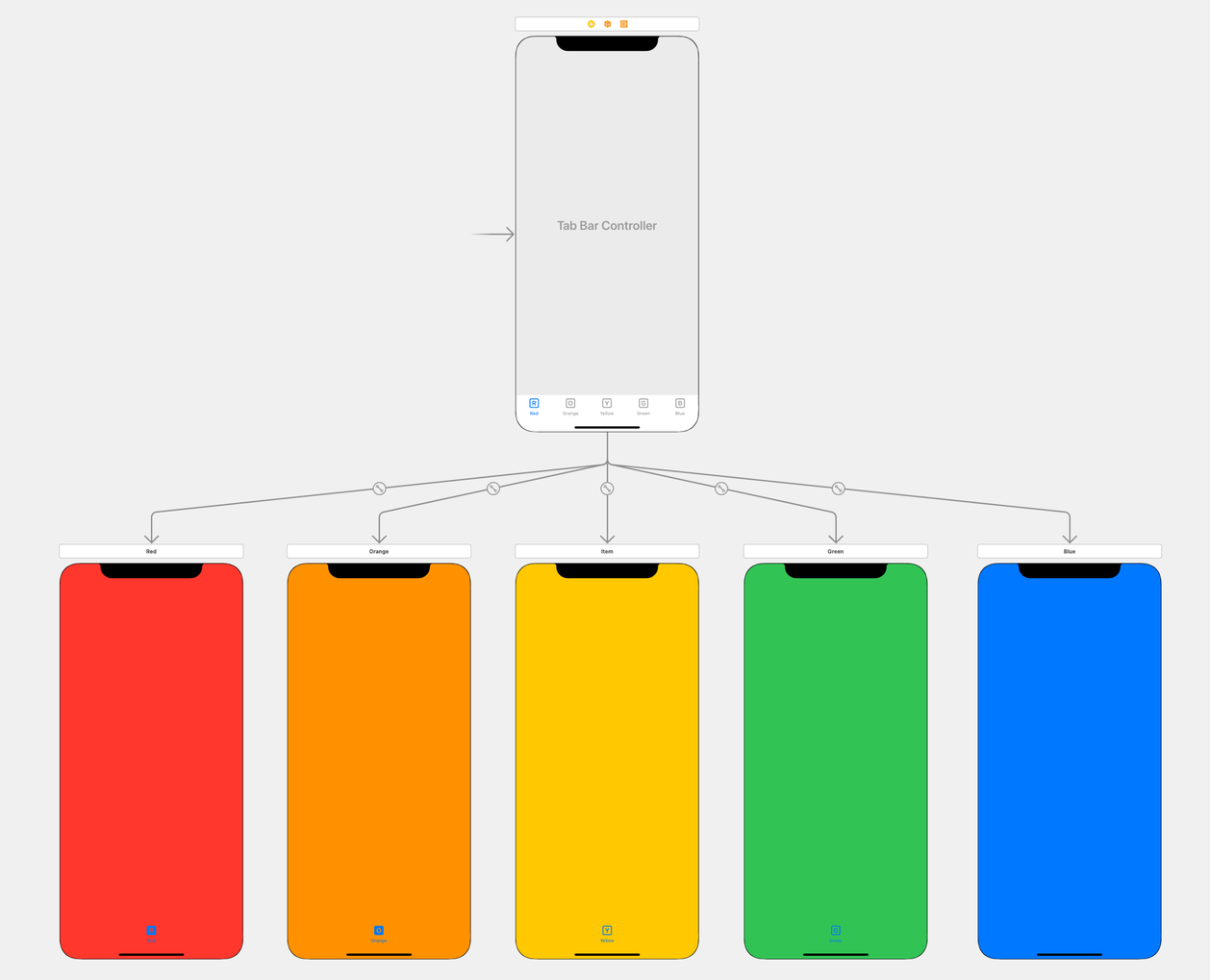
Segues



Navigation Controller



Tab Bar Controller



Summary

- Optionals, Guard, Enumerations
- Type casting and inspection
- Segues
- Navigation Controller
- Tomorrow:
  - More UIViewController, Auto Layout, and Swift Protocols and Extensions