SpaceAdventure
Lesson 11

Description

Prompt the user for the name of a planet to travel to, and print the planet's description.

```
Welcome to the Solar System!
There are 8 planets to explore.
What is your name?
Jane
Nice to meet you, Jane. My name is Eliza, I'm an old friend of Siri.
Let's go on an adventure!
Shall I randomly choose a planet for you to visit? (Y or N)
N
Name the planet you would like to visit.
Saturn
Traveling to Saturn...
Arrived at Saturn. This planet has beautiful rings around it.
```

Learning Outcomes

- Practice defining parameterized methods within a class definition.
- Relate the Swift `for` loop syntax to similar constructs in other familiar languages.
- Apply subscript syntax to access specific objects within an array.
- Practice logic and control flow with an `if` statement.
- Discover the Swift `for-in` loop, and compare them with traditional `for` loops.

Vocabulary

method call	method implementation	type annotation
`for` loop	counter variable	array subscripting
bracket	iterate	`for-in` loop

Materials

- **SpaceAdventure Lesson 11** Xcode project

Opening

How can we ask the traveler which planet he or she would like to visit, and then display that planet's description?

Agenda

- Examine the `if` statement in the implementation of `determineDestination` within the `SpaceAdventure` class.
- Replace the `TODO` and `println` call with a prompt to capture a planet's name that the user will type, and a call to a private `visit:` method.

```
...
} else if decision == "N"{
   let planetName = responseToPrompt("Ok, name the planet you would
      like to visit.")
   visit(planetName)
} else {
...
```

- Implement a simple version of the `visit:` method.

```
private func visit(planetName: String) {
   println("Traveling to \(planetName)...")
}
```

- Explain the method definition syntax, emphasizing the parameter name and type annotation.
- Discuss how one might print the `description` of the `Planet` in the `planetarySystem.planets` array whose `name` matches the value of `planetName`.
- Discuss the drawbacks of using a long, explicit `if` statement, such as `if planetName == "Mercury"`.
- Complete an implementation of `visit:` that uses a traditional `for` loop.

```
private func visit(planetName: String) {
   println("Traveling to \(planetName)...")
   for var i = 0; i < planetarySystem.planets.count; ++i {
      let planet = planetarySystem.planets[i]
      if planetName == planet.name {
         println("Arrived at \(planet.name). \(planet.description)")
      }
   }
}
```

- Explain the traditional `for` loop syntax.
- Discuss the the idiom of array subscripting using a `for` loop counter variable.
- Run the program (⌘R), enter a name, choose `N`, type a valid planet name, and observe the results displayed in the console (⇧⌘C).
- Discuss the first two lines of the `for` loop.

```
for var i = 0; i < planetarySystem.planets.count; ++i {
   let planet = planetarySystem.planets[i]
```

- Discuss how the loop iterates over each item in the array by using the counter variable to retrieve a `Planet` object out of the array, assigning the object to a `planet` constant.
- Replace the traditional `for` loop with a `for-in` loop.

```
for planet in planetarySystem.planets {
   if planetName == planet.name {
      println("Arrived at \(planet.name). \(planet.description)")
   }
}
```

- Discuss how the `for-in` loop manages the iteration, assigning each `Planet` object to the implicit `planet` constant during each repetition of the loop.
- Run the program (⌘R), enter a name, choose `N`, type a planet name, and observe the results displayed in the console (⇧⌘C).

Closing

What happens when the traveler types something else besides a valid planet name?

Modifications And Extensions

- Enhance the `visit:` method to handle cases where the traveler types an invalid planet name, and add logic to make certain planets unvisitable.

Resources

The Swift Programming Language: About Swift https://developer.apple.com/library/prerelease/ios/documentation/Swift/Conceptual/Swift_Programming_Language/

The Swift Programming Language: A Swift Tour https://developer.apple.com/library/prerelease/ios/documentation/Swift/Conceptual/Swift_Programming_Language/GuidedTour.html

The Swift Programming Language: The Basics https://developer.apple.com/library/prerelease/ios/documentation/Swift/Conceptual/Swift_Programming_Language/TheBasics.html

The Swift Programming Language: Methods https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/Methods.html

The Swift Programming Language: Subscripts https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/Subscripts.html

The Swift Programming Language: Collection Types https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/CollectionTypes.html

The Swift Programming Language: Control Flow https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/ControlFlow.html