

Programming Refresher

Helen Miles

Department of Computer Science
Aberystwyth University

hem23@aber.ac.uk

What this session all about

- Refreshing your skills
- Going over some of the basics
- Working through materials at your own pace
- We are here to support you

- We want to know if this session works...

Plan for Two Hour Session

15 mins Introduction & Questionnaire 1

1.5 hours Swift Playgrounds

5 mins Questionnaire 2

- Times are a rough guide
- If you want to leave early, please complete Q2! 😊

What Apple says:



Swift. A modern programming language that is safe, fast, and interactive.



Brad Larson @bradlarsen

260d

In an audit of the last 3 years of shipped bugs in our robotics software, ~40% would have been caught early by using Swift.

<http://www.sunsetlakesoftware.com/2015/11/03/what-we-learned-rewriting-our-robotic-control-software-swift>

SAFE

- Strong typing
- Compile-time checking as much as possible
- Make sure that things are initialised
- Make switch statements sensible
- Make switch statements cover all possible cases
- Make sure you know what is included in an if statement
- Take nil pointers seriously

FAST

- Language that helps compiler to optimise
- Expressive - can do a lot with a few lines of code

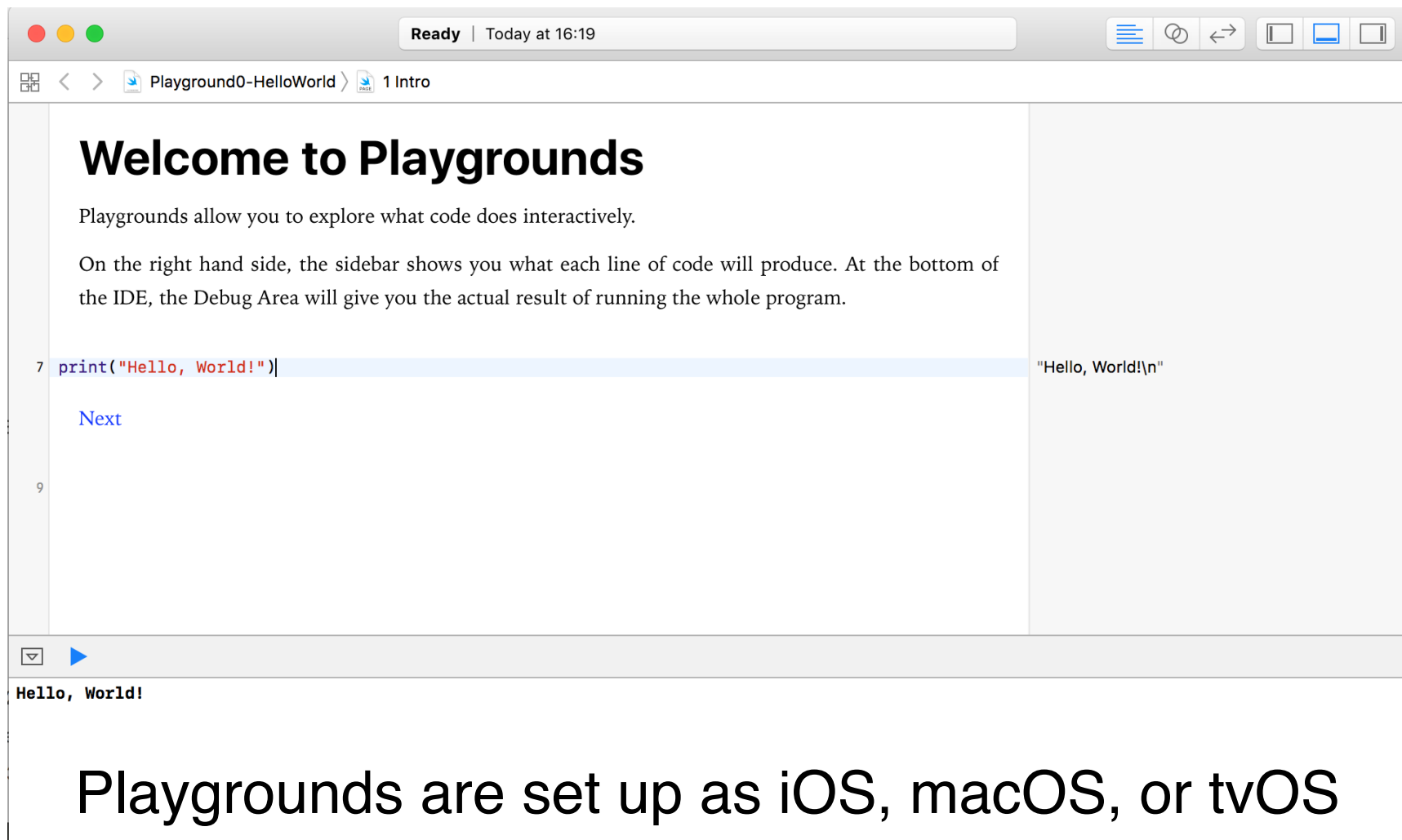
MODERN

- Don't make people write stuff the compiler should know:
 - Implied type declaration where possible
 - Implicit type name when type known (e.g. for enums)
- Have the features you might expect in a modern language
 - **Generics** - flexible functions that work with any type, subject to requirements that you define
 - **Protocols** - blueprint of methods, properties, etc that suit a particular task or functionality
 - **Multi-paradigm** - protocol-oriented, object-oriented, functional, imperative, block structured
 - Improvements on Objective-C

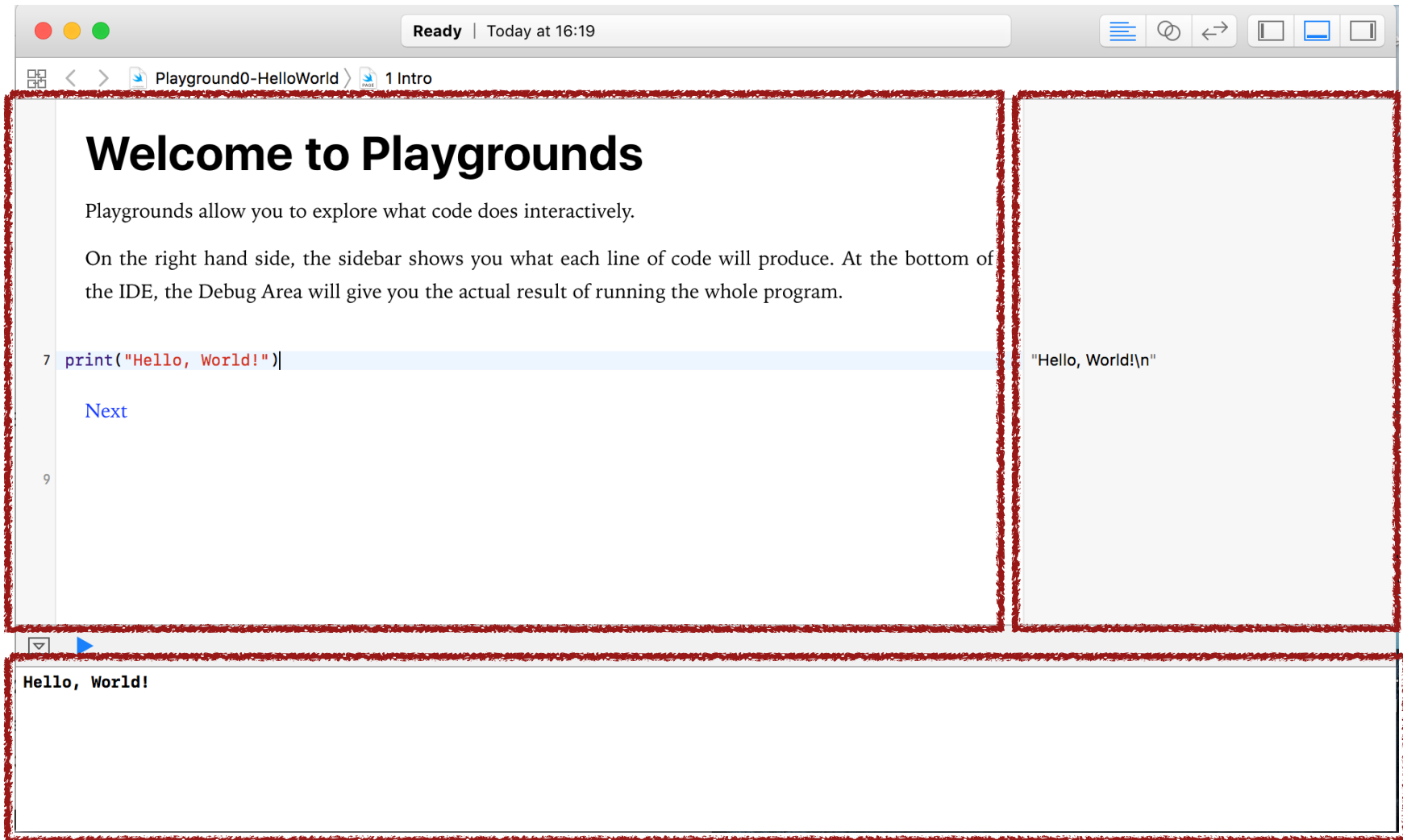
INTERACTIVE

- Great feature called Playgrounds is getting more emphasis
- Explore the code you are trying to write
- We are going to use playgrounds a lot in this session

Playgrounds



Playgrounds



The screenshot displays the Playgrounds IDE interface. At the top, a status bar shows "Ready" and the time "Today at 16:19". Below this, a toolbar contains icons for file operations and navigation. The main workspace is divided into three sections:

- Left Panel:** Contains a file explorer showing "Playground0-HelloWorld" and "1 Intro". Below this is a code editor with the following content:

```
7 print("Hello, World!")  
  
Next  
  
9
```
- Right Panel:** A sidebar showing the output of the code, displaying "Hello, World!\n".
- Bottom Panel:** A debug area showing the output of the program, displaying "Hello, World!".

Playgrounds

The screenshot shows the Playgrounds IDE interface. At the top, a status bar indicates 'Ready' and 'Today at 16:19'. The main editor area displays a 'Welcome to Playgrounds' message and instructions. A code editor shows a single line of Python code: `print("Hello, World!")`. A red oval highlights this line, with a red arrow pointing to the sidebar. The sidebar, on the right, shows the output of the code: `"Hello, World!\n"`. A red box highlights the sidebar with the text 'Sidebar shows instant line-by-line results'. At the bottom, a console area shows the output: `Hello, World!`. A red box highlights the console with the text 'Console Output'. A red arrow points from the code editor to the console, with the text 'Write code and markup' next to it.

Welcome to Playgrounds

Playgrounds allow you to explore what code does interactively.

On the right hand side, the sidebar shows you what each line of code will produce. At the bottom of the IDE, the Debug Area will give you the actual result of running the whole program.

7 `print("Hello, World!")`

Next

9

Write code and markup

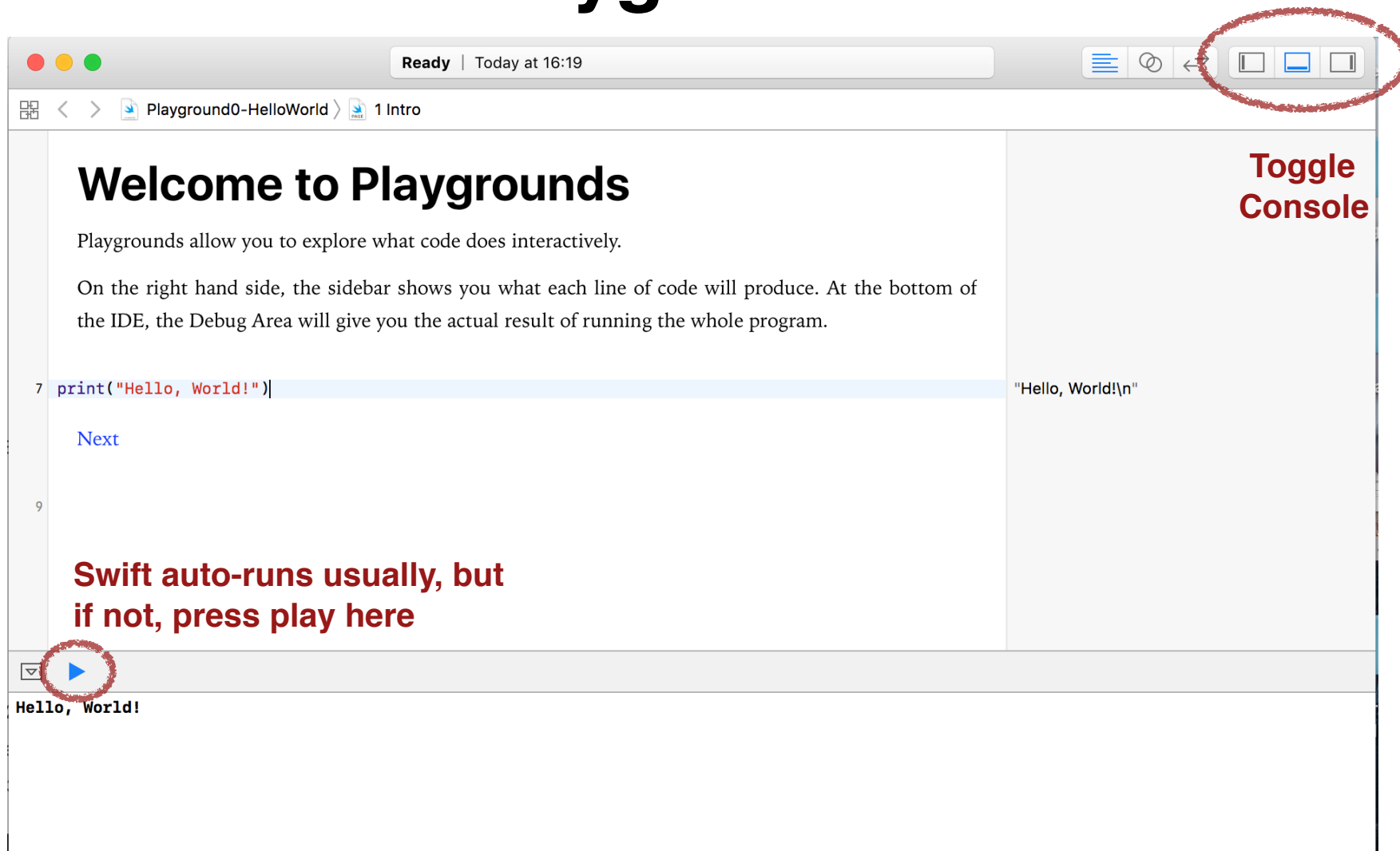
Sidebar shows instant line-by-line results

`"Hello, World!\n"`

Console Output

`Hello, World!`

Playgrounds



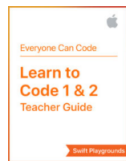
Playgrounds

List of Playgrounds

Filename	Purpose
P0-HelloWorld	Welcome to Playgrounds
P1-Types	Declaring values
P2-Strings	A closer look at Characters and Strings
P3-ControlStructures	Controlling the flow of a program using loops
P4-EnumSwitch	Declaring enums and using switch statements
P5-Functions	Making programs more useful with functions
P6-Collections	Looking at array, sets and dictionaries

- Files are provided - work through each one
- Playgrounds will guide you through exercises
- Use the booklet to help you (PDF in materials)

Swift Books



Swift Playgrounds: Learn to Code 1 & 2
Teacher Guide
Apple Education >
Education
13 Jun, 2016

Get

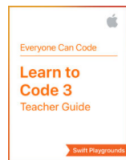
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Intro to App Development with Swift
Apple Education >
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Apple Education >
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Web Resources

Swift Programming Reference:

https://developer.apple.com/library/content/documentation/Swift/Conceptual/Swift_Programming_Language/

Ray Wenderlich's Tutorials:

<https://www.raywenderlich.com/category/swift>

Apple Developer Swift Resources:

<https://developer.apple.com/swift/>

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