

# **The Swift Programming Lang**

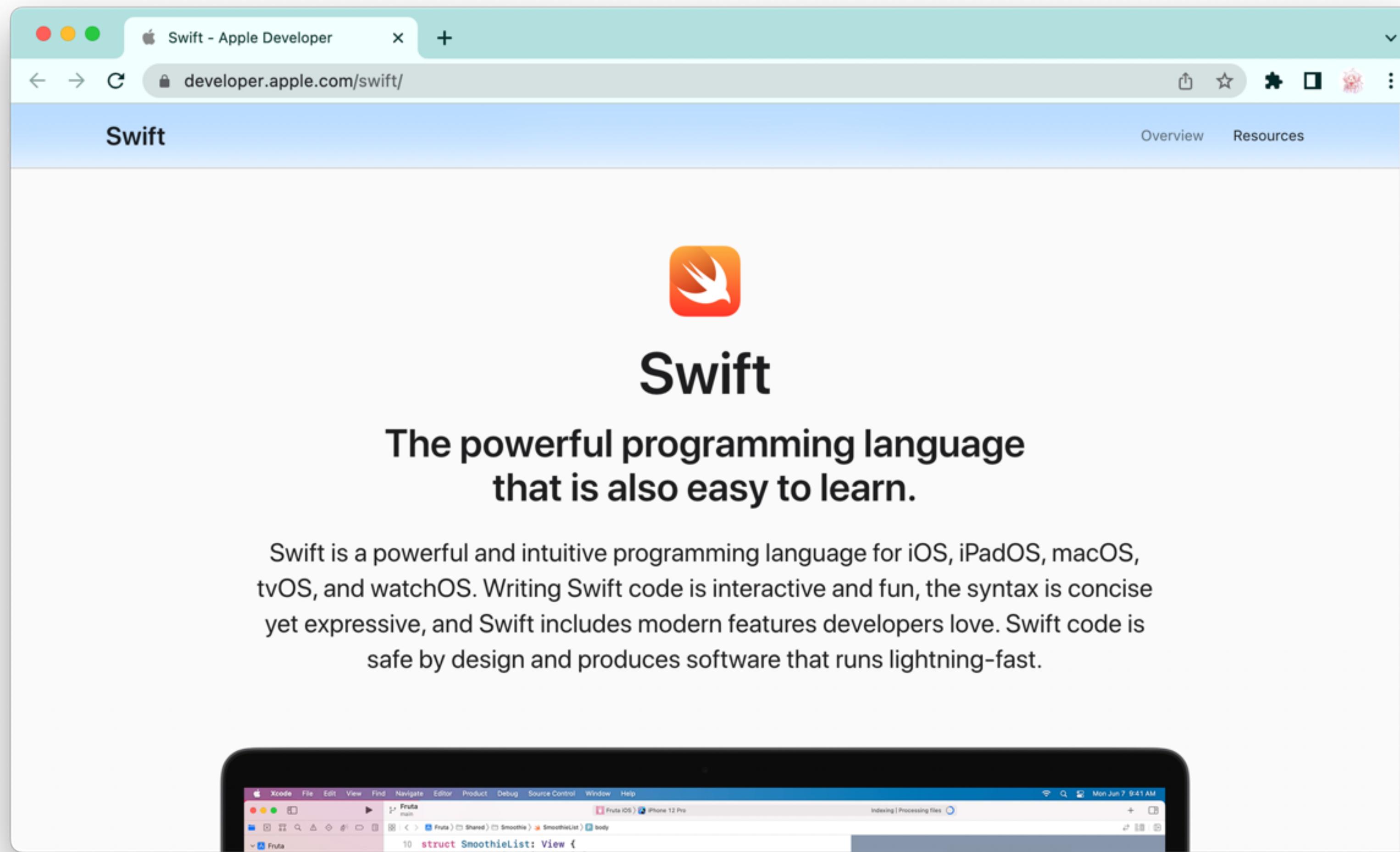
## **First Step**

- The Swift Programming Lang & Online Resources
- Setup Environment & Hello World
- Swift Basics
- Today's Assignment

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**The Swift Programming Lang & Online Resources**

The screenshot shows a web browser displaying the Swift.org Documentation page. The title bar reads "Swift.org - Documentation". The URL in the address bar is "swift.org/documentation/". The main content area features a large "Documentation" heading. To the left is a sidebar with the Swift logo and several navigation links: "ABOUT SWIFT", "BLOG", "GETTING STARTED", "DOWNLOAD", "PLATFORM SUPPORT", "DOCUMENTATION" (which is currently selected), and "COMMUNITY". Under "DOCUMENTATION", there are links to "Swift Language", "Standard Library", "Packages", "API Design Guidelines", and "Tools". Below the sidebar, the main content area has a section titled "Swift Language" with a sub-section titled "The Swift Programming Language Book". It describes the book as the authoritative reference for Swift, offering a guided tour, a comprehensive guide, and a formal reference of the language. It includes links to "Read The Swift Programming Language", "A Swift Tour", "Language guide", and "Language reference".

# Documentation

If you are new to Swift, you may want to check out these additional resources.

[Getting started guide >](#)  
[Swift resources at Apple.com ↗](#)

## Swift Language

### The Swift Programming Language Book

*The Swift Programming Language* is the authoritative reference for Swift, offering a guided tour, a comprehensive guide, and a formal reference of the language.

[Read The Swift Programming Language >](#)  
[A Swift Tour >](#)  
[Language guide >](#)  
[Language reference >](#)

**The Swift Programming Lang & Online Resources**

Forums – Hacking with Swift

hackingwithswift.com/forums

# Hacking with Swift Forums

A welcoming place where everyone can come and ask questions, get answers, and talk about Swift.

Search the forums

## Announcements

Site news, jobs, and more.

- Site News
- Job Postings
- App Announcements

## Help and Discussion

This category is for asking questions, getting answers, and general development discussion.

- Hacking with Swift+
- Swift
- SwiftUI
- iOS
- macOS
- watchOS
- tvOS
- Server-side Swift

## 100 Days Courses

Latest Topics	Replies	Activity
I got the wrong book, need help finding the right one Books	6	3h
Need help , Project 4 first challenge. 100 Days of Swift	19	4h
Initializing a single variable from Core Data in a view SwiftUI	1	5h
Day 77 Challenge 100 Days of SwiftUI	0	5h

The Swift Programming Lang & Online Resources

**Swift is a general-purpose, multi-paradigm, compiled programming language developed by Apple Inc. and the open-source community. First released in 2014.**

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**The Swift Programming Lang & Online Resources**

The screenshot shows the GitHub repository page for `apple/swift`. The repository is public and has 339 branches and 2,056 tags. The main branch is selected. The repository has 141,569 commits. The sidebar includes links to `swift.org`, `Readme`, `Apache-2.0 license`, `Code of conduct`, `60.6k stars`, `2.5k watching`, and `9.7k forks`. The releases section shows the `Swift 5.7 Release` (Latest) from 7 days ago and + 42 releases.

apple / swift Public

Code Issues 5k+ Pull requests 560 Security Insights

main 339 branches 2,056 tags Go to file Add file ▾ < Code

DougGregor Merge pull request #61179 from DougGregor/swift-compil... 36573f3 6 hours ago 141,569 commits

.github Track the change from 'master' to 'main'. 17 days ago

SwiftCompilerSources [cxx-interop][SwiftCompilerSources] Use `swift::SubstitutionM...` 4 days ago

apinotes [OSSignpost] Update apinotes to allow usage of `os_signpost ABI e...` 2 years ago

benchmark Merge pull request #60770 from YOCKOW/W291 24 days ago

bindings/xml review: rename Attribute to `InlineAttributes` in `MarkupXML` 2 months ago

cmake [Unit tests] Use the rpaths determined for unit tests 2 days ago

docs Merge pull request #61136 from amritpan/update-output-example 4 days ago

include Adopt new SwiftCompilerSupport header and enumerator names. 10 hours ago

lib Add missing `usesFeatureParserSequenceFolding` 10 hours ago

localization [Frontend] Switch from YAML to `.strings` based localization 28 days ago

About

The Swift Programming Language

[swift.org](#)

[Readme](#)

[Apache-2.0 license](#)

[Code of conduct](#)

[60.6k stars](#)

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Releases 43

[Swift 5.7 Release](#) Latest 7 days ago

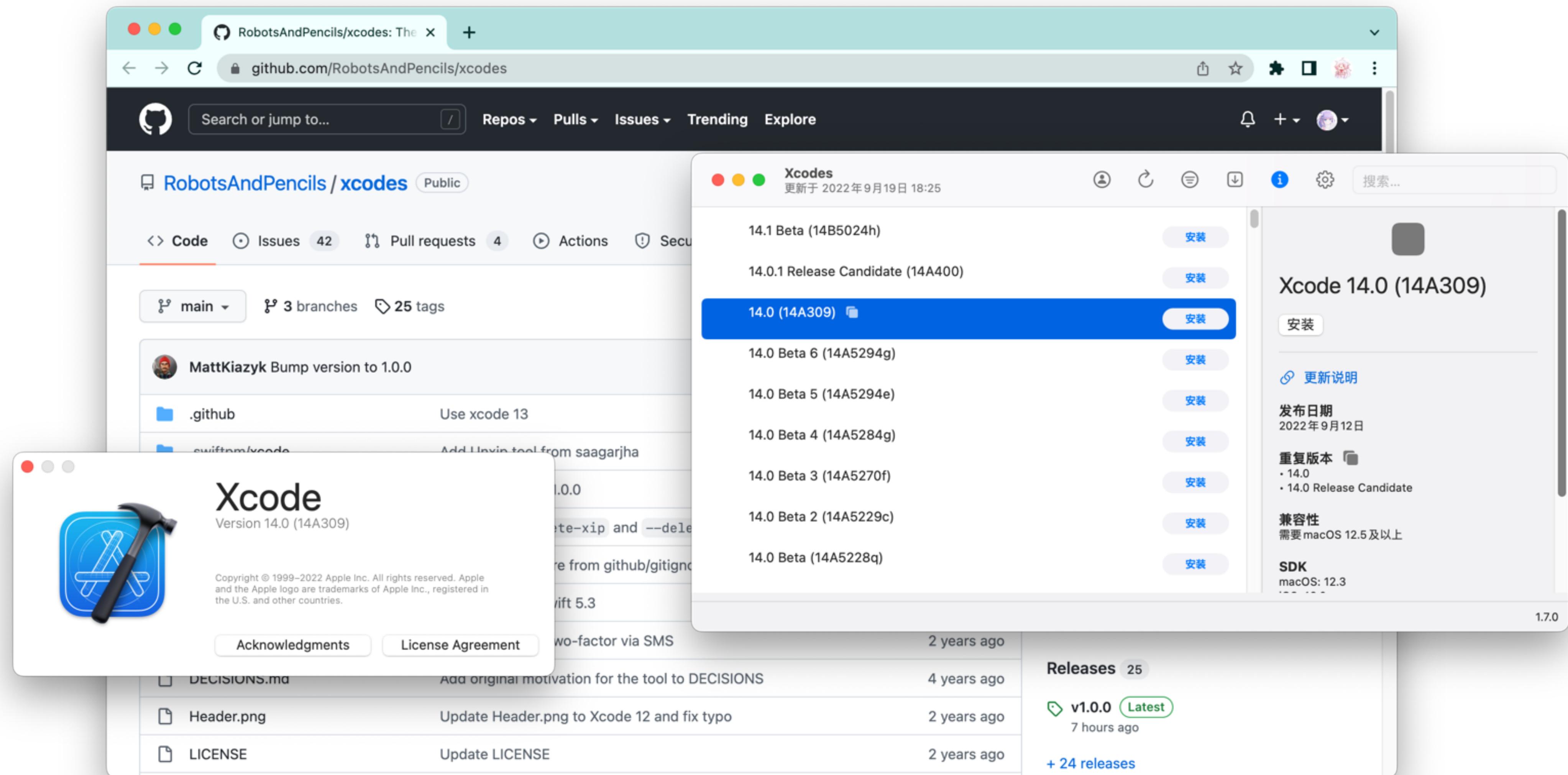
+ 42 releases

## The Swift Programming Lang & Online Resources

**The platforms Swift supports are Apple's operating systems (Darwin, iOS, iPadOS, macOS, tvOS, watchOS), Linux, Windows, and Android.**

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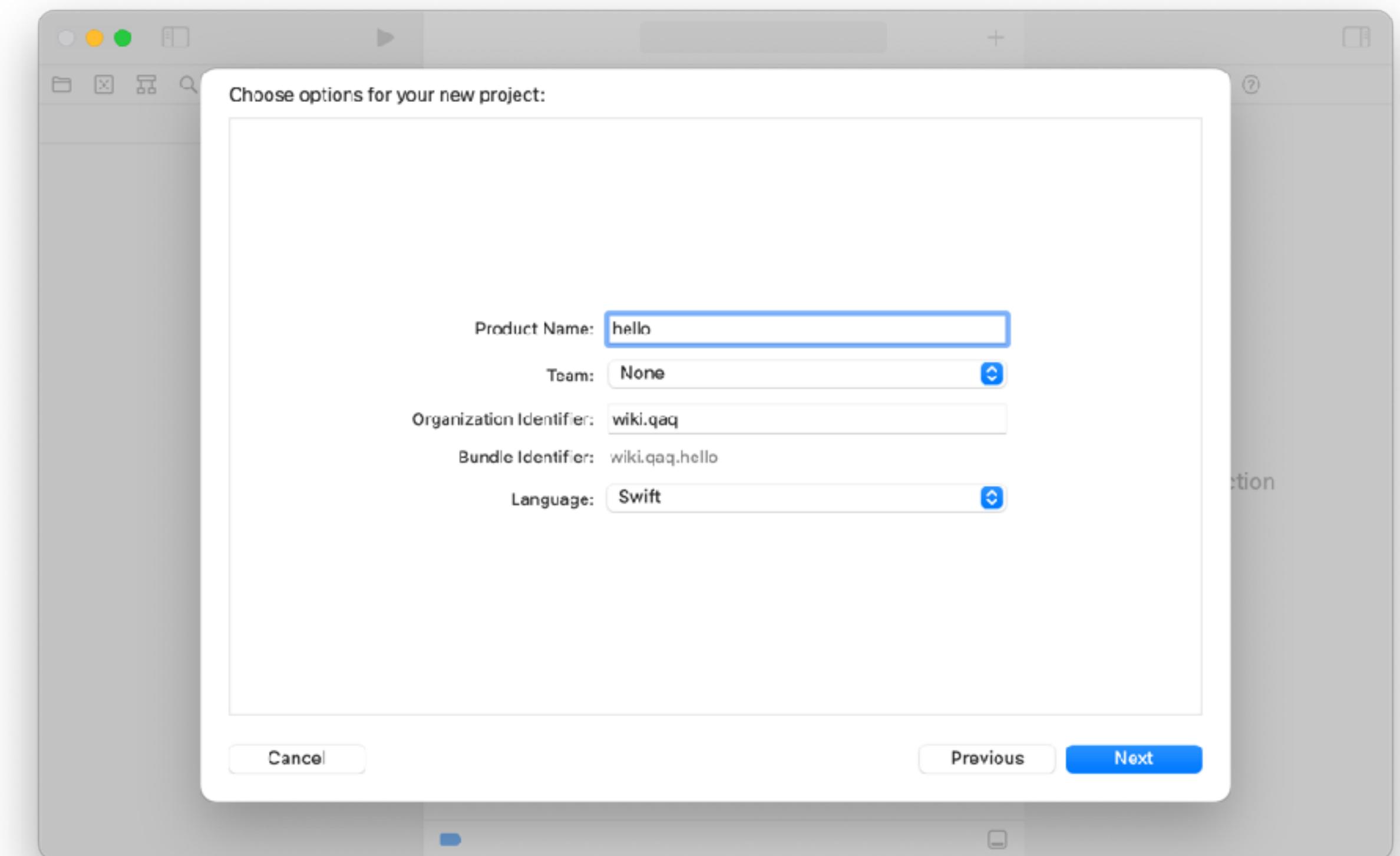
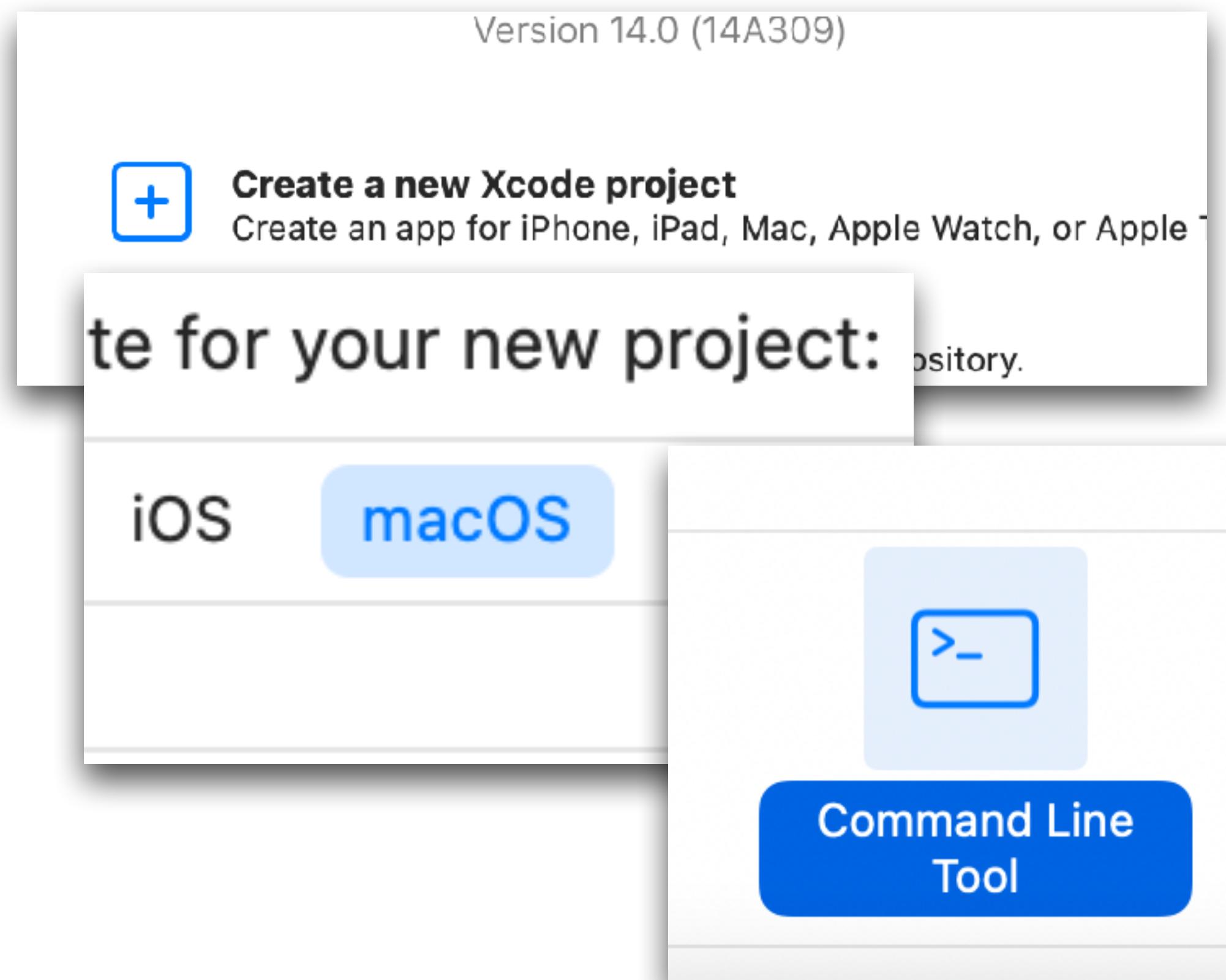
## Setup Environment & Hello World (macOS & Xcode)

→ **`sudo xcode-select -s /Applications/Xcode.app`**

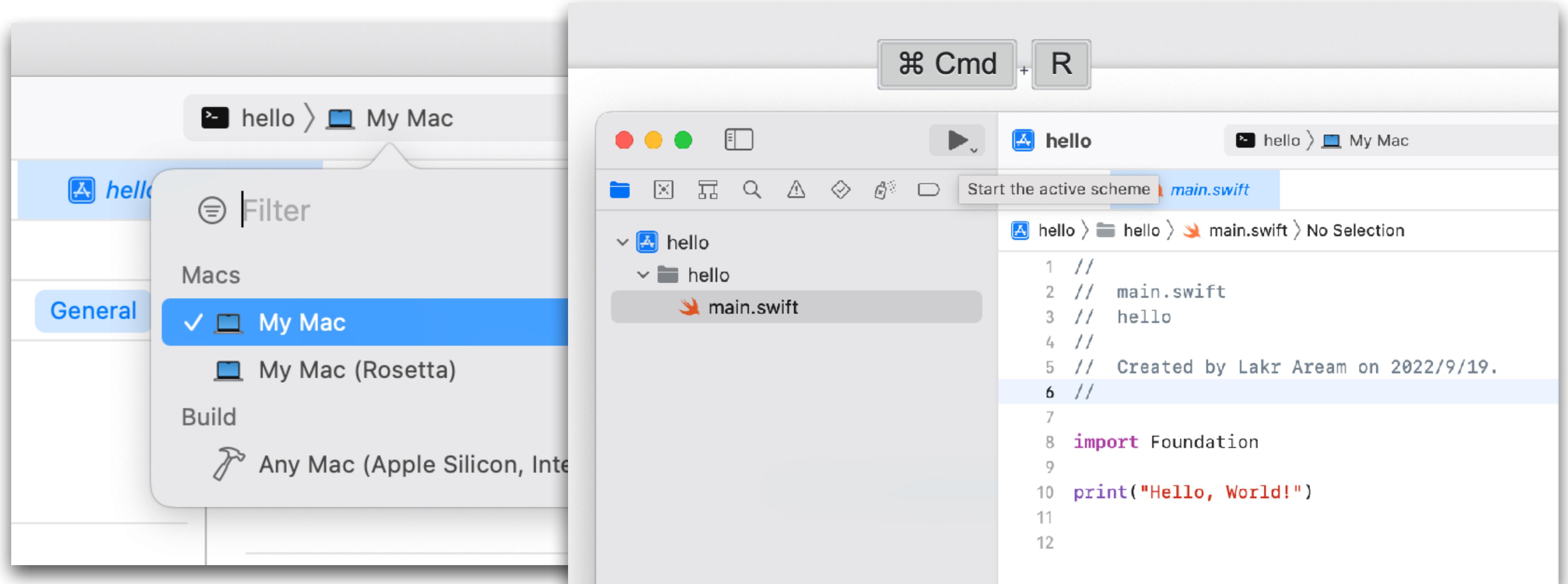
→ **`sudo xcode-select -p`**

: */Applications/Xcode.app/Contents/Developer*

**Setup Environment & Hello World (macOS & Xcode)**



## Setup Environment & Hello World (macOS & Xcode)



## Setup Environment & Hello World (macOS & Xcode)

```
$ wget https://download.swift.org/swift-5.7-release/ubuntu2004/swift-5.7-RELEASE/swift-5.7-RELEASE-ubuntu20.04.tar.gz
```

```
$ gzip -d ./swift-5.7-RELEASE-ubuntu20.04.tar.gz  
$ tar -xvf swift-5.7-RELEASE-ubuntu20.04.tar  
$ mv swift-5.7-RELEASE-ubuntu20.04 swift
```

```
$ export PATH=$(pwd)/swift/usr/bin:$PATH  
$ swiftc --version
```

## Setup Environment & Hello World (Using `swiftc` Binary)

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```
let this = 0  
var that = "paipai moe"
```

## Constants and Variables

```
let this = 0          // immutable
this = 1            // crash the compiler
```

> Cannot assign to value: 'this' is a 'let' constant

```
var that = "paipai moe" // mutable
that = "kankan wtf"    // value changed
```

## Constants and Variables

```
let this = 0  
var that = "paipai moe"
```

## Constants and Variables

```
let this: Int = 0  
var that: String = "paipai moe"
```

## Constants and Variables

```
let 你好 = "你好世界"  
let 🐶🐮 = "dogcow"
```

## Constants and Variables

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```
//  
// main.swift  
// hello  
//  
// Created by Lakr Aream on 2022/9/19.  
//
```

## Comments

```
/*  
 main.swift  
 */
```

## Comments

```
let 你好 = "你好"    // Swift supports utf8  
let 🐶🐮 = "世界"    // as variable name
```

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Bool,

Int,

Int8, Int16, Int32, Int64,

UInt8, UInt16, UInt32, UInt64,

Double, Float,

String, Character, Substring,

Range<T>, ClosedRange<T>,

Array<T>, Dictionary<T, T>, KeyValuePairs<T, T>,

## Data Types

```
let uint8_min: UInt8 = UInt8.min          // 0
let uint8_max: UInt8 = UInt8.max         // 255
let uint16_min: UInt16 = .min            // 0
let uint16_max: UInt16 = .max            // 65535
let int_min: Int = .min                 // -9223372036854775808
let int_max: Int = .max                 // 9223372036854775807
let int64_min: Int64 = .min              // -9223372036854775808
let int64_max: Int64 = .max              // 9223372036854775807
```

## Data Types

```
// immediate value
let intVal_immediate      = 1

let intVal_defaultInit    = Int() // 0
let intVal_byConvert      = Int(1.0) // Double -> Int
let intVal_byConvertWithoutLoss = Int(exactly: 1.1) // fail, nil

// all above can be expended to init function
let intVal_byConvertExpended = Int.init(1.0)

// special case
let range: ClosedRange     = 0 ... 100 // <- immediate value
let intVal_byUsingRandom   = Int.random(in: range) // static convince initializer
```

## Variable Initializer

```
let whoIsMoe: String? = nil
```

**Data Type - Optional<T>**

```
let whoIsMoe: String? = nil
```

**Data Type - Optional<T>**

```
let whoIsMoe: String? = nil
```



**This value is optional, and might be nil.**

**Data Type - Optional<T>**

```
let whoIsMoe: String? = nil
```



The type of wholsMoe is Optional<String>

Data Type - Optional<T>

```
let whoIsMoe: String? = nil
```



If you force cast nil to Int, it is 0.

Data Type - Optional<T>

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+ - \* / // () %

## Basic Operators

# Terminology

Operators are unary, binary, or ternary:

- **Unary** operators operate on a single target (such as `-a`). Unary prefix operators appear immediately before their target (such as `!b`), and unary postfix operators appear immediately after their target (such as `c!`).
- **Binary** operators operate on two targets (such as `2 + 3`) and are infix because they appear in between their two targets.
- **Ternary** operators operate on three targets. Like C, Swift has only one ternary operator, the ternary conditional operator (`a ? b : c`).

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```
let someValue = true

if someValue {
    print("someValue is true")
} else {
    print("someValue is false")
}
```

## Basic Control Flow

```
let someValue = true

if someValue {
    print("someValue is true")
} else {
    print("someValue is false")
}
```

## Basic Control Flow

```
let whoIsMoe: String? = nil

if let thatOne = whoIsMoe {
    // thatOne is moe

    // 1 define thatOne with type String
    // 2 the value of whoIsMoe into thatOne
    // 3 you can use thatOne with it's value as String
} else {
    // no one! The value of whoIsMoe is nil
}
```

## Basic Control Flow

```
let whoIsMoe: String? = nil

guard let whoIsMoe = whoIsMoe else {
    fatalError("I can't live without moe!")
}
```

## Basic Control Flow

```
let whoIsMoe: String? = nil

guard let whoIsMoe = whoIsMoe else {
    fatalError("I can't live without moe!")
    // if whoIsMoe is nil, kill the control flow
}

// whoIsMoe now has type String (not String? anymore)
```

## Basic Control Flow

```
let value = 1

switch value {

    // each case is default to break
    case 1: print("value is 1")

    // tell the compiler to go on with this keyword
    case 2: fallthrough

    // if cases are not exhausted, default is required
    default: break
}
```

## Basic Control Flow

```
var c = 100

while c > 0 {
    print(" [*] doing it at \\" + c + "\\")
    c -= 1
}
```

## Basic Control Flow

```
repeat {  
    print("[*] I only live once!")  
} while false
```

## Basic Control Flow

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# Guess The Number

```
[*] Now tell me a number and press enter!  
9  
[*] This number is too big!  
[*] Now tell me a number and press enter!  
2  
[*] This number is too small!  
[*] Now tell me a number and press enter!  
5  
[*] You win this game!  
Program ended with exit code: 0
```

# Guess The Number



```
[*] Now tell me a number and press enter!  
9  
[*] This number is too big!  
[*] Now tell me a number and press enter!  
2  
[*] This number is too small!  
[*] Now tell me a number and press enter!  
5  
[*] You win this game!  
Program ended with exit code: 0  
  
[*] Tips: use readLine() to get user input  
      ^ do not have \n at end
```

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**Ask Questions!**