Swift & SwiftUI

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What is Swift?

Swift is a general-purpose, high-level programming language created by Apple in 2014 by Chris Lattner for iOS, macOS, tvOS, watchOS, and Linux applications.

Background/Rationale

Why Did Swift Replace Objective-C?

Swift

- Can develop in Xcode, Swift Playgrounds, Cocoa Touch, and more
- 2.6x faster
- Rich documentation that's constantly updated
- Types are inferred
- Static type

Objective-C

- Can develop in Xcode
- 2.6x slower
- Rich documentation that's not frequently updated
- Types must be declared
- Dynamic type

Objective-C

```
const int count = 10;
double price = 23.55;

NSString *firstMessage = @"Swift is awesome. ";
NSString *secondMessage = @"What do you think?";
NSString *message = [NSString stringWithFormat:@"%@%@", firstMessage, secondMessag
e];

NSLog(@"%@", message);
```

Swift

```
let count = 10
var price = 23.55

let firstMessage = "Swift is awesome. "
let secondMessage = "What do you think?"
var message = firstMessage + secondMessage

print(message)
```

Code Demo

Classification

Programming Language Design Principles

Simplicity

"A language should be as simple as possible. There should be a minimum number of concepts, with simple rules for their combination."

Security

"No program that violates the definition of the language, or its own intended structure should escape detection."

Simplicity

- Easy to learn
  - Designed with beginner programmers in mind
- Built to be fast
  - Uses high performance LLVM computer technology
- Code more closely resembles English
- More compact language
  - Requires fewer lines of code for same feature

Objective-C

```
1  #import <Foundation/Foundation.h>
2
3  int main (int argc, const char * argv[])
4  {
5      printf("Hello World");
6      return 0;
7  }
```

```
#import <Foundation/Foundation.h>

int main(int argc, const char * argv[]) {
    @autoreleasepool {
        // insert code here...
        NSLog(@"Hello, World!");
    }
    return 0;
}
```

Swift

```
1  import Foundation
2
3  print("Hello World")
```

Security

- Automatic memory management
  - Tracks and manages the app's memory
- Objects can never be nil
  - Compiler throws an error if there's a nil object
- Type-safe
  - Verifies that all types are used correctly
- Variables always initialized before use
- Arrays and integers checked for overflow

```
func myNum(passedNum: Int?) -> Int {
    var num: Int
    if let myNum = passedNum {
        num = myNum
    }
    return num                    Variable 'num' used before being initialized
}
```

```
1  class XmasPresent {
2      func surprise() -> Int {
3          return Int.random(in: 1...10)
4      }
5  }
6
7  let present: XmasPresent? = nil
8
9  // Check the optional to see if it contains an object
10 if present != nil {
11     // it contains an object
12     // call the surprise function
13     present.surprise()
   Value of optional type 'XmasPresent?' must be unwrapped to refer to member 'surprise' of wrapped base type 'XmasPresent'
15 Chain the optional using '?' to access member 'surprise' only for non-'nil' base values   Fix
   Force-unwrap using '!' to abort execution if the optional value contains 'nil'           Fix
```

Evaluation

Business Benefits of Swift

Speedy App Development

- Products can be quickly developed and modified

Higher Level of Security

- Developers can immediately see mistakes and fix them.

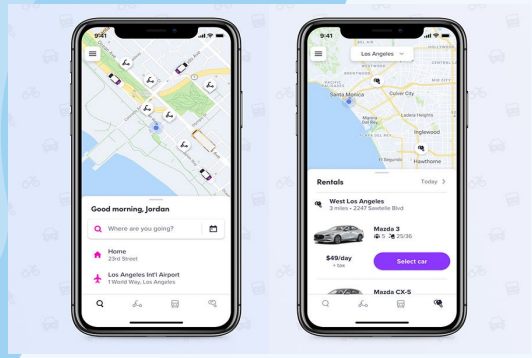
Lower Cost of Maintenance

- Features can be implemented in a reduced amount of code lines

Supported and Accepted by Apple

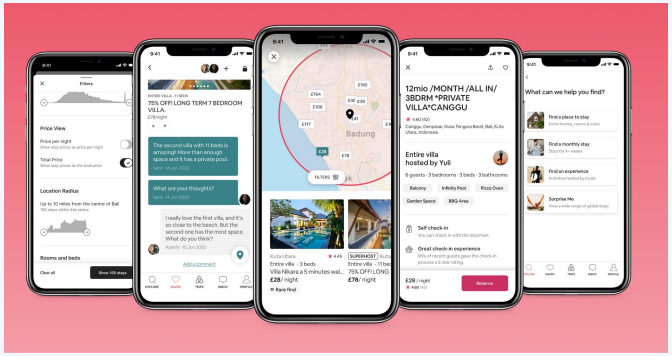
- Swift is the leading technology for iOS apps

Apps Written in Swift



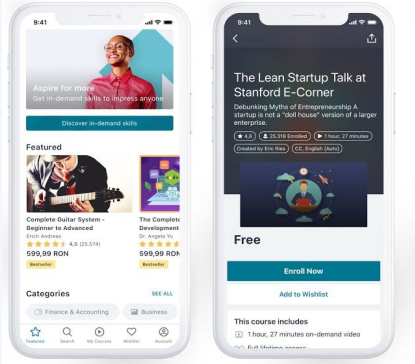
Lyft

Get a ride from a friendly driver within minutes.



Airbnb

Find vacation rentals, cabins, beach house, unique homes and experiences around the world.



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What is SwiftUI?

SwiftUI is Apple's new cross-platform framework for building user interfaces for iOS, macOS, tvOS, and watchOS.

Is SwiftUI Better than Storyboard?

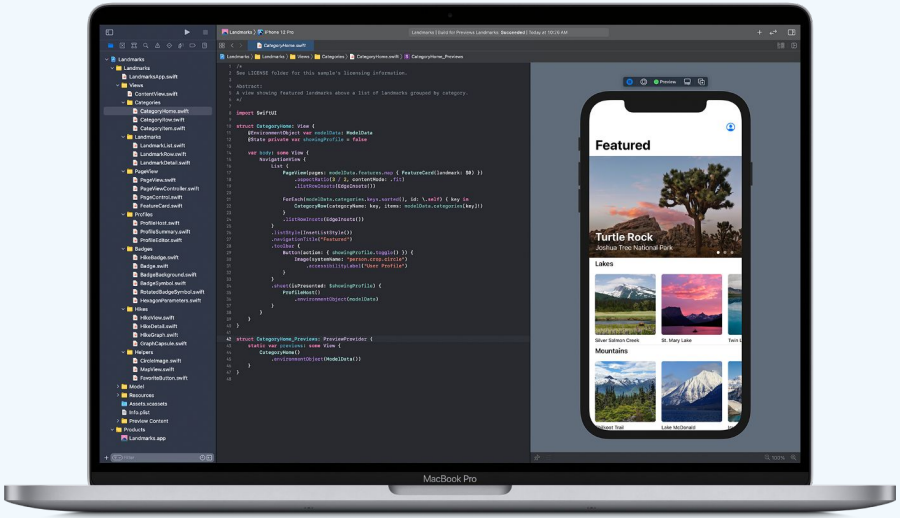
SwiftUI

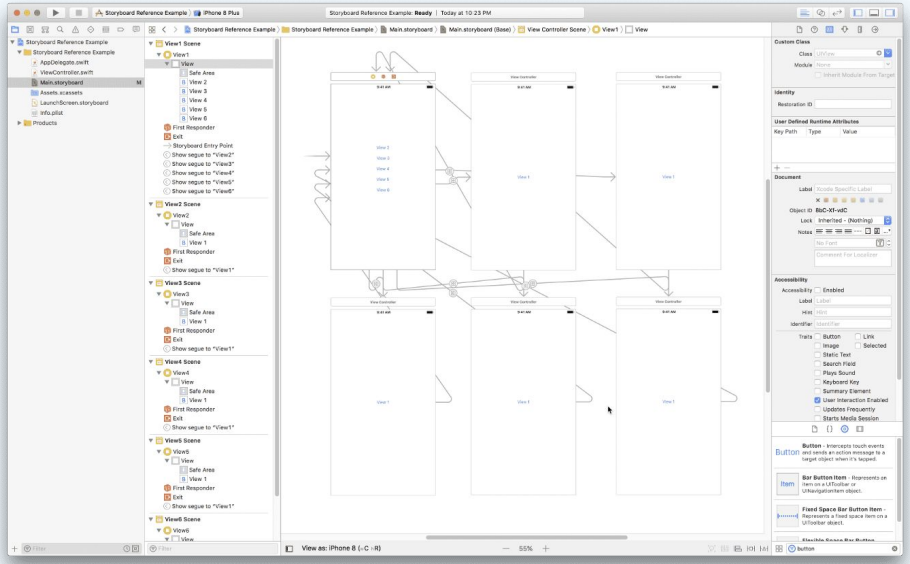
- Declarative
- Single framework for multiple platform iOS apps
- Offers automatic live preview
- No Autolayout issues
- Code is simple and clean
- Gives way to reactive programming by providing bindable objects

Storyboard (Interface Builder)

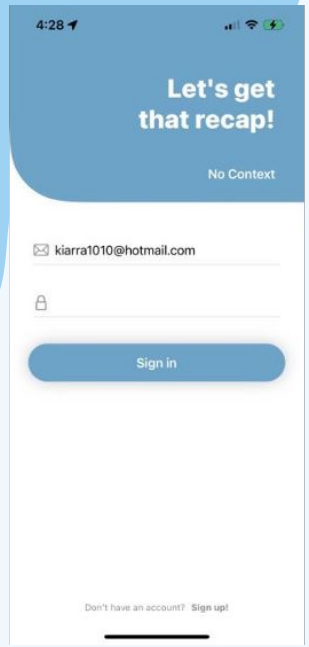
- Imperative
- Harder to learn as a beginner
- Management of storyboards become difficult as number of screens increase
- Autolayout issues
- Difficult to track changes over time

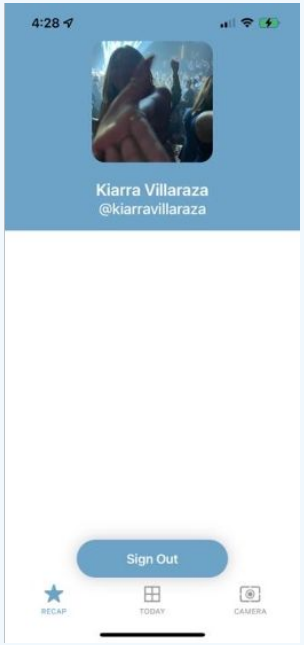
SwiftUI vs. Storyboard

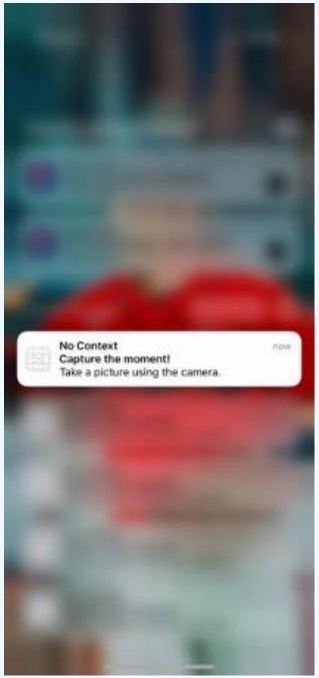




An App that I've Created Using Swift & SwiftUI







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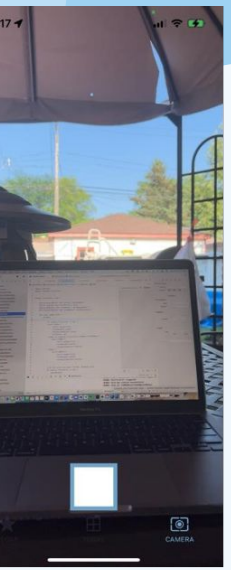

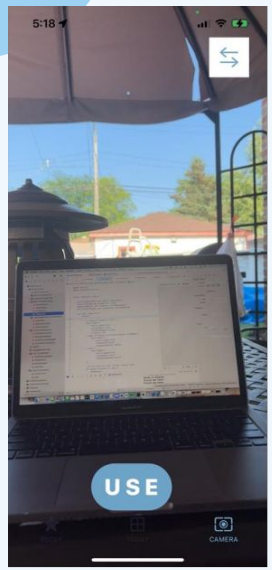

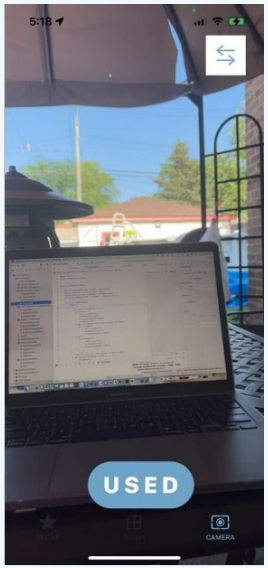

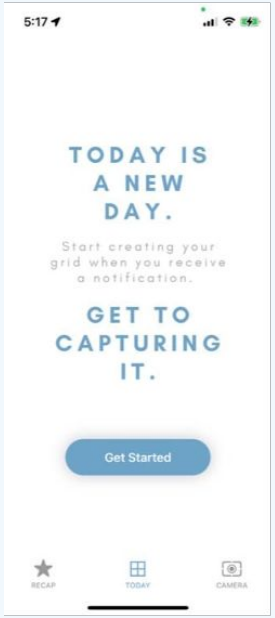

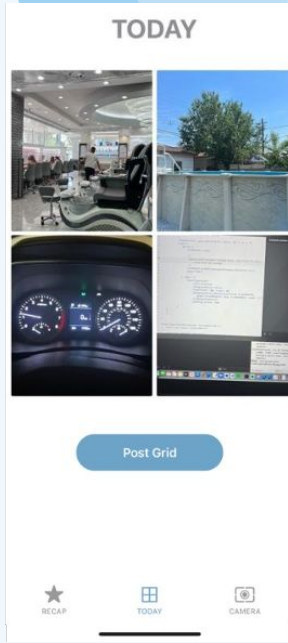

Conclusion

Swift is an open-source programming language for iOS applications that is

- Quick to use
- Easy to learn
- Secure

SwiftUI is an interactive and expressive framework that uses declarative syntax to build interfaces for iOS.

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Thanks for listening!

Any questions?