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SE 4020: Mobile Application Design and Development

Types of Mobile Apps

- **Native apps**
  - Apps developed for a single mobile operating system exclusively (iOS, Android.)
- **Hybrid apps**
  - Apps built using multi-platform web technologies (HTML5, CSS and Javascript, etc.)
- **Web apps**
  - Responsive versions of Websites to work on any mobile device with a browser.

Native Apps

- Pros
  - High performance
  - Ability to ensure good user experience
  - Wide range of APIs that puts no limitation on app usage
- Cons
  - Higher cost

Hybrid Apps

- Pros
  - Fast and relatively easy to develop
  - Single code base for all platforms
  - Low Cost
- Cons
  - Performance hits
  - Limitations with API usage

Web Apps

- Pros
  - No need to develop a separate app
- Cons
  - Always requires an internet connection
  - No access to many low level APIs

iOS vs Android

- Device sales - Q2 2018
  - 329.5 million Android
  - 44.72 million iPhones

(Ref: statista.com)

- App Sales
  - $11.8 billion - Google Play
  - $22.6 billion - App Store

(Ref: techcrunch.com)

Why iOS

- Pros
  - Majority of users run the latest version od OS
  - Little device fragmentation
  - Mostly high end hardware
  - Learn a new programming language Swift
- Cons
  - Requires a Mac and an Apple Developer Account with yearly subscription
  - Takes few days of approval time to be released to App Store
  - Multiple ways of developing applications

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Devices

Swift

- Development of the language began in 2010
- First version released Mid 2014
- Swift 1.0 was released for Xcode 6.0
- Swift 2.0 and 3.0 were released in September 2015 and 2016, respectfully
- Swift was originally a proprietary language to Apple
- With the release of Swift 2.2, it was made open source
- Swift 5.0 was released late 2019
- We are now in Swift 6.0 as of February 2025
- Swift is intended to be safer and more concise than Objective-C

Benefits of Swift

- The basics of swift are easier for beginners
- The language is modern (compared to Objective-C being 30+ years old)
- More readable
- Swift is designed to be safer than Objective-C (This is due to Swift's strong typing system and error handling)
- New versions are developed and released quickly
- Swift code process faster than equivalent Objective-C code
- Designed to work with Cocoa and Cocoa Touch, as well as the existing Objective-C code

iOS Development Prerequisites

- A Mac
  - Mac Mini - $600
  - Macbook Air - $1,100
  - Macbook Pro - $1,600
- Apple Developer Account
  - $99/year
  - $299/year for Enterprise Developer Account
- Xcode
- iOS Device (Optional)

Xcode

In short, Xcode is an IDE for making iOS, macOS, tvOS and watchOS apps, and the only officially-supported by Apple tool for doing that

- Code editor
  - Support multiple languages
- User Interface Designer
- Facilitates testing and debugging
- Provides version controlling
- Has built-in iOS simulator, which can run simulators for many of the physical devices available today

Simulator

- "Simulator allows you to rapidly prototype and test builds of your app during the development process. Installed as part of the Xcode tools, Simulator runs on your Mac and behaves like a standard Mac app while simulating an iPhone, iPad, Apple Watch, or Apple TV environment. Think of the simulator as a preliminary testing tool to use before testing your app on an actual device."