Mobile Application Development
Day 1: Course Overview and Introductions

Class Introductions
Introduce myself
Introduce the class https://canvas.colorado.edu/courses/75752

- Two semester course sequence
- Canvas

Go over Syllabus

- Undergrad vs. grad
- How many don't have Macs?
- How many don't have an iOS device?
- How many don't have an Android device?

ATLAS building access https://www.colorado.edu/atlas/roser-atlas-building-access

Class list

- Share one fun/unique thing about yourself
    - A hobby you picked up during the pandemic
    - Something you did this summer

Mobile platform landscape (slides)

- Almost 3.5 million apps in the Google Play store, and 2.226 million in Apple's app store
- US vs. Worldwide mobile os platforms
    - Why do you think there's such a difference US vs worldwide?

Mobile App Development

- Native apps
    - Developed in the device's native language
    - Use native tools
    - Access to native APIs
    - Native look and feel
    - Fastest performance
    - Distribute through the app store
    - Internet access not usually required
    - Can't run on multiple platforms
    - Multiple code bases for multiple platforms
- Native app frameworks
    - Web stack
        - Phonegap and Cordova
    - Native stack
        - React Native (Facebook React)
        - Ionic (Google Angular 2)
        - Xamarin (Microsoft C#)
        - Flutter (Google Dart)
        - Single code base
        - Runs on multiple platforms

        - Good performance, closest to native
        - Doesn't always look and feel native
        - Dependent on the components available
        - Depending on functionality will get you 60-80% there, the rest native
        - Still need some knowledge of native iOS and Android development
- HTML 5 web app
    - Built with HTML, CSS, and JavaScript or Web framework
    - Takes advantage of web development skills
    - Runs on the Internet through a browser
    - Internet access required
    - Single code base
    - Can run on multiple platforms
    - Updated instantly
    - Many frameworks available to help with development (interfaces, navigation, etc)
    - Distributed through web sites(unrestricted), not app store
    - No/limited access to native APIs limits functionality (ie camera access)
    - UI can feel not native
    - Performance can be an issue
- Hybrid apps
    - Takes HTML5 web apps and wraps them in a native package (ie Cordova)
    - Can take advantage of more native APIs (if plugins are available)
    - Distributed through app store
    - Takes advantage of web development skills
    - Runs through an embedded browser
    - Single code base
    - Can run on multiple platforms
    - Multiple frameworks, plug-ins, and wrappers to coordinate
    - Need to understand native platform to develop or customize plug-ins
    - UI can feel not native
    - Performance can be an issue
    - Still the wild west of development

Getting Started

- Apple https://developer.apple.com/
    - iOS is Apple's operating system that runs on the iPhone, iPad, and iPod touch
    - Xcode (app store download) https://itunes.apple.com/us/app/xcode/id497799835?ls=1&mt=12
        - Integrated Development Environment (IDE) to create and manage development projects
        - Interface Builder
            - Tool to build your application user interfaces
        - Frameworks
            - Software libraries that provide specific functionality
        - Simulator
            - Simulates running your apps on your Mac
        - Instruments
            - Gather and analyze data on your apps behavior
    - Requirements
        - Runs on a mac and only a mac

        - macOS Big Sur 11.3 or later
        - Xcode and the SDK is installed on all the computers in ATLAS
    - Swift released in 2014 https://developer.apple.com/swift
        - Objective-C
    - Developer programs https://developer.apple.com/programs
        - Free program
            - Unlimited apps in the simulator
            - Limited apps installed on a device at one time
            - Can't submit it to the app store
            - No access to some advanced capabilities
        - University Program (CU is a member)
            - Unlimited apps installed on a device
            - Can't submit it to the app store
            - No access to some advanced capabilities
        - $99/yr Standard Developer Program https://developer.apple.com/programs/whats-included/
            - Allows you to distribute your apps in the Apple App Store
            - Access to Apple's Testflight for large scale beta testing
            - Access to advanced capabilities
        - You can use your existing Apple ID and join the developer program
- Google https://developer.android.com/index.html
    - Android runs on Google and third party phones such as Samsung, HTC, LG
        - Android Studio
        - Google's Software Developer's Kit is included
        - Java or Kotlin

Thomas Suarez TED talk 4:41 https://www.youtube.com/watch?v=Fkd9TWUtFm0

For Thursday

- Install Xcode on your Mac if you have one. After installing it, start Xcode as it will then install more components.
- Purchase/download the iOS book if you haven't already and read the first two chapters
- Download Swift 5 for Absolute Beginners