Hot Topics & Conclusions

Mobile Application Development in iOS
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Hot Topics

- GameKit
- HomeKit
- HealthKit
- ResearchKit
- CareKit
GameKit

- Game Center
  - Social
  - Multiplayer
  - Leaderboards
  - Achievements
- Peer-to-peer connectivity
- In-game voice chat
- Requires special capability entitlement
GameKit

```swift
#import "ViewController.h"
#import <GameKit/GameKit.h>

@interface ViewController () <GKGameCenterControllerDelegate>
@end

@implementation ViewController

-(void)showLeaderboard {
    GKGameCenterViewController *gameCenterController = [[GKGameCenterViewController alloc] init];
    GKLocalPlayer* localPlayer = [GKLocalPlayer localPlayer]; // needs to be authenticated
    if (gameCenterController != nil) {
        gameCenterController.gameCenterDelegate = self;
        gameCenterController.viewState = GKGameCenterViewControllerViewStateLeaderboards;
        gameCenterController.leaderboardTimeScope = GKLeaderboardTimeScopeToday;
        gameCenterController.leaderboardIdentifier = localPlayer.playerID;
        [self presentViewController: gameCenterController animated: YES completion:nil];
    }
}

-(void)gameCenterViewControllerDidFinish:(GKGameCenterViewController *)gameCenterViewController {
    [self dismissViewControllerAnimated:YES completion:nil];
}
```
HomeKit

- Framework for communication and control of connected accessories in user's home
- HomeKit apps require special capability entitlement
- HomeKit products require chip from Apple
- HomeKit Accessory Simulator
HomeKit Accessory Simulator

- Add **accessory** (name, model, etc.)
- Add **service** (lightbulb, motion sensor, etc.)
- Add **characteristic** (on/off, brightness, etc.)
HomeKit Overview

• Create HMHomeManager
• Add HMHome to manager
• Add HMRooms to home
• Browse for discoverable HMAccessory’s
• All of the above trigger calls to delegates when done
  – Add accessories to home or room
• Access accessory’s HMService’s and HMCharacteristic’s
HomeKit Overview

```swift
#import "ViewController.h"
#import <HomeKit/HomeKit.h>

@interface ViewController () <HMHHomeManagerDelegate>
@property (strong) HMHomeManager* homeManager;
@property (strong) HMHome* myHome;
@end

@implementation ViewController

-(void)setupHome {
    // Create home manager
    _homeManager = [[HMHHomeManager alloc] init];
    _homeManager.delegate = self;
    // Add home (wait for homeManager:didAddHome delegate method)
    [_homeManager addHomeWithName:@"myHome" completionHandler:^(HMHome* home, NSError* error) {
    }]
}

-(void)homeManager:(HMHomeManager *)manager didAddHome:(HMHome *)home {
    _myHome = home;
    // Add rooms and accessories...
}
```

Mobile Application Development in iOS 8
HealthKit

• Secure database for health-related data
  – Characteristic data (e.g., birthday, blood type)
  – Sample data (e.g., blood pressure on April 28)
  – Source data (e.g., blood pressure device)

• Share between apps

• Requires capability entitlement
HealthKit

• Get access to HKHealthStore

• Request authorization (per data type)
  – DateOfBirth, BodyMass, etc.

• Create/access HKObject’s
  – HKSample
    • HKQuantity, HKQuantityType, HKUnit (e.g., weight in grams)
    • HKCategory, HKCategoryType (e.g., activity)
    • HKWorkout, HKWorkoutType
Health App

Mobile Application Development in iOS
ResearchKit

• Open source framework (ORK)

• Assist with medical research
  – Informed consent, surveys, active tasks

• Integrated with HealthKit
ResearchKit

• Download ResearchKit
  – [https://github.com/researchkit/researchkit](https://github.com/researchkit/researchkit)

• Add ResearchKit.xcodeproj to your project

• Add under General->Embedded Binaries

• #import <ResearchKit/ResearchKit.h>
ResearchKit

• E.g., Obtaining Consent

```swift
#import "ViewController.h"

@interface ViewController () <ORKTaskViewControllerDelegate>
- (IBAction)consentTapped:(UIButton *)sender;
@end

@implementation ViewController

-(void)taskViewController:(ORKTaskViewController *)taskViewController didFinishWithError:(nullable NSError *)error {
[ self dismissViewControllerAnimated:YES completion:nil];
}

-(void)getConsent{
ORKConsentDocument *document = [ORKConsentDocument new];
ORKConsentSection *section1 = [[ORKConsentSection alloc] initWithType:ORKConsentSectionTypeData Gathering];
section1.title = @"The title of the section goes here ...";
section1.summary = @"The summary about the section goes here ...";
section1.content = @"The content to show in learn more ...";

// Create additional section objects for later sections
document.sections = @[section1];

ORKVisualConsentStep *step = [[ORKVisualConsentStep alloc] initWithIdentifier:@"DataGatheringConsent" document:document];

// Create a task containing those steps.
ORKOrderedTask *task = [[ORKOrderedTask alloc] initWithIdentifier:@"task" steps:@[step]];

ORKTaskViewController *taskViewController = [[ORKTaskViewController alloc] initWithTask:task taskRunUUID:nil];
[ self presentViewController:taskViewController animated:YES completion:nil];
}
```
CareKit

• Open source framework
• Manage medical conditions (e.g., diabetes)
• Integrated with ResearchKit
• Coming soon…
Resources

• GameKit, Game Center

• HomeKit

• HealthKit

• ResearchKit & CareKit
  – http://researchkit.org/
Summary

- iOS & Xcode
- Model-View-Controller
- Storyboard
- Navigation & Segues
- Tables
- Settings
- Alerts & Notifications
- Gestures

- Sensors
- Communications
- Data Storage
- Graphics & Animation
- Sound
- Camera & Microphone
- Kits...
- Android
iOS Outlook ($)

• Jan 2016: 1 billion active iOS devices
• Apr 2016: 84% (840 million) running iOS 9
• Making money developing for iOS
  – YourSuperApp sells for $1 on App Store
  – You get $0.70 per purchase; Apple gets $0.30
  – Sold to 1% (8.4M): You get $5.8M
• 25% of iOS developers earn over $5,000 per month
iOS Outlook ($)

• Many apps are free, but have inApp purchases
  – Apple also gets 30% cut on these
  – “Candy Crush” earns over $800K/day through InApp purchases

• Avoid Apple’s 30% cut by managing own services/subscriptions (e.g., Spotify)

• Mobile app market about $50B in 2016
  – Estimated $100B by 2020

• Android still market leader, but iOS more profitable
Conclusions

• iOS & Xcode powerful platform for mobile app development
  – Frameworks and Kits cover vast functionality using consistent programming models

• Emphasis on interface consistency eases adoption

• Obj-C to Swift transition still a work in progress
Course Evaluations

• Please fill out your course evaluation!
  – And provide qualitative feedback

• myWSU portal: Blue Course Evaluations

• Thank you!