



Location-based Frameworks

Dr. Sarah Abraham

University of Texas at Austin

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Location Data

- ❖ Provides information on device's GPS location
- ❖ Provides information about surrounding area
- ❖ Requires user's permission for privacy concerns

Core Location

- ❖ Framework that determines current location and heading of device
- ❖ Power-intensive operation
 - ❖ Standard location service
 - ❖ Significant change location service

Accessing Location

- ❖ User must grant permission for app to use location services
- ❖ Can ask for permission:
 - ❖ When app is running
 - ❖ When app is not running (iOS will start app upon reaching a destination)
- ❖ String requesting permission stored in Info.plist:
 - ❖ `NSLocationWhenInUseUsageDescription`
 - ❖ `NSLocationAlwaysUsageDescription`

Key	Type	Value
▼ Information Property List	Dictionary	(16 items)
<code>NSLocationWhenInUseUsageDescription</code>	String	This application will use location data when running
<code>NSLocationAlwaysUsageDescription</code>	String	This application will use location data all the time

Core Location Upon App Start

1. Check that location services are available
2. If so, request authorization
3. If the user has not authorized the app, a popup will request permission
4. User permission stored in Settings -> Privacy -> Location Services -> [app name]
5. If the user has authorized the app, `didChangeAuthorizationStatus` method runs allowing app to begin location monitoring

CLLocationManagerDelegate

- ❖ Defines methods to receive heading and location updates
 - ❖ `didUpdateLocations ([CLLocation])`
 - ❖ Tells delegate new location data is available
 - ❖ `didUpdateHeading (CLHeading)`
 - ❖ Tells delegate new heading data is available
- ❖ `didVisit (CLVisit)`
 - ❖ Tells delegate new visit-related event was received

Additional Location Delegate Methods

- ❖ Receives and handles:
 - ❖ Location errors
 - ❖ Pauses in location data updates
 - ❖ Entering and exiting specified regions (CLLocation)
 - ❖ Monitoring for specified regions (CLLocation)
 - ❖ Checking for beacons (CLBeacon)
 - ❖ Changes in app authorization status

CLLocation

- ❖ Object that represents location data generated by `CLLocationManager`
 - ❖ Geographical coordinates
 - ❖ Altitude
 - ❖ Speed and heading
 - ❖ Accuracy of measurements
 - ❖ Time of sampling

Instapoll Question: Location Services

- ❖ True or False: An app must ask permission if it uses locational data while not running, but apps are always allowed to use locational data when running

MapKit

- ❖ API that handles:
 - ❖ Map display
 - ❖ Location plotting
 - ❖ Route drawing
 - ❖ Object rendering (overlays)

Using MapKit

- ❖ Import `MapKit`
- ❖ Include `MKMapView` in view controller
 - ❖ Allows display of map view
- ❖ Set view controller to implement `MKMapViewDelegate` protocol
- ❖ Add user location information, annotations and type of map view

Pins (MKAnnotation)

- ❖ Define locations of interest at specified coordinates
- ❖ `MKPointAnnotation` provides simple annotation (location, title and subtitle)
- ❖ Can customize pins using `MKAnnotation` protocol within a custom class

Custom MKAnnotation

1. Create annotation class as `NSObject` subclass
2. Implement `MKAnnotation` protocol
3. Create annotation object and add to map
4. Implement `viewForAnnotation` method to handle `annotation detailCalloutAccessoryView`
 - ❖ Must include view constraints to display properly

Using the Simulator with Location

- ❖ Emulate pinch gestures by mousing over screen and pressing “option”
 - ❖ Two “touch” points will appear
 - ❖ Click to move / rotate these positions to modify screen zoom and orientation
- ❖ Under Debug -> Location, Custom Location will allow you to position user within the simulator

Google Maps

- ❖ Possible to use Google Maps instead of Apple Maps
- ❖ Must have:
 - ❖ iOS Google Map SDK API and Google Places API Web Service enabled
 - ❖ API key for Google Maps SDK associated with bundle identifier
 - ❖ Google Places API key
 - ❖ Google Maps SDK installed in project

Making the Libraries Play Nicely

- ❖ Google Developer Console <<https://console.developers.google.com/apis/library>>
- ❖ Cocoapods Dependency Manager <<https://cocoapods.org>>
- ❖ Bridging Headers to allow Swift project to talk to Map's Objective-C library code
- ❖ <<https://www.raywenderlich.com/109888/google-maps-ios-sdk-tutorial>>