Location And Maps

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Core Location

- Core Location framework is used to determine the current latitude and longitude of a device
- To use the features of the Core Location framework, you must link your app to CoreLocation.framework in your Xcode project
- To access the classes and headers of the framework, include an #import <CoreLocation/CoreLocation.h> statement at the top of any relevant source files.

Core Location

- There are three technologies that core location uses :
  - **GPS**

    Reads microwave signals from multiple satellites to determine the current location
  - **Cell Tower Triangulation**

    Determine the current location by calculation based on location of cell towers in iPhone's range.
  - **Wi-Fi positioning Service (WPS)**

    Uses IP address from iPhone's Wi-Fi connection by referencing database of service providers and areas they service

CLLocationManager

- This class defines the interface for configuring the delivery of location-related events to your application
- To interact with core location we need to create an instance of Location Manager
  - CLLocationManager *locationManager =[[CLLocationManager alloc]init];
- When you are ready to start polling for location, you tell the location manager to start
  - [locationManager startUpdatingLocation];

Setting Desired Accuracy

- The accuracy is set using **CLLocationAccuracy** Value, a type that's defined as double
  - kCLLocationAccuracyBest
  - kCLLocationAccuracyNearestTenMeters
  - kCLLocationAccuracyHundredMetres
  - kCLLocationAccuracyKilometers
  - kCLLocationAccuracyThreeKilometers
- Setting Delegate and Accuracy:

```
locationManager.delegate=self;
locationManager.desiredAccuracy= kCLLocationAccuracyBest
```

Setting Distance Filter

- By specifying distance filter you can tell Location manager not to notify for every change in location but to only notify you when location changes by certain amount
- Specifying a distance filter of 1000 tells location manager not to notify the delegate until the iPhone has moved at least 1000 meters from previously reported position
- For example:

  locationManager.distanceFilter=1000.0f;

Location Object (CLLocation)

- Represents the location data generated by a CLLocationManager object
- The latitude and longitude are stored in property called coordinate
  - CLLocationDegress latitude=theLocation.coordinate.latitude
  - CLLocationDegress latitude=theLocation.coordinate.latitude
- The CLLocation object also has a property called altitude that tell you how many metres above the sea level you are:

  -CLLocationDistance altiude=theLocation.altitude

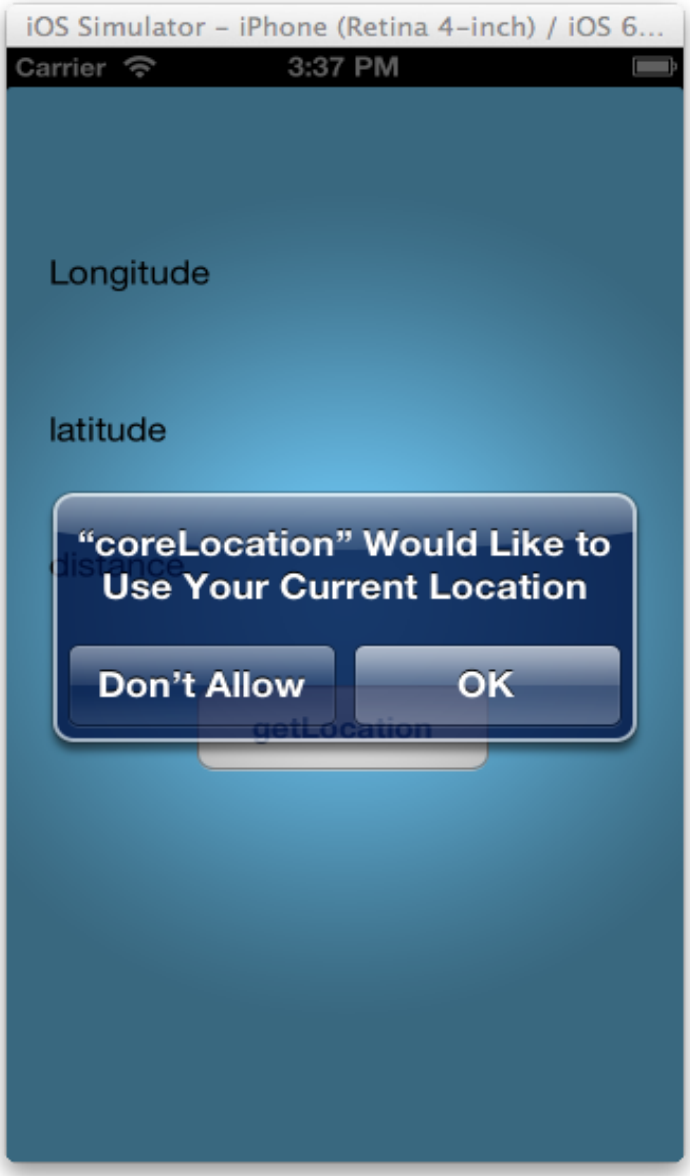
CLLocationManagerDelegate protocol

- The location manager must confirms to CLLocationManagerDelegate protocol, which defines two methods, both are optional
- One method is called by location manager when it has determined current location or detects any change in location:

  locationManager:didUpdateToLocation:fromLocation

- Other method is called when location manager encounters an error:

  locationManager:didFailWithError

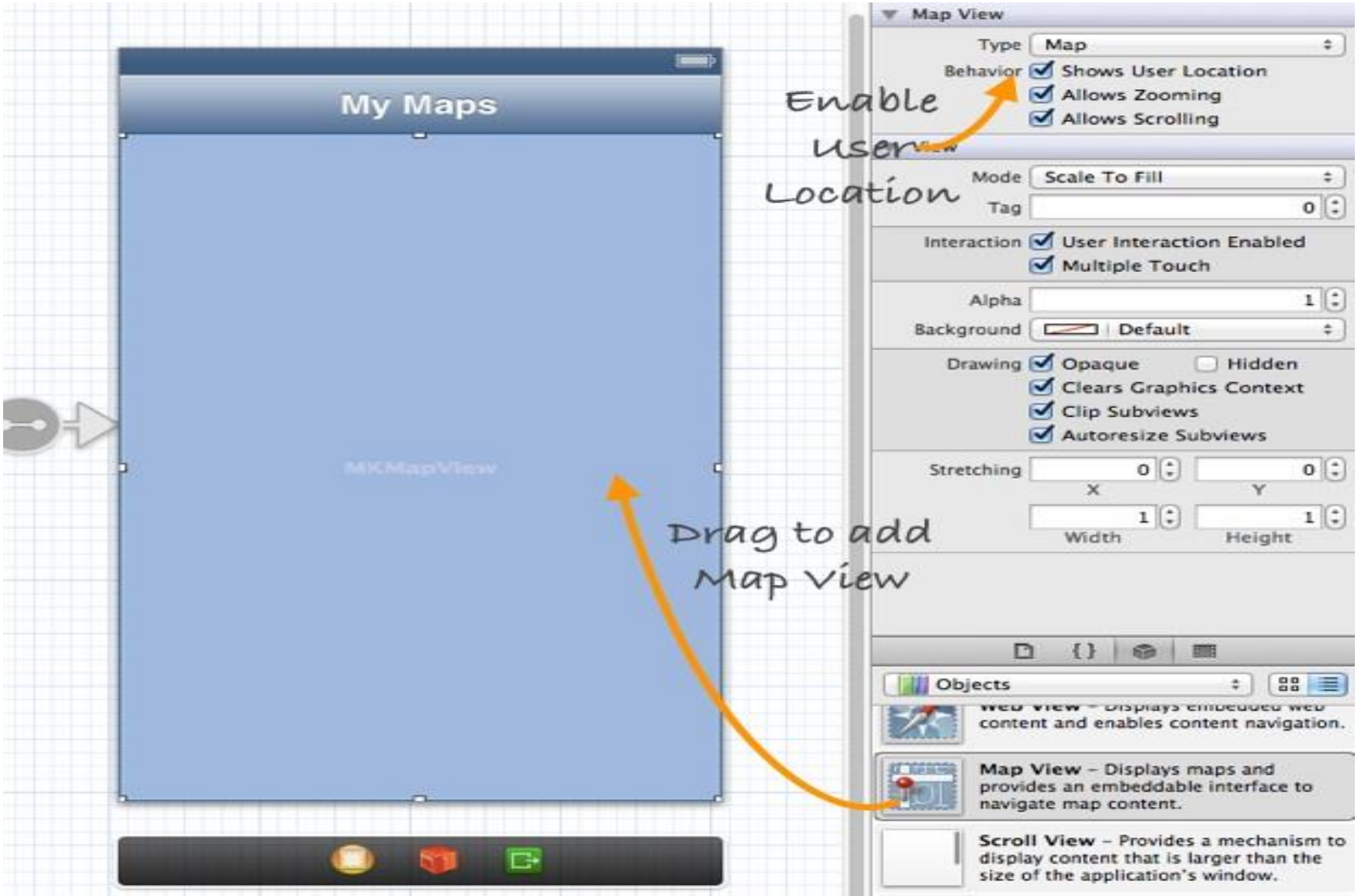

iOS Simulator – iPhone (Retina 4-inch) / iOS 6...
Carrier
3:37 PM
Longitude
latitude
distance
"coreLocation" Would Like to Use Your Current Location
Don't Allow
OK
getLocation


iOS Simulator – iPhone (Retina 4-inch) / iOS 6...
Carrier
3:38 PM
Longitude
-122.40641700
latitude
37.78583400
distance
0.00000000
getLocation

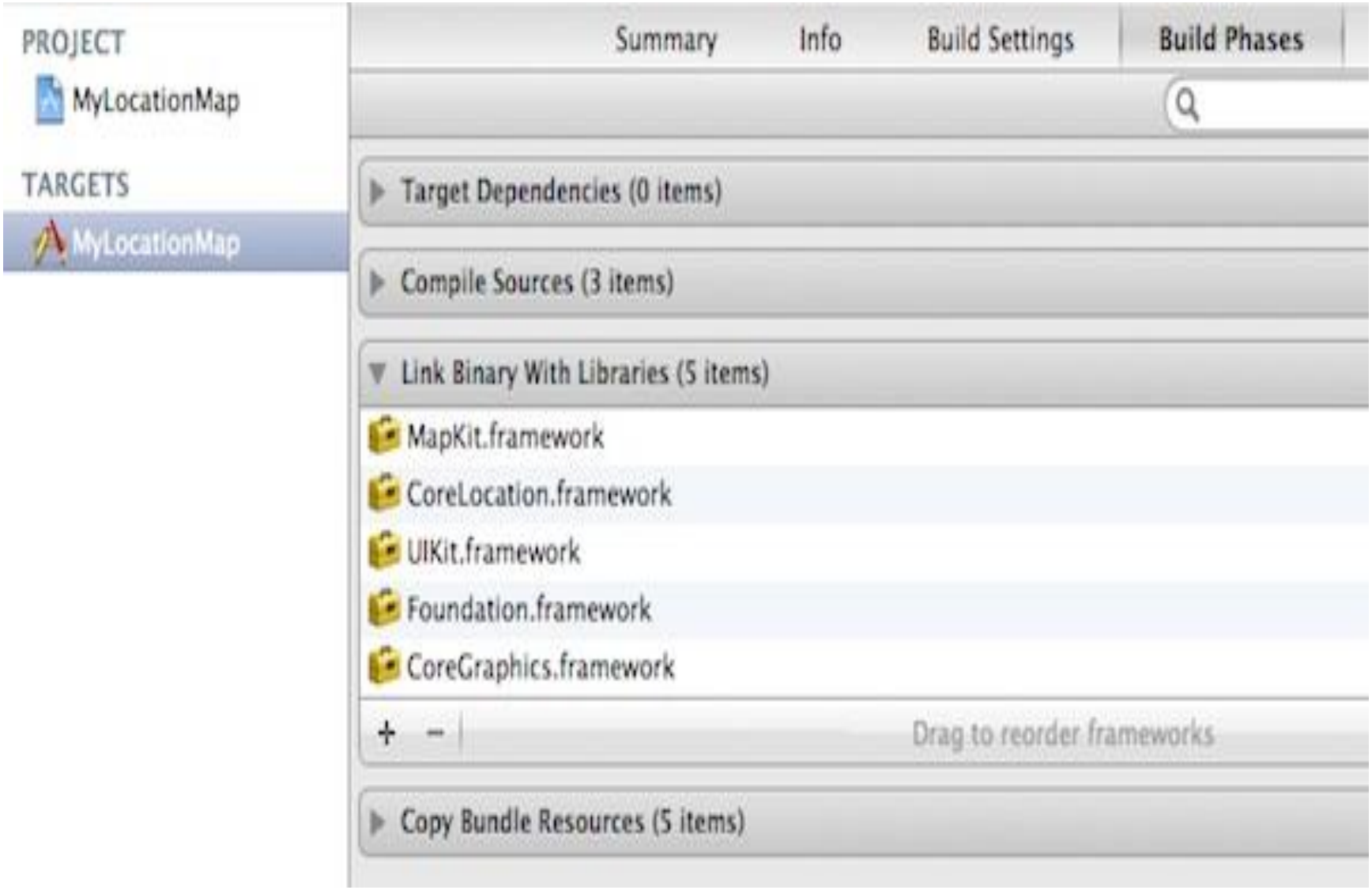
MapKit

- Maps are provided by the Map Kit framework, which supports both the display and annotation of maps
- Plan
  - Adding MapKit to your iPhone Application
  - Setting and zooming the Position
  - Annotations
  - Geocoding

Adding Mapkit



Adding Framework



MKMapViewDelegate protocol

- The MKMapViewDelegate protocol defines a set of optional methods that you can use to receive map-related update messages
- The MKMapViewDelegate protocol have methods for:
  - Responding to Map Position Changes
  - Loading the Map Data
  - Tracking the User Location
  - Managing Annotation Views
  - Managing the Display of Overlays

Map Region to Display

- A structure that defines which portion of the map to display.
- Set the **region** property (MKCoordinateRegion)
- Define the **center** point and a **span**
- **Span** defines the vertical & horizontal distance to display (zoom)

```
{    MKCoordinateRegion region;    region.center.latitude = [eventVenue.latitude
doubleValue];    region.center.longitude = [eventVenue.longitude doubleValue];
region.span.latitudeDelta = 0.0039;    region.span.longitudeDelta = 0.0034; //zoom ~.3
miles      mapView.region = region;
}
```

Annotations

- Annotations offer a way to highlight specific coordinates on the map and provide additional information about them
- In order to display an annotation on a map, your app must provide two distinct objects:
  - An object that conforms to the MKAnnotation protocol and manages the data for the annotation(annotation object)
  - A view used to draw the visual representation of the annotation(annotation view)

MKPointAnnotation

- // Add an annotation
  - MKPointAnnotation *point =[[MKPointAnnotation alloc] init];
  - point.coordinate = userLocation.coordinate; point .title = @"Where am I?";
  - point.subtitle = @"I'm here!!!"; [self.mapView addAnnotation:point];

CLGeocoder

- The CLGeocoder class provides services for converting between a GPS coordinate and the user-readable address of that coordinate
- By specify the latitude and longitude of a given location, you can use CLGeocoder to find a user-readable address
- The result (i.e. the address) returned by CLGeocoder is saved in a CLPlacemark object