

CS193P - Lecture 12

iPhone Application Development

Web Views

Location & Maps

Announcements

- Paparazzi 3 is due next Wednesday at 11:59pm
- Friday section tomorrow at 4 PM, Building 260 Room 113
 - Evan Doll
 - Former CS193p lecturer
 - Giving his thoughts on iPhone and iPad opportunities

Today's Topics

- UIView
 - Loading
 - Navigating
- CoreLocation
- MapKit
 - MKMapView
 - Annotations
 - Reverse Geocoding

UIWebViews

Displaying Web Content

- Web content can be displayed with UIWebView
- Content can be
 - local HTML string
 - local raw data + MIME type
 - remote URL
- Leverages WebKit
 - full WK functionality not currently exposed
 - simple API for loading & navigating
 - delegate for some control
 - limited JavaScript execution support
 - 5 seconds of execution & 10 MB of memory

UIWebView

- UIView subclass, configure in IB or in code
- Feed it data to display
 - (void)`loadHTMLString`:(NSString *)string baseURL:(NSURL *)baseURL;
 - (void)`loadData`:(NSData *)data `MIMETYPE`:(NSString *)MIMETYPE
`textEncodingName`:(NSString *)encodingName
`baseURL`:(NSURL *)baseURL;
- Or give it a URL request
 - (void)`loadRequest`:(NSURLRequest *)request;
- What's this NSURLRequest?
 - Encapsulates a URL to load and caching policy for fetched data

UIWebView

- Properties and actions you'd expect from a web view

```
@property BOOL loading;  
@property BOOL canGoBack;  
@property BOOL canGoForward;
```

- (void)reload;
- (void)stopLoading;
- (void)goBack;
- (void)goForward;

- A couple others that are handy

```
@property BOOL scalesPageToFit;  
@property BOOL detectsPhoneNumbers;
```

UIWebViewDelegate

- Callbacks for load progress

- (void)webViewDidStartLoad:(UIWebView *)webView;
- (void)webViewDidFinishLoad:(UIWebView *)webView;

- Error handling

- (void)webView:(UIWebView *)webView
didFailLoadWithError:(NSError *)error;

- Navigation management

- (BOOL)webView:(UIWebView *)webView
shouldStartLoadWithRequest:(NSURLRequest *)request
navigationType:(UIWebViewNavigationType)navigationType;

- navigationType specifies things like link clicked, reload, form submitted, back/forward, or other

Demo

UIWebView

Demo

UIWebView - using WebViews for “rich” text

Core Location

What is CoreLocation?

- A framework to manage Location
 - CLLocation
 - CLLocationManager
 - CLHeading

- No UI

How Does it KNOW??

- Three tiered approach:
 - GPS
 - Wifi
 - Cell Network
- The more accurate the technology, the more power it costs

CLLocation

- An object to represent a point and vector in the real world

```
@property CLLocationCoordinate2D coordinate;  
@property CLLocationDistance altitude;
```

```
@property CLLocationAccuracy horizontalAccuracy;  
@property CLLocationAccuracy verticalAccuracy;
```

```
@property CLLocationDirection course;  
@property CLLocationSpeed speed;
```

- (NSDate *)**timeStamp**;
- (CLLocationDistance)**distanceFromLocation:(CLLocation *)location**

CLLocationManager

- Your entry point to the location service

```
@property CLLocation *location;
```

```
@property id <CLLocationManagerDelegate> delegate;
```

```
@property CLLocationDistance distanceFilter;
```

```
@property CLLocationAccuracy verticalAccuracy;
```

- (void)startUpdatingLocation
- (void)stopUpdatingLocation
- (void)startUpdatingHeading
- (void)stopUpdatingHeading

CLLocationManagerDelegate

- Callbacks for location change

- (void)locationManager:(CLLocationManager *)manager
didUpdateToLocation:(CLLocation *)newLocation
fromLocation:(CLLocation *)oldLocation;

Callbacks for heading change

- (void)locationManager:(CLLocationManager *)manager
didUpdateHeading:(CLHeading *)newHeading;

Error handling

- (void)locationManager:(CLLocationManager *)manager
didFailLoadWithError:(NSError *)error;

MapKit

What is MapKit?

- API to display Maps
- Classes to translate between CLLocation and human-readable addresses
- Support for “**annotations**” (pins on a map)
- Reverse Geocoding

MKMapView

- Handles display of map
- “Map” & “Satellite” types
- Panning and Zooming
- Annotations
- Display User Location



MKMapView

- Properties in MKMapView

```
@property MKCoordinateRegion region;  
@property CLLocationCoordinate2D centerCoordinate;
```

```
@property MKMapType mapType;
```

```
@property NSArray *annotations;  
@property MKUserLocation userLocation;
```

```
@property id <MKMapViewDelegate> delegate;
```

MKMapViewDelegate

- Callback methods about loading state:

- (void)mapViewWillStartLoadingMap:(MKMapView *)mapView;
- (void)mapViewDidFinishLoadingMap:(MKMapView *)mapView;
- (void)mapViewDidFailLoadingMap:(MKMapView *)mapView
withError:(NSError *)error;

- Callback methods about region changes:

- (void)mapView:(MKMapView *)mapView
regionWillChangeAnimated:(BOOL)animated;
- (void)mapView:(MKMapView *)mapView
regionDidChangeAnimated:(BOOL)animated;

MKMapViewDelegate

- Callback methods to customize and interact with “annotations”:

- (MKAnnotationView *)mapView:(MKMapView *)mapView
viewForAnnotation:(id <MKAnnotation>)annotation;
- (void)mapView:(MKMapView *)mapView
didAddAnnotationViews:(NSArray *)views;
- (void)mapView:(MKMapView *)mapView
annotationView:(MKAnnotationView *)view
calloutAccessoryControlTapped:(UIControl *)control;

MKAnnotation

- A @protocol - not a @class
- Add to a MapView to plot pins

```
@property CLLocationCoordinate2D coordinate;
```

```
@property NSString *title;
```

```
@property NSString *subtitle;
```

MKPlacemark

- Conforms to MKAnnotation protocol
- Convenience for holding human-readable addresses alongside Coordinate

```
- (void) initWithCoordinate:(CLLocationCoordinate2D *)coordinate  
    addressDictionary:(NSDictionary *)dictionary;
```

- Easy to convert between AddressBook addresses and location:
 - thoroughfare, subThoroughfare, locality, subLocality, administrativeArea, subAdministrativeArea, postalCode, country, countryCode

MKUserLocation

- Special case of an MKAnnotation
- Represents device's location only

```
@property BOOL updating (getter = isUpdating);  
@property CLLocation *location;
```

```
@property NSString *title;  
@property NSString *subtitle;
```

MKReverseGeocoder

- Given a location, what's the human-readable address?
 - (void)`initWithCoordinate:(CLLocationCoordinate2D)coordinate;`
@property id <MKReverseGeocoderDelegate> delegate;
 - (void)`start;`
 - (void)`cancel;`
- Delegate callbacks:
 - (void)`reverseGeocoder:(MKReverseGeocoder *)geocoder`
`didFindPlacemark:(MKPlacemark *)placemark;`
 - (void)`reverseGeocoder:(MKReverseGeocoder *)geocoder`
`didFailWithError:(NSError *)error;`

Demo

MKMapView and friends

Questions?