CS193P - Lecture 12

iPhone Application Development

Web Views
Location & Maps

Announcements

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- Paparazzi 3 is due next Wednesday at 11:59pm

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- 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

- UIWebView
  - 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;
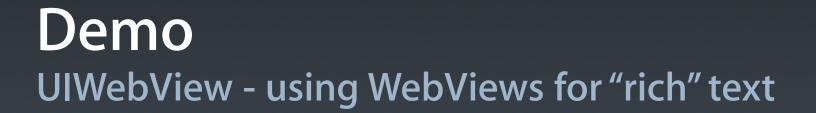- (void)goForward;
```

- 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 transalte 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

```objc
@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?