WebView Browser

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Notes are based on:

Android Developers
http://developer.android.com/index.html

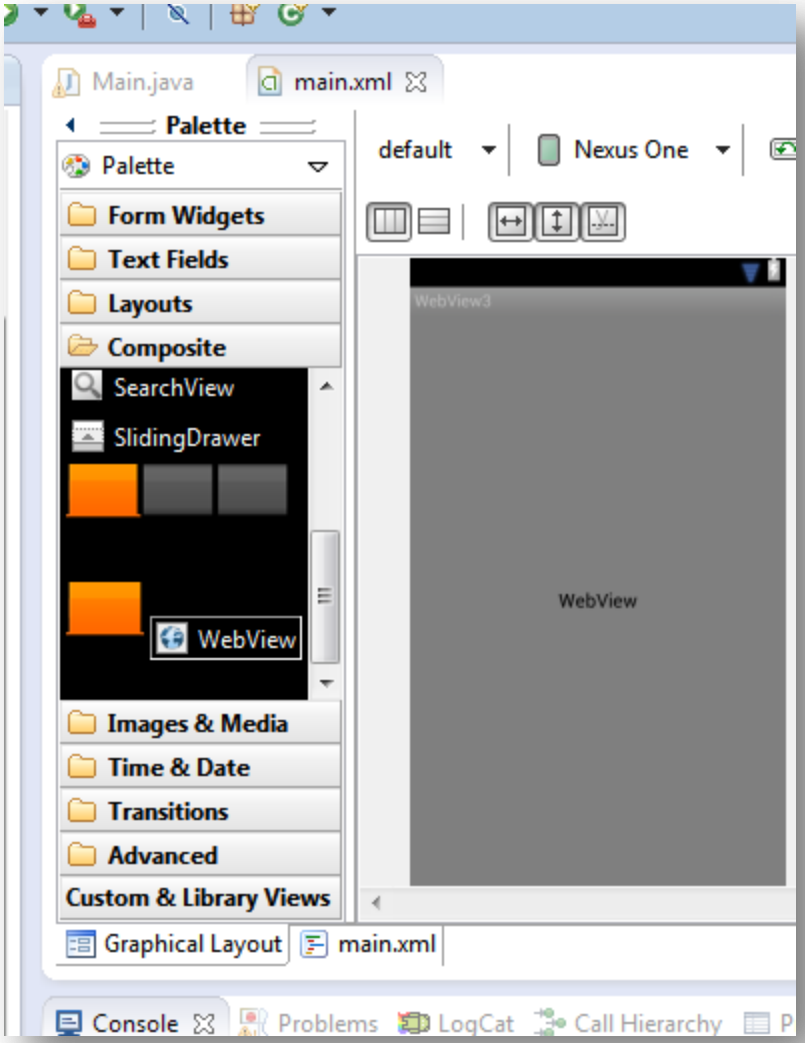
Google Maps Javascript API V3 Basics
http://code.google.com/apis/maps/documentation/javascript/basics.html

The Busy Coder's Guide to Android Development
by Mark L. Murphy

ISBN: 978-0-9816780-0-9

WebView Browser

- Android provides a built-in *Web browser UI* control called **WebView**.
- WebView is used for displaying local HTML material or browsing Internet pages.
- The Android browser is based on **WebKit**, the same engine that powers *Apple's Safari Web* browser.
- Applications using the **WebView** widget must request **INTERNET** *permission*.



WebView Browser

The browser will try to access the **Internet** through

- WiFi services,
- cellular network,
- reverse tethering,
- any other technology available.

The **WebKit** engine includes methods to

- navigate forward and backward through a history record,
- zoom in and out,
- perform text searches,
- load data
- stop loading and
- more…

WebView Browser

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.webview_url"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="8"
        android:targetSdkVersion="15" />
    <uses-permission android:name="android.permission.INTERNET"/>

    <application
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >

        <activity
            android:name=".MainActivity"
            android:label="@string/title_activity_main" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

Warning !!!

In order for your Activity to access the Internet you must add the *INTERNET* permission to your Android Manifest file:

(see next example)

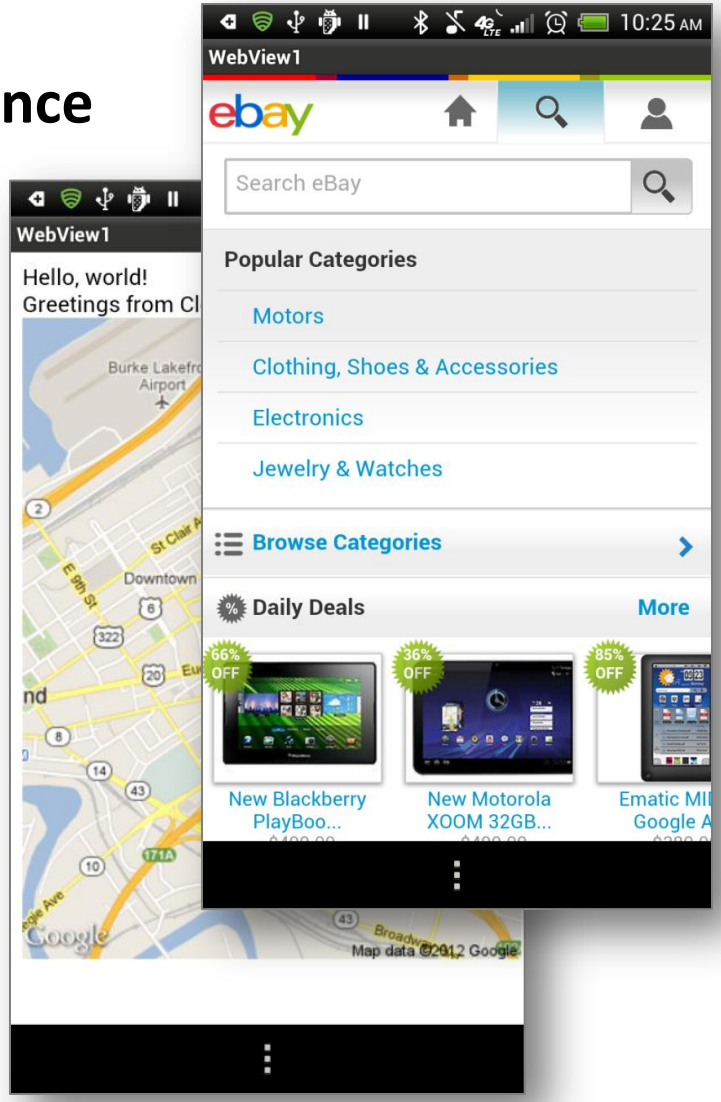
WebView Browser

Example 1A: A simple browsing experience

This example uses a WebView widget to

(a) Reach a particular URL (eBay)

(b) Load a local HTML page in which the user instructs Google Maps to show a static map around given coordinates.



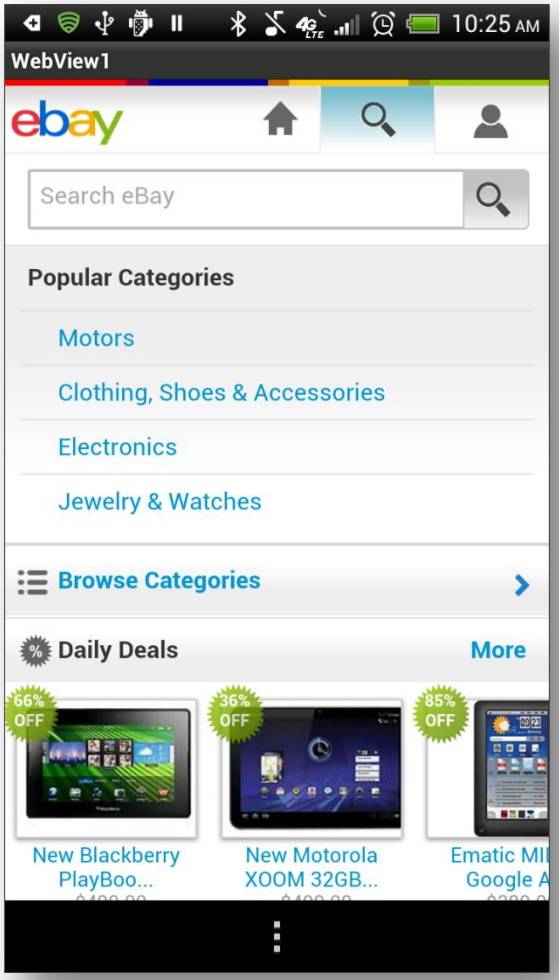
Reference:
http://developer.android.com/guide/webapps/webview.html

WebView Browser

Example 1A: A simple browsing experience

Example 2 - Let's go e-shopping

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    >

    <WebView
        android:id="@+id/webkit"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
    />

</LinearLayout>
```



WebView Browser

Example 1A: A simple browsing experience

(1) Let's go e-shopping (2) Visiting Cleveland State U.

```
public void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);

     browser = (WebView) findViewById(R.id.webkit);
     browser.getSettings().setJavaScriptEnabled(true); // allow scripts
     browser.setWebViewClient(new WebViewClient() );   // page navigation

     // Try version 1 or 2 (please, one at the time!!!)

     // Version 1.-----------------------------------------------------
     // provide an URL to some web page outside of the app
        browser.loadUrl("http://www.eBay.com");

     // Version 2. ----------------------------------------------------
     // code your htlm in-line page (or store page in "/assets" or SD card)
     // we show a static Google map centered on CSU
     // showMyHomeMadeHtmlPage();
}// onCreate
```

1

2

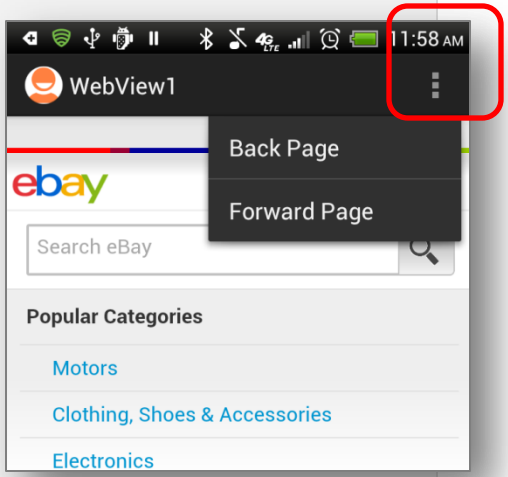
This app is hard-wired to eBay

WebView Browser

Example 1A: A simple browsing experience

Part 1 - Let's go Back & For

```
        // ////////////////////////////////////////////////////////////
        // browser navigation implemented through the menu
        @Override
        public boolean onCreateOptionsMenu(Menu menu) {
                getMenuInflater().inflate(R.menu.activity_main, menu);
                return true;
        }// onCreateOptionsMenu

        @Override
        public boolean onOptionsItemSelected(MenuItem item) {
                String option = item.getTitle().toString();
                if (option.equals("Forward Page"))
                   browser.goForward();

                if (option.equals("Back Page"))
                   browser.goBack();

                return true;
        }//onOptionsItemSelected

}// class
```



WebView Browser

Example 1A: A simple browsing experience

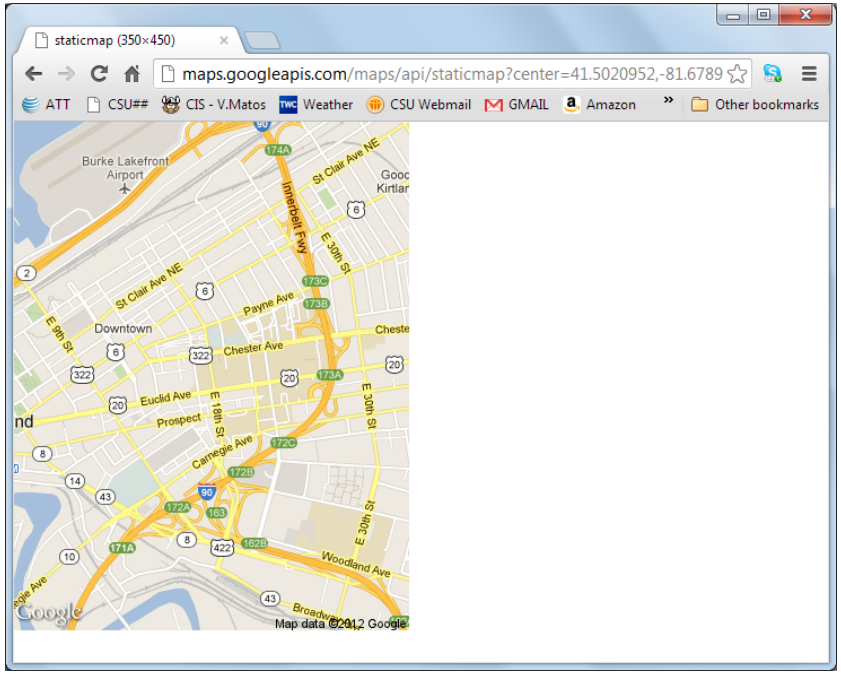
Part 2 - Let's visit CSU

Playing with Google Maps: Use your computer to access the following link

http://maps.googleapis.com/maps/api/staticmap?center=41.5020952,-81.6789717&zoom=14&size=350x450&sensor=false

It displays a web page showing a static map centered around the the given coordinates (latitude and longitude of Cleveland State University Student's center)

We want to reproduce this behavior in our Android app.

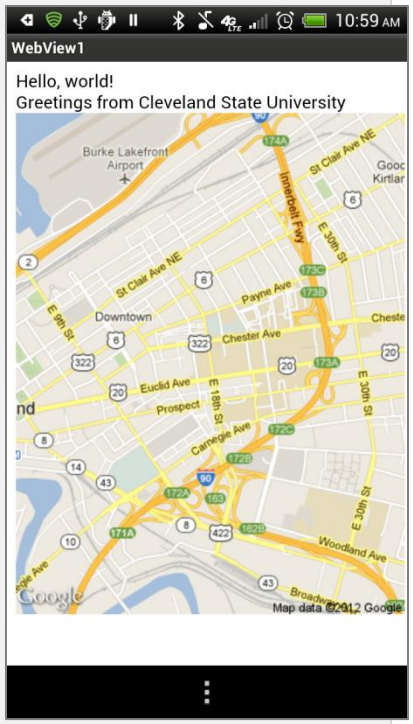


WebView Browser

Example 1A: A simple browsing experience

Part 2 - Let's visit CSU (add this method to the app)

```
private void showMyHomeMadeHtmlPage() {

   String aGoogleMapImage =
        "<img src=\"http://maps.googleapis.com/maps/api/"
      + "staticmap?center=41.5020952,81.6789717&"
      + "zoom=14&size=350x450&sensor=false\"> ";

String myLocalHtmlPage =
          "<html> "
        +  "<body> Hello, world! "
        +  "<br> Greetings from Cleveland State University"
        +  aGoogleMapImage
        +  "</body> "
        + "</html>";

browser.loadData( myLocalHtmlPage, "text/html", "UTF-8“ );

}
```



Warning

Your Android application **must** explicitly enable the *javaScript* code of visited pages to operate .

By default WebViews have *Javascript* is turned **off**

To activate scripts do this:

```
browser.setSettings().setJavaScriptEnabled(true);
```

Warning

To open links clicked by the user (History Record), provide a **WebViewClient** for your WebView

In our example:

```
WebView  browser  = (WebView) findViewById(R.id.webview);

browser.setWebViewClient( new WebViewClient() );
```

WebView Browser

Browser Commands

There is no navigation toolbar with the WebView widget (*saving space*).
You could supply the UI –such as a Menu– to execute the following operations:

- **reload()** to refresh the currently-viewed Web page
- **goBack()** to go back one step in the browser history, and canGoBack() to determine if there is any history to trace back
- **goForward()** to go forward one step in the browser history, and canGoForward() to determine if there is any history to go forward to
- **goBackOrForward()** to go backwards or forwards in the browser history, where *negative/positive* numbers represent a count of steps to go
- **canGoBackOrForward()** to see if the browser can go backwards or forwards the stated number of steps (following the same positive/negative convention as goBackOrForward())
- **clearCache()** to clear the browser resource cache and **clearHistory()** to clear the browsing history

WebView Browser

Using our running example:

```
browser.goBack();
browser.goForward();
browser.goBackOrForward(-2);
browser.goBackOrForward(+2);

browser.canGoBack();
browser.canGoForward();
browser.canGoBackOrForward(-2);
browser.canGoBackOrForward(+2);

browser.clearCache(true);
browser.clearHistory();
browser.stopLoading();
```

WebView Browser

Why it is important to allow JavaScript in WebView?

Using javaScript in a WebView has several important consequences:

1. Visited pages powered by javaScript become functional and operate as their designers expected them to be.

2. You could create Android applications whose User-Interface is designed in HTML.

3. Java custom-made **exchange objects** could be created to mediate data exchange between the hosting Android application and its locally stored set of HTML pages (powered by JavaScript).

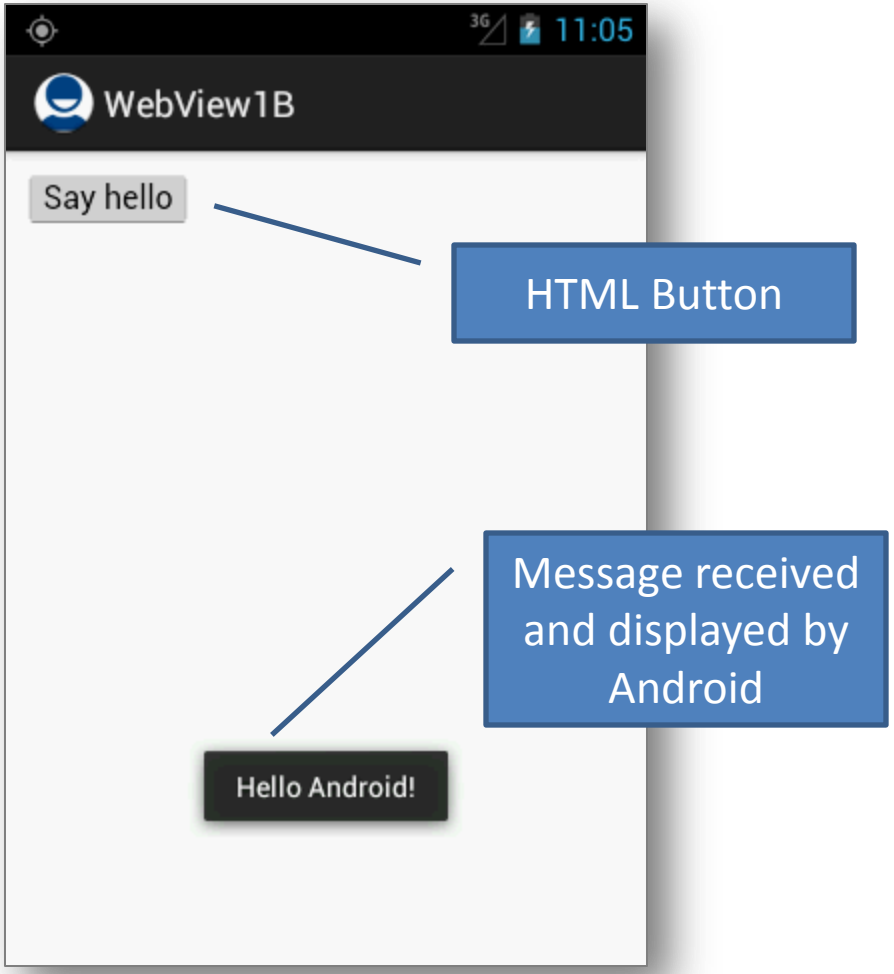
WebView Browser

Example 1B: JavaScripting

1. This app has two pieces; one is a 'local' HTML page, the other a typical Android app.

2. Android loads the HTML page into a WebView and waits for the user to operate on the page (It contains a button)

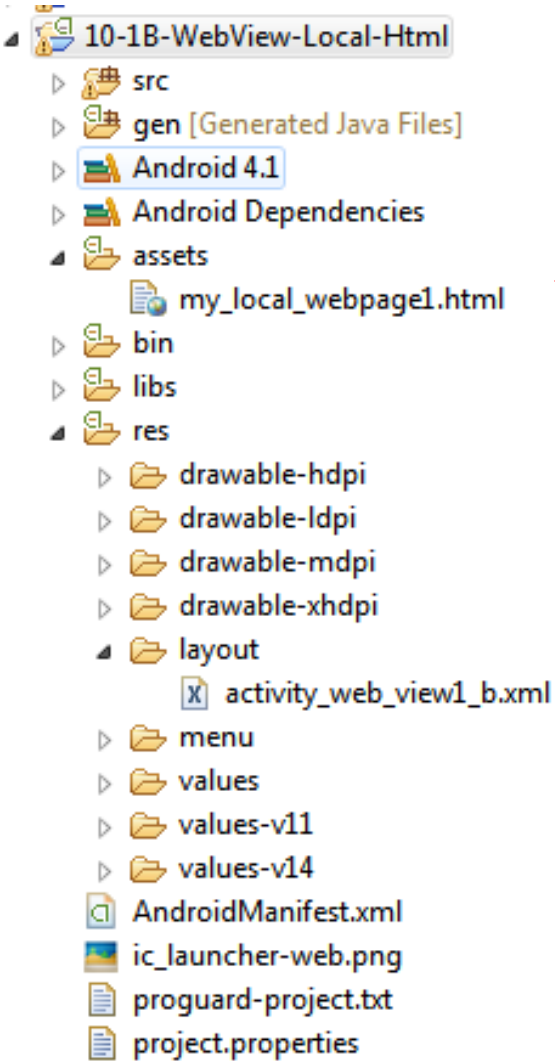
3. When the user clicks the (html) button, a javaScript method is called. The method sends to Android a piece of html data which is shown in an Android Toast view.



Reference: http://developer.android.com/guide/webapps/webview.html

WebView Browser

Example 1B: JavaScripting




```
<html>
<input type="button"
       value="Say hello"
       onClick="showAndroidToast(
                                 'Hello Android!')" />

<script type="text/javascript">
    function showAndroidToast(toast) {
        Android.showToast(toast);
    }
</script>
</html>
```

assets/my_local_webpage1.html

This local page is stored in the **/assets** folder. It declares an HTML <input> button and its *onClick* handler.

WebView Browser

Example 1B: JavaScripting

The Android app defines a WebView control to host HTML pages

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent" >

    <WebView
        android:id="@+id/webView1"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_alignParentLeft="true" />

</RelativeLayout>
```

WebView Browser

Example 1B: JavaScripting

An interface object is attached to the WebView. It will allow the Android app and the HTML page to 'talk' to each other.

```
public class WebView1B extends Activity {

     @Override
     public void onCreate(Bundle savedInstanceState) {
          super.onCreate(savedInstanceState);
          setContentView(R.layout.activity_web_view1_b);

          WebView browser = (WebView) findViewById(R.id.webView1);
          browser.getSettings().setJavaScriptEnabled(true);

          browser.addJavascriptInterface(new JavaScriptInterface(this), "AndroidInterface");

          // if the html file is in the app's memory space use:
             browser.loadUrl("file:///android_asset/my_local_webpage1.html");

          // if the file is in the app's SD card use:
          // browser.loadUrl("file:///sdcard/my_local_webpage1.html");

          // CAUTION: Manifest must include
          // <uses-permission android:name="android.permission.INTERNET"/>
          // <uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"/>

     }//onCreate
}//class
```

WebView Browser

Example 1B: JavaScripting

The method *showToast*() will be invoked by a javaScript *onClick* handler defined in the HTML page, in addition the event will supply data for the *toastMsg* string

```
public class JavaScriptInterface {
    Context mContext;

    /** Instantiate the interface and set the context */
    JavaScriptInterface(Context c) {
        mContext = c;
    }

    /** Show a toast from the web page */

    public void showToast(String toastMsg) {
        Toast.makeText(mContext, toast, Toast.LENGTH_SHORT).show();
    }
}
```

HTML supplied data

WebView Browser

Example 1B: **JavaScripting**

You need to request Internet permission for accessing pages outside of your app space. If you local HTML pages are stored in the SD card you also need permission to read the device.

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.webview_local_html"
    android:versionCode="1"  android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="8"
        android:targetSdkVersion="15" />
    <uses-permission android:name="android.permission.INTERNET"/>
    <uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"/>

    <application
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name=".WebView1B"
            android:label="@string/title_activity_web_view1_b" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

WebView Browser

Combining HTML + JAVASCRIPT + ANDROID

Advantages offered by Android Development

1. Access to native services on the device, including location services
2. Placement in the Android Market
3. Rapid development using the Android SDK and Eclipse.

Advantages offered by Google Maps API

1. Application exists in a server not inside a device.
2. Rapid versioning, removing the requirement for your users to download and install constant updates.
3. More frequent feature additions and bug fixes from Google.
4. Cross-platform compatibility: Using the Maps API allows you to create a single map that runs on multiple platforms.
5. Designed to load *fast* on Android and iPhone devices.

WebView Browser

Combining HTML + JAVASCRIPT + ANDROID

Learning Strategy

- **WebView2:** Passing complex objects between Android and JS (goal: create interconnectivity)

- **WebView3:** Mapping a fixed location using Google Maps V3 (Pure HTML + JS, just update the server -no need to upgrade ALL devices carrying the application, portability, homogeneous design)

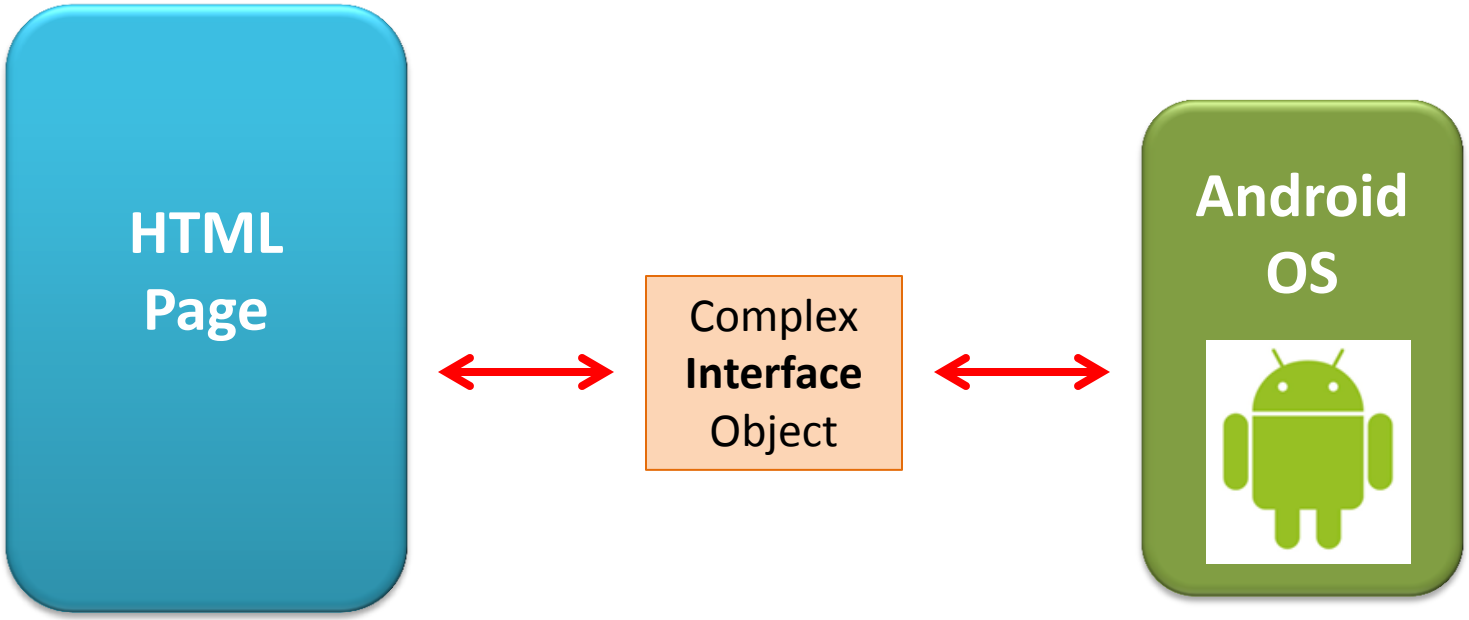
- **WebView4:** Passing a real location object to JS – draw a map centered at given location (mapping current location, combines two above).

WebView Browser

HTML + JAVASCRIPT + ANDROID

Example 2: Exchanging objects between Android & JS

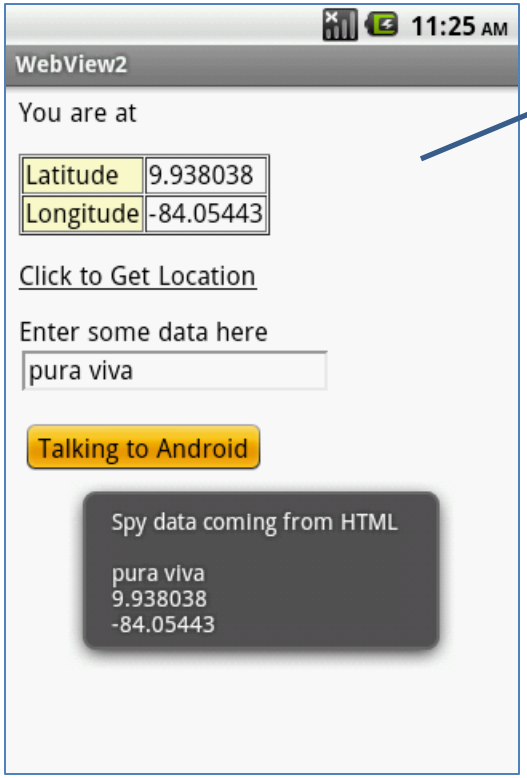
1. The app consists of an Android Activity and an HTML page holding JS scripts.
2. The user will interact with the app through the commanding HTML page.
3. A complex interface object will be created by the Android side of the app.
4. The object will include methods to pass data/actions from Android-to-HTML, and HTML-to-Android



WebView Browser

HTML + JAVASCRIPT + ANDROID

Example 2: Exchanging objects between Android & JS



HTML

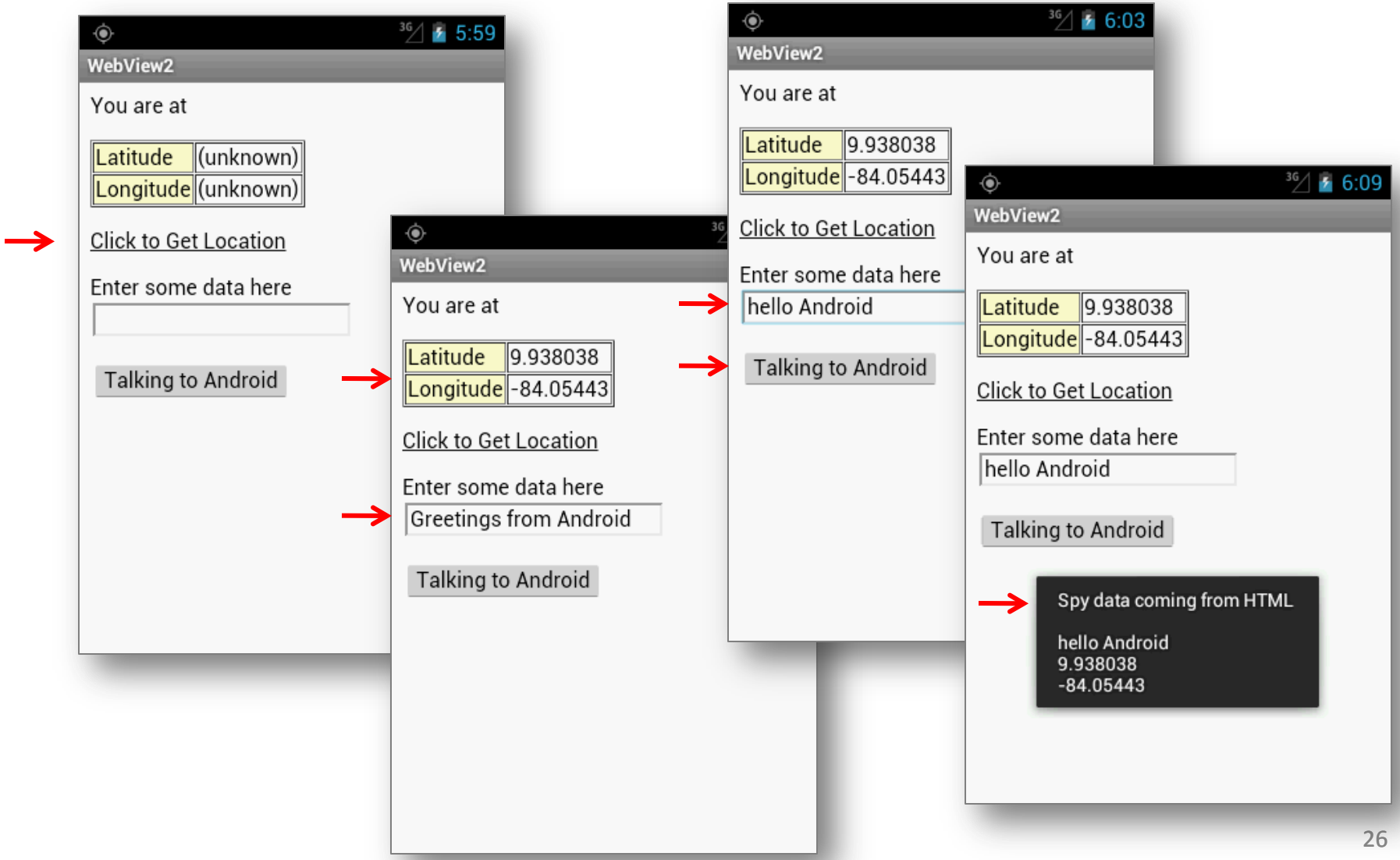
locater object

MyLocater
-spy
+getLatitude() +getLongitude() +htmlPassing2Android()

The **methods** in this object are made public so JavaScript code can invoke them
(class variables are not visible)

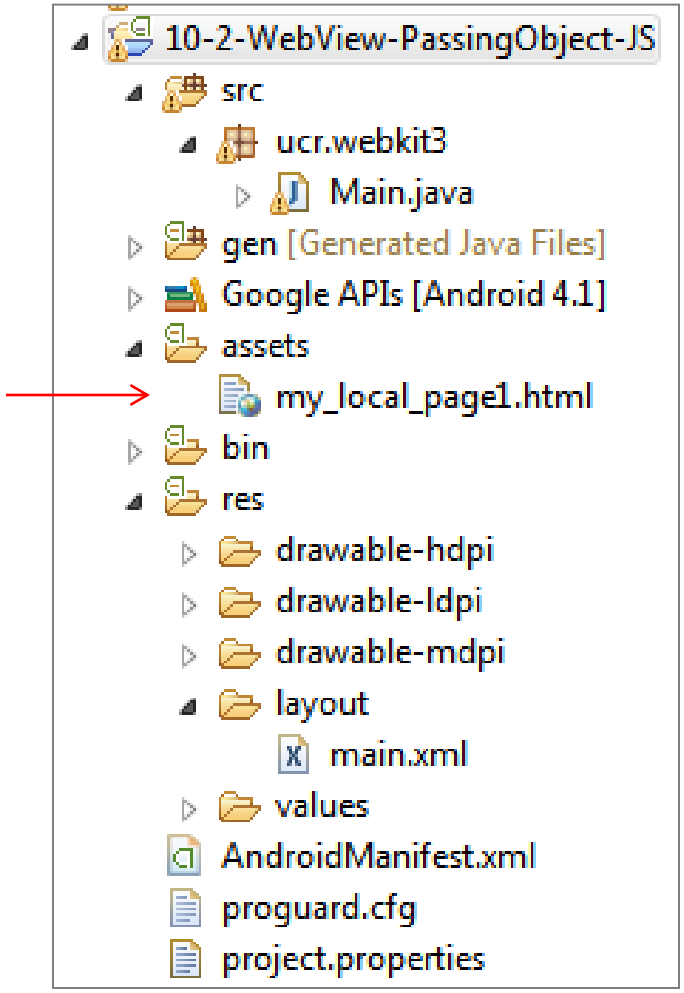
WebView Browser

Example 2. Passing Objects between Android and JS



WebView Browser

Example 2. Passing Objects between Android and JS



Putting the pieces together:

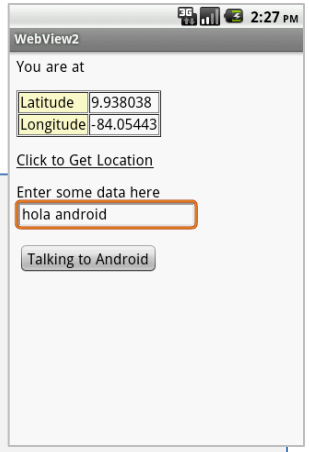
1. Place a **WebView** in the main.xml file
2. Place html page in the **assets** folder
3. Create the Java **object** to share with JS

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="horizontal"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

  <WebView
      android:id="@+id/webview"
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"/>

</LinearLayout>
```

WebView Browser

Example 2.

HTML Page (1 of 2) Passing Objects between Android and JS

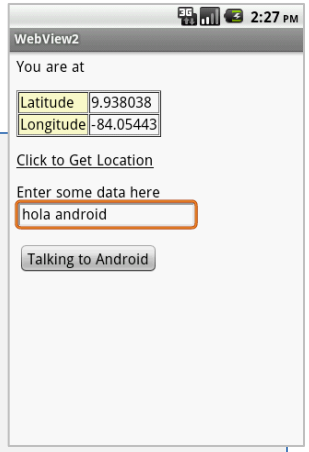



```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
   <title>Android GeoWebOne Demo</title>
   <script language="javascript">
      function whereami() {
          // html asks android to provide data using object's GET methods
         document.getElementById("lat").innerHTML=locater.getLatitude();
         document.getElementById("lon").innerHTML=locater.getLongitude();
         document.getElementById("myText").value = locater.getCommonData();
      }
      function talkBack2Android() {
          // bridge object used to send local (html) data to android app
          locater.setCommonData("Greetings from html");
          var spyHtml  = "Spy data coming from HTML\n"
                    + "\n" + document.getElementById("myText").value
                    + "\n" + document.getElementById("lat").innerHTML
                    + "\n" + document.getElementById("lon").innerHTML;
         locater.htmlPassing2Android(spyHtml);
      }
   </script>
</head>
```

WebView Browser

Example 2.

HTML Page (2 of 2) Passing Objects between Android and JS




```
<body>
        <p>You are at</p>
        <table  border="1" cellspacing="1" cellpadding="1">
          <tr>
            <td  bgcolor="#FFFFCC"> Latitude </td>
            <td> <span id="lat">  (unknown) </span></td>
          </tr>
          <tr>
            <td bgcolor="#FFFFCC"> Longitude </td>
            <td> <span id="lon">  (unknown) </span></td>
          </tr>
        </table>

        <p><a onClick="whereami()" ><u>Click to Get Location</u></a></p>

        <p> Enter some data here  <input type="text" id="myText" />

        <p> <input type="button"
                   onclick= "talkBack2Android()"
                   onclick= "talkBack2Android()"
                   value="Talking to Android">
</body>
</html>
```

WebView Browser

Example 2. Passing Objects between Android and JS

```
public class Main extends Activity {

WebView browser;
MyLocater locater = new MyLocater();
Location mostRecentLocation;

@Override
public void onCreate(Bundle icicle) {
      super.onCreate(icicle);
      setContentView(R.layout.main);

      // get a location fix (lat, lon)
      mostRecentLocation = fakeGetLocation();

      // set up the webview to show location results
      browser = (WebView) findViewById(R.id.webview);
      browser.getSettings().setJavaScriptEnabled(true);

      browser.addJavascriptInterface(locater, "locater");

      browser.loadUrl("file:///android_asset/my_local_page1.html");

}//onCreate
```

WebView Browser

Example 2. Passing Objects between Android and JS

```
private Location fakeGetLocation() {
     // faking the obtaining of a location object (discussed later!)
     Location fake = new Location("fake");
     fake.setLatitude(9.938038);
     fake.setLongitude(-84.054430);
     return fake;
}

// "MyLocater" is used to pass data back and forth between
// Android and JS code-behind

public class MyLocater {
     private String commonData = "XYZ";

     public double getLatitude() {
          if (mostRecentLocation == null) return (0);
          else return mostRecentLocation.getLatitude();
     }

     public double getLongitude() {
          if (mostRecentLocation == null) return (0);
          else return mostRecentLocation.getLongitude();
     }
```

WebView Browser

Example 2. Passing Objects between Android and JS

```
    public void htmlPassing2Android(String dataFromHtml) {

        Toast.makeText(getApplicationContext(),
                       "1\n" + commonData, 1).show();

        commonData = dataFromHtml;

        Toast.makeText(getApplicationContext(),
                       "2\n" + commonData, 1).show();
    }

    public String getCommonData(){
     return commonData;
    }

    public void setCommonData(String actualData){
     commonData = actualData;
    }

    }//MyLocater

}//class
```

WebView Browser

Example 3. Using Google JavaScript Maps API V3

- The **Google Maps Javascript API** is a free service that lets you embed Google Maps in your own web pages.

- It is especially designed to be faster and more applicable to mobile devices (as well as traditional desktop browser applications)

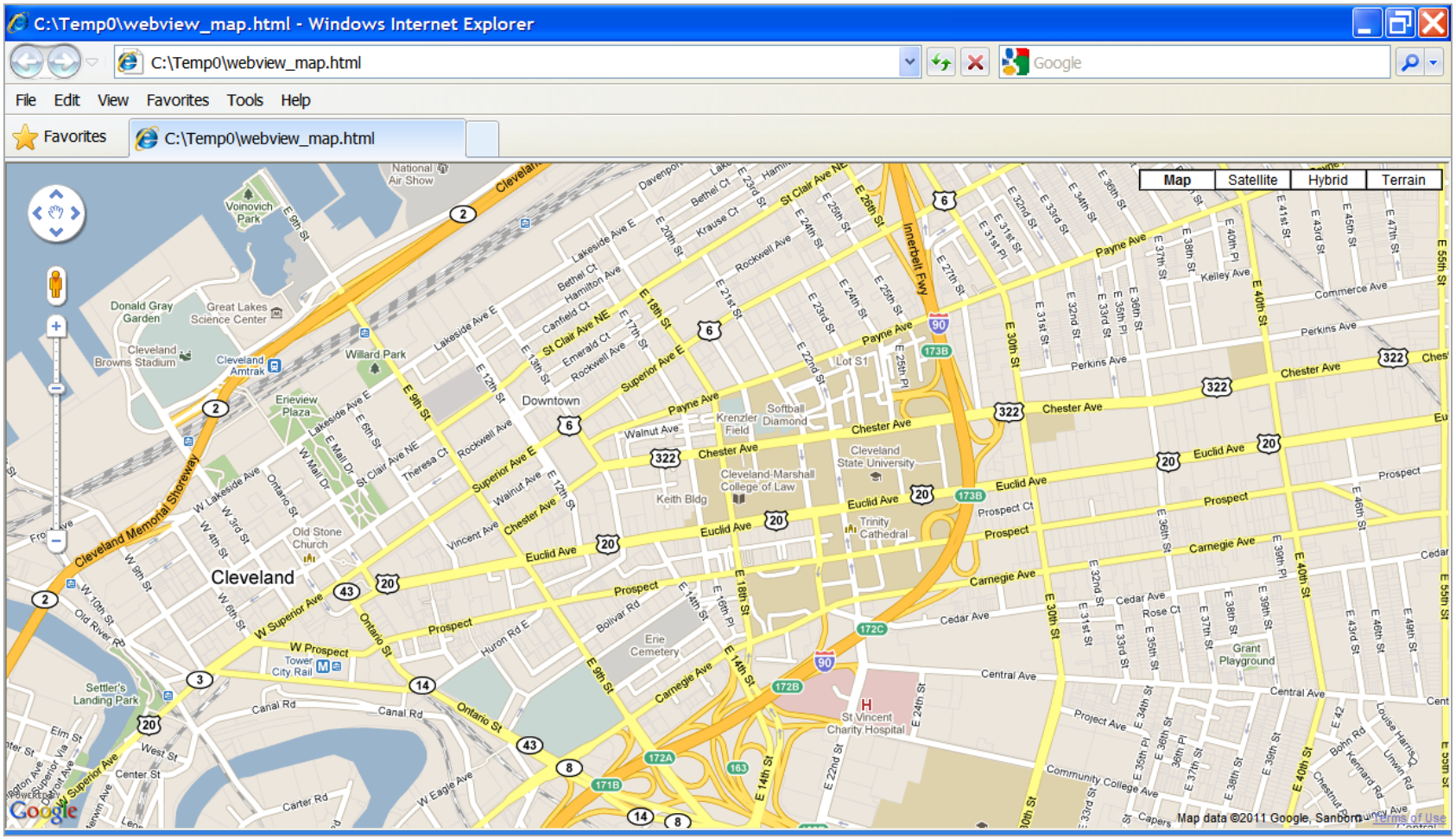
- The API provides a number of utilities for manipulating maps (just like on the http://maps.google.com web page) and adding content to the map through a variety of services, allowing you to create robust maps applications on your website/app.

Link: https://developers.google.com/maps/documentation/javascript/

WebView Browser

Example 3. Using Google JavaScript Maps API V3

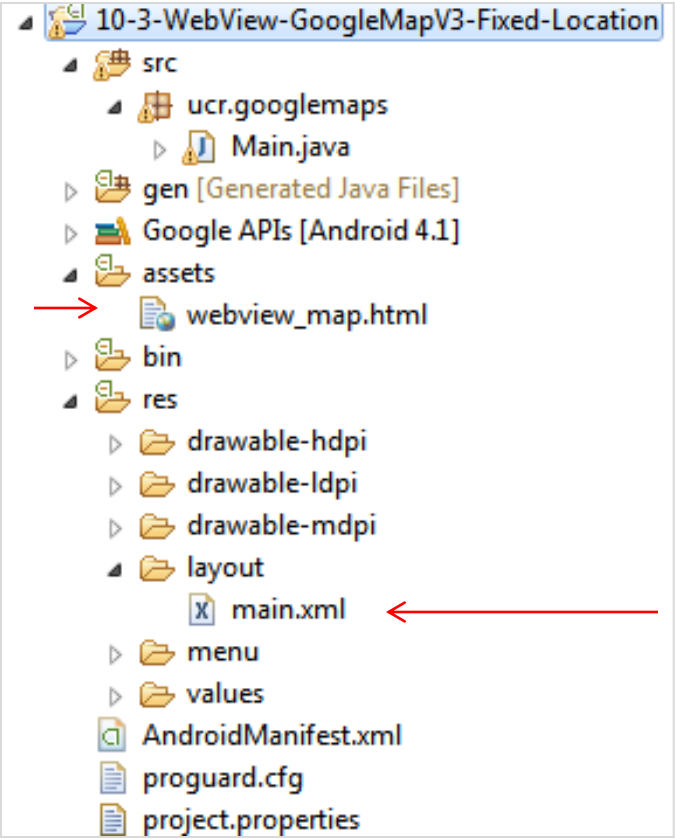
A Google map centered around "Cleveland State University, Ohio"
(seeing here with IExplorer on Windows machine)



Link: http://code.google.com/apis/maps/documentation/javascript/basics.html

WebView Browser

Example 3. Using Google JavaScript Maps API V3



Putting the pieces together:

1. Place a **WebView** in the main.xml file
2. Place html page in the **assets** folder
3. Add **permission** requests to manifest
4. Connect to Java code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="horizontal"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

  <WebView
      android:id="@+id/webview"
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"/>

</LinearLayout>
```

WebView Browser

Example 3. Using Google JavaScript Maps API V3 1 of 2

This is the HTML page: webview_map.html

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="initial-scale=1.0, user-scalable=no" />
    <style type="text/css">
      html { height: 100% }
      body { height: 100%; margin: 0px; padding: 0px }
      #map_canvas { height: 100% }
    </style>
    <script type="text/javascript"
        src="http://maps.google.com/maps/api/js?sensor=false">
    </script>
    <script type="text/javascript">
      function initialize() {
        var latlng = new google.maps.LatLng(41.5020952, -81.6789717);
        var myOptions = { zoom: 15,
                          center: latlng,
                          mapTypeId: google.maps.MapTypeId.ROADMAP };

        var map = new google.maps.Map( document.getElementById("map_canvas"),
                                       myOptions );
      }
    </script>
</head>
```

WebView Browser

Example 3. Using Google JavaScript Maps API V3 2 of 2

This is the HTML page: webview_map.html

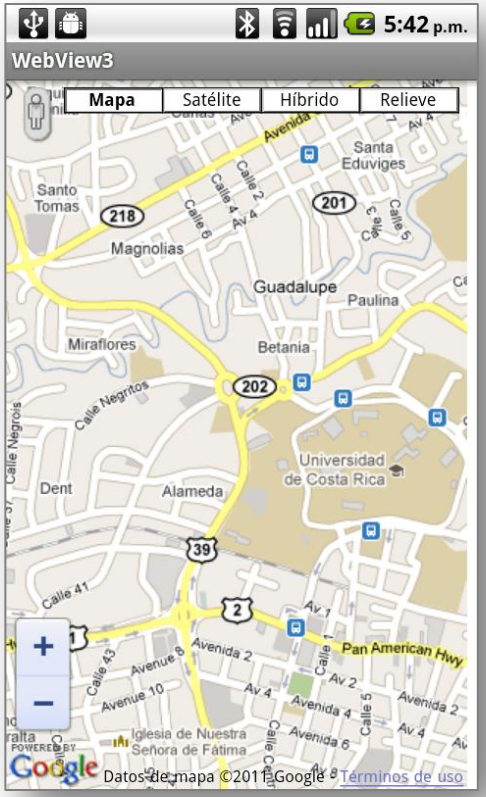
```
    <body onload="initialize()">
      <div id="map_canvas" style="width:100%; height:100%"></div>
    </body>

</html>
```

WebView Browser

Example 3. Using Google JavaScript Maps API V3

Add the following permission requests to the AndroidManifest.xml file

```
<uses-permission android:name="android.permission.INTERNET"/>
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
```



Map image shown on an Android device

WebView Browser

Example 3. Using Google JavaScript Maps API V3

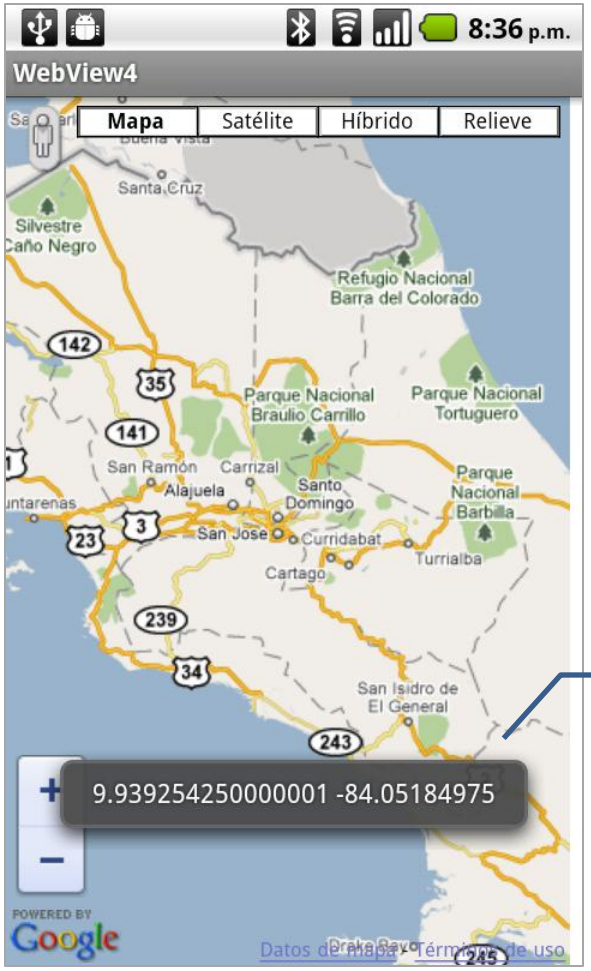
```
public class WebView4 extends Activity {
  WebView browser;

  @Override
  public void onCreate(Bundle savedInstanceState) {
   super.onCreate(savedInstanceState);
   setContentView(R.layout.main);

   // connect browser to local html file showing map
   browser = (WebView) findViewById(R.id.webview);
   browser.getSettings().setJavaScriptEnabled(true);
   browser.loadUrl("file:///android_asset/webview_map.html");

  }

}
```

WebView Browser

Delay until Service Lesson

Example4.

Using Google JavaScript Maps API V3 (real locations)



This experience combines the two previous examples:

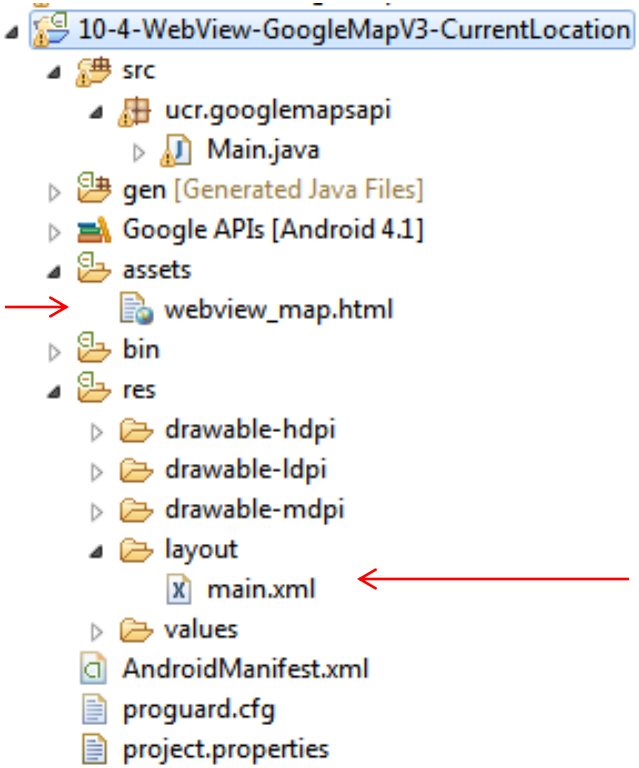
- The goal is to use an Android object to pass '*real location*' data to an html webpage.
- The page contains a JavaScript fragment to draw a map centered on the given coordinates.

Latitude and longitude detected by the device. Image taken from an Android phone.

***Warning**: Make sure your target is: **Google APIs (API Level 8)** or higher.*

WebView Browser

Example 4. Using Google JavaScript Maps API V3 (real locations)



Putting the pieces together:

1. Place a **WebView** in the main.xml file
2. Place html page in the **assets** folder
3. Add **permission** requests to manifest
4. Connect to Java code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="horizontal"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

  <WebView
      android:id="@+id/webview"
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"/>

</LinearLayout>
```

WebView Browser

Example 4. assets/webview_map.html

This HTML page creates a map using 'real' coordinates passed inside the 'locater' object

```
<!DOCTYPE html>
<html>
<head>     <meta name="viewport" content="initial-scale=1.0, user-scalable=no" />
           <meta http-equiv="content-type" content="text/html; charset=UTF-8"/>
           <title>Google Maps JavaScript API v3 Example4: Marker Simple</title>

<style type="text/css">
  html { height: 100% }
  body { height: 100%; margin: 0px; padding: 0px }
  #map_canvas { height: 100% }
</style>

<script type="text/javascript" src="http://maps.google.com/maps/api/js?sensor=false"></script>
<script type="text/javascript">
  function initialize() {
    //var myLatlng = new google.maps.LatLng(41.5020952, -81.6789717);  //CSU coordinates
    var myLatlng = new google.maps.LatLng(locater.getLatitude(), locater.getLongitude());
    var myOptions = { zoom: 17,
                      center: myLatlng,
                      mapTypeId: google.maps.MapTypeId.ROADMAP
                    }
    var map = new google.maps.Map(document.getElementById("map_canvas"), myOptions);

    var marker = new google.maps.Marker( { position: myLatlng, map: map });
  }
</script>
</head>
<body onload="initialize()">
  <div id="map_canvas"></div>
</body>
</html>
```

WebView Browser

Example4. Main Activity Android & Google Map V3 App (real locations)

```
public class Main extends Activity implements LocationListener {

        private WebView browser;
        LocationManager locationManager;
        MyLocater locater = new MyLocater();


        @Override
        protected void onDestroy() {
                super.onDestroy();
                // cut location service requests
                locationManager.removeUpdates(this);
        }

        private void getLocation() {
                locationManager = (LocationManager)
                                  getSystemService(Context.LOCATION_SERVICE);
                Criteria criteria = new Criteria();
                criteria.setAccuracy(Criteria.ACCURACY_FINE); // use GPS device
                //criteria.setAccuracy(Criteria.ACCURACY_COARSE); // towers, wifi
                String provider = locationManager.getBestProvider(criteria, true);

                // In order to make sure the device is getting the location, request
                // updates [wakeup after changes of: 5 sec. or 10 meter]
                locationManager.requestLocationUpdates(provider, 5, 10, this);
                locater.setNewLocation(locationManager.getLastKnownLocation(provider));
        }
```

WebView Browser

Example4. Main Activity Android & Google Map V3 App (real locations)

```
@Override
public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
        getLocation();
        setupBrowser();
        this.setRequestedOrientation(ActivityInfo.SCREEN_ORIENTATION_PORTRAIT);
}//onCreate

/** Set up the browser object and load the page's URL  **/
@SuppressLint("SetJavaScriptEnabled")
private void setupBrowser() {
        final String centerMapURL = "javascript:centerAt("
                + locater.getLatitude() + ","
                + locater.getLongitude() + ")";

        // set up the browser to show location results
        browser = (WebView) findViewById(R.id.webview);
        browser.getSettings().setJavaScriptEnabled(true);
        browser.addJavascriptInterface(locater, "locater");
        browser.loadUrl("file:///android_asset/webview_map.html");

        // Wait for the page to load then send the location information
        browser.setWebViewClient(new WebViewClient() {
                @Override
                public void onPageFinished(WebView view, String url) {
                        browser.loadUrl(centerMapURL);
                }
        });
} //setupBrowser
```

WebView Browser

Example4. Main Activity Android & Google Map V3 App (real locations)

```
@Override
public void onLocationChanged(Location location) {
        String lat = String.valueOf(location.getLatitude());
        String lon = String.valueOf(location.getLongitude());
        Toast.makeText(getApplicationContext(), lat + "\n" + lon, 1).show();
        locater.setNewLocation(location);
}

@Override
public void onProviderDisabled(String provider) {
        // needed by Interface. Not used

}

@Override
public void onProviderEnabled(String provider) {
        // needed by Interface. Not used

}

@Override
public void onStatusChanged(String provider, int status, Bundle extras) {
        // needed by Interface. Not used

}
```

WebView Browser

Example4. Main Activity Android & Google Map V3 App (real locations)

```
        // ////////////////////////////////////////////////////////////////
        // An object of type "MyLocater" will be used to pass data back and
        // forth between the Android app and the JS code behind the html page.
        // ////////////////////////////////////////////////////////////////
        public class MyLocater {
                private Location mostRecentLocation;

                public void setNewLocation(Location newCoordinates){
                        mostRecentLocation = newCoordinates;
                }

                public double getLatitude() {
                        if (mostRecentLocation == null) return (0);
                         else return mostRecentLocation.getLatitude();

                }

                public double getLongitude() {
                        if (mostRecentLocation == null) return (0);
                         else return mostRecentLocation.getLongitude();
                }
        }// MyLocater


}//class
```

WebView Browser

Example4. Main Activity Android & Google Map V3 App (real locations)

Testing the app using the Emulator Control Panel

DDMS - 10-4-WebView-GoogleMapV3-CurrentLocation/src/ucr/googlemapsapi/Main.java - Eclipse

File Edit Refactor Source Navigate Search Project Run Window Help

Devices

Name	Online
IceCream4x-16 [emulator-5554]	
com.android.deskclock	340
com.android.systemui	201
com.android.calendar	313
com.android.providers.calenc	380
com.android.phone	229
com.android.mms	407
com.android.exchange	467
android.process.acore	294
android.process.media	417
com.android.launcher	244
system_process	146
com.android.inputmethod.lat	215
com.android.settings	270
com.android.email	449
com.android.defcontainer	550
com.android.keychain	566
com.svox.pico	580
com.android.quicksearchbox	594
ucr.googlemapsapi	625
com.example.playingwithwel	899

File Explorer | Emulator Control

Telephony Status

Voice: home Speed: Full

Data: home Latency: None

Telephony Actions

Incoming number:

Voice

SMS

Message:

Call Hang Up

Location Controls

Manual GPX KML

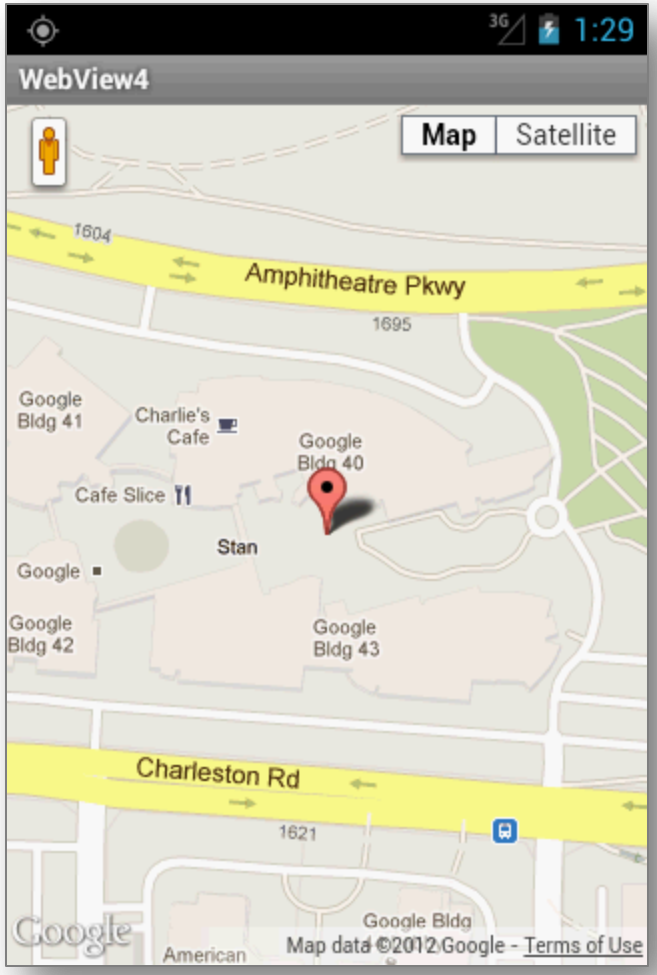
Decimal

Sexagesimal

Longitude -122.084095

Latitude 37.422006

Send



WebView Browser

Where to go next?

Google Maps Developers Documentation
https://developers.google.com/maps/documentation/

Google Maps API – Webservices
http://code.google.com/apis/maps/documentation/webservices/index.html

Google Maps JavaScript API V3
http://code.google.com/apis/maps/documentation/javascript/tutorial.html

Questions ?