GoogleMap

Definitely, Google map is one of popular web applications nowaday and better than Apple map.

- Howto: basic requirement of using Goole Map App
- Template: A simple demo of app using Google Map
- Mark the Position: anchor the position
- Marker
- Demo; Demo of Marker Draggable
- How Far from Here Distance Measurement
- Area Estimation Estimate the Area of polygon
- Make Note List of Locations
- Map Animating Create a Marauders-Maps

Howto

To use the Google Map service, there are some standard procedures to do as folows:

1. **Use javascript library of the Google Map API's**

```
 <script type="text/javascript"
     src="http://maps.googleapis.com/maps/api/js?sensor=true&language=tw&
v=3" >
 </script>
```

option "sensor=true": use mobile device

1. **Initialize the service**

```
        function initialize() {
           // Options of Map
           // center position, rate of magnitude, and type of maps given
           var mapOptions = {
               center: new google.maps.LatLng(25.034264,121.389395),
               zoom: 16,
               mapTypeId: google.maps.MapTypeId.ROADP
           };
           // location at which the map is displayed
           var map = new google.maps.Map(document.getElementById("map_can
vas"),
               mapOptions);
        }
```

1. **Run the code while loaded**

```
        <body onload="initialize()">
        <div id="map_canvas" style="width: 600px;height: 400px;" />
```

Note

Here, type of maps is ROADP; other formats are

- MapTypeId.SATELLITE
- MapTypeId.HYBRID
- MapTypeId.TERRAIN
- MapTypeId.ROADMAP, defaulted.

Template

A simple demo:

```
<html>
<head>
<script type="text/javascript"
      src="http://maps.googleapis.com/maps/api/js?sensor=true&language=tw
&v=3" >
</script>

<script type="text/javascript">
      function initialize() {
        var mapOptions = {
          center: new google.maps.LatLng(25.034264,121.389395),
          zoom: 16,
          mapTypeId: google.maps.MapTypeId.ROADP
        };
        var map = new google.maps.Map(document.getElementById("map"),
            mapOptions);
      }

</script>
</head>
<body onload="initialize()">
     <div id="map" style="width: 600px;height: 400px;"/>
</body>
</html>
```

CSSModification

Except given the option of size of "map_canvas", we can aslo use CSS to set the size of Canvas of Map

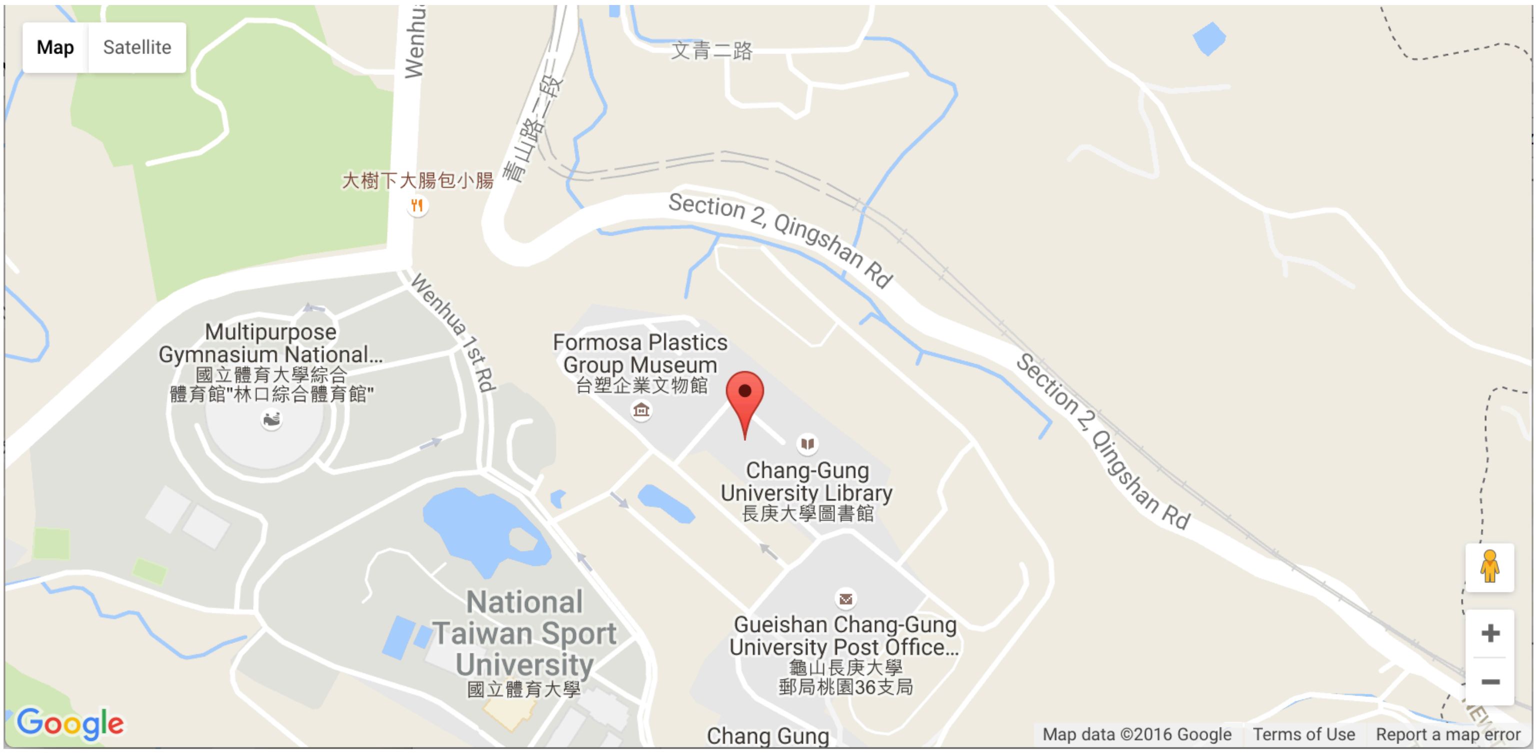
```
<style>
    html, body, #map {
        height: 100%;
        width: 100%;
        margin: 0px;
        padding: 0px;
    }
</style>
```

The app size should be resized according to user's necessary.

In [8]:

```
from IPython.display import Image
Image("imgs/gmap-1.png")
```

Out[8]:


Map
Satellite
Wenhua
文青二路
青山路二段
大樹下大腸包小腸
Section 2, Qingshan Rd
Wenhua 1st Rd
Multipurpose Gymnasium National...
國立體育大學綜合體育館"林口綜合體育館"
Formosa Plastics Group Museum
台塑企業文物館
Chang-Gung University Library
長庚大學圖書館
Section 2, Qingshan Rd
National Taiwan Sport University
國立體育大學
Gueishan Chang-Gung University Post Office...
龜山長庚大學郵局桃園36支局
Chang Gung
Google
Map data ©2016 Google
Terms of Use
Report a map error
+
−

MarkThePosition

1. define the the latitude and lonitude of given position:

```
var CGU_latlng = new google.maps.LatLng(25.034264,121.389395)
;
```

2. create marker:

```
var marker = new google.maps.Marker({
    position: CGU_latlng,
    map: gmap,
    title:"Chang-gung University"
});
```

Marker

```
<script type="text/javascript">
    window.onload = function () {
      // initialize Google Map
      var latlng = new google.maps.LatLng(25.034264,121.389395);
      var mapOptions = {
          zoom:12,
          center:latlng,
          mapTypeId: google.maps.MapTypeId.ROADMAP
      };
      var gmap = new google.maps.Map(document.getElementById("map_canvas"
), mapOptions);
      // Show Mark
      var CGU_latlng = new google.maps.LatLng(25.034264,121.389395);
      var marker = new google.maps.Marker({
          position: CGU_latlng,
          map: gmap,
          title:"Chang-gung University"
      });
    };
</script>
<body>
  <div id="map_canvas" style="width: 600px;height: 400px;" />
</body>
```

MarkerDraggable

1. Show the marker at defaulted position while loading;
2. Use mouse to drag the marker;
3. show the **new** Latitude and longitude of the position at which the mark was placed.

Basic HTML

Create a block to display the lat-long of poisition:

```
<div id="map_canvas" style="width: 600px;height: 480px;"></div><br />
<label for="latitude">Latitude:</label>
<input id="latitude" type="text" value="" />
<label for="longitude">Longitude:</label>
<input id="longitude" type="text" value="" />
```

This should create the input columns as follows:

```
""" Google Map Here """
```

Latitude: ▭ Longitude: ▭

JavaScript part

"HTML PART" Here....

```
    <script type="text/javascript">
      var myCoordsLenght = 6;
      var defaultLat = 25.034264;
      var defaultLng = 121.389395;

      function initialize() {
         var mapOptions = {
             ...
         };
         var map = new google.maps.Map(document.getElementById("map_canva
s"),mapOptions);

         // creates a draggable marker to the given coords
         var myMarker = new google.maps.Marker({
             ...
              draggable: true
         });

         google.maps.event.addListener(myMarker, 'dragend', function(evt)
{
             document.getElementById('latitude').value = evt.latLng.lat()
;
             document.getElementById('longitude').value = evt.latLng.lng(
).toFixed(myCoordsLenght);
         });

         // centers the map on markers coords
         map.setCenter(myMarker.position);

         // adds the marker on the map
         myMarker.setMap(map);
      }

      google.maps.event.addDomListener(window, 'load', initialize);
    </script>
```

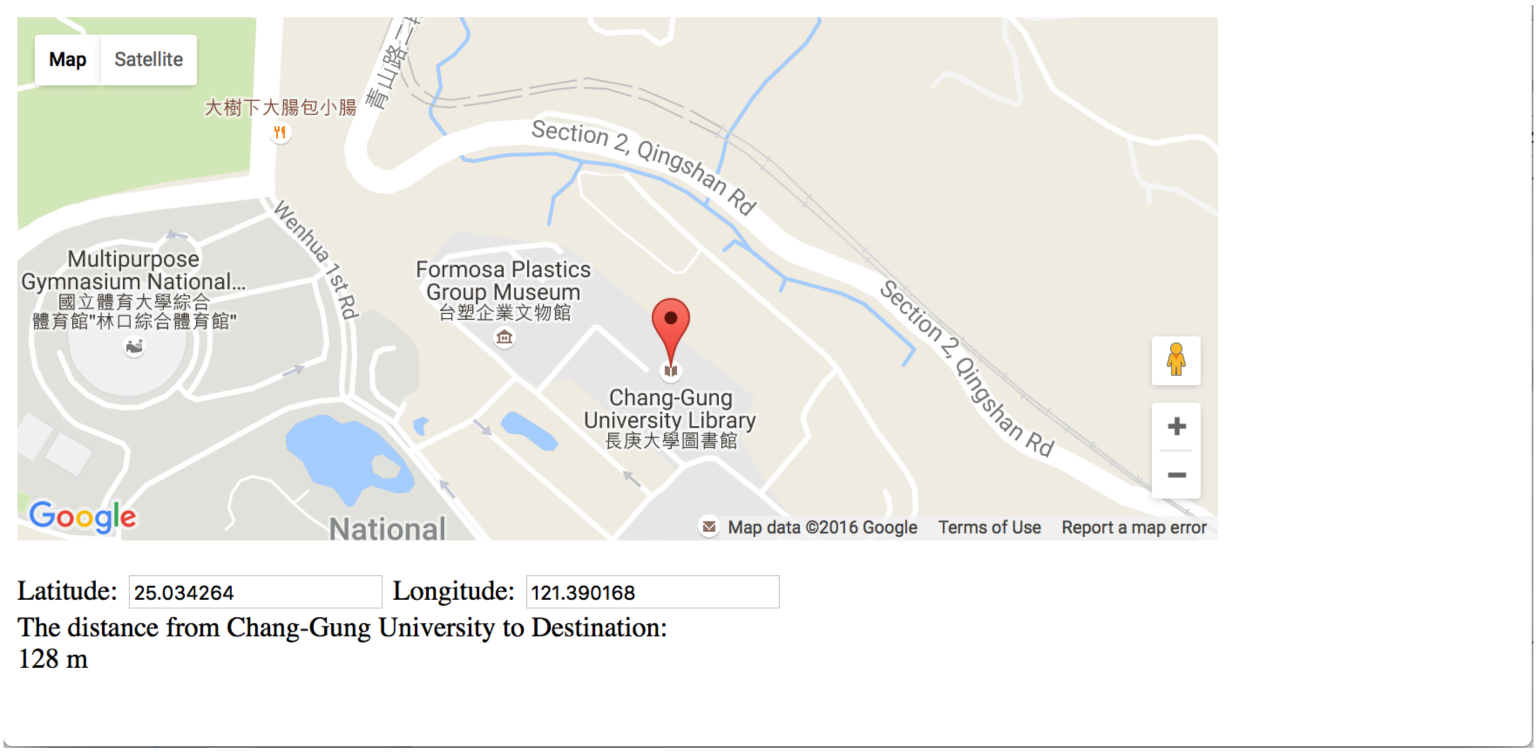
Completed Codes

```
<html lang="en">
<head>
   <meta charset="utf-8" />
   <script type="text/javascript" src="http://maps.google.com/maps/api/js
?sensor=true"></script>
</head>
<body>
    <div id="map_canvas" style="width: 600px;height: 400px;"></div><br />
    <label for="latitude">Latitude:</label>
    <input id="latitude" type="text" value="" />
    <label for="longitude">Longitude:</label>
    <input id="longitude" type="text" value="" />
<script type="text/javascript">
  var myCoordsLenght = 6;
  var defaultLat = 25.034264;
  var defaultLng = 121.389395;

  function initialize() {
     var mapOptions = {
         center: new google.maps.LatLng(defaultLat,defaultLng),
         zoom: 16,
         mapTypeId: google.maps.MapTypeId.ROADP
     };
     var map = new google.maps.Map(document.getElementById("map_canvas"),
mapOptions);

     var myMarker = new google.maps.Marker({
         position: new google.maps.LatLng(defaultLat, defaultLng),
         draggable: true
     });

     google.maps.event.addListener(myMarker, 'dragend', function(evt){
         document.getElementById('latitude').value = evt.latLng.lat();
         document.getElementById('longitude').value = evt.latLng.lng().to
Fixed(myCoordsLenght);
     });

     map.setCenter(myMarker.position);
     myMarker.setMap(map);
  }
  google.maps.event.addDomListener(window, 'load', initialize);
</script>
</body></html>
```

In [9]:

```
Image("imgs/gmap-2.png")
```

Out[9]:



Latitude: 25.034264 Longitude: 121.390168

The distance from Chang-Gung University to Destination:
128 m

Application

- Make Survey (get data in csv format)
- make map of survey data (by scratch or by Python)

In [6]:

```
IFrame(src="ntufolium.html", width="800px", height="500px" )
```

Out[6]:

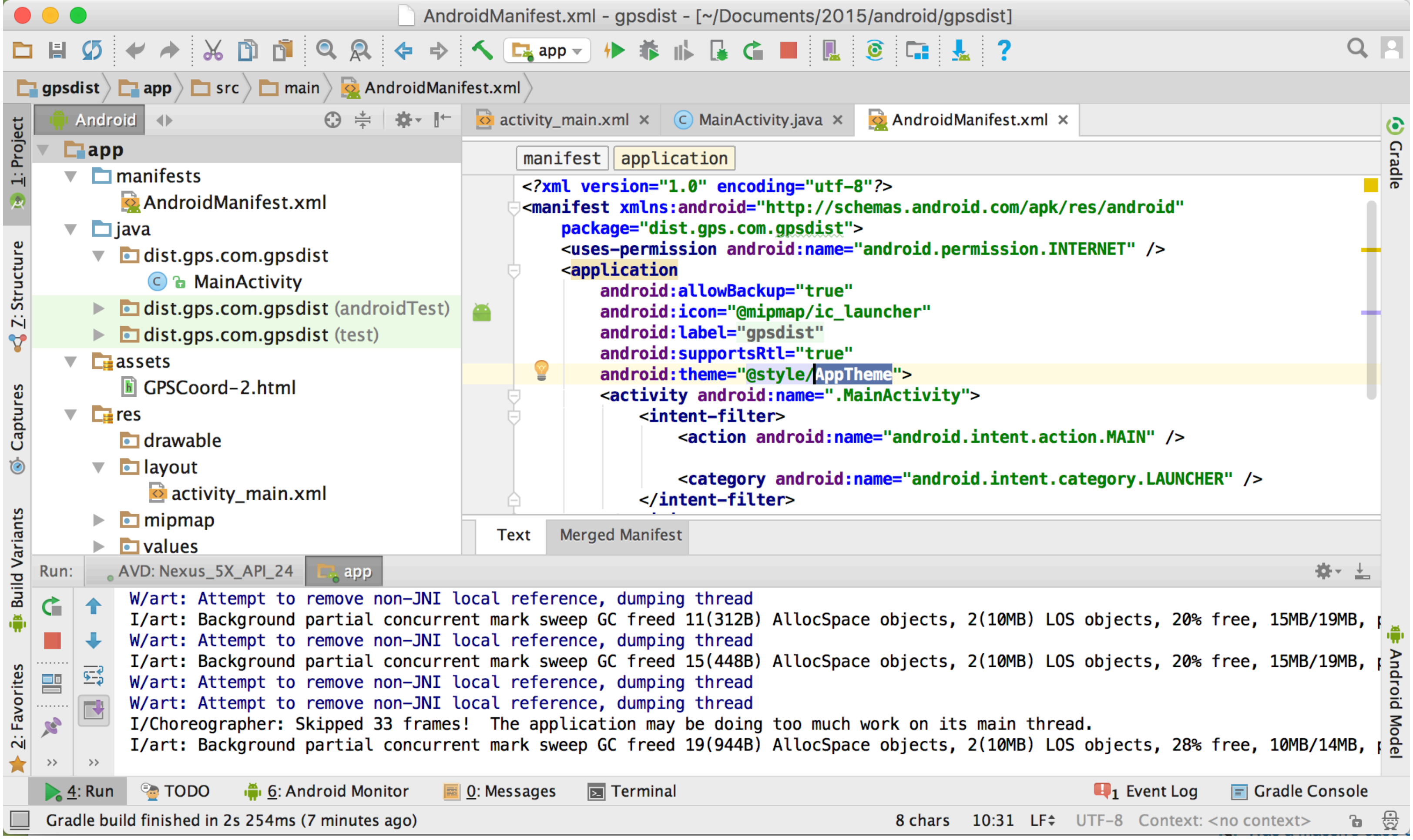
In [ ]:

```
```

Note

1. How to get rid of app title bar?

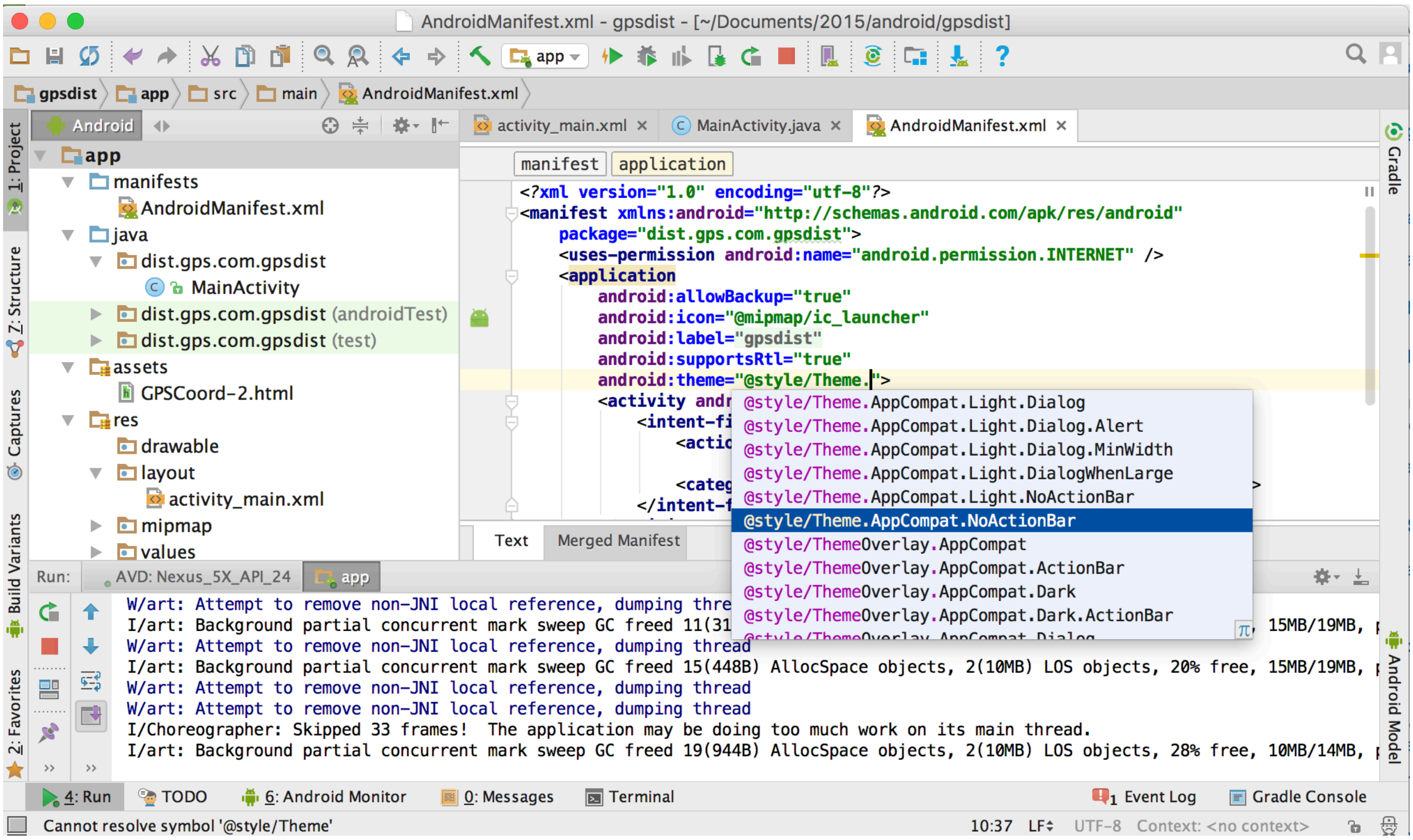
So small to display the unnecessary info. Modify the default setting of Theme in AndroidManifest.xml:



```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="dist.gps.com.gpsdist">
    <uses-permission android:name="android.permission.INTERNET" />
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="gpsdist"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

```
W/art: Attempt to remove non-JNI local reference, dumping thread
I/art: Background partial concurrent mark sweep GC freed 11(312B) AllocSpace objects, 2(10MB) LOS objects, 20% free, 15MB/19MB, p
W/art: Attempt to remove non-JNI local reference, dumping thread
I/art: Background partial concurrent mark sweep GC freed 15(448B) AllocSpace objects, 2(10MB) LOS objects, 20% free, 15MB/19MB, p
W/art: Attempt to remove non-JNI local reference, dumping thread
W/art: Attempt to remove non-JNI local reference, dumping thread
I/Choreographer: Skipped 33 frames!  The application may be doing too much work on its main thread.
I/art: Background partial concurrent mark sweep GC freed 19(944B) AllocSpace objects, 2(10MB) LOS objects, 28% free, 10MB/14MB, p
```

Gradle build finished in 2s 254ms (7 minutes ago)   8 chars   10:31   LF   UTF-8   Context: <no context>



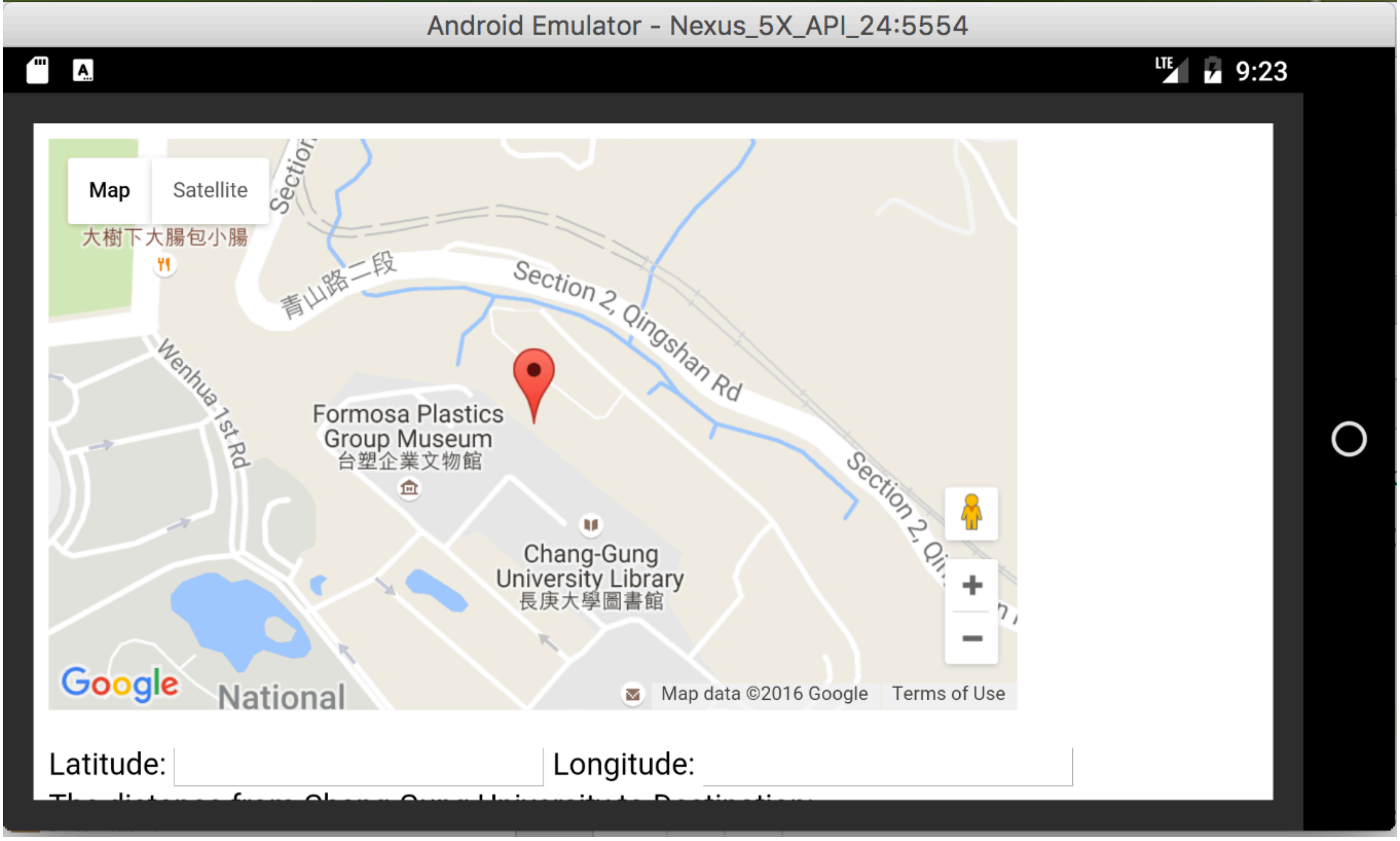
```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="dist.gps.com.gpsdist">
    <uses-permission android:name="android.permission.INTERNET" />
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="gpsdist"
        android:supportsRtl="true"
        android:theme="@style/Theme.">
        <activity andr
            <intent-fi
                <actio

                <categ
            </intent-f
```

```
@style/Theme.AppCompat.Light.Dialog
@style/Theme.AppCompat.Light.Dialog.Alert
@style/Theme.AppCompat.Light.Dialog.MinWidth
@style/Theme.AppCompat.Light.DialogWhenLarge
@style/Theme.AppCompat.Light.NoActionBar
@style/Theme.AppCompat.NoActionBar
@style/ThemeOverlay.AppCompat
@style/ThemeOverlay.AppCompat.ActionBar
@style/ThemeOverlay.AppCompat.Dark
@style/ThemeOverlay.AppCompat.Dark.ActionBar
@style/ThemeOverlay.AppCompat.Dialog
```

```
W/art: Attempt to remove non-JNI local reference, dumping thre
I/art: Background partial concurrent mark sweep GC freed 11(31                                                   15MB/19MB, p
W/art: Attempt to remove non-JNI local reference, dumping thread
I/art: Background partial concurrent mark sweep GC freed 15(448B) AllocSpace objects, 2(10MB) LOS objects, 20% free, 15MB/19MB, p
W/art: Attempt to remove non-JNI local reference, dumping thread
W/art: Attempt to remove non-JNI local reference, dumping thread
I/Choreographer: Skipped 33 frames!  The application may be doing too much work on its main thread.
I/art: Background partial concurrent mark sweep GC freed 19(944B) AllocSpace objects, 2(10MB) LOS objects, 28% free, 10MB/14MB, p
```

Cannot resolve symbol '@style/Theme'   10:37   LF   UTF-8   Context: <no context>

The result



Latitude:
Longitude:

DistanceMeasurement

[Codes, GPSCoord-2.html (codes/GPSCoord-2.html)](codes/GPSCoord-2.html)

1. To access the function of distance measurement requires geometry libarary:

```
<head>
  <script type="text/javascript"
     src="http://maps.google.com/maps/api/js?sensor=true&v=3&libraries=geometry"></script>
</head>
```

1. where the measurement is placed:

```
<label>
    The distance from Chang-Gung University to Destination: <div id="distanceAB"></div>
<label>
```

2. calculate the distance, set new coordinates, then measure by **"google.maps.geometry.spherical.computeDistanceBetween()"**:

```
        google.maps.event.addListener(myMarker, 'dragend', function(evt){
           var newLat=evt.latLng.lat();
           var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
           document.getElementById('latitude').value = newLat;
           document.getElementById('longitude').value = newLng;
           var loc2 = new google.maps.LatLng(newLat, newLng);
           document.getElementById('distanceAB').innerHTML =
                Math.round(google.maps.geometry.spherical.computeDistance
Between (loc1, loc2))+'  m';
        });
```

Sketch

```
                 HTML
            defaulted Lat/Lng                                     JavaScr
ipt

     Latitude: (defaultLat)  Longitude: (defaultLng)    google.maps.event
.addListener(,,function(evt))
                   |                        |                      :
                   |                        |                      :
                   ▼                        ▼                      :
                 newLat                   newLng                   :    w
aiting for position changed
                   ▲                        ▲                      :
                   |                        |                      :
            evt.latLng.lat()  ◀-..  evt.latLng.lng() ◀------------ ┤    I
f dragged
                                                                   :
                                                                   :
           <div id="distanceAB">     </div>                        :
                                  ▲                                :
                                  └ ------------------------------┘

google.maps.geometry.spherical.computeDistanceBetween(loc1,loc2)
```

Make a note via Google Map

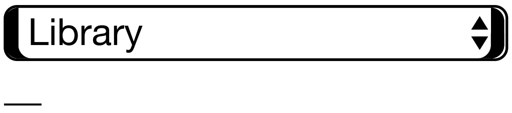
Codes, GPSCoord-3.html (GPSCoord-3.html)

Create an arraay of latitude/longitude list for which we are interested. Move the marker to the place which we select from the HTML options.

- create the html options

```
        <select id="PosMenu">
           <option value="0">Library</option>
           <option value="1">National Sport University</option>
           <option value="2">Post Office</option>
        </select>
        <div id="distanceAC">__</div>"
```

Result:



__

- Array in Javascript

```
  var loctoLib=[[25.035236, 121.389524],[25.034225,121.390168]];
  var loctoPO=[[25.035236, 121.389524],[25.032514, 121.39066]];
  var loctoNSU=[[25.035236,121.389524],[25.034750,121.389245],[25.
033991,121.388494],[25.034147,121.388237], [25.033350,121.387013],
[25.032125,121.388022],[25.0317170,121.387464],
           [25.0319892,121.386692]];
```

- show the marker at the place on the map while option was selected (i.e. `[Element]`.onchange):

```
    document.getElementById('PosMenu').onchange = function() {
       var index = this.value;

       var loc2 = new google.maps.LatLng(loc[index][0], loc[index][1]);
       document.getElementById('distanceAC').innerHTML =
          Math.round(google.maps.geometry.spherical.computeDistanceBetwee
n (loc1, loc2))+'  m';
       var newMarker = new google.maps.Marker({
          position: new google.maps.LatLng(loc[index][0], loc[index][1]),
          draggable: myMarkerIsDraggable
       });

       // centers the map on markers coords
       var mapOptions = {
          ...
       };

       var map = new google.maps.Map(document.getElementById("map_canvas"
),mapOptions)

       google.maps.event.addListener(newMarker, 'dragend', function(evt){
          var newLat=evt.latLng.lat();
          var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
          document.getElementById('latitude').value = newLat;
          document.getElementById('longitude').value = newLng;
          var loc2 = new google.maps.LatLng(newLat, newLng);
          document.getElementById('distanceAB').innerHTML =
          Math.round(google.maps.geometry.spherical.computeDistanceBetwee
n (loc1, loc2))+'  m';
        });

        map.setCenter(newMarker.position);
        newMarker.setMap(map)
     }
```

- create the chosen tracjectory

```
     if (index==0) {
        var coord =[];
        for (i = 0; i < loctoLib.length; i++) {
             coord.push(new google.maps.LatLng(loctoLib[i][0], loc
toLib[i][1]));
        }
     } else if (index==1) {
        var coord =[];
        for (i = 0; i < loctoNSU.length; i++) {
            coord.push(new google.maps.LatLng(loctoNSU[i][0], loct
oNSU[i][1]));
        }
     } else {
       var coord =[];
       for (i = 0; i < loctoPO.length; i++) {
           coord.push(new google.maps.LatLng(loctoPO[i][0], loctoP
O[i][1]));
       }
     }
```

PositionMarker

```
<script type="text/javascript">
window.onload = function () {
    var latlng = new google.maps.LatLng(25.034264,121.389395);
    var mapOptions = {
        zoom:12,
        center:latlng,
        mapTypeId: google.maps.MapTypeId.ROADMAP
    };
    var gmap = new google.maps.Map($("map_canvas"), mapOptions);

    var Coordinates = [
        new google.maps.LatLng(25.034264,121.389395),
        new google.maps.LatLng(25.034264,121.391395),
        new google.maps.LatLng(25.036264,121.391395),
     ];
     var flightPath = new google.maps.Polyline({
        path: Coordinates,
        strokeColor: "#FF0000",
        strokeOpacity: 1.0,
        strokeWeight: 3,
        map: gmap
     });
 };
</script>
</head><body>
<div id="map_canvas" />
```

- Make the trajectory:

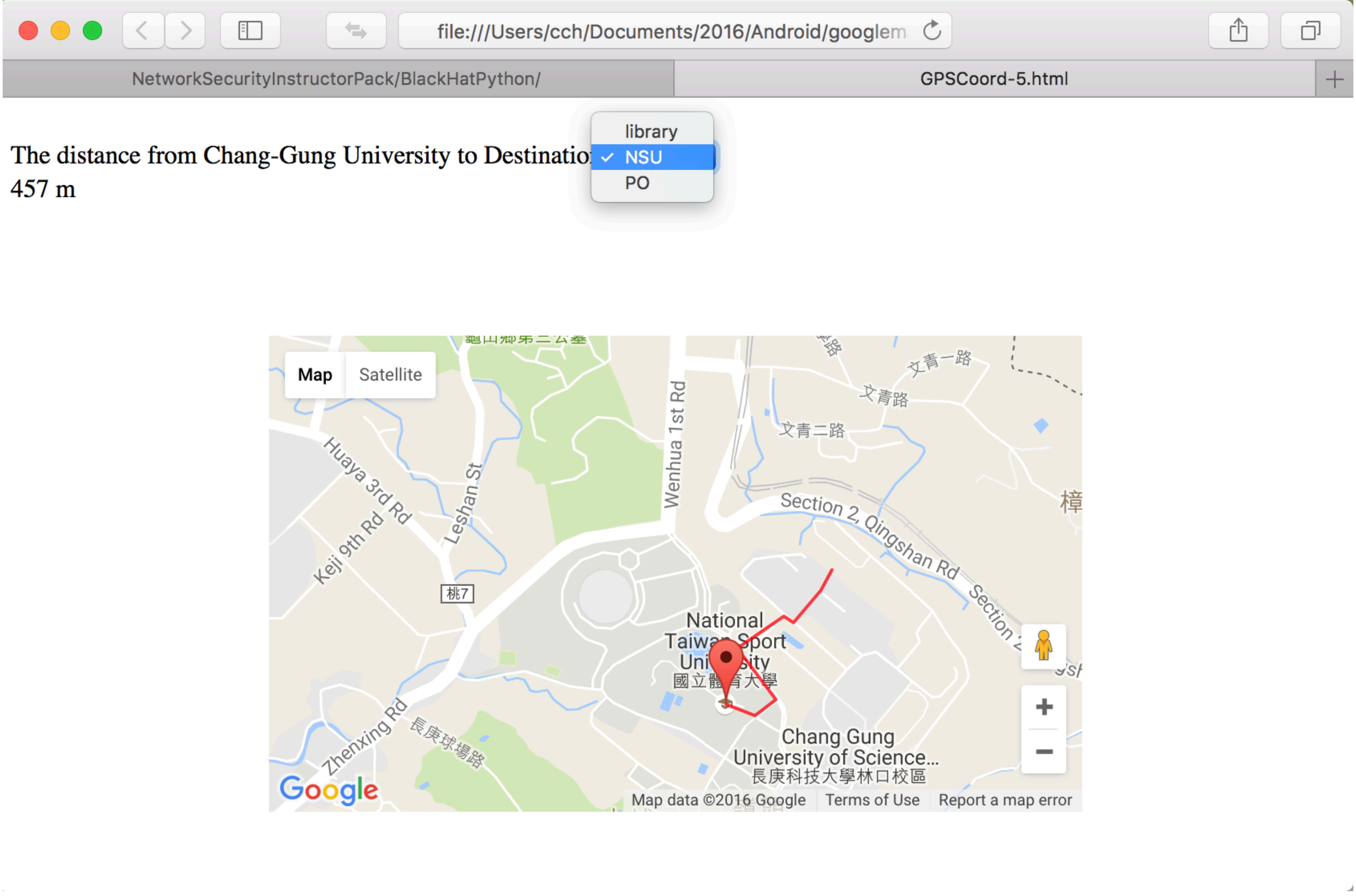
```
     var TrajPath= new google.maps.Polyline({
          path: coord,
          geodesic: true,
          strokeColor: '#FF0000',
          strokeOpacity: 0.8,
          strokeWeight: 2
      });
      TrajPath.setMap(map);
```

Complete Code

Show the distance of destiny positions

```
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width" />
    <title></title>
    <script type="text/javascript"
       src="http://maps.google.com/maps/api/js?sensor=true&v=3&libraries=
geometry"></script>

<style type="text/css">
    body {
       margin: 10;
       padding: 10
     }
    #map_canvas {
        position: absolute;
        width: 60%;
        height: 60%;
        left:20%;
        right:20%;
        top:30%;
        overflow: auto
     }
</style>
</head>

<body>

    <div id="map_canvas"></div>
    <br />
    <label for="latitude">Latitude:</label>
    <input id="latitude" type="text" value="" />
    <label for="longitude">Longitude:</label>bottom
    <input id="longitude" type="text" value="" />

    <br><label>
    The distance from Chang-Gung University to Destination: <div id="dist
anceAB"></div>
    <label>
    <br>
      The distance from Chang-Gung University to Destination
      <select id="PosMenu">
              <option value="0">library</option>
              <option value="1">NSU</option>
              <option value="2">PO</option>
          </select>
       <div id="distanceAC"></div>

<script type="text/javascript">

  var myZoom = 16;
  var myMarkerIsDraggable = true;
  var myCoordsLenght = 6;
  var defaultLat = 25.035255529260443;
  var defaultLng = 121.389524;
  var loc1 = new google.maps.LatLng(25.035255529260443, 121.389524);
  var loc = [[25.034225,121.390168],[25.032047,121.386692],[25.032514, 12
1.390661]];

  function initialize() {
    var mapOptions = {
          center: new google.maps.LatLng(defaultLat,defaultLng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.ROADP
    };
    var map = new google.maps.Map(document.getElementById("map_canvas"),m
apOptions);
    // creates a draggable marker to the given coords   -3.118-3.118

    var myMarker = new google.maps.Marker({
    position: new google.maps.LatLng(defaultLat, defaultLng),
    draggable: myMarkerIsDraggable
    });


    google.maps.event.addListener(myMarker, 'dragend', function(evt){
        var newLat=evt.latLng.lat();
        var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
    document.getElementById('latitude').value = newLat;
    document.getElementById('longitude').value = newLng;
    var loc2 = new google.maps.LatLng(newLat, newLng);
    document.getElementById('distanceAB').innerHTML =
       Math.round(google.maps.geometry.spherical.computeDistanceBetween (
loc1, loc2))+'  m';

    });

    // centers the map on markers coords
    map.setCenter(myMarker.position);

    // adds the marker on the map
    myMarker.setMap(map);
  }

  google.maps.event.addDomListener(window, 'load', initialize);

  document.getElementById('PosMenu').onchange = function() {
    var index = this.value; // array indices start at 0
    //alert(loc[index][0]);
    var loc2 = new google.maps.LatLng(loc[index][0], loc[index][1]);
    document.getElementById('distanceAC').innerHTML =
    Math.round(google.maps.geometry.spherical.computeDistanceBetween (loc
1, loc2))+'  m';
    var newMarker = new google.maps.Marker({
        position: new google.maps.LatLng(loc[index][0], loc[index][1]),
        draggable: myMarkerIsDraggable
    });

    // centers the map on markers coords
    var mapOptions = {
          center: new google.maps.LatLng(defaultLat,defaultLng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.ROADP
    };

    var map = new google.maps.Map(document.getElementById("map_canvas"),m
apOptions)

    google.maps.event.addListener(newMarker, 'dragend', function(evt){
        var newLat=evt.latLng.lat();
        var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
        document.getElementById('latitude').value = newLat;
        document.getElementById('longitude').value = newLng;
        var loc2 = new google.maps.LatLng(newLat, newLng);
        document.getElementById('distanceAB').innerHTML =
          Math.round(google.maps.geometry.spherical.computeDistanceBetwee
n (loc1, loc2))+'  m';
    });

    map.setCenter(newMarker.position);

    // adds the marker on the map
    newMarker.setMap(map)
  }

</script>

</body>
</html>
```

Result



The distance from Chang-Gung University to Destinatio

457 m

In [ ]:

AreaEstimation

The steps to solve the last practice, mark a region:

1. Find the the (latitude, longitude)'s of defaulted building;
2. make a closed polygon formed by set of given points, found by above;
3. calculate the area of polygon above.

code1-1

```
<head>
     <meta charset="utf-8" />
     <title>Laditude and Longitude</title>
     <script type="text/javascript" src="http://maps.google.com/maps/api/
js?sensor=true" >
     </script>
 </head>
```

code1-2

```
<body>
   <div id="map_canvas" style="width: 600px;height: 400px;"></div><br>
   <label for="latitude">Latitude:</label>
   <input id="latitude" type="text" value="" />
   <label for="longitude">Longitude:</label>
   <input id="longitude" type="text" value="" />
<script type="text/javascript">
  var myZoom = 16;
  var myMarkerIsDraggable = true;
  var myCoordsLenght = 6;
  var defaultLat = 25.034264;
  var defaultLng = 121.389395;

  function initialize() {
    var mapOptions = {
          center: new google.maps.LatLng(defaultLat,defaultLng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.ROADP
    };
    var map = new google.maps.Map(document.getElementById("map_canvas"),m
apOptions);

    // creates a draggable marker to the given coords
    var myMarker = new google.maps.Marker({
    position: new google.maps.LatLng(defaultLat, defaultLng),
    draggable: myMarkerIsDraggable
    });

    google.maps.event.addListener(myMarker, 'dragend', function(evt){
    document.getElementById('latitude').value = evt.latLng.lat().toFixed(
myCoordsLenght);
    document.getElementById('longitude').value = evt.latLng.lng().toFixed
(myCoordsLenght);
    });

    // centers the map on markers coords
    map.setCenter(myMarker.position);

    // adds the marker on the map
    myMarker.setMap(map);
  }

  google.maps.event.addDomListener(window, 'load', initialize);
</script>
</body>
```

Code 2-1

Code 2-1

```
<script>
  // This example creates a simple polygon representing the library building in CGU .
  var myZoom = 16;
  //var myMarkerIsDraggable = true;
  //var myCoordsLenght = 6;
  var defaultLat = 25.034264;
  var defaultLng = 121.389395;

  function initialize() {
    var mapOptions = {
          center: new google.maps.LatLng(defaultLat,defaultLng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.TERRAIN
    };
    var map = new google.maps.Map(document.getElementById('map_canvas'),mapOptions);

    // Define the LatLng coordinates for the polygon's path.
    var PolygonCoords = [
        new google.maps.LatLng(25.034200,121.390527),
        new google.maps.LatLng(25.034020,121.390790),
        new google.maps.LatLng(25.033413,121.390237),
        new google.maps.LatLng(25.033612,121.390001),
        new google.maps.LatLng(25.034200,121.390527)
    ];
    // Construct thepolygon.
    var myPolygon;
    myPolygon= new google.maps.Polygon({
      paths: PolygonCoords,
      strokeColor: '#FF0000',
      strokeOpacity: 0.8,
      strokeWeight: 2,
      fillColor: '#FF0000',
      fillOpacity: 0.35
    });
    myPolygon.setMap(map);
  }
  google.maps.event.addDomListener(window, 'load', initialize);
  </script>
```

Code2-2

```
<body>
    <div id="map_canvas" style="width: 600px;height: 400px;"></div>
</body>
```

Code3-1

```
<script type="text/javascript"
    src="https://maps.googleapis.com/maps/api/js?libraries=geometry&senso
r=false" >
</script>
<script type="text/javascript">
    var myZoom = 16;
    var myMarkerIsDraggable = true;
    var myCoordsLenght = 6;
    var defaultLat = 25.034264;
    var defaultLng = 121.389395;
    var map;
    function initialize(){
        var mapOptions = {
          center: new google.maps.LatLng(defaultLat,defaultLng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.ROADP
        };
        var map = new google.maps.Map(document.getElementById("map_canvas
"),mapOptions);
    }
    google.maps.event.addDomListener(window, 'load', initialize);
</script>
```

Code3-2

```
<script>
   function test(){
        var arr = new Array()
        arr.push('25.034200,121.390527');
        arr.push('25.034020,121.390790');
        arr.push('25.033413,121.390237');
        arr.push('25.033612,121.390001');
        arr.push('25.034200,121.390527');
        AreaComp(arr);
   }
   function AreaComp(CoordArr){
      var a = new Array();

      for(var i=0; i<CoordArr.length; i++){
          var point = CoordArr[i].split(",");
          a[i] = new google.maps.LatLng(point[0],point[1]);
      }

      mypolygon = new google.maps.Polygon({
        paths: a,
        strokeColor: "#22B14C",
        strokeOpacity: 0.8,
        strokeWeight: 2,
        fillColor: "#22B14C",
        fillOpacity: 0.35
     })

     mypolygon.setMap(map);//until here is ok
     var z =  google.maps.geometry.spherical.computeArea(mypolygon.getPat
h());
     alert(z); //this is not working
   }
</script>
```

Code3-3

```
<body onload="test();">
    <div id="map_canvas" style="width: 600px;height: 400px;"></div>
</body>
```

Practice

Make a squre around your dormitory and estimate the base area of the building.

In [ ]:

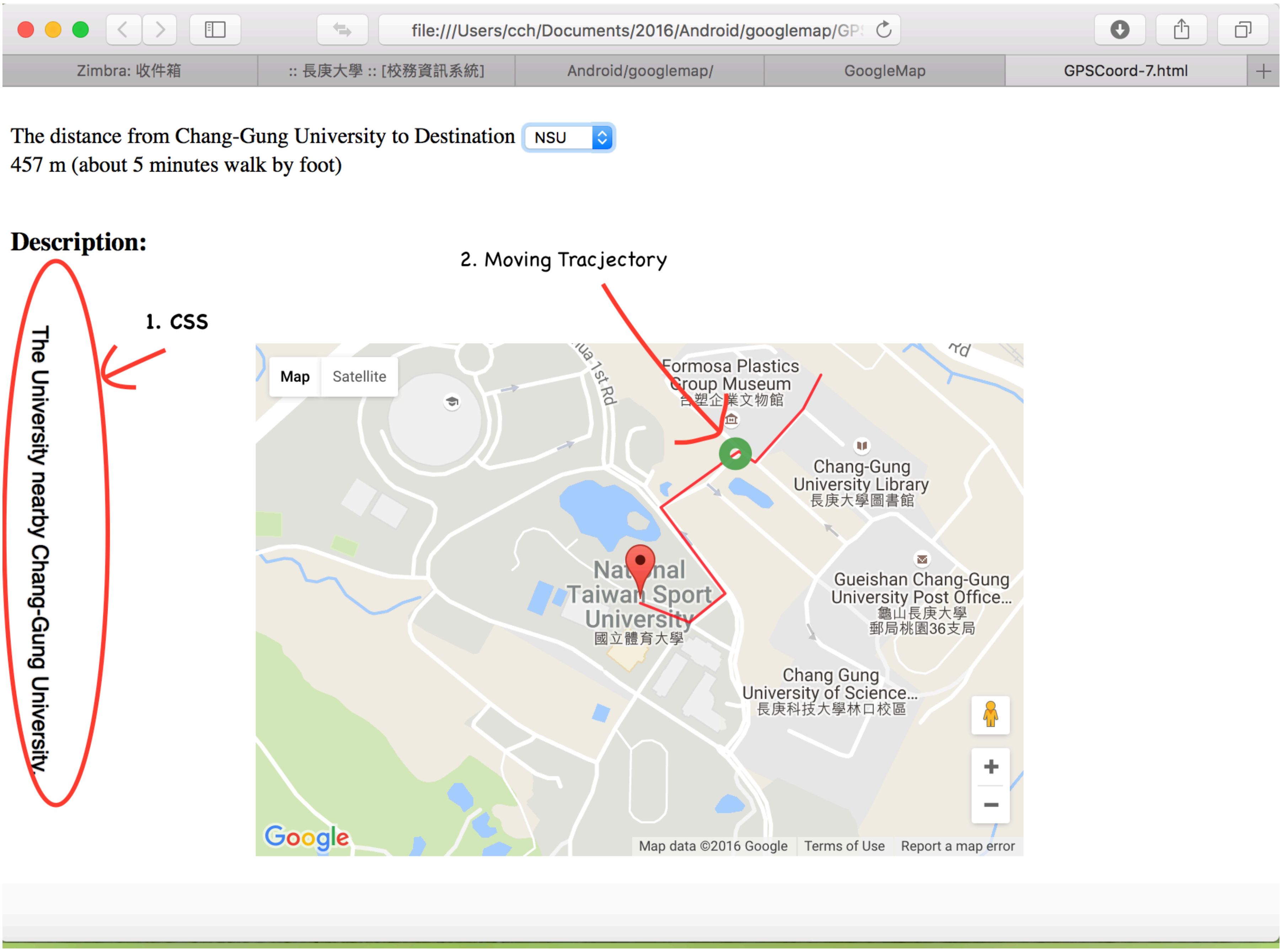
```

```

Marauders Maps

The Marauder's Map is a magical document that reveals all of Hogwarts School of Witchcraft and Wizardry.

Animated Map

To create the animated trajetory of object, we make some changes from the last example, make notes.



The distance from Chang-Gung University to Destination NSU
457 m (about 5 minutes walk by foot)

Description:

file:///Users/cch/Documents/2016/Android/googlemap/GP
Zimbra: 收件箱
:: 長庚大學 :: [校務資訊系統]
Android/googlemap/
GoogleMap
GPSCoord-7.html
2. Moving Tracjectory
1. CSS
The University nearby Chang-Gung University
Map
Satellite
Formosa Plastics Group Museum
台塑企業文物館
Chang-Gung University Library
長庚大學圖書館
National Taiwan Sport University
國立體育大學
Gueishan Chang-Gung University Post Office...
龜山長庚大學郵局桃園36支局
Chang Gung University of Science...
長庚科技大學林口校區
Google
Map data ©2016 Google
Terms of Use
Report a map error

1. First for

```
<!doctype html>
<html lang="en">
<head>
    ...
<style type="text/css">
    body {
       margin: 10;
       padding: 10
     }
    #map_canvas {
        position: absolute;
        width: 60%;
        height: 60%;
        left:20%;
        right:20%;
        top:30%;
        overflow: auto
    }
    div.vertical-text {
        -webkit-transform:rotate(90deg);
        -moz-transform:rotate(90deg);
        -o-transform: rotate(90deg);
        transform: rotate(90deg);
        transform-origin: left top 0;
        white-space:nowrap;
        display:block;
        bottom:0;
        width:20px;
        height:20px;
        font-family: ‘Trebuchet MS’, Helvetica, sans-serif;
        font-size:1.em;
        font-weight:normal;
        text-shadow: 0px 0px 1px #333;
    }
</style>
</head>
...
```

Here the syntax for CSS

- `tag {...}`: function on HTML's `<tag>`;
- `#name {...}`: function on HTML's tag with `id/name="name"`;
- `div.vertical-text {...}`: function on HTML's tag, <div class='vertical-text>`;

2. create a moving object, small circle ○, which runs on the chosen trajectory:

```
<script type="text/javascript">
...
   var lineSymbol = {
       path: google.maps.SymbolPath.CIRCLE,
       scale: 8,
       strokeColor: '#393'
   };
...
   var myMarker = new google.maps.Marker({
    ...
       animation: google.maps.Animation.DROP
   });
   google.maps.event.addListener(myMarker, 'click', toggleBounce);

   function toggleBounce() {
       if (myMarker.getAnimation() != null) {
          myMarker.setAnimation(null);
       } else {
        myMarker.setAnimation(google.maps.Animation.BOUNCE);
       }
    };
```

- Marker can be animated by two ways:
  - DROP: jump to the end;
  - BOUNCE: move while animation is *null*.
- While initialized, set Marker is DROP,
- set Listener on mouse `click` event; if `on`, continuously `jump`ing while animation becomes null.

3. Determine the position of moving marker and refresh map; the respose requires a new function, `animateCircle()`, to refresh the marker position every **20** milli-second:

```
   <script type="text/javascript">
   ...
      var TrajPath= new google.maps.Polyline({
         ...
         icons: [{
            icon: lineSymbol,
            offset: '100%'
         }],
         ...
         map: map
       });
      //TrajPath.setMap(map);
      animateCircle();
      map.setCenter(newMarker.position);

      // adds the marker on the map
      newMarker.setMap(map);

      function animateCircle() {
        var count = 0;
        window.setInterval(function() {
           count = (count + 1) % 200;

           var icons = TrajPath.get('icons');
           icons[0].offset = (count / 2) + '%';
           TrajPath.set('icons', icons);
        }, 20);
      };

   }
   </script>
```

In [1]:

```
!jupyter nbconvert --to html GoogleMap.ipynb
```

```
[NbConvertApp] Converting notebook GoogleMap.ipynb to html
[NbConvertApp] Writing 1096979 bytes to GoogleMap.html
```

In [ ]: